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# Exploring Characteristics of Credit Risk in Business Loans

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The purpose of this study is to explore the main features of credit risk in grant of commercial loans in Indian public sector banks and its impact on their profitability. The study is based on empirical analysis of historical data of public sector banks from 2008-2013, and primary data from survey among 337 credit managers. The study uses ratios, growth rates, ANOVA, linear regression analysis, and post hoc tests, to find the main characteristics of credit risk in these banks. The study concludes that though the public sector banks are financially sound, they have large amount of stressful assets which include both non-performing and restructured advances for business and industry. This study suggest that understanding the characteristics of credit risk is essential to study the causes of credit risk, for effective credit risk management in these banks. High non-performing assets impact on fresh credit delivery to business and industry, and thereby affect economic growth.

**Keywords-** GNPA ratio, Sensitive sectors, Restructured advances, Differential risk, Stressed Assets

## Introduction

The Indian banking industry has undergone tremendous transformation since the 1980s under the impact of deregulation, advances in IT and globalization (RBI report on Currency and Finance, 2006-08). Risk exposure to banking system has increased due to fierce competition, socio-economic patterns,increased foreign exchange business and cross border activities (Arora, 2013). Changing global and business environment has necessitated for the industry, the need for a better credit risk framework for risk mitigation and control. Since loans and advances, and that for business and industry, are the largest asset item on any bank's balance sheet, they are the major source of their profitability, and credit risk. Any advance becoming non-performing immediately dents into the profits of the bank and deteriorates its asset quality.

Since the character of the Indian banking industry is broadly public in nature, with public sector banks (PSBs) accounting for more than two-thirds of total assets of all scheduled commercial banks, as at end-March 2012 (RBI Report on Trends& Progress of Banking in India, 2011-12), the problem of credit risk management is a serious business for these banks. The immediate challenge faced by these banks is to manage quality of their loan assets while boosting the credit flow to all the productive sectors of the economy.For facing this challenge, there is a need for understanding the main characteristics or parameters of credit risk in public sector banks.

## Literature Review

The health of the financial sector is a matter of policy concern, especially in developing countries where failure in financial intermediation can disrupt the development process (Das &Ghosh, 2007). According to Lepus (2004), one of the hardest challenges faced by banks in the risk area is active credit risk management. It requires banks to have consistent risk-based credit limits, rational risk based capital allocations and consistent credit decisions (Lepus, 2004). Active credit risk management can also mitigate future crisis events thus bringing considerable financial benefits (Lepus, 2004).

The risk of loan default is the one of the most important risks faced by banks (Dahiya et al., 2003).Risks associated with the key banking products (what the bank has lent) must be understood and managed (Greuning&Bratanovic, 2009). A bank's capacity for credit risk management will contribute significantly to the quality of its risk

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management practices (Greuning&Bratanovic, 2009). To reduce or limit credit risk, regulators shall pay close attention to three issues: exposure to a single customer, related party financing, and overexposure to a geographic area or economic sector (Greuning&Bratanovic, 2009).

During economic expansion, banks are often engaged in fierce competition for market share in loans, resulting in rapid credit growth (Das &Ghosh, 2007). This has resulted in high non-performing assets (NPAs). NPAs do not generate interest income for the banks, but at the same time banks are required to make provisions for such NPAs from their current profits (Muniappan, 2002). NPAs have a deleterious effect on the return on assets in several ways they erode current profits through provisioning requirements, they result in reduced interest income, they require higher provisioning requirements affecting profits and accretion to capital funds and capacity to increase good quality risk assets in future, and they limit recycling of funds, set in asset-liability mismatches, etc. (Muniappan, 2002).

Tracey & Leon (2011) suggested threshold range for the ratio of NPL/Total Loans as determining differential loan behavior of banks. An implication is that bank lending behavior could restrain economic activity, especially in periods of stress when NPLs are high (Tracey & Leon, 2011). An effective strategy of NPA resolution has to involve the financial and operational restructuring of unviable industrial borrowers (Dong, 2002). However, corporate restructuring has been a difficult process worldwide (Dong, 2002). Its success depends not only on an efficient and effective corporate insolvency regime, but also on labor laws, competition policies, trade policies, and other structural factors (Dong, 2002).

Restructuring is a tool to lend a hand of assistance to borrowers who are temporarily in distress, in particular, where the distress is caused by circumstances beyond the control of the borrower (Chakrabarty, 2012). The need for restructuring should arise only due to circumstances beyond the control of the borrowers and not generally for errors / mismanagement by them (Chakrabarty, 2012). Further, the viability of the project should be established and only after that should any restructuring proposal be considered (Chakrabarty, 2012).

Sah&Bittu (2012) empirically analyzed fundamental factors affecting periodic addition to non-performing assets (NPAs or fresh slippage), taken as proxy for measuring credit risk, in Indian scenario, and revealed that macroeconomic factor(s) gross domestic product (GDP) had significant implication on credit risk management of banks while no 'reverse causation' was observed.

Ghosh (2011) developed a Banking Stability Index (BSI) of 28 public sector banks on the basis of annual data from 1997 2007. He utilized three indicators of banking operations-Loanloss provisions to Total asset ratio, Total capital to Total risk weighted asset ratio and Return on assets ratio. The author classified banks as of high stability, moderate stability and low stability. He classified 10 public sector banks with BSI of low stability.

According to KPMG survey, while there was no major increase in new restructured loans for private sector banks, it has continued to remain high for PSBs during Q1FY13 due to the latter's exposure to State Electricity Boards (SEBs) and sectors such as aviation, textile and steel.Though all the sectors in the economy contributed to the decline in credit growth, the deceleration was more visible in agriculture, real estate, hotels and restaurants, professional services, telecommunication, power, cement, textiles, iron and steel and personal vehicle loans (KPMG, 2013). During FY12, both the global and Indian economies were under stress resulting in an increase in the GNPAs, net non-performing assets (NNPAs) and restructured assets (KPMG, 2012).

During 2011-12, the trends in non-performing assets as per RBI report 'Trends and Progress of Banking in India 2011-12' show that there is a problem of asset quality maintenance and credit risk management before banks. Reserve Bank of India (RBI) in its report on 'Trends and progress of Banking in India, 2011-12' dated 08 November, 2012 (Para 4.29) has specifically maintained, " Gross NPA ratio at system - level increased mainly on account of the deterioration in asset quality of public sector banks... The spurt in NPAs could be attributed to the slowdown prevailing in the domestic economy as well as to inadequate appraisal and monitoring of credit proposals". These public sector banks account for the bulk of the banking system in terms of aggregate deposits, credit, and investments (Misra& Dhal, 2010).

Thus there is a great challenge before Indian public sector banks to understand and tighten their credit risk management practices for loans to business and industry.

## Research Methodology

The objective of this study is to ascertain how and why the characteristics of banking credit risk for commercial or business loans are evolving in Indian public sector banks.

The credit risk characteristics of Indian public sector banks (PSBs), have been sourced from the reports and surveys of Reserve Bank of India (RBI), mainly its annual reports on trends and progress of banking in India, and biannual financial stability reports, from 2008-13.These risk characteristics for PSBs as a group have been substantiated with historical data (annual reports) on individual sample PSBs for the same period (2008-13), to find which banks are facing higher credit risk.

The study has been further reinforced witha survey (3questions-11 variables) on banks' credit managers during July to December, 2013, to understand the managerial perception on few of these risk characteristics:

1. Which sector is more risk prone, manufacturing, services or trading?
2. Which method is more effective to recover/resolve NPAs- one time compromise, debt recovery tribunals, recovery agents, lokadalats, SARFAESI Act, writing off or debt restructuring?
3. How banks can control willful defaults- ban on new finance, making names public or criminal proceedings?

