

Credit Risk Management in Commercial Banks

Suresh N.^{a*}, Anil Kumar S.^b and Gowda D. M.^c

Abstract

The study was conducted to establish framework for measuring and managing credit risk for fifteen private Banks and to analyse the relationship of diversified portfolio of credit advances and NPAs of private banks. The portfolios of all credit advances in all regions were considered for the study. It was found that the relationship between Over all NPAs of private sector banks had no correlation with that of individual Bank and portfolios of occupations plays significant role towards contribution of NPAs. Personal loans are inversely proportional to the NPAs and are significant in all regions. The credit advances towards services sector is very low even though, 62 % of India's GDP is from them. Hence, Banks need to diversify their portfolio to achieve a better credit equilibrium and establish Risk Management Information System. The study enables a Banking Industry to progress towards its goals and objectives in the most direct, and effective way.

Key words: Risk Management, Credit Risk, Portfolios of Credit Advances, Non-performing Assets

1. Introduction

Credit risk is the oldest and biggest risk in bank, by virtue of its very nature of business, inherits. The aim of credit risk management is to establish a framework that defines corporate priorities, loan approval process, credit risk rating system, loan-review mechanism and comprehensive reporting system. Better and effective strategic credit risk management process is a better way to manage portfolio of credit advances. There is a need for Strategic approach to Credit Risk Management (CRM) in Indian Commercial Banks, in view of Higher NPAs level in comparison with global benchmark. (McKinley and Berrickman, 1994; Arunkumar and Kotreswar, 2003).

Concentration risk is the aggregation of risk within the portfolio and may result from loans to one borrower or one industry, geographic area, or lines of business. Concentrations within a portfolio will determine the magnitude of problems, a bank will experience under adverse conditions. (Kim

and Lee, 2007). The concentration risk is an important component of the credit risk and is prompted by the concentration of the credit portfolio in one or more occupations. NPAs of banks are the resultants of ineffective management of Credit Advances. (Bidani, 2002). Hence, Study was made to present a general framework for quantification of contributions of credit advances towards over all NPA level of private Banks.

2. Objectives of the study

The main aim of the study was to analyze and evaluate the Credit Risk associated with Private Banks with the following objectives

1. To study the Non-Performing Assets (NPAs) as percentage of Total Assets of Private Banks and concentration of Credit Advances of occupations as percentage of Total Credit Advances.
2. To analyse the relationship of NPAs with diversified portfolio of Credit Advances and the Sensitivity of Non-Performing Assets to portfolio of Credit Advances.

^a Principal, Don Bosco Institute of Bio-sciences and Management Studies, Bangalore, India
Email: sureshn_rao@yahoo.co.in

^b Professor, Dept. of Commerce, NMKRV College for Women, Bangalore, India, Email: anilsrivr@yahoo.co.in

^c Professor & Head, Department of Statistics, Applied Mathematics and Computer Science,
University of Agriculture Science, Bangalore, India, Email: dmgowda@rediffmail.com

* Author for correspondence

Table 1 NPAs of Private Sector Banks

	1995-1996	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Private Sector Banks	9.29	11.41	12.13	14.26	12.45	12.61	13.07	8.86	7.59	5.97	4.39	3.13
Bank of Rajasthan Ltd.	6.29	12.07	17.61	20.55	18.55	17.2	15.73	11.39	9.14	5.34	3.26	2.08
Catholic Syrian Bank Ltd.	8.91	10.56	17.74	19.01	16.99	14.24	14.88	13.01	8.84	7.16	5.76	4.19
City Union Bank Ltd.	6.94	8.1	8.36	7.08	10.89	13.69	13.2	12.11	10.36	5.89	4.32	2.58
Dhanalakshmi Bank Ltd.	4.67	6.75	15.68	18.8	14.58	14.77	15.29	13.18	11.43	8.51	6.71	5.06
Federal Bank Ltd.	6.13	7	7.34	10.93	11.75	12.84	11.88	8.21	7.44	7.29	4.62	2.95
ING Vysya Bank Ltd.	4.71	18.73	15.07	19.82	14.33	4.7	4.64	3.61	2.65	2.14	1.77	1.05
Jammu & Kashmir Bank Ltd.	12.07	12.14	9.4	7.9	6.52	4.97	3.62	3.11	3.04	2.72	2.51	2.89
Karnataka Bank Ltd.	4.61	4.47	4.98	8.01	8.82	10.58	10.43	12.99	11.93	7.58	5.13	3.95
Karur Vysya Bank Ltd.	1.67	3.06	4.06	6.7	6.2	7.14	8.97	7.46	5.83	5.1	3.91	2.82
Lakshmi Vilas Bank Ltd.	5.86	7.99	9.86	9.45	8.18	9.61	13.42	11.47	10.15	7.88	4.14	3.57
Ratnakar Bank Ltd.	11.94	9.38	10	11.11	12.37	11.03	12.88	11.96	10.63	10.31	7.59	6.81
Sangli Bank Ltd.	22.76	27.83	20.83	16.87	14.95	13.21	11.8	12.45	11.79	8.95	6.67	9.06
SBI Commercial & International Bank Ltd.	27.08	26.02	20.39	30.02	19.38	30.38	32.72	38.48	41.28	24.06	15.2	3.28
South Indian Bank Ltd.	8.43	9.28	10.25	16.76	12.51	10.12	10.05	9.27	7.59	6.64	4.99	3.94
Tamilnad Mercantile Bank Ltd.	7.23	7.76	10.42	10.88	10.8	14.69	16.47	16.06	13.79	11.26	7.02	4.54

