A STUDY ON LENDING CONCENTRATION OF INDIAN PUBLIC SECTOR BANKS TO THE SENSITIVE SECTORS

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ABSTRACT

Commercial banks with its number of branches and subsidiaries work as the backbone of the economy of a country. The activity today, of the commercial banks are not only confined to the traditional kind of banking like accepting deposit, lending credit, creating credit etc. Globally, banks now stretched their activities towards various intermediary and advisory services to the clients. Indian banks are also working on the same way. With its increasing sphere of activities, the risks for the commercial banks are also increasing. One of the major risks in the banking business is the concentration risk. The concentration risk arises due to concentration of credit extended by banks in a single entity or group of entities carrying on same line of business. In India there are certain regulatory measures, issued by the Reserve Bank of India (RBI), for better asset management and safeguarding the banks from the concentration risks. In this study an attempt has been made to study the different risks associated with the banking business as well as the nature of financing by banks to the sensitive sectors in India. And it has also been tried in this study to examine the relationship between banks’ performance and lending concentration. For the purpose of the study we have selected 27 public sector banks operating in India and data have been collected for eight years from 2007 to 2014, since the new exposure norm has come into effect from 2007. The result of this study reveals that the lending concentration has significant relation with the banks’ performance and it also has significant impact on banks’ performance.

KEYWORDS: Central Banking, Commercial Banks, Risks, Diversification.

JEL Classification: E88, G21, G11
sectors for the financing and also issued some measures for financing towards these sectors. These sectors are sensitive because the volatility in these sectors can largely affect the asset quality of the banks. In this study, the discussions are made relating to the risks associated with the banking business, the nature of financing to the sensitive sectors and whether there is any relation between the performance of the Public Sector Banks (PSBs) in India and their lending concentration towards two largest sensitive sectors, real estate and capital market.

Risks in Banking

Risk may be defined as the probability of not getting according to the expectation. Every financial institution has to face several types of risks namely credit default risk, financial risk, liquidity risk, maturity risk, interest rate risk, currency risk, operational risk etc. As a financial institution banks also have to face these kinds of risks. The “Principles for Effective Risk Data Aggregation and Risk Reporting (January, 2013)” published by the Basel Committee of Banking Supervision, categorized risks of the banks into but not limited to three major classes; counterparty credit risk, liquidity risk and operational risk. The Office of the Comptroller of Currency (OCC), US Department of Treasury defines the counterparty credit risk as “the risk arising from the possibility that the counterparty may default the amounts owned on a derivative transaction”. Simply it can be said that, the risk arises out of the possibility of not getting any return from the borrower, may be in terms of interest or principal, according to the terms and condition of the agreement can be called the counterparty credit risk. This risk is also known as the credit risk. The liquidity risk arises due to lack of marketability of the security or assets. It can be expressed as the probability of incurring losses for inadequate liquid resources for clearing certain payment obligation within a certain time horizon. The operational risk arises due to failure in the internal operational activity/ system or from some external inevitable events. The Basel Committee of Banking Supervision defines the operational risk as “the risk of direct or indirect loss resulting from inadequate or failed internal process, people and system or from external events”.

The credit risk can be classified into three namely credit default risk, concentration risk and country risk. Credit default risk arises when the borrower is either not making payment according to the terms of the contract or delaying the payment unreasonably. The concentration risk arises when the lending or advancing of the banks are heavily concentrated to a single entity or group of entity belonging to the same industry or carrying on same line of business. The country risk arises from the possible changes in the business scenario of a country which affects the foreign currency inflows and outflows. This study is focused on the concentration risk; hence the entire discussion will be concentrated on this kind of risk.

Evidence from Industry

The Indian banking industry as well as the international banking had suffered from this risk concentration. There are number of evidences of the bank sufferings. In international context, the failures of the large borrowers like Enron, Parmalat and World Com causes considerable losses to its lenders. Enron was the US energy, commodity and service company based on Houston, Texas. J.P. Morgan Chase and the Citigroup suffered worst for the failure of Enron. The Citigroup again and the Merrill Lynch were the worst sufferer in the scam of multinational Italian dairy and food corporation Parmalat. US’s second largest telecom company WorldCom’s failure leaded to suffer the Citigroup again.