## Sampling and Data Collection

The study uses a sample of six large and six small PSBs, thus covering 46 per cent of 26 Indian PSBs. The banks in large and small categories have been divided on the basis of their share in total assets of public sector banks. Banks with less than 2.5 per cent share of assets have been treated as small banks. Based on 2011-12 annual reports, 14 public sector banks are classified as large banks and 12 as small banks. Sample banks in each category have been selected on judgment sampling method. Large banks in sample are the State Bank of India, Punjab National Bank, Bank of Baroda, Oriental Bank of Commerce, IDBI Bank,Syndicate Bank, and the small banks are the VijayaBank , Dena Bank, United Bank of India, Punjab and Sind Bank , Andhra Bank, and the State Bank of Bikaner and Jaipur.

### *Respondents' Profile*

The study is also based on a survey of 337 credit managers working in credit and recovery departments of sample PSBs, in and around Delhi, polled through a structured questionnaire. The respondents are primarily dealing with SME and mid-corporate loans and have been selected through non-probability convenience sampling method.Out of 337 respondents, 172 are from large PSBs and 165 from small PSBs. The 39 per cent respondents have up to 7 years of banking experience, 25 per cent from 8 to 20 years, and 36 per cent have more than 20 years' experience. The 14.8 per cent respondents are junior managers, 53.4 per cent middle level managers, and 31.8 per cent senior level managers. The respondents also have adequate educational and professional knowledge.

## Data Analysis and Results

The study has been undertaken on both secondary and primary data. Ratios, mean score, standard deviation, andbench mark values of various (secondary data) risk variables have been computed. Linear regression analysis has been undertaken to find degree and direction of causal relationship between credit risk indicators. Descriptive statistics, ANOVA and Tukey's post hoc tests, at 95 per cent confidence level, have been calculated on surveyresponses,through SPSS, to understand the statistically significant differences in managerial perception of three groups of bank managers, on few of the risk characteristics.

### *Credit Risk Characteristics*

The study finds the following main characteristics of credit risk before the Indian public sector banks:

1. *The slow-down in credit growth to business and industry*

   Banking loans to business and industry account for more than two-third of total advances by the Indian banking industry. Since public sector banks (PSBs) dominate the industry, the commercial loans are their main channel for

credit or default risk. Annual growth rate of commercial loans by PSBs indicate their risk appetite or risk aversion.

Stressful macro-economic factors like slow GDP growth, high inflation, as well as growing non-performing assets, had increased the risk aversion among PSBs, and they had reduced their annual credit growth to commercial sectors (Figures 1 & 2).

2. *Differential Credit Risk*

Another important characteristic of credit risk faced by Indian PSBs is that not all commercial sectors or industries are equally risky or equally contributing towards their non-performing assets. Both macro and micro-economic factors are changing the credit risk spectrum of different industries, in different manner. Presently, aviation, power generation, textiles, infrastructure, telecommunication, iron and steel, coal, and mining sectors have highest stressful banking loans, in the form of restructured and non-performing loans.

This makes it essential for banks to assess industry risk for mitigation of both transactional and portfolio credit risk. (Figure 3).

The survey on 337 credit managers about which sector in any industry is more risk prone, manufacturing, services or trading, revealed that 43 % agreed that trading activities in any industry/sector is most risky, 35% found manufacturing risky and only 22% held services sectors more risky. (Figure 4)

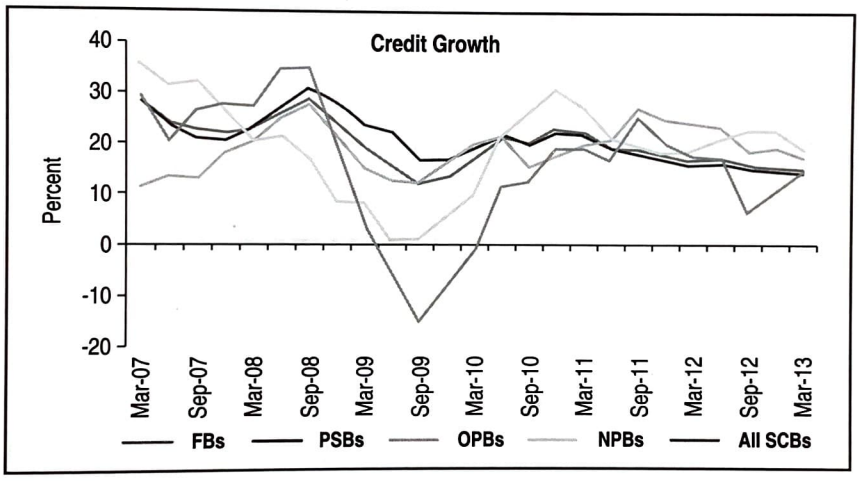


**Figure 1: Credit Growth Rate for all sectors.**

(Source: The RBI's Financial Stability Report, June, 2013)

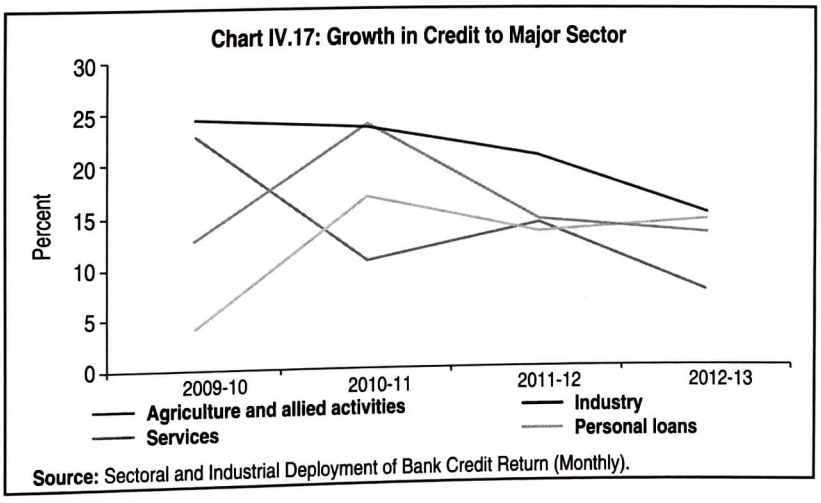


**Figure 2: Credit Growth to Major Sectors.**

(Source: The RBI Report on Trends and Progress of Banking in India, 2012-13).

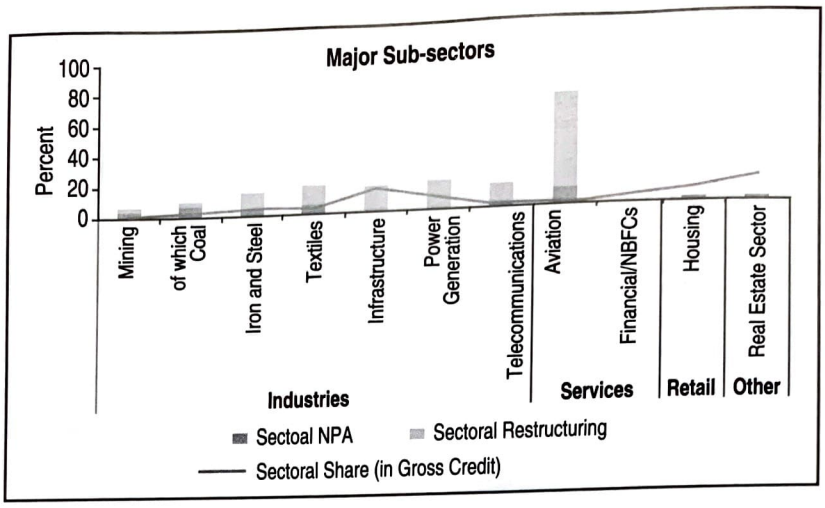


**Figure 3: Stressful Industries in 2012-13.**

(Source: The RBI's Financial Stability Report, June, 2013)

