

W P S (DEPR): 03 / 2014

RBI WORKING PAPER SERIES

---

Re-emerging Stress in the Asset  
Quality of Indian Banks:  
Macro-Financial Linkages

---

Shashidhar M. Lokare



DEPARTMENT OF ECONOMIC AND POLICY RESEARCH  
FEBRUARY 2014

The Reserve Bank of India (RBI) introduced the RBI Working Papers series in March 2011. These papers present research in progress of the staff members of RBI and are disseminated to elicit comments and further debate. The views expressed in these papers are those of authors and not that of RBI. Comments and observations may please be forwarded to authors. Citation and use of such papers should take into account its provisional character.

Copyright: Reserve Bank of India 2014

# Re-emerging Stress in the Asset Quality of Indian Banks: Macro-Financial Linkages

Shashidhar M. Lokare<sup>1</sup>

## Abstract

*In a bank-based economy, sound health of the banking system is an imperative for efficient financial intermediation in the context of overall development and financial stability. In the post- global crisis period, the Indian banking system, has suffered growing impairment of asset quality. This paper explores the macro-financial linkages and micro-level sources underlying the asset quality deterioration. In line with the ongoing international intellectual discourse, this paper finds the evidence of procyclicality in the Indian context as reflected in past credit boom-bust episodes as well as economic and interest rate cycles. Anemic external macroeconomic situation post-crisis, high inflation and dwindling asset prices have eroded the debt servicing capacity of borrowers and contributed to the asset quality problems. Sectoral analysis demonstrates rising incidence of loan defaults in infrastructure, particularly power, retail, SSIs and agriculture, across bank groups. Going forward, asset quality could come under greater strains, given the weakening economic backdrop and global headwinds, impinging on the soundness of banks and macro financial stability.*

**JEL Classification:** E230, E3, G21

**Key words:** GDP, business cycles, prices, credit, assets

---

<sup>1</sup> Assistant Adviser, Monetary Policy Department, Reserve Bank of India: ([email](#)). The paper reflects personal views of the author and should not be ascribed to the institution to which he belongs.

The author would like to thank Shri K. U. B. Rao, Adviser and Smt. Rekha Misra, Director of DEPR for instigating this work and their insightful comments. He thanks the Department of Banking Operations and Development and Financial Stability Unit for their comments and Department of Banking Supervision for the data support. Thanks are also due to Kum. Shromona Ganguly for her useful inputs on Section VI of this paper.

## **Re-emerging Stress in the Asset Quality of Indian Banks: Macro-Financial Linkages**

### **Preface**

The Indian banking sector accounts for a major portion of financial intermediation and is considered to be the main channel of monetary policy transmission, credit delivery and payment systems. The stability and sound health of the banking system hence is a key pre-requisite for overall economic development and financial stability. The Non-Performing Assets (NPA) is an important prudential indicator to assess the financial health of the banking sector. Besides asset quality, NPAs epitomize the credit risk management and efficacy in the allocation of resources.

There is a near unanimity in the literature that asset quality is a critical determinant of sound functioning of the banking system. NPAs affect the operational efficiency, which in turn affects profitability, liquidity and solvency position of banks (Michael, *et al*, 2006). The consequences of NPAs would be reduction in interest income, high level of provisioning, stress on profitability, gradual decline in ability to meet steady increase in cost, increased pressure on net interest margin (NIM) thereby reducing competitiveness, steady erosion of capital resources and increased difficulty in augmenting capital resources (Batra, 2003). The asset quality problems could be contagious, insidious and they prey on the weak. The contagious nature of loan losses emanates from the fact that their downside impact can quickly transmit to earnings, capital, and liquidity. They are insidious in the sense that it is often difficult to know that there is a problem until it's too late. Moreover, these problems prey on the weak banks, which are vulnerable and have relatively small amounts of capital to absorb unanticipated losses<sup>2</sup>.

NPAs generate a vicious cycle of effects on the sustainability and growth of the banking system, and if not managed properly could lead to bank failures. Empirical evidence indicates a relationship between bank failures and higher NPAs worldwide (Chijoriga, 2000 and Dash, *et al*, 2010). The links between financial crises and bank funding may be strongest during banking crises. Such crises tend to arise primarily from deteriorating economic fundamentals, notably declines in asset quality (Borio and Lowe, 2002). The issue is of particular importance after the recent global financial crisis and the failure of some large institutions and bailouts that followed. In the Indian context also empirical research suggests that asset quality is one of the main determining factors of credit, besides time deposits and lending interest rate (RBI, RCF, 2006-08).

---

<sup>2</sup> [www.fedpartnership.gov/bank-life-cycle/transcripts/AssetQuality.htm](http://www.fedpartnership.gov/bank-life-cycle/transcripts/AssetQuality.htm)

With the initiation of the reform process in the early 1990s, there has been a paradigm shift in the credit allocation process from micromanagement to a greater role for market forces. The banking sector in India has witnessed significant transformation over the last two decades in terms of type of borrowers/type of instruments and the credit pricing. With enhanced freedom for business operations and increased presence of private/ foreign banks and non-bank credit institutions, the predominance of banking institutions in the credit market has increased and has become increasingly competitive. Rapid credit expansion, particularly since the last decade, was encouraged by improvement in asset quality, which, to some extent reflected the financial deepening process. Robust economic growth during the first half of the last decade also increased the demand for credit (RBI, RCF, 2008).

In the period immediately following the global financial crisis, when asset quality of banks in most advanced and emerging economies was impaired, the asset quality of Indian banks was largely maintained (RBI, AR, 2011-12). Nevertheless, in the recent years, particularly since 2012, concerns regarding impairment in asset quality of Indian banks have come to the fore. Against this backdrop, this paper attempts to undertake a critical analysis of asset quality of scheduled commercial banks (SCBs), since they account for more than three-fourths of total credit outstanding in the country. In this endeavour, Section II sets out some stylized facts from literature on the possible causes and impact of asset quality impairment. A brief recap of data and methodology used in this study is outlined in Section III. Section IV examines the trends in gross advances and NPAs at the aggregate level and also undertakes an empirical analysis to understand the macro-financial linkages underlying the asset quality phenomenon. Section V delineates the micro level sources of NPAs at sectoral level. The bank group-wise trends are set out in Section VI. Section VII assesses the recent policy of restructuring of advances and examines its impact in the near to medium term. The concluding remarks are set out in the last Section VIII.

## **II. Evidence from Literature**

Literature on the asset quality of banks brings to the fore several useful perspectives. An asset can turn in to a NPA when the borrower defaults on his repayment of interest and/or principal on agreed terms. In the literature several reasons are cited for asset quality impairment. Business cycle could be a primary reason for banks' non-performing loans (Misra and Dhal, 2010). Sergio (1996) in a study on non-performing loans in Italy found that an increase in the riskiness of loan assets is rooted in a bank's lending policy adducing to relatively unselective and inadequate assessment of sectoral prospects.

The problem of NPAs is related to several internal and external factors confronting the borrowers (Muniappan, 2002). The internal factors are diversion of funds for expansion, diversification and modernisation, taking up new projects, helping/ promoting associate concerns, time/cost overruns during the project implementation stage, business (product, marketing, etc.) failure, inefficient management, strained labour relations, inappropriate technology/technical problems, product obsolescence, etc., while external factors are recession, non-payment in other countries, inputs/power shortage, price escalation, accidents and natural calamities.