Source: Trend and Progress of Banking in India, Table: Non-Performing Assets of Private Sector Banks As Proportion to Total Assets, RBI Publications, 1995-96 to 2006-07

3. Hypothesis

Following are the Hypothesis formulated for the study.

1. There is homogeneity with respect to NPA among the private banks.
2. Overall NPA of private banks had a positive relation with NPAs of Individual banks.
3. Portfolios of occupations had a positive relation with Overall NPAs of private banks.
4. Overall NPAs of private banks are influenced by Portfolios of occupations.

4. Scope of the study

To establish a coherent frame work for measuring and managing credit risk and responsive to the development in the market, the study was framed in the following manner. The measurement of Credit risk was done through concentration index of Credit Advances towards portfolios of occupations viz., Agriculture, Industry, Transport operators, Professional and other services, Personal loans, Trade and Finance, which lead to NPAs.

The study was restricted to all old private banks for all regions viz., rural, semi-urban, urban and metropolitan regions. The gross NPAs of private banks as a proportion to total asset and details of credit advances of private towards occupations were obtained from the data published by RBI for the group 'Other Scheduled Commercial Banks' (Private Banks).

5. Methodology

For the measurement of credit risk, secondary data for Private Banks available from RBI publications were used for a period from 1995-96 to 2006-07. (Bidani, 2002). All Fifteen old private banks were selected for the study. In order to analyse the data one-way ANOVA, correlation coefficient and regression analysis, were used.

6. Results and Discussions

Credit risk measurement studies were done to analyse the trends in NPAs and its relationship with diversified portfolio of Credit Advances of Private Banks. The trend of NPAs of private banks is shown in Table 1(RBI, 2007a).

Using one-way analysis of variance the homogeneity with respect to NPA among private banks was tested and the results are presented in Table 2.

Table 2 Mean NPAs of Private Sector Banks

Private Sector Banks	Mean
Bank of Rajasthan Ltd.	11.601
Catholic Syrian Bank Ltd.	11.774
City Union Bank Ltd.	8.627
Dhanalakshmi Bank Ltd.	11.286
Federal Bank Ltd.	8.198
ING Vysya Bank Ltd.	7.768
Jammu & Kashmir Bank Ltd.	5.907
Karnataka Bank Ltd.	7.790
Karur Vysya Bank Ltd.	5.243
Lakshmi Vilas Bank Ltd.	8.465
Ratnakar Bank Ltd.	10.501
Sangli Bank Ltd.	14.764
SBI Commercial & International Bank Ltd.	25.691
South Indian Bank Ltd.	9.152
Tamilnad Mercantile Bank Ltd.	10.910
F- Value 11.45**	
CD (Critical difference) = 0.5249	

It has been observed that the average NPAs of private banks are highly significant with 1% level. The highest mean NPA was found in Bank 'SBI Commercial & International Bank Ltd' and lowest mean in 'Karur Vysya Bank Ltd'. It was found that homogeneity exists among 'Bank of Rajasthan Ltd', 'Catholic Syrian Bank Ltd.' and 'Dhanalakshmi Bank Ltd' when compared by using Critical difference. Similarly, homogeneity also exists among 'City Union Bank Ltd', 'Federal Bank

Ltd.' and 'Lakshmi Vilas Bank Ltd'. 'Ratnakar Bank Ltd' and 'Tamilnad Mercantile Bank' are similar with the exposure to credit advances. 'ING Vysya Bank Ltd' and 'Karnataka Bank Ltd' are similar with the exposure to credit advances. The results indicate that there is no homogeneity among all private sector banks and hence reject the first hypothesis.