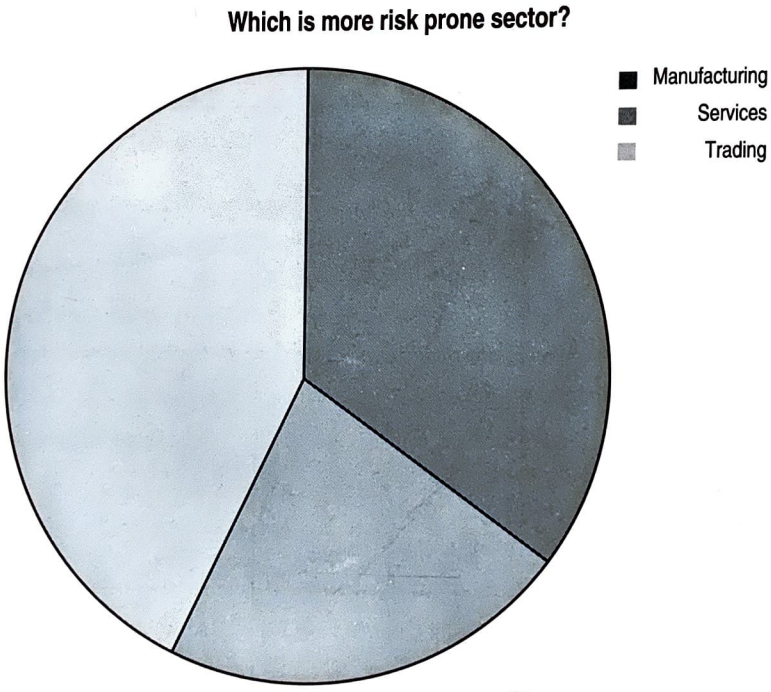


**Figure 4: Differential Credit Risk in any Industry**

ANOVA analysis was conducted to find the statistical significance of mean difference between and within three management group, managers of large and small public sector banks; managers at junior, middle and senior levels; and managers with three levels of experience, up to 7 years, 8 to 20 years, and above 20 years. The F statistics has shown that only responses of large and small bank managers are statistically significant($F=4.061$, df 1,335, at $p=0.045$). Mean values analysis has shown that the managers in large PSBs find trading activities more risky, whereas managers in small banks find manufacturing activities riskier. In other words, differential credit risk exists in different industries as well as in different activities in the same industry, and requires thorough credit analysis by banks to manage credit risk.

3. *Banking Soundness through CRAR or Capital Adequacy Ratio*

Capital to Risk-weighted Assets Ratio (CRAR) is the indicator of banking soundness. Risk-weighted assets are valued based on risk weights for different category of banking loans/exposures. As per RBI's prudential guidelines, the banks shall have minimum 9 per

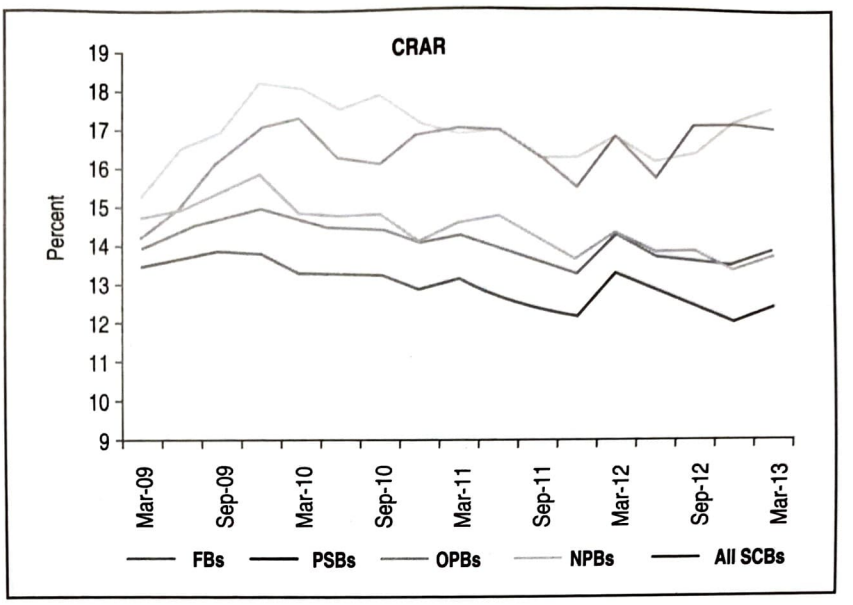


**Figure 5: Capital Adequacy Ratio.**

(Source: The RBI's Financial Stability Report, June, 2013)

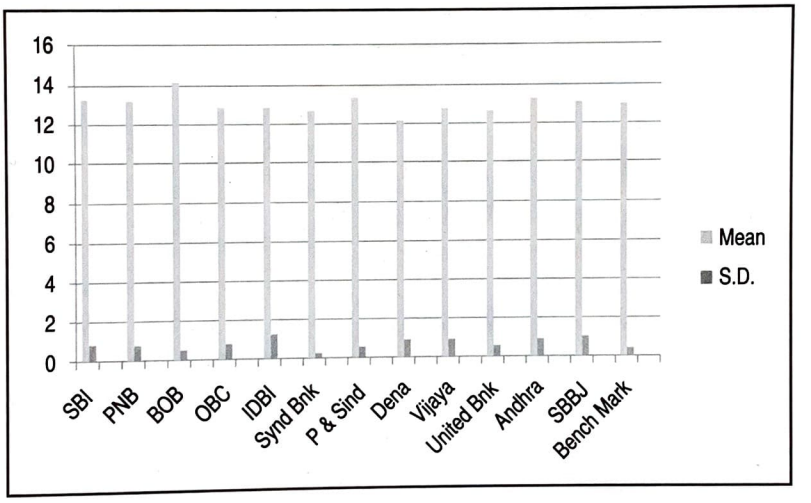


**Figure 6: CRAR(%): 2008-2013**

Note 1: Benchmark is total mean and standard deviation for 2008-13.

cent CRAR or regulatory capital under Basel II framework.

All the PSBs have been consistently above the mark (Figure 5) and with sound capital position. However, their CRAR is also consistently lower than the industry average (SCBs all scheduled commercial banks), and average of foreign banks (FBs), old and new private banks (OPBs and NPBs) (Figure 5). Thus the public sector banks are least capitalized in the banking industry.

A study of CRAR of 12 sample public sector banks for the period 2008-13 has shown that the mean values of capital adequacy are ranging from 12.65% to 14.18%. The mean value is highest in BOB (14.18), followed by Punjab & Sind Bank (13.31). Dena Bank has the lowest mean CRAR (12.16). SBI, the largest PSB has the mean CRAR as 13.28. For 2012-13, six samplebanks, SBBJ, Andhra Bank, United Bank of India, Vijaya Bank, Dena Bank, and OBC; had capital adequacy ratio less than the benchmark ratio (12.30). The most important point is that during 2012-13, except PNB and Syndicate Bank, all other sample banks have reduced CRAR, with highest reduction by the Vijaya Bank ( -13.32%). Benchmark ratios are total

mean and standard deviation for all sample banks.(Figure 6)

While studying the dispersion of capital adequacy, it has been observed that the standard deviation in case of IDBI bank remained the highest (1.24), which was much above the benchmark value of 0.38. It indicates the highest fluctuations in this ratio in IDBI bank.