Kent and D'Arcy (2000), while examining the relationship between cyclical lending behaviour of banks in Australia argued that the potential for banks to experience substantial losses on their loan portfolios increases towards the peak of the expansionary phase of the cycle. However, towards the top of the cycle, banks appear to be relatively healthy; non-performing loans are low and profits are high, reflecting the fact that even the riskiest of borrowers tend to benefit from buoyant economic conditions. While the risk inherent in banks lending portfolios peaks at the top of the cycle, this risk tends to be realized during the contractionary phase of the business cycle. At this time, banks non-performing loans increase, profits decline and substantial losses to capital may become apparent. There are other reasons why credit growth and loan quality are pro-cyclical aside from a financial accelerator. Herd behavior of bank managers can lead to a deterioration of credit standards during economic booms, as credit mistakes are judged more leniently (De Bock and Demyanets, 2012).

Gopalakrishnan (2005) classified the causes for NPAs into political, economic, social and technological and observed that neglect of proper credit appraisal, lack of follow-up and supervision, recessionary pressures in economy, change in government policies, infrastructural bottlenecks, and diversion of funds are the major causes of NPAs. The problem of NPAs is not mainly because of lack of strict prudential norms, but due to legal impediments and time consuming nature of asset disposal process, postponement of the problem by the banks to show higher returns and manipulation by the debtors using political influence (Reddy, 2002). According to another study, the major reasons for NPAs include improper selection of borrowers' activities, weak credit appraisal system, industrial problems, inefficient management, slackness in credit management and monitoring, lack of proper follow-up, recessions and natural calamities and other uncertainties (Aggarwal and Mittal, 2012). The clamor for credit risk management can easily be lost in the heat of credit cycles, economic adversity, and intense competition<sup>3</sup>. In the context of intense competition, focus on market

---

<sup>3</sup> [www.fedpartnership.gov/bank-life-cycle/transcripts/AssetQuality.htm](http://www.fedpartnership.gov/bank-life-cycle/transcripts/AssetQuality.htm).

share leads to lax underwriting standards without enough regard for borrowers' repayment capability<sup>4</sup>.

The opinion over the relationship between inflation and NPAs is divided. Rinaldi and Sanchis Arellano (2006) find a positive relation between the inflation rate and nonperforming loans, while Shu (2002) reports a negative relation. Negative structural shocks to economic growth, the exchange rate, or debt-creating capital inflows tend to bring down private credit while loan quality deteriorates. It is also said that an increase in asset prices pushes up the net worth of firms, households or countries, improving their capacity to borrow. Through general equilibrium effects, this dynamic can then lead to further increases in asset prices. In this way, strong balance sheets in boom periods may lead to excessive lending against inflated values of collateral (De Bock and Demyanets, 2012).

In the Indian context, it has been pointed out that though public sector banks recorded improvements in profitability, efficiency (in terms of intermediation costs) and asset quality in the 1990s, they continue to have higher interest rate spreads but at the same time earn lower rates of return, reflecting higher operating costs. Private sector banks, on the other hand, appear to have lower spreads as well as lower operating expenses comparable to the banking system in G3 countries (Table 6). At the same time, asset quality is weaker so that loan loss provisions continue to be higher (Mohan, 2004).

### **III. Data and Methodology**

In order to explore the macro-financial linkages of the asset quality phenomenon, the key variables used in this paper include credit growth (credit to agriculture and industry separately), GDP growth (in agriculture and industry separately) and interest rate cycles as also inflation, asset prices and world GDP growth. The relationship between these variables and asset quality has been tested in the extant international literature (see Section II). In the Indian context, the quarterly data for scheduled commercial banks spanning from 2001 to 2013 (2012, wherever not available) are used in this paper. Since the disaggregated (component-wise) NPA data are not available prior to 2001, it has not been possible to extend the sample to the earlier decade. Moreover, the industry-wise NPA data are available only from March 2005.

To investigate the relationship between the above macro-financial variables and asset quality, the regression of the following form has been estimated using the OLS technique. In addition to other diagnostic tests, LM tests, normality distribution tests and heteroskedasticity tests have been used.

---

<sup>4</sup> IDFC Securities Research, online: [www.idfc.com/capital/pdf/report/Asset-quality-Aug11.pdf](http://www.idfc.com/capital/pdf/report/Asset-quality-Aug11.pdf)

$$NPAG_t = \alpha + \beta_1 GDPG_{t-1} + \beta_2 CRGDPR_{t-1} + \beta_3 MMKTRATE_{t-1} + \beta_4 BANKEX_{t-2} + \beta_5 WGDP_{t-10} + \beta_6 WPIINFL_{t-5} + \beta_7 D2004Q3 + \beta_8 D2005Q3 + \beta_9 D2008Q4$$

Where, GDPG stands for GDP growth, CRGDPR for credit-GDP ratio, MMKTRATE for money market rate (proxy for lending rate), BANKEX for stock prices, WGDP for world GDP growth, WPIINFL for WPI inflation and the dummy variables (D2004Q3, D2005Q3, D2008Q4). The results have been analysed in Section IV.

#### IV. An Overview of Macro Trends

##### (A) Trends in Gross Advances and NPAs

An analysis of trends in gross advances and gross NPAs during the last decade brings out the following trends.

##### *(1) Deterioration in Asset quality in recent times*

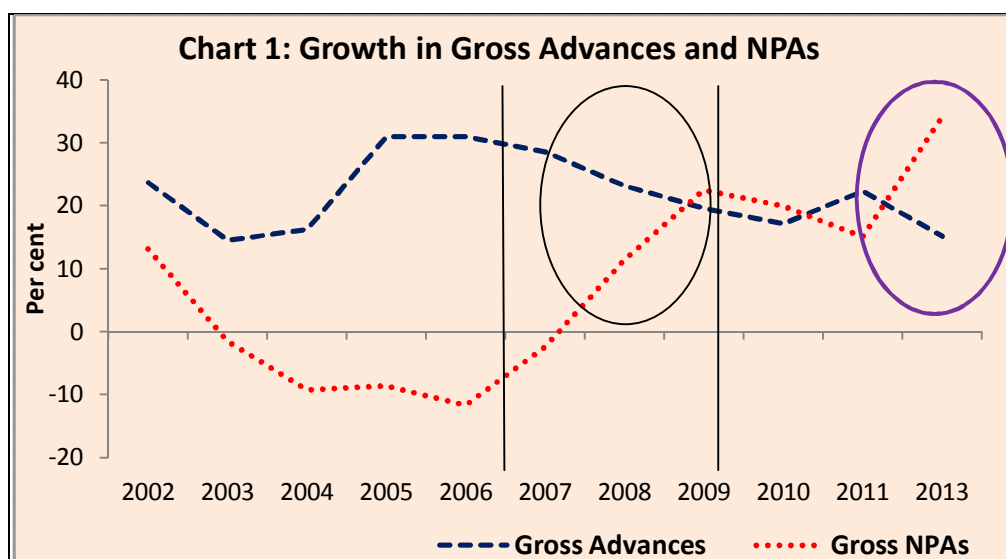
The period since mid-2000 was marked by a sustained improvement in the asset quality of SCBs. However, with the turn of the decade, the signs of asset quality impairment soon came to the fore with the reversal in the declining trend of NPA ratio. The gross NPA ratio (gross NPAs as a per cent of gross advances) witnessed a sequential decline from 12 per cent as at end March 2001 to 2.4 per cent as at end March 2011. Thereafter, the NPA ratio rose to 3.4 per cent as at end-March 2013 (Table 1 and Chart 1).