An attempt was made to quantify the relationship between overall NPAs of private banks, NPA_{ALL} and NPAs of Individual private banks, NPA_i by the way of coefficient of

correlation as shown in table 3 for Private Banks. The significance of 'r' was done by student's t-test. The critical value of 'r' for (n-2) degree of freedom at 5% significance is 0.576.

From the Table 3, it is found that, NPA_{ALL} has a positive relationship with NPA_i . Further; it was observed that nine banks out of fifteen private banks had significant relation with NPA_{ALL} . It means that NPA_{ALL} increases with NPA_i . Hence, the results confirm the hypothesis 2 for private banks.

Table 3 Correlation coefficient between NPAs of private Banks and Individual Private Banks

Banks	Correlation Coefficient (r)
Bank of Rajasthan Ltd.	0.948**
Catholic Syrian Bank Ltd.	0.923**
City Union Bank Ltd.	0.671**
Dhanalakshmi Bank Ltd.	0.761**
Federal Bank Ltd.	0.837**
ING Vysya Bank Ltd.	0.713**
Jammu & Kashmir Bank Ltd.	0.511
Karnataka Bank Ltd.	0.287
Karur Vysya Bank Ltd.	0.485
Lakshmi Vilas Bank Ltd	0.680**
Ratnakar Bank Ltd.	0.707**
Sangli Bank Ltd.	0.553
SBI Commercial & International Bank Ltd.	0.460
South Indian Bank Ltd.	0.894**
Tamilnad Mercantile Bank Ltd.	0.489

** denotes significance at 5 % levels

Study was also conducted to find the relationship between NPAs of private banks, NPA_{ALL} and concentration index of Credit Advances for the portfolio of occupations, viz., Agriculture, Industry, Transport operators, Professional and other services, Personal loans, Trade, and Finance as percentage of Total

Credit Advances. Concentration index of portfolios of occupations region-wise data, O_i , are shown in Table 4 (RBI, 1996-2007a). The study was conducted for private banks with region-wise data. The mean of credit advances towards portfolios of occupations is shown in Table 5.

Table 4 Occupation Index for Private Banks (Other Scheduled Commercial Banks)