*Result of Linear Regression Analysis:* Capital adequacy ratio is the indicator of financial leverage risk before a bank. Higher is CRAR, lower is financial leverage. Since credit risk and financial leverage risk reinforce each other, higher is CRAR, and lower is the credit risk. Credit risk is measured by gross or net non-performing assets (GNPA or NNPA).

A linear regression analysis has been conducted, at 5% level of significance, to find the impact of CRAR on NNPA/ Net Advances ratio in 12 sample banks from 2008-13.

Linear regression analysis shows statistically significant inverse relationship between CRAR and NNPA ratio.(Table1). The t-statistic is also significant for intercept and CRAR with unstandardized coefficient equal to -0.276. R Square is 0.151, and Durbin-Watson statistic is 1.403.

The regression equation is:

NNPA Ratio=4.798 0.276*CRAR

Thus during the period the banks have reduced CRAR, theyhave increased the credit risk. The sample PSBs had average CRAR of 12.30% only during 2012-13, recording 6.70% reduction from the past year and 33% increase in NNPA ratio, showing increased credit risk during 2012-13.

4. *Worsening Asset Quality*

The asset quality of the Indian public sector banks has been continuously deteriorating. The main indicators of asset quality of a bank are its gross non-performing (GNPAs) and net non-performing (NNPAs) assets.

Net NPAs =Gross NPA (Balance in Interest Suspense account + credit insurance claims received and held pending adjustment + Part payment received and kept in suspense account + Total provisions held).

Gross NPA ratio (Gross NPA to Gross Advances) and Net NPA ratio (Net NPA to Net Advances) are indexed to measure the quality of banking assets or level of credit risk faced by any bank. Since March, 2011, the gap between growth rate of loans and advances, and growth rate of Gross NPAs has been widening (Figure 7). The GNPA ratio has been increasing at a higher rate for public sector banks (Figure 8).

An analytical study has been undertaken on GNPA and NNPA ratios of 12 sample public sector banks from 2008-2013.

Asset quality measurement by GNPA/ Gross Advances ratio: The mean values of GNPA ratio range from 1.38% to 3.88%. SBI has shown the highest value (3.88), whereas the Punjab & Sind Bank has the lowest value of 1.38. Proportion of gross NPAs are at alarming rate in SBI(3.88) and United Bank of India (3.25), and thusrecording highest credit risk in these two PSBs. Other banks which are higher than the bench mark (2.35) are Vijaya Bank (2.40), SBBJ (2.45), and PNB (2.5). The study of dispersion (standard deviation) of asset quality, based on this ratio, shows that Andhra Bank has the highest variation (1.07). (Figure 9)

**Table 1 : Regression Coefficients**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 4.798 | 1.123 | | 4.274 | .000 |
| | CRAR | -.276 | .086 | -.389 | -3.218 | .002 |

*Note 1: Dependent Variable: NNPA Ratio*
*Note 2:F statistic is 3.893 (df 1, 58), at p=0.002.*

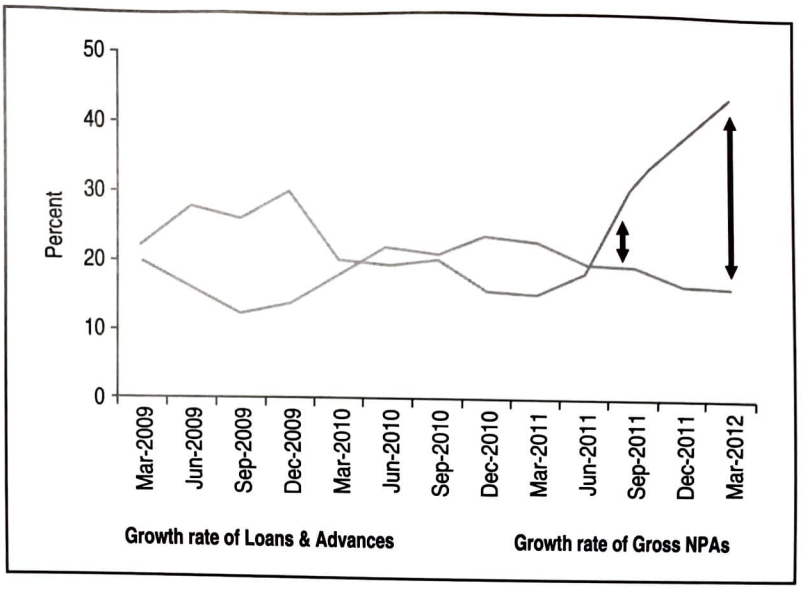


**Figure 7: Increasing GNPAs.**
(Source: The RBI's Financial Stability Report, June, 2012)

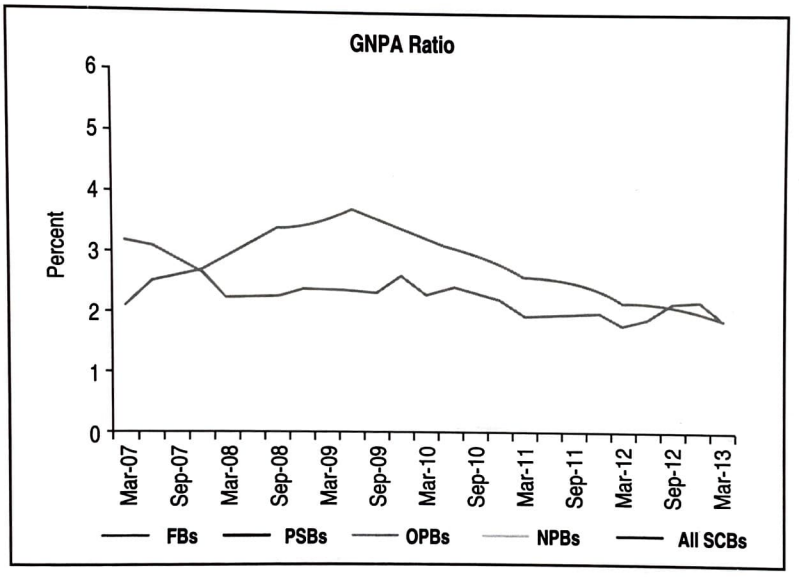


**Figure 8: Worsening GNPA Ratio of Indian PSBs.**
(Source: The RBI's Financial Stability Report, June, 2013)

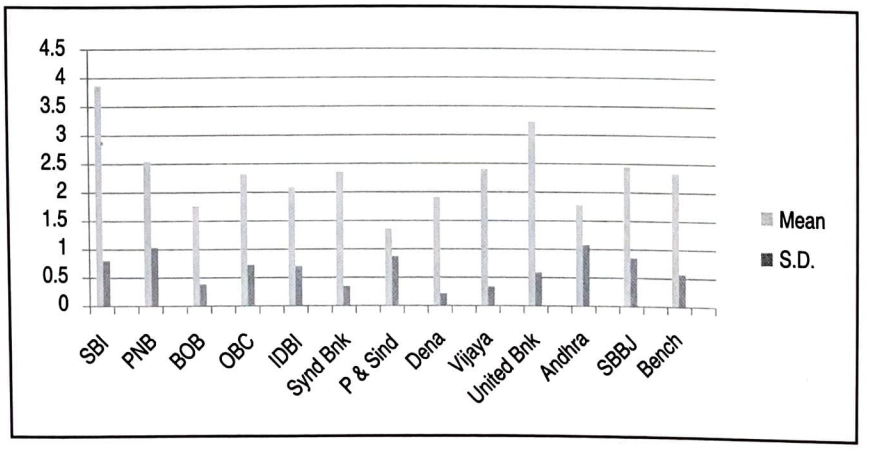


**Figure 9: GNPA Ratio(%): 2008-2013**
Note 1: Benchmark is total mean and standard deviation for 2008-13.

*Asset quality measurement by NNPA/ Net Advances ratio:* The mean values of NNPA ratio in sample banks are ranging from 0.56 (BOB) to 1.87 (United Bank of India). SBI which had the highest average GNPA ratio, has the second highest NNPA ratio at 1.82. Other banks which have poor asset quality in term of this ratio, are OBC (1.40), Vijaya Bank (1.35), and IDBI (1.24). These five banks, United Bank of India, SBI, Vijaya Bank, IDBI Bank, and OBC are also having proportion of NPAs higher than the bench mark value of 1.19. The dispersion study of Net NPA ratio of sample banks provides that the Andhra Bank has the highest variation at 0.86, whereas the Syndicate Bank has the highest stability at 0.12. (Figure 10)