**Table 1: Total Gross Advances and Gross NPAs of SCBs**  
(Amt in Rs. crore)

End-March	Total Gross Advances	Gross NPAs	Gross NPAs as a %age of Gross Advances	Growth in Gross Advances	Growth in Gross NPAs
2001	522,365	62,896	12.0	-	-
2002	645,865	71,113	11.0	23.6	13.1
2003	739,125	70,042	9.5	14.4	-1.5
2004	859,092	63,538	7.4	16.2	-9.3
2005	1,125,056	58,024	5.2	31.0	-8.7
2006	1,473,723	51,243	3.5	31.0	-11.7
2007	1,893,775	49,997	2.6	28.5	-2.4
2008	2,331,750	55,695	2.4	23.1	11.4
2009	2,788,424	68,216	2.4	19.6	22.5
2010	3,264,907	81,808	2.5	17.1	19.9
2011	3,992,145	94,121	2.4	22.3	15.1
2012	4,666,337	137,102	2.9	16.9	45.7
2013*	5,371,151	183,854	3.4	15.1	34.1

\* As at end-September.





## ***(2) Growth in NPAs outpaces the growth in credit***

During the period 2001-2012, three distinct phases are discernible in terms of growth in gross advances and growth in gross NPAs.

***(a) First Phase: 2001 to 2006:*** This period was marked by a sharp decline in the growth of gross NPAs and gradual acceleration in the growth of credit (Table 1 and Chart 1). In fact, during the pre-crisis period, bank credit expanded at a robust pace, averaging at over 25 per cent. Several factors, such as increased financial deepening, increased competition, improvement in asset quality of banks and rapid product innovations contributed to the rapid credit expansion. Infrastructure, SMEs, farm credit and retail sectors primarily powered the growth of bank credit during this period (RBI, RCF, 2008).

As a result of various reform measures<sup>5</sup>, there was significant improvement in the asset quality, particularly from the year 2000, partly as a result of expansion of loan volumes and partly on account of write-offs and recovery of past dues. Thus, rapid credit expansion from 2002-03, to an extent, was encouraged by improvement in asset quality as credit intermediation function was impaired in the mid-1990s on account of high level of NPAs (RBI, RCF, 2007).

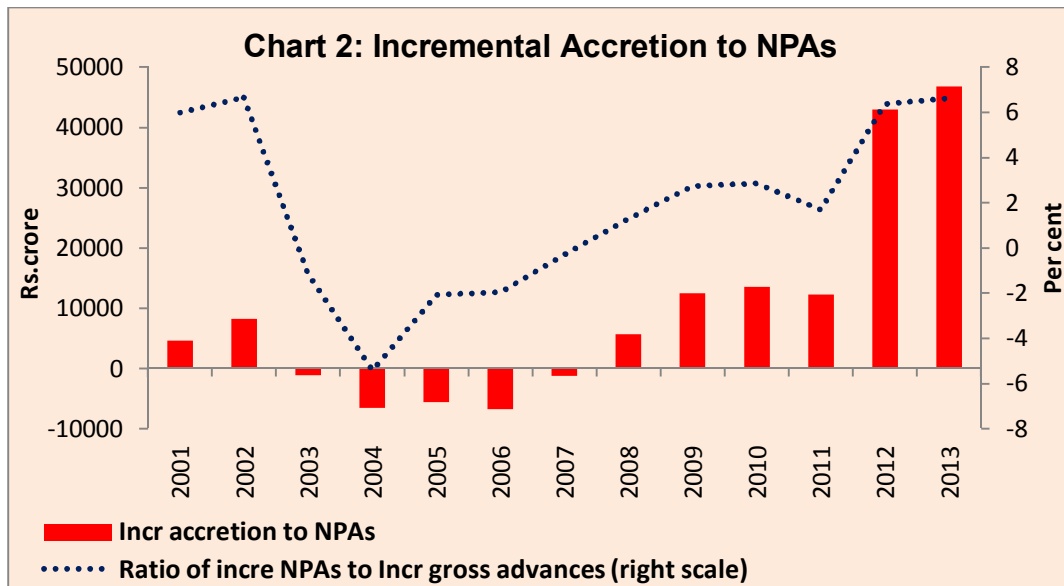
<sup>5</sup> It may be recalled that by the mid 1990s, a large magnitude of resources of credit institutions had become locked up in unproductive assets in the form of non-performing loans. Apart from limiting the ability of credit institutions to recycle their funds, this also weakened them by adversely affecting their profitability. The Reserve Bank and the Central Government, therefore, initiated several institutional measures to recover the past dues to banks and FIs and reduce the NPAs. These were Debt Recovery Tribunals (DRTs), Lok Adalats (people's courts), Asset Reconstruction Companies (ARCs) and the Corporate Debt Restructuring (CDR) mechanism. Settlement Advisory Committees were also formed at regional and head office levels of commercial banks. Furthermore, banks could also issue notices under the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act, 2002 for enforcement of security interest without intervention of courts. Further, banks, FIs and NBFCs (excluding securitisation companies/reconstruction companies) were permitted to undertake sale/purchase of NPAs. Thus, banks and other credit institutions were given a menu of options to resolve their NPA problems.

**(b) Second Phase: 2006 to 2009:** This period witnessed a reversal in the earlier trends with growth in NPAs showing a sharp spurt and growth in credit registering a gradual slowdown. This was also a period when the divergence between the growth in credit and NPAs narrowed down. In the post-crisis period, credit growth averaged at around 19 per cent partly on account of the pressures from global financial crisis. Banks and other financial institutions were impacted by the indirect spillovers of the crisis during 2008-09. Indian banks faced the stress because foreign investors pulled out of the economy and created a liquidity crunch. There was suddenly less money available to borrow or lend. The tight global liquidity situation in the period immediately following the failure of Lehman Brothers in mid-September 2008, coming as it did on top of a turn in the credit cycle, increased the risk aversion of the financial system and made banks cautious about lending (Subbarao, 2009)

**(c) Third Phase: 2009 to 2012:** During this period, growth in credit as well as NPAs slowed down in 2010. However, by end-March 2012, there was a sharp contrast in the movement of both, with credit growth witnessing a sharp contraction and growth in NPAs trending up. NPAs grew at around 46 per cent as at end March 2012, far outpacing credit growth of around 17 per cent. This widening divergence in the growth of credit and NPAs has implications for the asset quality in the near term. The decline in credit growth during this period could be attributed to the general economic slowdown that set in as a result of combination of domestic and global factors.