RURAL REGION													
	PORTFOLIOS OF OCCUPATIONS	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
1	Agriculture	29.6	29.6	28.7	23.6	21.6	22.4	20.1	19.9	17.8	13.7	10.1	9.95
2	Industry	24.2	27.8	30.1	36.6	38.6	34.8	38.5	37.7	35.7	22.3	24.2	31.82
3	Transport operators	6.2	6.4	5.3	3.8	3.2	2.7	2.1	2.2	1.7	7.7	9.6	5.45
4	Professional and other services	3.1	2.8	3.1	3.3	3.2	3.9	6.5	7.2	5.5	3.9	2.7	2.93
5	Personal loans	13.3	14.4	14.3	13.0	14.4	17.4	15.0	16.7	23.8	39.8	41.7	38.96
6	Trade	16.2	13.5	12.4	13.2	12.2	12.9	11.9	8.7	9.2	8.3	6.1	6.91
7	Finance	0.7	0.6	0.7	0.8	1.1	1.7	1.0	1.0	1.7	0.5	1.3	1.06
SEMI-URBAN REGION													
1	Agriculture	12.2	12.2	12.4	12.2	11.9	10.8	5.6	5.5	8.3	11.6	12.7	12.27
2	Industry	25.8	25.8	29.1	34.3	34.7	31.9	62.6	65.4	41.5	37.2	30.2	30.59
3	Transport operators	8.2	8.2	6.2	4.2	3.4	2.5	1.6	1.5	1.5	1.3	1.9	1.88
4	Professional and other services	4.4	4.4	4.3	4.2	4.7	5.0	4.3	4	6.4	5.9	4.0	4.81
5	Personal loans	18.9	18.9	19.3	17.0	17.7	21.6	9.9	10	24.2	26.3	31.6	32.85
6	Trade	19.6	19.6	18.5	16.5	15.5	17.6	9.5	7.9	9.4	9.7	9.4	9.24
7	Finance	1.0	1.0	1.2	1.1	1.0	1.4	0.8	0.6	0.8	0.8	0.3	0.34
URBAN REGION													
1	Agriculture	3.2	3.7	3.8	3.4	3.8	3.8	2.5	2.6	3.4	3.9	5.0	7.58
2	Industry	46.5	47.1	44.6	45.1	44.7	42.8	64.5	65.9	48.2	35.9	32.8	31.70
3	Transport operators	3.3	3.1	2.4	1.8	1.6	1.4	0.9	0.8	0.9	2.1	3.8	3.90
4	Professional and other services	5.8	4.8	16.7	17.3	14.9	14.7	9.3	7.8	9.5	8.6	4.9	5.35
5	Personal loans	13.2	11.9	10.4	9.3	11.1	12.3	7.1	8.0	23	32.6	38.0	37.20
6	Trade	18.4	20.8	15.4	15.2	16.2	17.0	11.1	10.0	9.3	9.5	8.5	8.87
7	Finance	2.0	2.7	1.8	1.4	1.5	1.2	1.0	0.9	0.6	0.7	1.5	1.23
METROPOLITAN REGION													
1	Agriculture	1.0	1.3	1.4	1.6	1.6	1.3	1.5	1.8	2.4	3.0	3.0	3.94
2	Industry	46.2	49.8	54.4	56.7	55.9	49.2	56.6	56.1	41.5	35.5	32.1	30.47
3	Transport operators	1.0	1	1.9	1.5	1	1.2	2.0	1.8	1.0	1.0	2.2	2.23
4	Professional and other services	5.4	4.6	4.3	4.0	3.8	7.2	9.8	8.6	8.1	6.8	7.9	8.06
5	Personal loans	5.1	4	4.0	3.8	4.3	5.2	4.3	7.3	25.6	31.5	33.3	37.64
6	Trade	20.1	17.4	14.8	12.9	12.5	11.9	7.4	7.9	6.7	7.6	7.2	7.66
7	Finance	15.6	15.2	12.4	14.0	13.7	13.9	11.9	10.6	9.4	9.9	8.4	6.88

Source: Basic statistical returns of Scheduled commercial banks in India, Table: Population Group and Bank Group - Wise Classification of Outstanding Credit of Scheduled Commercial Banks According to Occupation, Volume 25-36, 1996 to 2007. RBI Publication.

Results reveal that credit advances are concentrated towards Industry in all the regions ranging from 25 to 47 %. Credit advances towards agriculture is about 36 % in rural region, personal loans varies from 14 to 21 %, Trade is about 12 to 14 %, Transport operators as low as 1.5 to 3.5 %, Finance is as low as 0.86 to 1.36 except in metropolitan region.

Table 5 Mean of credit Advances of portfolios of occupations

Occupations / Regions	Rural	Semi-urban	Urban	Metro-politan
Agriculture	35.73	10.68	3.89	1.99
Industry	24.93	37.51	45.82	47.04
Transport operators	2.12	3.47	2.17	1.49
Professional and other services	2.44	4.66	9.97	6.55
Personal loans	14.53	20.69	17.84	13.84
Trade	13.54	13.55	13.36	11.17
Finance	1.04	0.86	1.38	11.82

The correlation coefficient between NPA_{ALL} of private banks and credit advances towards portfolio of occupations were tabulated in Table 6.

Table 6 Correlation coefficient between NPAs and portfolios of occupations-Region-wise

Occupations	Rural	Semi-Urban	Urban	Metro-politan
	r	r	r	r
Agriculture	0.755**	-0.136	-0.667	-0.867**
Industry	0.523	0.124	0.523	0.918**
Transport operators	-0.526	0.381	-0.529	-0.297
Professional and other services	0.119	-0.303	0.700**	-0.458
Personal loans	0.892**	0.762**	0.910**	-0.926**
Trade	0.781**	0.607**	0.673**	0.477
Finance	-0.068	0.818**	0.276	0.809**
** denotes statistical significance at 5 % levels				

In case of private banks, it was found that portfolios of occupations viz. Personal loans, Agriculture except in rural region, Transport operations except in semi-urban region, Professional & other services in rural and metropolitan region and Finance in rural region are inversely proportional to the NPA levels of private banks, indicating that NPAs of private banks decreases with the increase of credit advances towards these occupations. The value of 'r' is significant for portfolio of occupations viz., Agriculture in rural and metropolitan, Industry in Metropolitan, Professional and other services in urban, Personal loans in all regions, Trade in all regions except metropolitan, Finance in semi-urban and metropolitan regions. Further, it was found that Transport Operations was not significant in any of the regions. Hence, the results reject the hypothesis 3 for private banks.