5. *Increasing Loans to Sensitive Sectors*

Sensitive sectors are those businesses which are prone to business cycle volatility or are speculative in nature, and thus have high credit risk. RBI prudential norms categorize capital market exposures such as loans to stock brokers, market makers, loans against security of shares and debentures; real estate sector, both residential and commercial; and commodity market exposures as sensitive sectors. Prudent credit risk management practices and cautious approach are needed to regulate flow of credit to these sectors. RBI report on trends and progress of banking in India, 2012-13 reported thatcredit to sensitive sectors picked up even in a period of slow down in overall credit growth. Growth almost doubled for real estate sector, may be due to steep rise in real estate prices, and high profit margins.

For our sample PSBs during 2008-13, the mean value of Exposure to Sensitive Sectors/ Total Advances ratio ranged from 11.02% (United Bank of India) to 23.07% (IDBI Bank). With bench mark value of 15.88, IDBI Bank (23.07), Vijaya Bank (22.07), PNB (19.02), OBC (17.20), SBI (16.53) and Punjab & Sind Bank (16.31) had the high proportion of loan and advances to sensitive sectors, and thus more credit risk. Moreover, seven out of 12 sample PSBs increased theseexposures during 2012-13. Highest increase was by the Andhra Bank and SBI. (Figure 11)

Comparing the dispersion values, it is observed that the United Bank of India (4.40) has the highest variation, and Punjab & Sind Bank (0.93) has the highest stability in exposures to sensitive sectors.

6. *Increasing Trend to Restructure and Reschedule Advances*

Restructuring and rescheduling of standard or performing loans under RBI's schemes has helped banks to contain the problem loans from becoming a non-performing asset. Public sector banks have the highest proportion of restructured standard loans, even above the industry average. (Figure12). Again, the highest restructuring has been undertaken of loans to industry and services. (Figure13).

Restructured loans may be under pressure any time. Hence, higher is the proportion of restructured loans to total advances, higher is the credit risk. Further, in case both restructured standard loans and gross NPAs are weighed against total advances, it will indicate the true degree of credit risk the bank is facing. It will also show the strain on a bank's capacity to issue fresh credit.

For our 12 sample banks, the ratios of Restructured Standard Loans/ Total Advances, and Restructured Standard Loans and GNPAs/ Total Advances have been calculated to find the PSBs with the highest credit risk.

Restructured Standard Loans/ Total Advances Ratio: During the period 2008-13, the mean value of this ratio ranged from 1.95 (SBI) to 5.18 (IDBI Bank). Against the bench mark value of 4.13, eight banks have equal or higher proportion of restructured loans. These are IDBI Bank (5.19), Andhra Bank (5.13), SBBJ (4.86), OBC (4.84), Punjab & Sind Bank (4.67), Dena Bank (4.63), PNB (4.57), and Syndicate Bank (4.13) (Figure 14).

SBI, the largest PSB which has the lowest mean ratio of 1.95 during 2008-13, has the largest increase of 218% in restructured advances in 2012-13, as against the average increase of 62% by 12 sample PSBs.

*Result of Linear Regression Analysis:* Restructured loans have higher chances of default or becoming a non-performing asset. Thus loan restructuring is expected to have positive relation with GNPA ratio, the credit risk measure. The impact of this variable on GNPA ratios of sample banks for the period 2008-13, has been studied to find the degree and direction of causal relationships between them. The findings of linear regression analysis (Tables 2), at 95% confidence level, show direct and positive impact of Restructured Standard Loans/ Total Advances Ratio on GNPA/Gross Advances Ratio.