### **(3) Incremental Accretion to NPAs Accelerate**

Accretion to NPAs is a critical indicator of efficiency in credit risk management. Banks need to bring down fresh additions to NPAs to improve the quality of their asset portfolio. In consonance with the trends in gross NPAs, the accretions to NPAs was considerably curtailed during the period 2003-2007, but increased significantly thereafter (Chart 2). The incremental NPAs remained negative in most of the years prior to the year 2008. A sharp decline in incremental NPAs reflected significant improvement in credit appraisal, improved risk management and better resource allocation process (RBI, RCF, 2007). The incremental NPAs as percentage of incremental gross advances, which were as low as -0.3 per cent as at end-March 2007 increased significantly thereafter to over 6.6 per cent by end-March 2013.



Thus, in the context of financial turmoil, although some slippage in NPAs was expected, it is noteworthy that the growth in NPAs of Indian banks has largely followed a lagged cyclical pattern with regard to credit growth (RBI, RTP, 2009-10). This relationship is examined in greater detail in the following section.

## **(B) Asset Quality Impairment and its Macro-Financial Linkages**

The asset quality linkages with other macro-financial variables such as credit growth, GDP growth and interest rate cycles as also inflation, asset prices and world GDP growth are examined below.

### **(i) NPAs and Credit Cycle**

The literature identifies credit cycles as an important determinant of banks' asset quality. Cyclicity/pro-cyclicality has been defined as "dynamic interactions (positive feedback mechanisms) between the financial and real sectors of the economy" (FSF, 2009). Financial institutions tend to over-stretch their lending portfolio during economic booms and tend to retrench the same during economic downturns. It has been argued that an expansion in credit growth is associated with the deterioration in asset quality because when banks over expand their lending, they tend to lower their credit standards. This behaviour translates itself into greater slippages in asset quality at matured stages of the credit cycle. The literature identifies various reasons for such pro-cyclical risk-taking behaviour of banks, *viz.*, "herd behaviour" (Rajan, 2005), "principal-agent problem" between shareholders and managers (Borio *et al*, 2001), "disaster myopia" or shortsightedness in underestimating the likelihood of high-loss low-probability events (Guttentag and Herring, 1986), among others.

Recent findings, in the Indian context using quarterly data from June 2000, suggested a lagged statistically significant positive relation between deviations from trend in credit to GDP (C-GDP) ratio and growth in gross NPAs (RBI, AR, 2011-12). The deviations from trend in C-GDP ratio has been recommended as a principle guide by the Basel Committee on Banking Supervision (BCBS) for determining economic and financial cycles under its Basel III framework (BIS, 2010). This brings out the cyclicity in the behaviour of asset quality of Indian banks.

An empirical analysis of trends in gross advances and gross NPAs since June 2000 carried out in this study indicates that NPA growth follows credit growth with a lag. The results bring out the fact that credit growth fed into growth in NPAs in a lagged manner, *i.e.*, 1 per cent rise in credit- GDP ratio increases NPAs growth by 0.4 percentage points (after 11 quarters). Similarly, the disaggregated analysis suggest that 1 percent increase in agriculture credit results subsequently in 0.7 per cent growth in agriculture NPAs after a lag of 12 quarters. The estimates, though tentative<sup>6</sup>, are even higher in respect of industrial sector, *i.e.*, 1 per cent increase in industrial credit could increase NPAs by 1.26 per cent after a lag of 9 quarters. This underlines the pro-cyclical behaviour of the banking system, wherein asset quality can get compromised during periods of high credit growth and this can result in the creation of NPAs for banks in the later years (Annex Table 1, 2 and 3).

The asset quality of banks plays a significant role in determining the portfolio behaviour of banks. Earlier findings have brought out that asset quality is one of the main determining factors of credit, besides time deposits and lending interest rate (RBI, RCF, 2006-08). In fact, the credit boom in the pre-crisis period was encouraged by the improvement in asset quality. Secondly, the outcome of high credit growth during the pre-crisis period resulted in the rise in NPAs overtime in the post-crisis period, as evident from the empirical analysis above. Hence, pro-cyclicality of credit pattern during the pre-crisis period could be considered as one of the factors responsible for asset quality deterioration during the recent years. Further, it justifies the countercyclical prudential regulatory policy, as pursued by the Reserve Bank, and corroborates the need to further strengthen such a policy by putting it on a more systematic and rule-based footing to effectively address the concerns of asset quality (RBI, AR, 2011-12).

### ***(ii) Growth and NPAs Cycle***

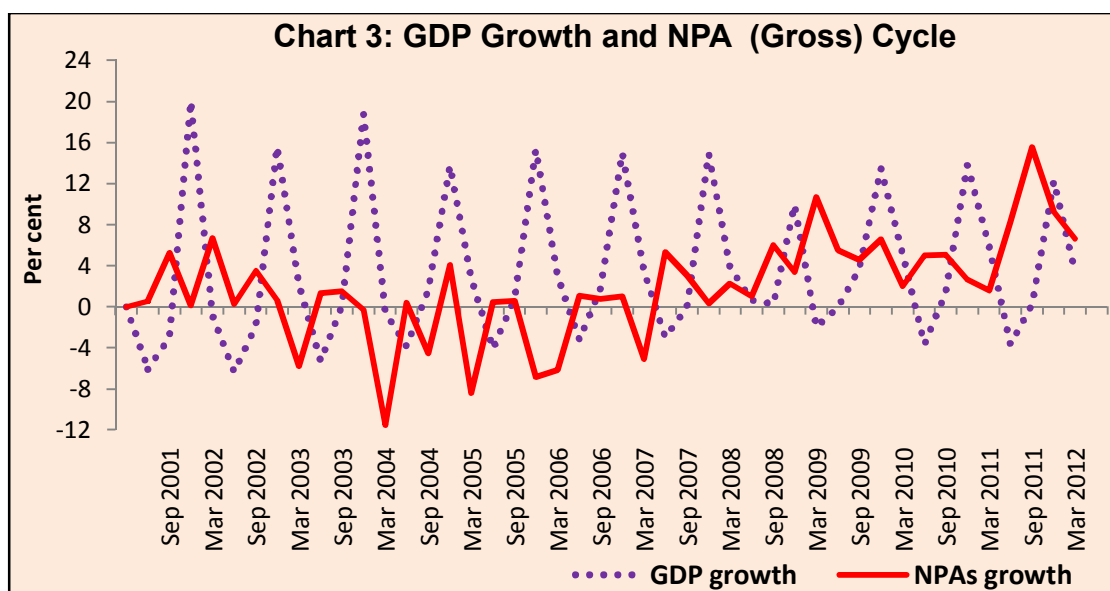
It is often said that general economic slowdown impinges on the performance of banks and financial institutions, since slump in major economic activities results in poor recoveries and consequent deterioration in asset quality. During the pre-crisis

---

<sup>6</sup> The long period disaggregated NPA data on industries is not available for arriving at conclusive results.

period, particularly between 2003-08, the real GDP growth witnessed an impressive turnaround, averaging at 8.9 per cent per annum, which also acted as a strong impetus for credit upturn. However, during the post-crisis period, the real GDP growth decelerated to 6.7 per cent in 2008-09 and to 7.4 per cent in 2009-10. In 2011-12, growth further dropped to 6.2 per cent and further to 5.0 per cent in 2012-13. The slowdown in growth was a result of combination of domestic and global factors. Global macroeconomic and financial uncertainty, weak external demand, elevated level of prices, widening twin deficits combined with weak investment resulted in growth slowdown (RBI, AR, 2011-12).