An attempt was made to quantify the contribution of portfolios of occupations to NPA_{ALL} of private banks by using a Regressor

$$NPA_{ALL} = \alpha + \beta_1 O_i$$

This indicates that Overall NPA of private banks, NPA_{ALL} changes with the occupational Index, O_i . If occupational index, O_i , changes by 1%, change in NPA_{ALL} will be indicated by β_1 value. The test of significance was done with student's t-test. For $n=12$ from the student's t-distribution table, $t = 2.179$. The occupations, which are significant at 5% significance, are shown in Table 7-10 for Private Banks.

In the analysis of private sector banks for rural region, it was observed that portfolios of occupations viz. Transport operators, personal loans and Finance make negative contributions indicates that, NPA_{ALL} decreases with increase in these portfolios. On the other hand portfolios of occupations viz. Agriculture, Industry, Professional and other services and Trade make positive contributions toward NPA_{ALL} . Further, results reveal that value of ' β_1 ' is significant for Agriculture, Personal loans and Trade.

Table 7 Regression Analysis for Private Sector Banks at rural region

	Region	Occupation	Coefficient (α)	β_1	t
1	Rural	Agriculture	1.321 (2.384)	0.4020** (0.1103)	3.64
2		Industry	-0.542 (5.315)	0.3182** (0.1642)	1.94
3		Transport operators	13.233 (2.083)	-0.7744** (0.3955)	-1.96
4		Professional and other services	8.455 (3.207)	0.2846 (0.7509)	0.38
5		Personal loans	15.879 (1.125)	-0.2869** (0.0460)	-6.24
6		Trade	-0.677 (2.684)	0.9375** (0.2367)	3.96
7		Finance	10.237 (3.155)	-0.635 (2.931)	-0.22

(The figures in the parenthesis indicates the standard error)

** denotes statistical significance 5% levels

For semi-urban region, it was observed that portfolios of occupations viz., Agriculture, Professional and other services and Personal loans make negative contributions indicating, NPA_{ALL} decreases with increase in these portfolios. On the other hand portfolios of

occupations viz, Industry, Transport operators, Trade and Finance make positive contributions toward NPA_{ALL} . Further, results reveal that value of ' β_1 ' is significant for Personal loans, Trade and Finance.

Table 8 Regression Analysis for Private Sector Banks at Semi-urban region

	Region	Occupation	Coefficient (α)	β_1	t
1	Semi-Urban	Agriculture	11.587 (4.704)	-0.1863 (0.4283)	-0.44
2		Industry	8.302 (3.461)	0.03453 (0.0875)	0.39
3		Transport operators	7.655 (1.809)	0.5589 (0.4290)	1.30
4		Professional and other services	16.213 (6.677)	-1.420 (1.415)	-1.00
5		Personal loans	17.597 (2.264)	-0.3867** (0.1038)	-3.73
6		Trade	3.219 (2.785)	0.4706** (0.1949)	2.41
7		Finance	1.737 (1.861)	9.121** (2.029)	4.50

For urban region, it was observed that portfolios of occupations viz., Agriculture, Transport operators and Personal loans make negative contributions indicating, NPA_{ALL} decreases with increase in these portfolios. On the other hand portfolios of occupations viz, Industry, Professional and other services, Trade and Finance make positive contributions toward NPA_{ALL} . Further, results reveal that value of ' β_1 ' is significant for Agriculture, Professional and other services, Personal loans and Trade.

For metropolitan region, it was observed that portfolio of occupations viz., Agriculture, Professional & other services and Personal loans make negative contributions indicating, NPA_{ALL} decreases with increase in these portfolios. On the other hand portfolios of occupations viz, Industry, Transport operators, Trade and Finance makes positive contributions toward NPAs of private banks. Further, results reveal that value of ' β_1 ' is significant for Agriculture, Industry, Personal loans and Finance. Hence, the results confirm the hypothesis 4 for private banks.