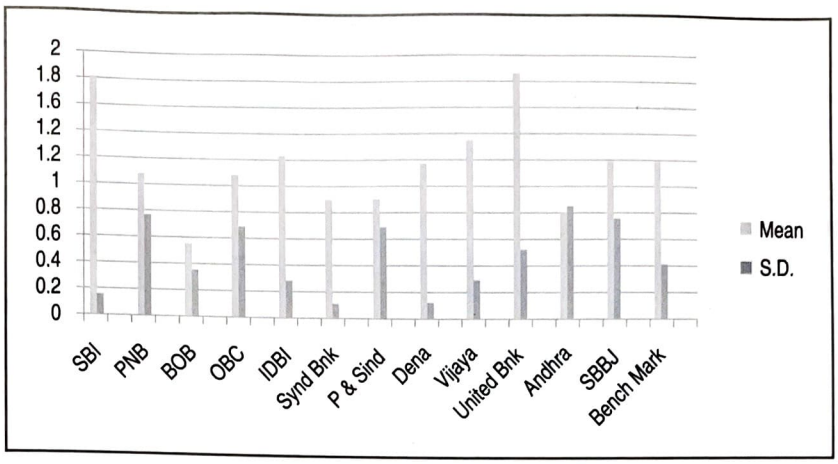


**Figure 10: NNPA Ratio(%): 2008-2013**
Note 1: Benchmark is total mean and standard deviation for 2008-13.

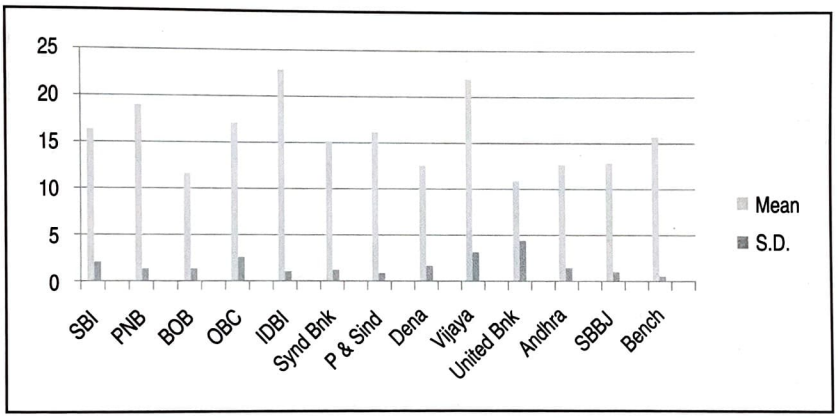


**Figure 11: Sensitive Assets Ratio(%): 2008-2013**
Note 1: Benchmark is total mean and standard deviation for 2008-13.

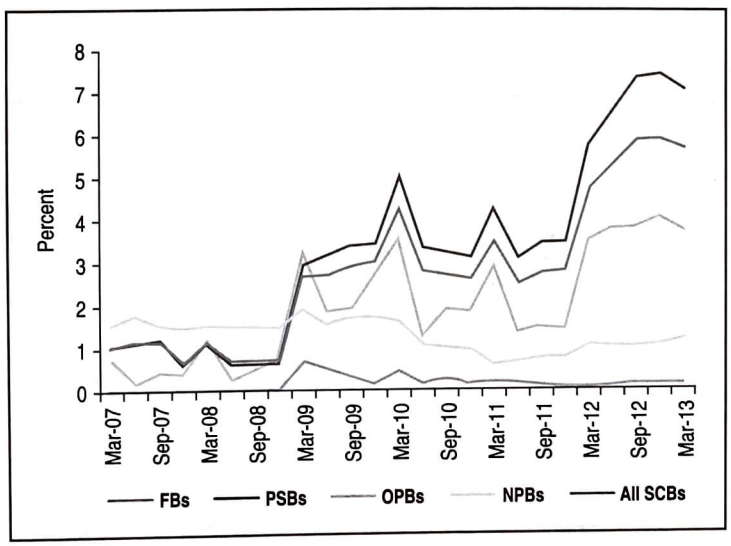


**Figure 12: Highest Loan Restructuring by PSBs.**
(Source: The RBI's Financial Stability Report, June, 2013)

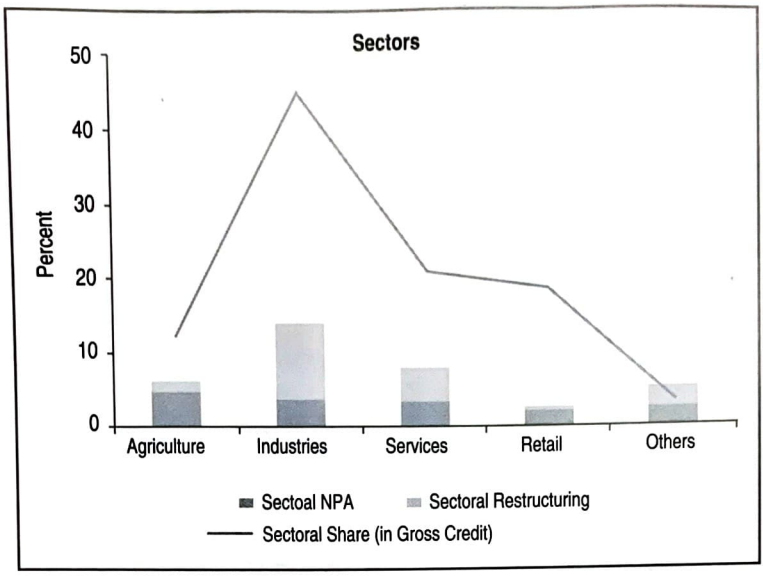


**Figure 13: Highest Loan Restructuring For Industries and Services.**
(Source: The RBI's Financial Stability Report, June, 2013)

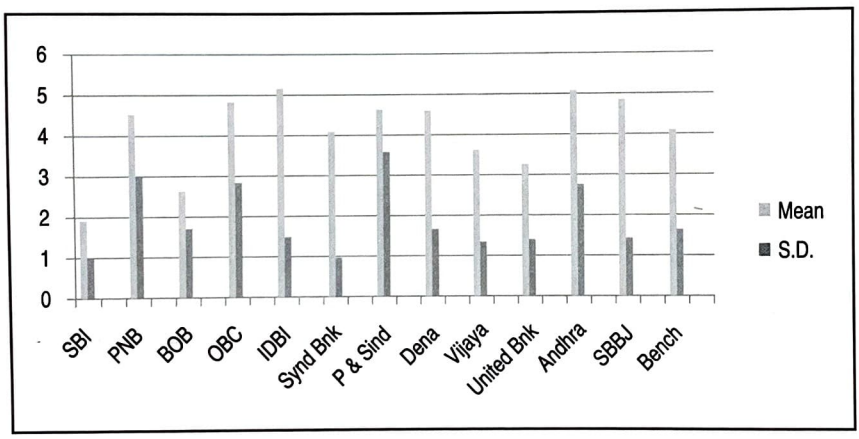


**Figure 14: Restructured Standard Advances Ratio(%): 2008-2013**
Note 1: Benchmark is total mean and standard deviation 2008-13.

**Table 2: Regression Coefficients**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.855 | .245 | | 7.571 | .000 |
| | Rest. Standard Advances/ Tot. Advances Ratio | .119 | .052 | .289 | 2.301 | .025 |

*Note1: Dependent Variable- GNPA Ratio.*
*Note 2: F statistic is 5.297 (df 1, 58), at p=0.025.*

Linear regression analysis shows statistically significant positive relationship between restructured standard advances ratio and GNPA ratio. The t-statistic is also significant for intercept and Restructured Standard Advances ratio. The unstandardized coefficient is equal to +0.119. R Square is 0.084, and Durbin-Watson statistic is 0.853.

The regression equation is:

GNPA Ratio=1.855+ 0.119*Restructured Standard Advances Ratio

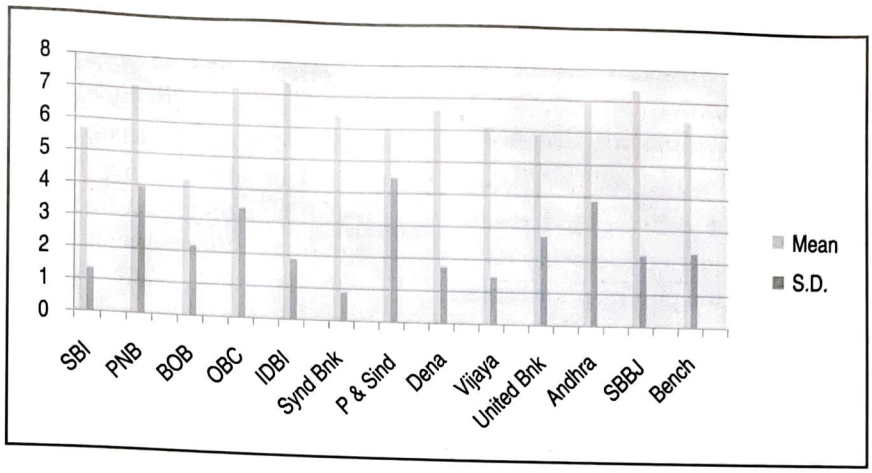


**Figure 15: Stressed Assets Ratio (%): 2008-2013**
Note 1: Benchmark is total mean and standard deviation values for 2008-13.

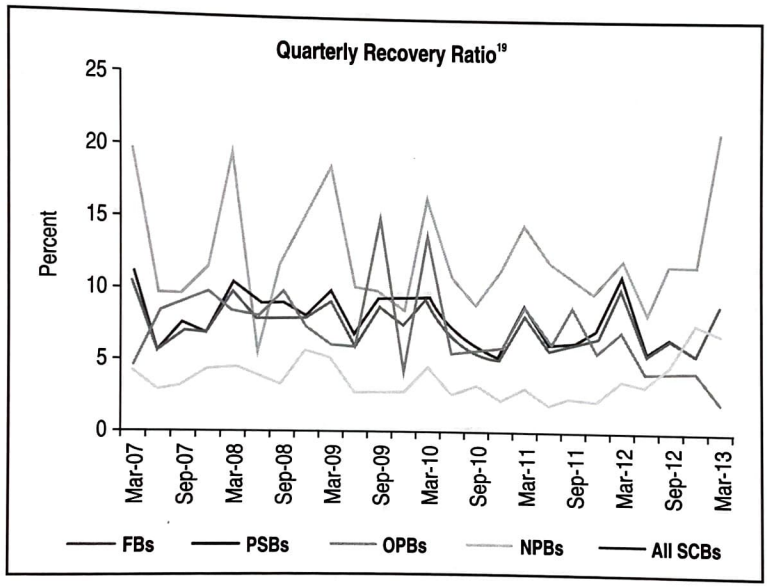


**Figure 16: Slow Loan Recoveries.**
(Source: The RBI's Financial Stability Report, June, 2013)

The regression results are establishing that increasing loan restructuring had direct impact on credit risk in public sector banks. In other words, higher restructuring of loans has only increased non-performing assets, instead of reducing them. Thus for true measurement of credit risk, both GNPAs and restructured advances shall be taken to find the stress on loan assets of the banks