An analysis of growth in nominal GDP and gross NPAs reveals that slowdown in GDP growth is accompanied by rise in NPAs growth (Chart 3). Over the last one decade, growth in NPAs decelerated sharply, following acceleration in GDP growth in 11 quarters, whereas growth in NPAs rose sharply following the deceleration in GDP growth in 12 quarters.



The empirical analysis in this regard brings out the following points:

- The NPAs growth is inversely related to the GDP growth. Low GDP growth translates in to higher NPAs after a lag of one quarter. Empirical estimates reveal that 1 per cent decline in GDP growth leads to rise in NPAs growth by 0.4 percentage points (Annex Table 1).
- The disaggregated empirical analysis reveals that NPAs growth is inversely associated with growth in agricultural GDP, with a lag period of six quarters approximately, viz., 1 per cent decline in agriculture GDP causes 1.2 per cent increase in NPAs (Annex Table 2).

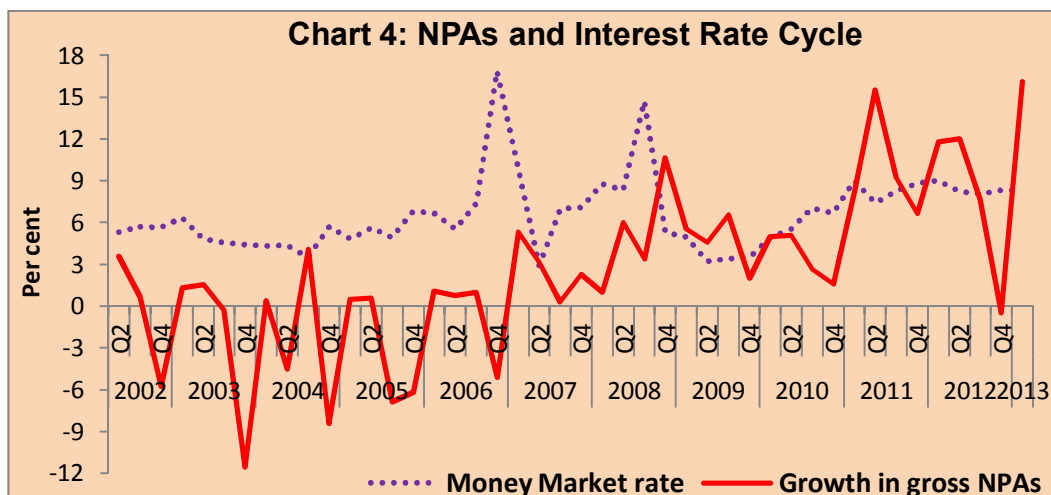
- The relationship between NPAs and business cycle was broadly of the same nature in case of industries. Though long period disaggregated NPA data on industries is not available for arriving at conclusive results, the tentative results indicate that acceleration in industrial GDP causes fall in NPAs growth, with a lag of four quarters approximately (Annex Table 3).

Thus, growth slowdown could be considered as a factor explaining the rise in NPAs in the recent years.

### ***(iii) NPAs and Interest Rate Cycle***

The changes in lending rates of banks may also cause changes in NPA levels. Hardening of interest rates makes repayment of loans difficult for borrowers, particularly those who have availed loans earlier at floating rates. Growth in NPAs also seems to follow a cyclical pattern with lending rate. As a measure of debt servicing cost Bofondi and Ropele (2011) use the short-term money market rate since a large proportion of Italian households' and firms' outstanding bank debt (about 70 and 90 per cent, respectively) consists of floating rate loans or loans with short maturity. It was found that increases in money market rate worsens the quality of loans as higher debt servicing costs make it harder for borrowers to honour their debt. Furthermore, higher interest rates may result in adverse selection of borrowers, with only the riskier ones left in the market (Stiglitz and Weiss, 1981).

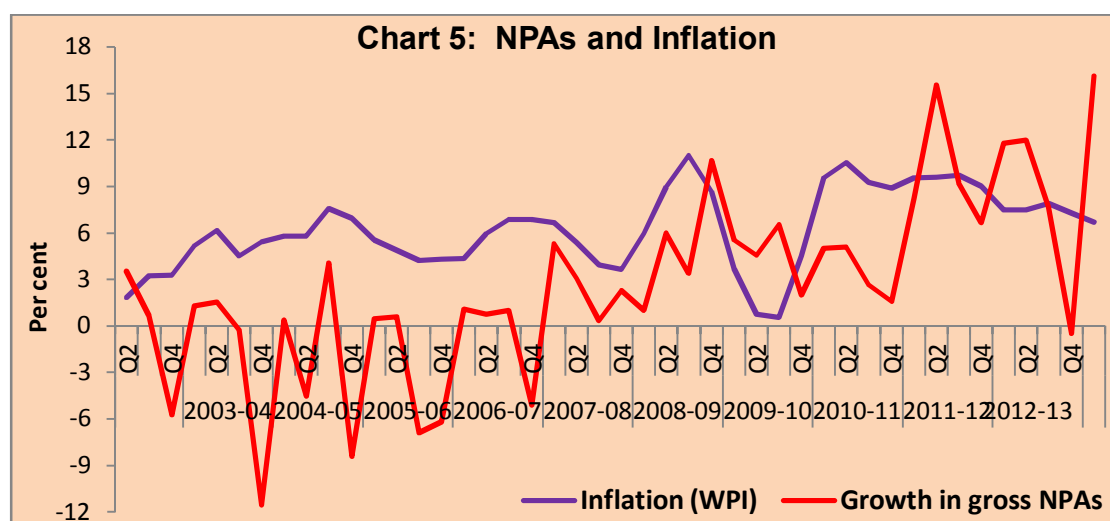
In the Indian context, the movement in short-term money market rate and NPAs reveals that growth in NPAs has remained low during the phases of low interest rate, while NPAs growth has increased with the increase in interest rate (Chart 4). The empirical estimates also corroborate the fact that growth in NPAs is likely to go up in the backdrop of elevated interest rate environment, i.e., 100 bps rise in interest rate (money market rate proxy for lending rate) leads to around 0.6 percentage point rise in NPAs growth after a lag of one quarter. Thus, hardening of interest rates in the recent times might have also contributed to increase in NPAs.



#### **(iv) NPAs and Inflation**

The rising prices erode the disposable incomes and impinge on the repaying capacity of borrowers. Moreover, high inflation passes through to nominal interest rates, making debt servicing more onerous. On the other hand, high inflation may help borrowers, whose debt is denominated in nominal terms, as it erodes the real value of debt (Bofondi and Ropele 2011). There is also evidence in the literature that banks' write-off ratio increases after increase in retail price inflation and nominal interest rates (Hoggarth *et al.* 2005)

In the three year period before the crisis of 2008, the Indian economy expanded by 9.5 per cent on average and WPI inflation averaged at about 5.2 per cent, despite a positive output gap (*i.e.* actual GDP growth minus potential growth). The post-crisis period has in fact exhibited phases of both high growth and low growth coexisting with high inflation. In fact, when India recovered quickly from the crisis, inflationary pressures reemerged due to supply shocks in the form a deficient monsoon, followed by hardening of global commodity prices. Inflation, as measured by the wholesale price index (WPI), went briefly into negative territory for a few months in 2009 but started rising sharply thereafter, touching a peak rate of 10.9 per cent in April 2010. Average WPI inflation was 9.6 per cent in fiscal year 2010-11, 8.9 per cent in 2011-12 and 7.4 per cent in 2012-13. Both growth in NPAs and inflation display a co-movement (Chart 5). The empirical estimates in this study also suggest that rise in inflation by 1 per cent, results in increase in NPAs by 0.4 percentage points after a lag of 5 quarters.