In Indian context, the failure of Kingfisher Airlines added recent evidence of financial turmoil of banks. The major sufferers in this case were the major banks in India namely State Bank of India, Bank of Baroda, Punjab National Bank, IDBI Bank, Central Bank of India, Bank of India and Corporation Bank etc. But the worst evidence of bank failure in India quite possibly the failure of the Global Trust Bank in early ’00s. GTB was one of the fastest growing banks in India in those days. It was failed due to its advances were heavily concentrated in the capital market. Later this bank was merged with the Oriental Bank of Commerce.

The Exposure Norm

Exposure means financing, in the banking terminology. This financing is related to the sensitive sectors. Sensitive sectors are those sectors, in which volatility causes the severe change in the asset quality of the banks. RBI had identified three sectors as the sensitive sectors, namely real estate, capital market and commodity market. May be from the evidence of the GTB, Reserve Bank of India had
introduced the Exposure Norm for all Scheduled Commercial Banks (excluding the Regional Rural Banks) in India in the Mid-Term Policy Review on August 20, 2002. The present norm had been come into force by the Master Circular – Exposure Norms, DBOD No. Dir. BC. 11/13.03.00/ 2007-08 dated July 2, 2007, effecting from April 1, 2007. Exposure comprises with the credit exposure and the investment exposure. Credit exposure comprises:

- All types of funded credit – where actual transfer of fund takes place
- All types of non funded credit – where actual transfer of fund does not takes place
- Facilities extended by way of equipment leasing, hire purchase finance and factoring services etc.

Investment exposure comprises the followings:

- Investment in Shares and Debentures of companies
- Investment in PSU Bonds
- Investment in Commercial Papers (CPs)
- Investment in Debentures, Bonds, Security Receipts and Pass-Through Certificates (PTCs) issued as compensation by a Securitization company or a Reconstruction Company
- Investment in Bonds and Debentures of the Corporates which are guaranteed by the Public Finance Institutions

The limit of exposure would be 15% of capital funds of the respective bank in case of single borrower or 40% of capital funds of the respective bank for the group of borrowers. For the purpose of calculation, Capital funds comprise of Tier I and Tier II capital as specified in the capital adequacy standard, of the previous year. However this ceiling can be relaxed under certain circumstances. If the credit extended towards infrastructure project, additional exposure of 5% of capital fund is permissible to the single borrower and additional 10% is permissible to the group of borrowers. Additional 5% of capital fund can be allowed further for single or group borrower in exceptional conditions, along with proper disclosure in annual reports. The exposure limit to the single borrower can be increased to 25% of the capital fund only in case of oil companies who have issued oil bonds.

Review of Literature

- **Abiola, I. & Olausi, A. S. (2014)** investigated the impact of credit risk management on performance of commercial banks in Nigeria. Panel regression model had been applied on the model prepared from financial data on Seven (7) commercial banks for Seven (7) years. It was found that the credit risk management has significant impact on the profitability.

- **Acharya, V. V., Hasan, I. & Saunders, A. (2002)** studied the effect of specialization and diversification on the return and the risk of Italian banks. The data has been obtained on 105 Italian banks over the period 1993-1999. The result did not guarantee that the diversification of banks’ assets should produce superior performance.

- **Afriyie, H. O. & Akotey, J. O. (2013)** examined the impact of credit risk management on profitability of rural and community banks in the Brong Ahafo Region of Ghana. Data had been collected from Ten (10) rural banks for the period of Five (5) years from 2006 to 2010. The findings revealed that there was a significant positive relationship between credit risk management and the profitability of banks. It was also found that the rural banks do not have the sound and effective credit risk management practice.

- **Ahmed, M. M. (Undated)** examined the effects of market concentration, bank-specific and macroeconomic determinants of profitability of Indian banking industry for period of Eight (8) years from 2004 to 2011. It was found that the market concentration has positive impact on performance of Indian banks.

- **Beatrice, N. (2012)** studied credit risk management process and the performance of Centenary Rural Development Bank of Kampala. Primary data were collected by way of questionnaires. It was found that there was a strong positive relation between the credit risk management and the performance of the bank.

- **Behr, A., Kamp, A., Memmel, C. & Pfingsten, A. (2007)** studied whether the benefits of risk sharing outweigh the risk of specialization of the German banks. The study was conducted on all the German banks for the period of 1993-2003. The study revealed that the specialized banks have slightly higher return than the diversified banks.
• Berger, A. N., Hasan, I., Korhonen, I. & Zhou, M. (2010) evaluated the empirical relationship between diversification strategies and risk-return trade off in banking. Data have been collected on Russian banks during the period 1999-2006. They found that the banks’ performance is inconsistently responding to their diversification strategies.