*Restructured Standard Loans and GNPAs/ Total Advances Ratio:* This ratio represents the **stressed loan assets** of a bank. The mean value of this ratio ranged between 4.24 % (BOB) and 7.35 % (IDBI Bank and SBBJ) during 2008-13. Against the bench mark value of 6.39 (2008-13), six banks have higher mean ratio. The banks are IDBI Bank (7.35), SBBJ (7.35), OBC (7.18), PNB (7.10), Andhra Bank (6.94) and Dena bank (6.58). These are the public sector banks which have higher credit risk in our sample. SBI, the largest PSB has a mean ratio of 5.65% (S.D. 1.30) of stressed assets during 2008-13 (Figure 15).

The highest stressed assets during 2012-13, are with Punjab & Sind Bank (14.57), followed by the PNB (14.25). Punjab and Sind Bank has also recorded the highest growth in this ratio during the year at 125.89%, against the bench mark growth rate of 46.52%.

During 2008-13, large banks' meanratio of stressed assets is 6.31% (S.D. 2.25), whereas small banks' mean ratio is 7.54% (S.D. 3.12).

Thus small public sector banks have higher credit risk.

7. *Relative Efficiency of NPA Recovery Channels*

A sound credit risk management system requires efficient credit delivery and credit recovery systems. The quarterly recovery ratio (Figure 16) shows that the public sector banks are not faring well in recovery of their non-performing loans, with average recovery ratio of around 7% only (Figure 16).

NPA recovery channels were surveyed among 337 credit managers of sample banks to understand the perception of credit managers about the effectiveness of these methods to recover or resolve non-performing assets (Figure 17). The mean and standard deviation values for different methods are:

Thus, the survey respondents find the SARFAESI Act, 2002, the most effective method to recover defaulted loans, followed by OTS (one time settlement schemes), and DRTs (Debt Recovery Tribunals). The least favored method is writing off debt. (Figure 17)

ANOVA analysis was conducted to find the statistical significance of mean difference between and within three management group, managers of large and small banks; managers at junior, middle and senior levels; and managers with three levels of experience, up to 7 years, 8 to 20 years, and above 20 years.Tukey's post hoc tests were also conducted to find the sub-management groups where significant differences existed.

The F statistics shows that responses of large and small bank managers are significantly different for debt recovery tribunals (F=8.150, df 1,335, at p=0.005) and debt restructuring (F=5.789,df 1,335, at p=0.017).

The responses of credit managers at different management levels are significantly different for one time compromise settlement scheme (F=3.993, df 2,334, at p=0.019) recovery agents (F= 3.136, df 2, 334, at p=0.045) and effectiveness of SARFAESI Act, 2002 (F=4.102, df 2,334.at p=0.017). Post hoc tests show significant differences are only between junior and senior level managers, and not between them with middle level managers.

The responses of credit managers with different experience are significantly different for recovery agents (F=5.403,df 2,334,at p=0.005), SARFAESI Act (F=4.118, df 2,334,at p=0.017) and debt restructuring (F=4.365,df 2,334, at p=0.013).Tukey's post hoc tests are indicating significant differences only between managers with 'up to 7 years' experience and with 'experience of 20 years and above', and not between them with '8 to 20 years'..

Thus among three group of managers, the managerial perception is highly different regarding effectiveness of debt restructuring, SARFAESI Act, and recovery agents for recovery or resolution of NPAs.

8. *Problem of Willful Defaults*

Willful defaulters are bank borrowers who default in debt servicing though they have capacity to pay.They divert bank funds for unauthorized purpose. RBI provides for a number of penal measures like no additional loans, criminal proceedings, track of their promoters/directors, and circulation of caution lists. RBI also provides that banks shall not misuse these penalties, and have a transparent policy. However, the banks are not able to control the problem. First, in many cases, they find it difficult to differentiate between a genuine or willful defaulter because of accounting malpractices. In many cases, banks are not tough in handling identified willful defaulters. A survey has been undertaken on 337 credit managers to understand their perception about controlling willful defaulters through ban on financing their new ventures, making their names public, or filing criminal charges against them. The mean and standard deviation values of their responses are:

Though, there are high mean values for all three methods to control willful defaults, the highest agreement is on making their names public (Figure 18).

9. *Impact on profitability or Return on Assets (ROA)*

Return on Assets (ROA) measures the profitability of a bank. The mean value of ROA for sample banks during 2008-13, ranges between 0.51 % (United Bank of India) and 1.27 % (PNB). The SBBJ has the highest stability in

profits (0.97) with standard deviation of 0.03. The five high performing banks are PNB (1.27), Andhra Bank (1.20), BOB (1.15), Dena Bank (0.99), and SBBJ (0.97).

During 2012-13, the most performing banks are Syndicate Bank (1.07), PNB (1.0) and Andhra Bank (0.99). Comparing the ROA and the stressed assets (restructured standard assets + GNPA ratios) during 2012-13, Syndicate Bank has the lowest stressed assets ratio and highest ROA, during 2012-13.(Figure 19)