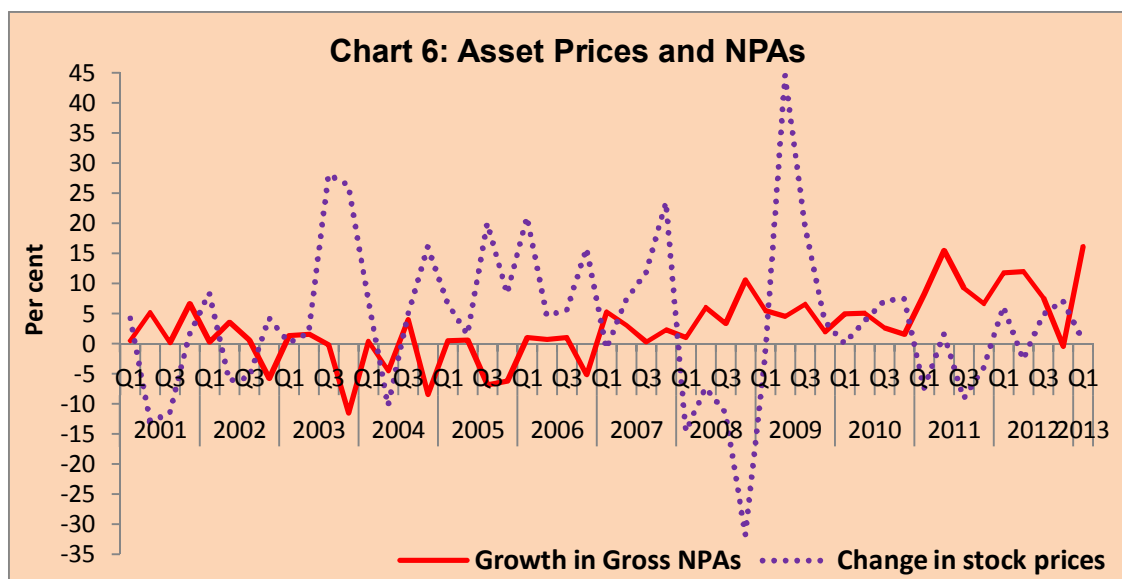


#### **(v) Asset Prices and NPAs**

A surge in asset prices can push up the net worth of borrowers through wealth effect and help in facilitating debt servicing. There is evidence in the literature about



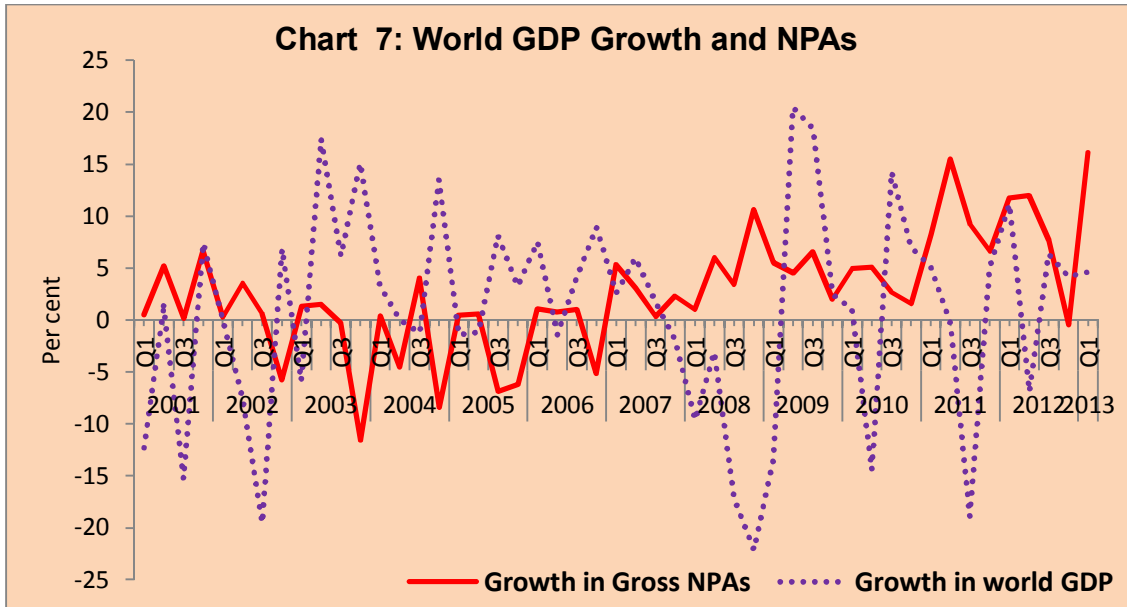
the role of asset prices, particularly stock prices in driving the asset quality of banks (Chen, 2001, Gambacorta, 2005 and Kunt and Detragiache, 1997). High asset prices can cushion borrowers from unexpected shocks by facilitating access to credit and/or helping to service existing debts. Higher asset valuations should, therefore, be associated with lower levels of NPA ratios. A booming stock market reflects a buoyant outlook on firms' profitability; moreover, an increase in financial wealth is expected to decrease households' probability of defaulting on loans since it gives them additional means for servicing their debt (Bofondi and Ropele 2011). There is an inverse co-movement between asset prices and NPAs (Chart 6). The empirical evidence in this study points out that increase in stock prices by 1 per cent leads to 0.04 percentage points decline in NPAs, after a lag of 2 quarters.



#### ***(vi) Global Macroeconomic Situation and Asset Quality***

External environment also plays a role in the setting of domestic macroeconomic conditions. A buoyant external environment can augur well for the overall profitability and asset quality of banks, since positive externalities flowing from positive external environment can feed into domestic economy performance by way of trade, confidence and financial sector channels. There is inverse relationship between world GDP growth (proxy for external environment) and NPAs (Chart 7). The estimates in this study suggest that a decline in world GDP by 1 per cent brings about 0.1 percentage point increase in NPAs (after a lag of 10 quarters).