• Haan, J. D. & Poghosyan, T. (2011) studied whether the banks earning volatility depends upon the bank size and degree of concentration. The study was performed on all commercial, savings and cooperative banks in US for the period Q1 2004 to Q4 2009. It was found that the bank size reduces the return volatility. But this negative impact of the bank size on earning volatility reduces with market concentration.

• Hosna, A., Manjura, B. & Juanjuan, S. (2009) studied the relationship of the credit risk management and profitability of Four (4) commercial banks in Sweden for Nine (9) years. It was found that credit risk management explains profitability to an important extent.

• Li, F. & Zou, Y. (2014) investigated the relationship between credit risk management and profitability of commercial banks in Europe. Data had been collected from Forty Seven (47) commercial banks in Europe for Six (6) from 2007 to 2012. The findings showed that the credit risk management has positive effect on the profitability.

• Turkmen, S. Y. & Yigit, I. (2012) examined the effect of sectoral and geographical diversification on the performance of Turkish banks for the period of 2007 and 2011. Sample has obtained from 50 Turkish banks. The result revealed that sectoral diversification has negative effect on banks’ performance.

Objective of the Study
In this study an attempt has been to study the nature of financing to the sensitive sectors as well as different types of risks associated with the banking business. It has also been tried in this study to examine whether there is any relationship between banks’ performance and lending concentration and the impact of lending concentration on the banks’ performance.

Research Methodology
• Sample Design: For the purpose of this study we have selected all Public Sector Banks in India, working as on 31st March, 2014. The numbers of PSBs are working as on that date is 27.

• Study Period: Study period is Eight (8) years from end March 2007 to end March 2014 for this study. This is because the new exposure norm has come into effective from April 1, 2007 and the data available as per the new exposure norm from end March 2007.

• Data Source: Data have been collected from three sources. Firstly, it is the Annual Reports of the respective bank. Secondly from the Statistical Tables Relating to Banks, various issues, as issued by RBI annually. And thirdly from the data package "AceEquity", developed and maintained by Accord.

• Variables Used: In this study, two dependent variables have been used, in form of Return on Asset (ROA) and Return on Equity (ROE), as the measures of performance of the public sector banks. According to the Reserve Bank of India Glossary, ROA is the profitability ratio which indicates net profit generated on total assets. It can be calculated as follows:

\[
ROA = \frac{Profit \ After \ Tax}{Average \ Total \ Assets} \times 100
\]

Where,

\[
Average \ Total \ Assets = \frac{Total \ Assets \ of \ Previous \ Year + Total \ Assets \ of \ Current \ Year}{2}
\]

ROE is another performance measure of the commercial banks. This is the ratio of net profit to the shareholders equity. It can be calculated as follows:

\[
ROE = \frac{Profit \ After \ Tax}{Average \ Shareholders’ \ Equity} \times 100
\]

Where,

\[
Average \ Shareholders’ \ Equity = \frac{Shareholders’ \ Equity \ of \ previous \ year + Shareholders’ \ Equity \ of \ current \ year}{2}
\]
In this study, two sectors both real estate and capital markets have been selected. Herfindahl-Hirschman Index (HHI) has been used as the measure of concentration. It is used as the opposite of Diversification Index (DI). HHI is the sum square of exposures as a fraction of total exposure under a given classification. It is calculated as under

\[ HHI = 1 - DI = \sum_{i=1}^{N} \left( \frac{Q_i}{Q} \right)^2 \]

Where, \( i \) = Sub-sectors under exposure \( X \)

\( X \) = Sector of lending under total exposure

\( Q \) = Total exposure under given classification

The value of HHI runs within 0 to 1. Higher value of HHI indicates higher level of concentration.

Hence, two HHIs have been used. Firstly, HHI_RE has been used as a measure of lending concentration in the real estate market. And secondly, HHI_CM has been used as a measure of lending concentration in the capital market. The calculations are as below

\[ HHI_{RE} = \left( \frac{\text{Exposure to Real Estate Market}}{\text{Total Exposure to Sensitive Sectors}} \right)^2, \text{ and} \]

\[ HHI_{CM} = \left( \frac{\text{Exposure to Capital Market}}{\text{Total Exposure to Sensitive Sectors}} \right)^2 \]

- **Hypothesis to be tested**
  
  \( H_0 \) : There is no relationship between banks’ performance and Lending Concentration to the sensitive sectors (i.e., Real Estate and Capital Market).

  \( H_{A1} \) : There is a relationship between banks’ performance and Lending Concentration to the sensitive sectors.