Table 9 Regression Analysis for Private Sector Banks at Urban region

	Region	Occupation	Coefficient (α)	β_1	t
1	Urban	Agriculture	16.742 (2.654)	-1.8368** (0.6484)	-2.83
2		Industry	1.326 (4.362)	0.1805** (0.0930)	1.94
3		Transport operators	13.313 (2.109)	-1.7151** (0.8711)	-1.97
4		Professional and other services	4.168 (1.920)	0.5444** (0.1754)	3.10
5		Personal loans	14.6911 (0.8642)	-0.2855** (0.0411)	-6.96
6		Trade	1.904 (2.798)	0.5760** (0.2003)	2.88
7		Finance	7.235 (2.807)	1.714 (1.885)	0.91

Table 10 Regression Analysis for Private Sector Banks at Metropolitan region

	Region	Occupation	Coefficient (α)	β_1	t
1	Metropolitan	Agriculture	16.621 (1.390)	-3.5360** (0.6420)	-5.51
2		Industry	-6.397 (2.236)	0.3400** (0.0466)	7.30
3		Transport operators	12.767 (3.391)	12.767 (3.391)	-0.98
4		Professional and other services	14.961 (3.440)	-0.8193 (0.5034)	-1.63
5		Personal loans	13.0221 (0.6064)	-0.2476** (0.0318)	-7.78
6		Trade	5.262 (2.708)	0.3880 (0.2262)	1.72
7		Finance	-2.941 (2.955)	1.0604** (0.2438)	4.35

7. Summary of findings

The analysis of secondary data resulted in satisfactory results, a summary of which is presented below.

1. NPAs level of private banks register a clear decreasing trend after post-liberalization period i.e. from 2001-02
2. By comparing with critical values, it was found that homogeneity does not exist among banks with their credit exposure.
3. The relationship between over all NPAs of private banks, NPA_{ALL} and NPA of individual bank, NPA_i is positive indicating that NPA_{ALL} increases with the increase in NPA_i . Further, it was observed that value of 'r' is significant in nine out of fifteen banks.
4. It was found that portfolios of occupations viz. Agriculture except in rural region, Transport operations except in semi-urban region, Professional & other services in rural and metropolitan region, Personal loans in all regions and Finance in rural region are inversely proportional to the NPA_{ALL} , indicating that NPA_{ALL} decreases with the increase of credit advances towards these occupations. The value of 'r' is significant for portfolio of occupations viz., Agriculture in rural and metropolitan, Industry in Metropolitan, Personal loans in all regions, Trade in rural, semi-urban and urban and Finance in Semi-urban and metropolitan regions.
5. It was observed that Agriculture in urban and metropolitan regions, Transport operators in rural and urban region, Professional and other services in semi-urban region, Personal loans in all regions and Finance in rural region make negative contributions, which indicate that, NPA_{ALL} decreases with increase in these portfolios.
6. It was observed that portfolios of occupations viz, Agriculture in rural,

Industry in all regions, Transport operators in semi-urban and metropolitan, Professional and other services in rural and semi-urban regions, Trade in all regions, Finance in all regions except in rural make positive contributions toward NPA_{ALL} .

7. Results reveal that contribution of credit advances towards Agriculture and Industry except semi-urban, Transport operators in rural & Urban, Professional and other services in urban, Personal loan in all regions, Trade except in metropolitan and Finance in semi-urban & metropolitan makes significant contributions towards NPA_{ALL}

8. Recommendations

Following are the recommendations

(1) Achieving better portfolio equilibrium:

Results reveal that Agriculture in urban and metropolitan, Transport operators in rural and urban, Professional and other services in semi-urban, Personal loans in all regions and Finance in rural region make negative contribution indicate that, NPA_{ALL} decreases with increase in these portfolios. Hence, credit Advances towards these occupations should be increased. It was also observed that portfolios of occupations viz, Agriculture in rural, Industry in all regions, Transport operators in semi-urban and metropolitan, Professional and other services in rural and semi-urban regions, Trade in all regions, Finance in all regions except in rural make positive contributions toward NPA_{ALL} . Hence, these advances towards these portfolios should be reduced. The share of transport operations and finance occupations is very less in all regions. In India the services sector is playing an important role and accounts for about 62 % of India's GDP and is generating more income and more employment opportunities. (RBI, 1996-2007b). Therefore, banks will have to sharpen their credit assessment skills by providing better training, which lay more emphasis in

providing finance to the wide range of activities in the services sector. Credit advances towards Trade occupation are about 13%, are also a relatively small fraction of the Indian banking system's total credit advances. In India Trade constitutes only about 28 % percent of aggregate GDP. The implication of this data is that the retail market is relatively 'under-penetrated' and has significant potential for growth for banks. Hence, Banks need to diversify their portfolios to achieve a better credit portfolio equilibrium.