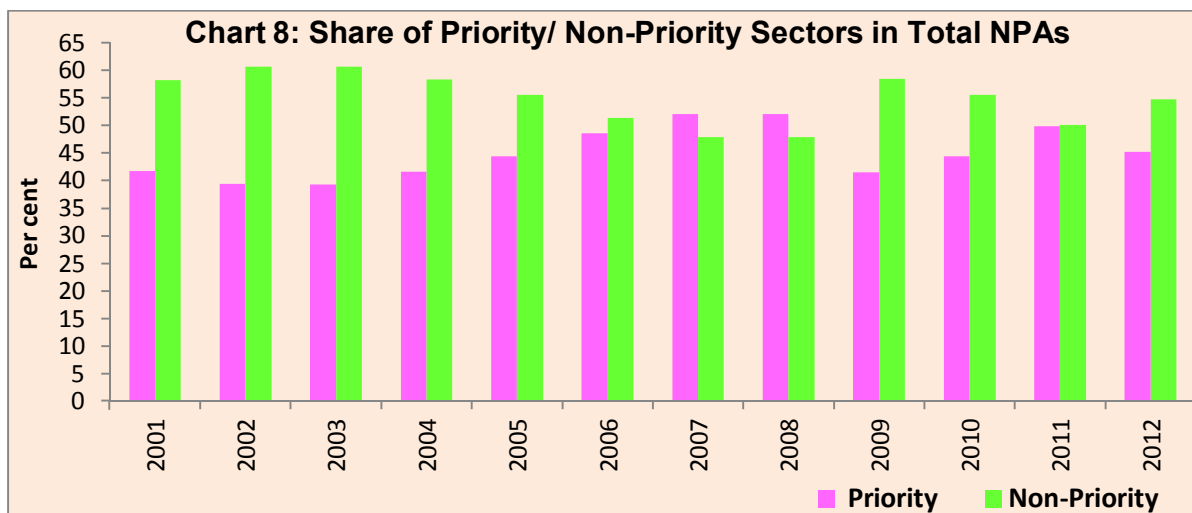


## V. Micro Level Sources of Asset Quality

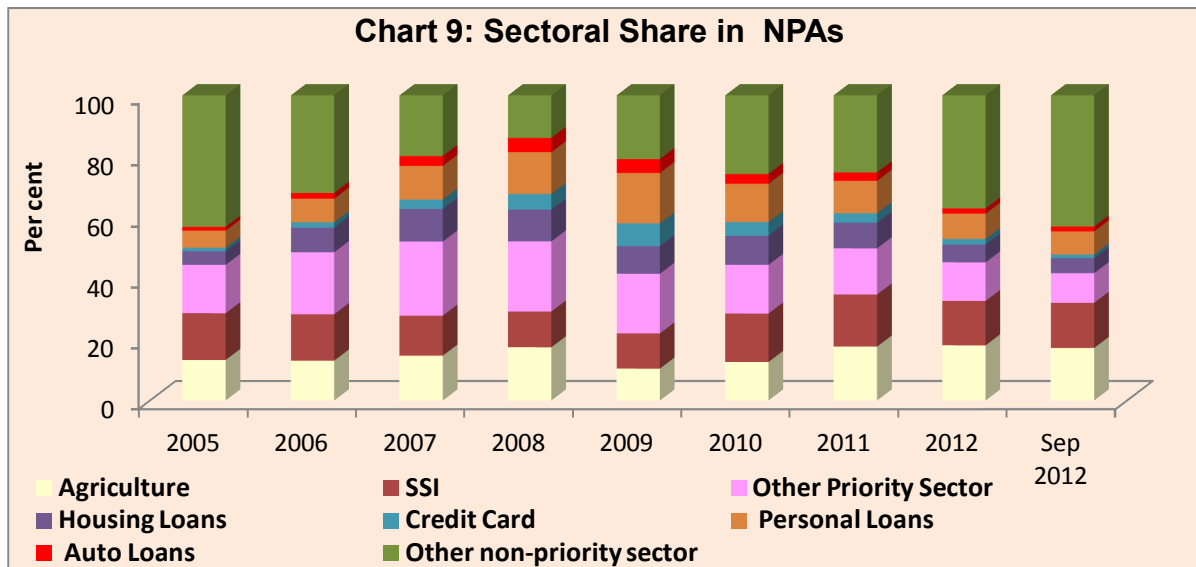
An assessment of trends in gross advances and NPAs in priority and non-priority sectors including the industrial sector are set out below.

### ***(1) Non-priority sector has contributed significantly to acceleration in total NPAs in the recent period***

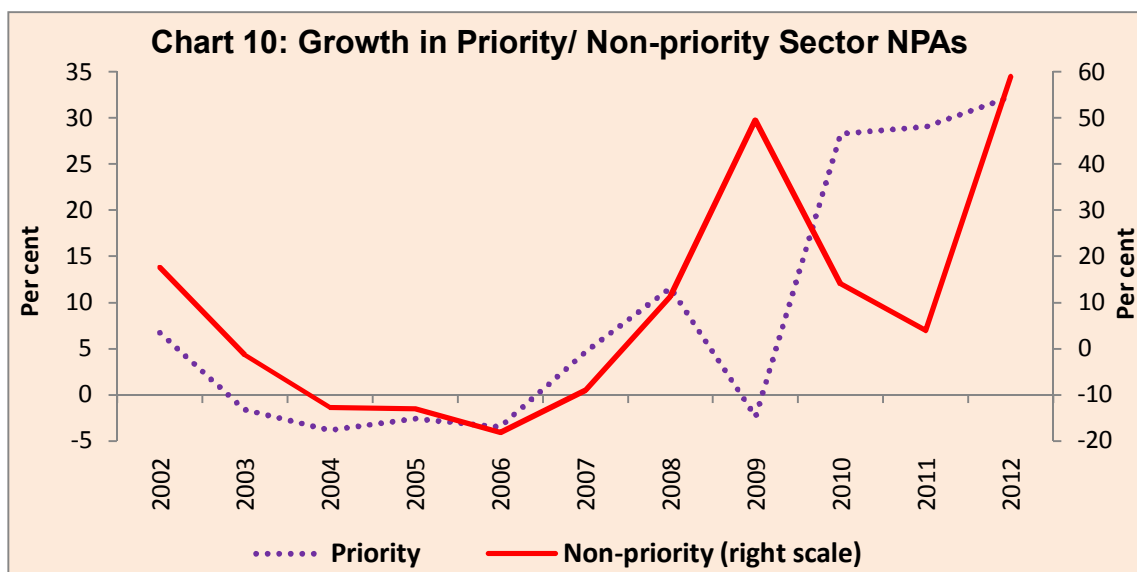
Since the year 2000, the share of priority sector in total NPAs has averaged at 45 per cent, while the share of non-priority sector averaged at 55 per cent. Prior to the period of 2008, the share of priority sector in total NPAs was expanding, while that of non-priority sector was declining in line with the general decline in total NPAs (Chart 8). Disaggregated analysis reveals that, on an average, retail loans occupy the largest share in total NPAs followed by small scale industries (SSIs), agriculture, personal loans, housing loans, exports, credit cards and auto loans (Chart 9).



The growth in NPAs in both priority and non-priority sectors has accelerated since the crisis period of 2008. However, the growth in NPAs of non-priority sector, which averaged at around 32 per cent during the post-crisis period was higher than that of the priority sector (around 22 per cent). Moreover, the growth in the non-priority sector NPAs during 2011-12 was the sharpest in the last one decade (59 per cent as at end-March 2012) (Chart 10).