  \( H_{A2} \) : Lending Concentration to the sensitive sectors does not affect the banks’ performance.

- **Tools and Techniques Used** To find out the relationship between the variables, lending concentration and bank’s performance Pearson’s Correlation Analysis has been done. And later to find out the impact of lending concentration, we have conducted Regression Analysis.

**Analysis & Findings**

To study the relationship between lending concentration and banks’ performance, we have used Pair-wise Pearson’s Correlation and Regression Analysis. At first, Pair-wise Pearson’s Correlation Analysis has been performed to find out whether there is any statistically significant relation within the variables ROA, ROE, HHI_RE and HHI_CM. The Table below displays the result of the Pearson’s Correlation analysis.

<table>
<thead>
<tr>
<th></th>
<th>roa</th>
<th>roe</th>
<th>hhi_re</th>
<th>hhi_cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>roa</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>roe</td>
<td>0.9936*</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hhi_re</td>
<td>-0.8276*</td>
<td>-0.8396*</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.0112</td>
<td>0.0091</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hhi_cm</td>
<td>0.7930*</td>
<td>0.8014*</td>
<td>-0.9959*</td>
<td>1.0000</td>
</tr>
<tr>
<td></td>
<td>0.0189</td>
<td>0.0168</td>
<td>0.0000</td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ own calculation

The Table above shows the correlation matrix, which reveals that all the correlations between the variables are statistically significant. Lending concentration, both to real estate and capital market, has significant correlation with the ROA and ROE. HHI_RE has negative and significant correlation with both ROA (i.e. -0.8276) and ROE (i.e. -0.8396). It indicates that if banks increase their lending to the real
estate, then both ROA and ROE will decrease. On the other hand, HHI_CM has positive significant correlation with both ROA (i.e. 0.7930) and ROE (i.e. 0.8014). It shows that if banks increase their lending towards capital market then both ROA and ROE will increase. Hence from the outcomes of the correlation analysis, hypothesis H01 that there is no relationship between banks’ performance and Lending Concentration to the sensitive sectors is rejected and it can be said that there is a significant relationship between the lending concentration and the performance of the banks. The level of significance is considered 5% for this purpose.

To find out whether the lending concentration affects the banks performance, two sets of Regression Analysis have been done, separately considering ROA and ROE as dependent variables. Table 2 below displays regression results considering ROA as the dependent variable and HHI_RE and HHI_CM are considered as independent variables.

Table 2: Regression Analysis (Dependent Variable: ROA)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1 (t value)</th>
<th>Model 2 (t value)</th>
<th>Model 3 (t value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>4.459 (4.49)</td>
<td>0.551* (5.04)</td>
<td>22.332 (2.15)</td>
</tr>
<tr>
<td>HHI_RE</td>
<td>-4.232* (-3.61)</td>
<td>-</td>
<td>-23.514 (-2.10)</td>
</tr>
<tr>
<td>HHI_CM</td>
<td>49.255* (3.19)</td>
<td>-235.142 (-1.73)</td>
<td></td>
</tr>
<tr>
<td>R Square</td>
<td>0.684</td>
<td>0.628</td>
<td>0.802</td>
</tr>
<tr>
<td>F</td>
<td>13.04*</td>
<td>10.17*</td>
<td>10.17*</td>
</tr>
<tr>
<td>Prob&gt;F</td>
<td>0.0112</td>
<td>0.0189</td>
<td>0.0173</td>
</tr>
</tbody>
</table>

*Statistically significant at 5% level

Source: Authors’ own calculation

Table 2 reveals the regression analysis considering ROA as dependent variable. HHI_RE solely can explain about 68% of ROA. The value of F statistics is 13.04 and the p-value of F statistics is 0.0112 which is less than 0.05. It indicates that the Model-1 is fit for the study. The result shows that HHI_RE has significant negative impact on ROA (i.e. -4.232).

On the other hand, individually HHI_CM can explain about 62% of ROA. The value of F statistics is 10.17 and the p-value of F statistics is 0.0189 which is less than 0.05. It indicates that the Model-2 is fit for the study. The result shows that HHI_CM has significant positive impact on ROA (i.e. 49.255).

Both HHI_RE and HHI_CM jointly can explain about 80% of ROA. The value of F statistics is 10.17 and the p-value of F statistics is 0.0173. It indicates the Model 3 is also fit for the study. The result reveals that jointly both HHI_RE and HHI_CM have negative effect on ROA (-23.514 and -235.142 respectively).