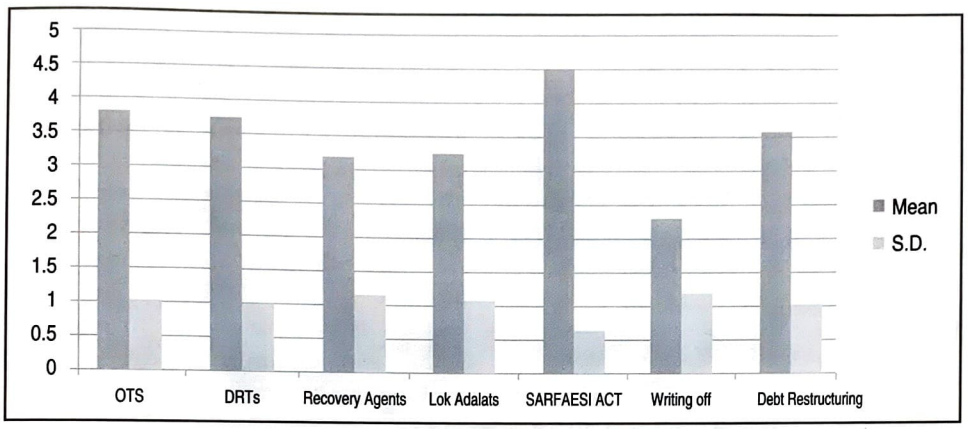


**Figure 17: NPA Recovery Channels- Mean & S.D.**

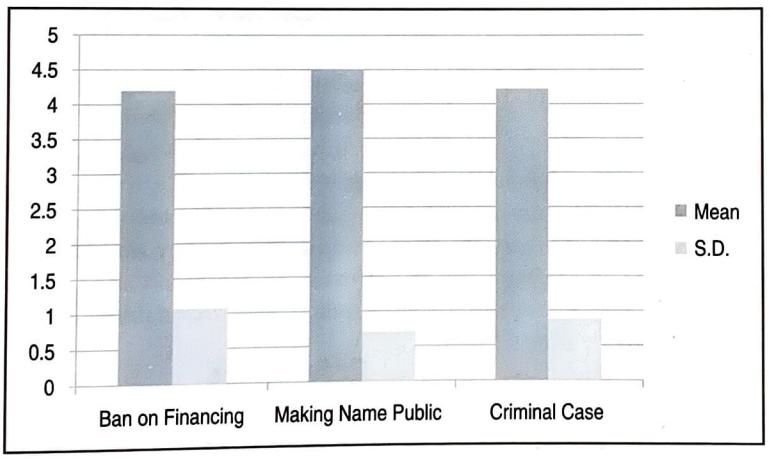


**Figure 18: Controlling Willful Defaulters.**

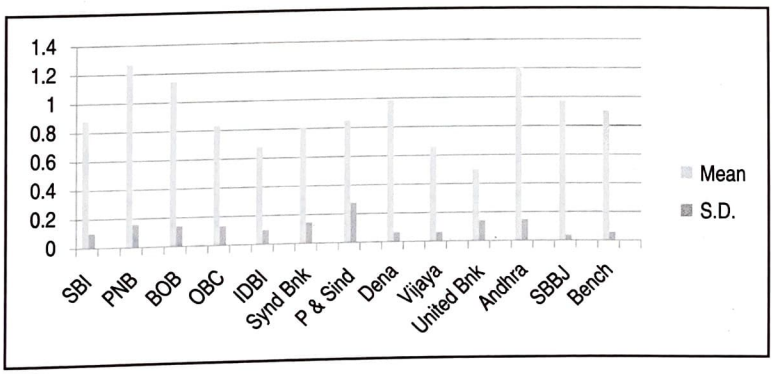


**Figure 19: Return on Assets (%): 2008-2013**

Note 1: Benchmark is total mean and standard deviation for 2008-13.

Result of Linear Regression Analysis: Linear regression analysis has been undertaken to study the impact of GNPAs or credit risk on Return on Assets (ROA) of sample banks for 2008-13.High credit risk is expected to reduce profitability and vice-versa. The results show statistically significant, inverse relationship between GNPA/Gross Advances ratio (independent variable), and ROA (dependent variable) (Table 3).

The F statistic is significant at 5% level of significance. The t-statistic is also significant for intercept and GNPA ratio. The unstandardized coefficient is equal to -0.108. R Square is 0.158, and Durbin-Watson statistic is 0.528.

The regression equation is:

Return on Asset=1.158 - 0.108*GNPA Ratio

The regression results are establishing that increasing GNPA ratio or credit risk had significant negative impact on the profitability of Indian public sector banks.

## Conclusions

The data analysis on characteristics of credit risk in Indian public sector banks shows:

The banks are well capitalized, with their capital adequacy ratios more than the Basel II norm of RBI (9%). However, the fact remains that their capital adequacy ratios are less than the private sector banks, foreign banks and the average of all scheduled commercial banks. Since capital adequacy ratios are inversely related to credit risk, the Indian PSBs are under higher credit risk than other banks in the industry. During 2012-13, the many indicators of credit risk are showing high pressure on public sector banks (in sample), such as: 15.60 % increase in GNPA/Gross Advances ratio, 33% increase in NNPA/Net Advances ratio, 62.27% increase in Restructured Standard Advances/Total Advances ratio, 46.52% increase in Stressed Assets ratio. (Restructured assets + GNPAs), 6.70% decrease in Capital Adequacy ratio (CRAR), 12.49% decrease in ROA and 0.18%, only marginal decrease in advances to sensitive sector.

In terms of stressed assets or loans (GNPAs and restructured standard loans), small PSBs rank higher in credit risk than the large PSBs (in sample). Micro and macro-economic factors are affecting the different industries or sectors within any industry, in different proportion. This necessitates clear identification of credit risk factors and differential credit risk assessment practices to measure and control credit risk for different industries or business groups. Efficiency of NPA recovery systems is very important to manage defaulted loans, and minimize credit losses. Empirical analysis shows significantly different perception of credit managers in large and small banks, as well as among junior and senior managers. There is a need to understand the perceptions of bank managers on various loan recovery systems to improve recoveries and take actions to minimize credit losses. Banks must tighten their control on willful defaulters through ban on new financing, initiating criminal proceedings, attaching their personal property. Banks also need atransparent staff accountability framework to ensure compliance with credit policy and procedures. Possibility of connivance of bank staff with willful defaulters must also be looked into.

## References


Arora,S. (2013). Credit risk analysis in Indian commercial banks-An empirical investigation. Asia Pacific Finance and Accounting Review, 1(2), Jan-Mar, 25-34.

Chakrabarty, K.,C., RBI.(2012). Corporate debt restructuring-Issues and way. Conference address at Mumbai, http://www.rbi.org.in.


**Table 3: Regression Coefficients**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.158 | .083 | | 13.899 | .000 |
| | GNPA Ratio | -.108 | .033 | -.397 | -3.294 | .002 |

*Note 1: Dependent Variable: NNPA Ratio*
*Note 2:F statistic is 3.893 (df 1, 58), at p=0.002.*

Dahiya, Sandeep., Anthony., Saunders., and Anand, Srinivasan . (2003).Financial distress and bank lending relationships. The Journal of Finance, (February) LVIII (1).

Das, Abhiman., and Ghosh,S., RBI. (2007). Determinants of credit risk in Indian state owned banks : An empirical investigation. http:// mpra. Ubi- unimuenchen.de/ 17301.

Dong, He., IMF. (2002).Resolving non-performing assets of the Indian banking system September, online at http://mpra.ub.uni-muenchen.de/ 9758.

Ghosh, Saibal. (2011) .A simple index of banking fragility: Application to Indian data. The Journal of Risk Finance, 12(2), 112-120.

Greuning, H.V., and Bratanovic, S.B. (2009). Analysing bankingrisk: A framework for assessing corporate governance and financial risk. 3rd Ed. The World Bank, Washington D.C.

KPMG Report. (2012). Indian banks-Performance benchmarking report-FY12 Results. KPMG.com/in.

Lepus, S. (2004). Best Practices in Strategic Credit Risk Management SAS, USA, October, pp. 1-26.

Misra, B.M., and Dhal, S. (2010). Pro- cyclical management of bank's non-performing loans by the Indian public sector banks.BIS Asian Research Papers, June, http://www.bis.org.

Muniappan, G., RBI. (2002). The NPAoverhang- Magnitude, solutions, legal reforms. April, Speech at CII Banking Summit at Mumbai, http://www.rbi.org.in.

RBI guidelines. (2007). Implementation of New Capital Adequacy Framework Standardised Approach. RBI/2011-12/311 April, 1-130.

RBI Report on Currency and Finance.(2006-08). The Banking Sector in India: Emerging Issues and Challenges. Vol.1,http://rbidocs.rbi.org.in.

RBI Reports. (2010-2013). Financial stability reports.June, December. http://rbidocs.rbi.org.in.

RBI guidelines.(2011). Implementation of the internal rating based (IRB) approaches for calculation of capital charge for credit risk. RBI/2011-12/311, December 22, 1-192.

RBI.(2008-13). Reportson trends and progress of banking in India.http://www.rbi.org.in.

RBI. (2013).Guidelines on exposure norms. RBI/2012-13/68, July, http://www.rbi.org.in.

Sah, Bittu., and Dwivedi, A.K. (2012).Determinants of Credit Risk in Indian Banking Sector: Some Panel Results. International Journal of Business Continuity and Risk Management, 3(2).

Statistical Tables Relating to Banks in India, 2008-2013.

Tracey, Mark., and Leon, H. (2011).The impact of non - performing loans on loan growth. IMF, Jamaica, Working paper Series, http://www.imf.org.