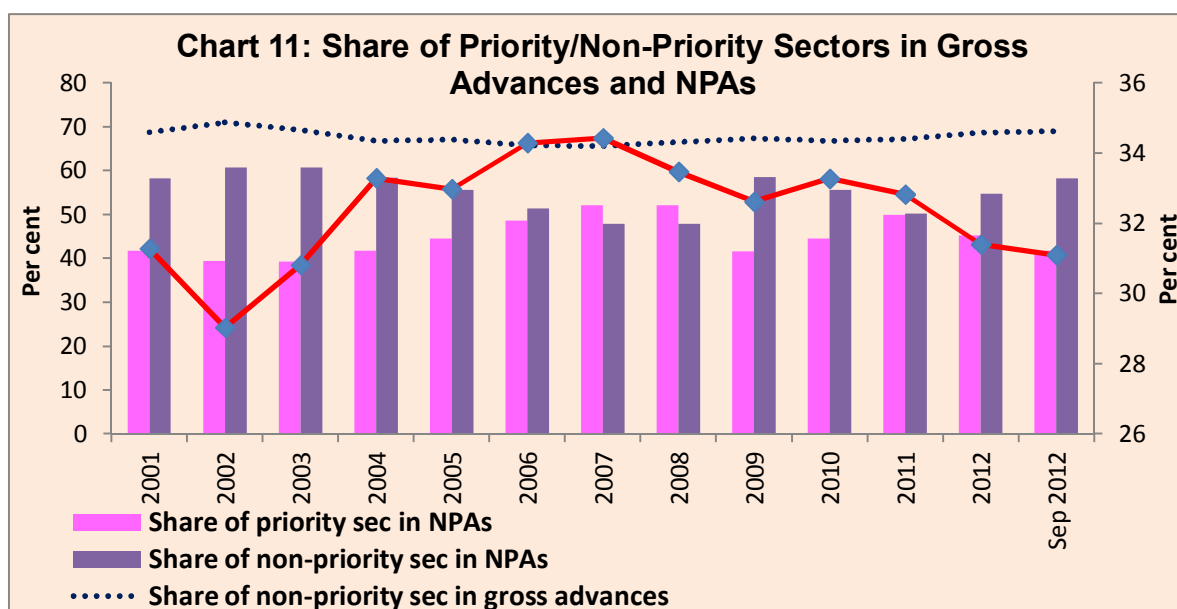


The sharp rise in NPAs of non-priority sector was reflective of the slowdown in the economy and stressed financial conditions of corporates that followed after the global financial crisis. It is noteworthy that the Reserve Bank issued guidelines regarding restructuring of loans, as a one-time measure in view of the extraordinary external factors during the crisis period, for preserving the economic and productive value of assets, which were otherwise viable.



**(2) Priority sector share in aggregate NPAs not commensurate with its share in total credit**

Since the last decade, the share of priority sector in gross advances averaged at over 32 per cent, while its share in total NPAs remained much higher, averaging at around 45 per cent (Chart 11 and Table 2).



**Table 2: Share of Priority/ Non-Priority Sectors in Total Gross Advances and NPAs**

(in per cent)

	Priority Sector		Agriculture		SSI		MSE		Other Priority Sector		Non-Priority Sector	
	Credit	NPAs	Credit	NPAs	Credit	NPAs	Credit	NPAs	Credit	NPAs	Credit	NPAs
2001	31.3	41.7	9.9	12.2	11.1	18.2	-	-	10.3	11.2	68.7	58.3
2002	29.0	39.4	9.3	11.9	9.4	17.0	-	-	10.4	10.4	71.0	60.6
2003	30.8	39.3	9.7	11.8	8.4	16.5	-	-	12.7	11.0	69.2	60.7
2004	33.3	41.7	10.2	12.2	8.1	16.1	-	-	14.9	13.4	66.7	58.3
2005	33.0	44.5	10.6	13.3	7.0	15.3	-	-	15.4	15.8	67.0	55.5
2006	34.3	48.6	11.7	13.1	6.6	15.2	-	-	16.0	20.3	65.7	51.4
2007	34.4	52.1	12.2	14.7	6.6	13.1	-	-	15.6	24.3	65.6	47.9
2008	33.5	52.1	11.7	17.5	8.1	11.7	-	-	13.6	23.0	66.5	47.9
2009	32.6	41.5	12.2	10.5	8.3	11.5	-	-	12.1	19.5	67.4	58.5
2010	33.3	44.5	13.1	12.7	9.6	15.9	-	-	10.6	15.9	66.7	55.5
2011	32.8	49.9	12.6	17.7	-	-	11.2	17.0	8.9	15.1	67.2	50.1
2012	31.4	45.3	12.3	18.1	-	-	10.3	14.5	8.7	12.7	68.6	54.7
Sep 2012	31.1	41.7	12.1	17.2	-	-	10.5	14.8	8.5	9.7	68.9	58.3
<b>Average Share</b>	<b>32.4</b>	<b>44.8</b>	<b>11.4</b>	<b>14.1</b>	<b>6.4</b>	<b>11.6</b>	<b>2.5</b>	<b>3.6</b>	<b>12.1</b>	<b>15.6</b>	<b>67.6</b>	<b>55.2</b>

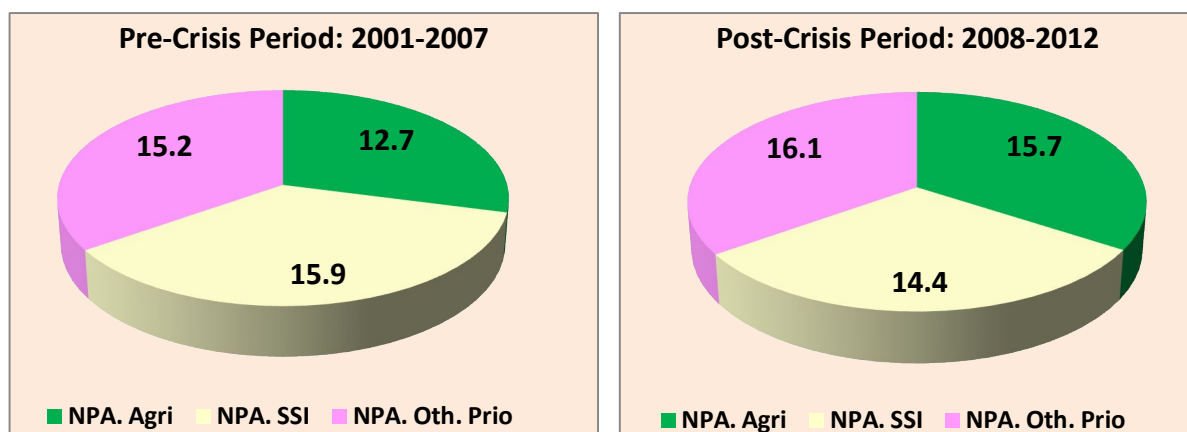
-: Not available

## (A) Priority Sector

### (1) *The share of agriculture in total NPAs remains lower than that of other priority sectors*

The disaggregated analysis of priority sector shows that over the last one decade, the average share of agriculture in total NPAs remains lower than the share of SSIs and other priority sectors. However, the share of agriculture and other priority sectors in aggregate NPAs increased, while that of SSIs declined during the post-crisis period (Chart 12).

**Chart 12: Share of Priority Sectors in NPAs**



The recent years have witnessed increased credit flow to agriculture. The share of agriculture in total gross advances increased from 10.5 per cent in the pre-crisis period to 12.3 per cent in the post-crisis period. The increase in credit flow to SSI sector was relatively lower in the post-crisis period. However, in respect of other priority sectors, even while the share in gross advances came down, their share in aggregate NPAs increased during the post-crisis period (Chart 13).

**Chart 13: Share of Priority Sectors in Gross Advances**