(2) Establishing Risk Management Information System

The effectiveness of risk management depends on efficient information system, computerization and networking of the branch activities. (Leeladhar, 2005a). An objective and reliable database has to be built up for which bank has to analyse its own past performance data relating to loan defaults, operational losses etc. It is essential to build awareness at the operating level about credit assessment skills and risk mitigation processes. Banks need to set up modern IT infrastructure in line with foreign and new generation private banks. (RBI, 2007b).

9. Conclusions

Credit risk management is a challenge in today's deregulated market. Banks must develop a competitive Early Warning System (EWS), which combines strategic planning, competitive intelligence and management action. (Sahajwala and Van den Bergh, 2000). EWS reveals how to change strategy to meet new realities. The reputation of a bank is very important for corporate clients. A corporation seeks to develop relationship with a reputable banking entity with a proven track record of high quality service and demonstrated history of safety and sound practices. Therefore, it is imperative to adopt the advanced Basel-II methodology for credit risk. The Basel Committee has suggested a Risk Based Capital approach for managing risk. Reserve Bank of

India had provided Risk Based Supervision reforms based on Basel Capital Accord-II. (Leeladhar, 2005b; Udeshi, 2005; Udeshi, 2004). With an emerging market scenario banks in India going down the Basel-II path could be an effective strategy to compete in very complex global banking environment. Indian banks need to prepare themselves to compete with the world's largest banks. As our large banks consolidate their balance sheets size and peruse aspirations of large international presence, it is expected that they adopt the international best practices in managing credit risk. (Basel, 1999; RBI, 2002).

References

1. Arunkumar, Rekha and Kotreswar, G, (2003). "Risk management in commercial banks", Social Science Research Network, pp 1-22.
2. Basel Committee on Banking Supervision, (1999). Principles for the management of credit risk, pp. 1-4.
3. Bidani S.N., (2002). "Managing Non-Performing Assets in Banks", Vision Books publishers, pp.71-74.
4. Kim, Joocheol and Lee, Duyeol (2007). "Simulation based approach for measuring concentration risk", MPRA Paper No. 2968, pp 1-15.
5. Leeladhar V, (2005a). Indian banking – the challenges ahead, Reserve Bank of India Bulletin, pp 1131-1136.
6. Leeladhar V (2005b). Regulation and Risk Management: Implementing : Basel II, Reserve Bank of India, 699-702.
7. McKinley, John and Berrickman, John R (1994). "strategic Credit Risk Management-Introduction", Robert Morris Associates, pp 4-5.
8. Reserve Bank of India (1996-2007a). Report on Trend and Progress of Banks in India, RBI publications.

9. Reserve Bank of India (1996 – 2007b). Basic statistical returns of Scheduled commercial banks in India, RBI publications, Volume 25 - 36, Table No. 5.5.
10. Reserve Bank of India (2002), Guidance note on credit risk management, pp 1-50.
11. Reserve Bank of India (2007a). A profile of Banks 2006-07, RBI publications. pp 1-94.
12. Reserve Bank of India, (2007b). Reserve Bank of India Annual report 2006-2007, RBI publications, Table II, pp 358.
13. Sahajwala, Ranjana and Van de Bergh, Paul (2000). Supervisory Risk Assessment and Early Warning Systems, Basel Committee On Banking Supervision Working Papers, pp1-59.
14. Udeshi, Kishori J(2004). Implementation of Basel II: An Indian Perspective, Reserve Bank of India Bulletin, pp 653-655.
15. Udeshi, Kishori (2005). Financial System Stability and Basel II -Way Forward, Reserve Bank of India Bulletin, 847-852.

Copyright of CURIE Journal is the property of BITS (Birla Institute of Technology & Science) and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.