Table 3 below shows the regression results considering ROE as the dependent variable and HHI_RE and HHI_CM are considered as independent variables.

Table 3: Regression Analysis (Dependent variable: ROE)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model-4 (t value)</th>
<th>Model-5 (t value)</th>
<th>Model-6 (t value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>82.979* (4.64)</td>
<td>9.186* (4.59)</td>
<td>454.101* (2.71)</td>
</tr>
<tr>
<td>HHI_RE</td>
<td>-79.952* (-3.79)</td>
<td>-</td>
<td>-480.319* (-2.65)</td>
</tr>
<tr>
<td>HHI_CM</td>
<td>926.877* (3.28)</td>
<td>-235.142* (2.22)</td>
<td></td>
</tr>
<tr>
<td>R Square</td>
<td>0.704</td>
<td>0.642</td>
<td>0.851</td>
</tr>
<tr>
<td>F</td>
<td>14.33*</td>
<td>10.77*</td>
<td>14.32*</td>
</tr>
<tr>
<td>Prob&gt;F</td>
<td>0.0091</td>
<td>0.0168</td>
<td>0.0085</td>
</tr>
</tbody>
</table>

*Statistically significant at 5% level

Source: Authors’ own calculation

Table 3 reveals that HHI_RE individually explains about 70% of ROE. The value of F statistics is 14.33 and the p-value of F statistics is 0.0091 which is below 0.05. It indicates the Model-4 is fit for the study. It reveals that HHI_RE has negative and significant impact on ROE (-79.952). On the other hand, HHI_CM explains about 64% of ROE. The value of F statistics is 10.77 in this model and the p-value of F statistics is 0.0168 which is below 0.05. It indicates that the Model-5 is fit for the study. This Model indicates that HHI_CM has significant positive impact on ROE (926.877). Moreover, jointly HHI_RE and HHI_CM can explain about 85% of ROE. The Model-6 is also fit because the value of F statistics is 14.32 and the p-value of the F statistics is 0.0085 which is less than 0.05. And jointly both HHI_RE and HHI_CM have significant negative impact on ROE (-480.319 and -4882.464 respectively).
Hence from the results of both Table 2 and Table 3, the null hypothesis $H_0^2$ that lending concentration to the sensitive sectors does not affect the banks’ performance is rejected and it can be said that the lending concentration to the sensitive sectors affects the bank’ performance.

**Conclusion**

This paper examined the relationship of lending concentration to the real estate and capital market, on performance of the Public Sector Banks in India. We have found that lending to the capital market has positive significant correlation with both ROA and ROE. The coefficients are 0.7930 and 0.8014 respectively. It can be concluded that if banks increase their lending towards capital market then both ROA and ROE will increase. But, lending to the real estate has significantly negative correlation with both ROA and ROE. The coefficients are -0.8276 and -0.8396 respectively. It indicates that if banks increase their lending to the real estate, then both ROA and ROE will decrease. So it is suggested that banks should be more careful to manage their financing towards the real estate. Hence, the results indicate that there is a relationship between banks’ performance and Lending Concentration to the capital market and real estate.

In this paper it is also examined the impact of lending concentration to the real estate and capital market on banks’ performance. We have found that lending concentration to real estate has significantly negative impact on both ROA and ROE. It can be concluded that lending concentration to the real estate has adverse impact on banks’ performance. On the other hand, we have also found that lending concentration to the capital market has significantly positive impact on both ROA and ROE. Alternatively, it can be said that lending concentration to the capital market has favourable impact on ROA and ROE. But interestingly, the joint effect of lending concentration to both real estate and capital market is negative on both ROA and ROE. This may be because of the negative effect of lending concentration to real estate is outweighing the positive effect of lending concentration to the capital market. However, the results of the regression analysis clearly indicate that the lending concentration to real estate as well as capital market has effect on banks’ performance. Results may differ for the other commercial banks which are designated as Private Sector Banks in India and it is also matter of further studies. Further study may also be conducted on credit diversification to food credit, non food credit, priority sector lending etc. of the commercial banks in India as well as on the other banks under global economy.

**Limitations**

This study also has certain limitations. This study has been conducted on 27 commercial banks in India with 8 years data. The findings and conclusion may be different if the study is conducted for all the banks working in India. The result may also be different if the study period is increased. Apart from that the result may be different if the tools and techniques have their own limitations.

**References**

- Exposure Norm, Reserve Bank of India.
- RBI Glossary.