A STUDY ON LIQUIDITY RISK AND INTEREST RATE RISK MANAGEMENT BY INDIAN BANKS

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ABSTRACT

Indian banking system has experienced a lot of changes in the last fifty years including structural, geographical and financial changes. With growing complexities, treasury risk management is very significant for a bank in today's world. No bank can survive without proper risk management. From the history of banks, it can be seen that poor risk management has always been the reason of failure of banks. Risk Analysis and Risk Management have got much significance in the Indian Economy. Understanding and managing the risk have been the most challenging tasks done by the banking sector today. The present paper attempts to analyze liquidity management and interest rate risk management of selected banks. Liquidity rations have been used to analyze the liquidity risk management. Similarly Net Interest Income and Net Interest Margin have been used to analyze Interest rate risk management. The results of this paper suggest that overall banks in India have very good liquidity position**.**

KEYWORDS: Interest Rate Risk Management, Liquidity Ratios, Liquidity Management, Risk Management.

I.   INTRODUCTION

Liquidity is the ability of the bank to pay its obligations when due. Bank can maintain sufficient liquidity position either by increasing current liabilities or by converting its assets into liquid assets. Liquidity crisis can be a reason of failure of a bank. So its very important to keep sufficient liquidity at all the points of time. RBI has also given guidelines to reduce liquidity risk. Asset Liability Management Committee plays a vital role in managing liquidity in a bank. The following ratios evaluate bank's liquidity:

- **Liquid Assets to Total Assets Ratio = Liquid Assets/ Total Assets**. Hence higher the ratio, greater is the comfort of the bank in meeting its timely obligations.

- **Liquid Assets to Demand Deposits=Liquid Assets/Demand Deposits**.Demand deposits demand high liquidity or immediate payment of funds without any delay

- **Liquid Assets to Total Deposits Ratio = Liquid Assets/Total Deposits Ratio.** It reveals that the time liability is very high in proportion

- **Approved Securities to Total Assets=Approved Securities /Total Assets**

Interest Rate Risk:

Interest rate risk is the outcome of changes in Net Interest Margin or Market Value of Equity because of some changes in interest rate. The impact of this change can be seen on net Interest Income of Banks.IRR can show its impact on two areas:

1. On the Earnings of banks.(Net Interest Margin)
2. On the economic value of Bank's Balance sheet.(Net Interest Income)

The effect on NIM and NII are short term but the effect on market value of equity is always long term.

Net Interest Income: The difference between interest income and interest expenditure is known as Net Interest Income. Interest income arises on the result of deployment of funds by loans and advances and investments in securities etc. Interest Expenditures are the result of payment of interest for its deposits.

Net Interest Margin (NIM): It can be calculated by subtracting interest expenses from interest incomes which is further divided by earning assets only. Nonperforming assets which do not contribute to the interest income are excluded.

II.   REVIEW OF LITERATURE

 Gupta V, Jain P K (2004) conducted study on" Liability Management in Commercial Banks in India: A Comparative Study of Bank Groups in Liberalized-Era" This research work inspects the liability structure of 68 commercial banks which were operating in India for the period of 8 years from 1992-2000. The special emphasis is on the influence of ownership structure and size in this regard. Time series and cross-section analysis of the liability structure of sample banks reveals that they use 17 units of debt for each unit of owned funds, which is consistent with limits set by regulation. After recapitalization, nationalized banks appear closer to foreign banks in terms of leverage; the leverage of private banks is closer to the State Bank group. Although net worth to total assets ratio is highest for small banks, relatively lower reserve to net worth ratio for them suggests that their shareholders are more interested in regular dividend income. With the notable exception of the foreign banks, the share of deposits has increased for all bank groups in the process of the study. The relative importance of various types of deposits seems to depend on the nature and scale of operations of the sample banks. Borrowings constitute a miniscule portion of total sources of funds for the sample banks.

Singh J.P., et al. (2006) in their research on "Managing risk in banking industry: Mapping the changing contours" highlighted the changing face of the Indian Banking industry to develop a better understanding about the risk threats which will facilitate a more efficient and effective management of risk. The authors suggested that every bank should build a vigorous platform that is strong enough to resist risk by taking various measures into considerations. The division of risk was also discussed under credit risk, market risk, and Operational risk which will form the basic super structure of a healthy, sound, consistent and proactive risk management system not only for banking business, but for all business entities. Three pillars to tolerate the risks were also highlighted as minimum capital, supervisory review process and market discipline.

Meena A.K. and Dhar J.(2014) in their research paper "An Empirical Analysis and Comparative Study of Liquidity Ratios and Asset-Liability Management of Banks Operating in India" analyzed and compared the liquidity ratios and asset liability management practices in top three banks from public, private and foreign sector in India. The authors also identified the interest rate sensitivity of the balance sheet items of selected banks to find out the gap between rate sensitive assets and rate sensitive liabilities. They concluded that overall banks in India have very good short term liquidity position and all banks are financing their short term liabilities by their long term assets.

Aneja S. et al. (2015) in their study, "Risk Management in Indian Banks: An Evaluation through Z Risk Index" have done an empirical study to assess how far the Indian banks have been doing well in attaining their goals of minimizing the effects that different risks can have on financial results of a bank. The objective of the research was to measure the Z Risk index for commercial banks. The study is done on 73 banks and the prediction of their book value bankruptcy for a period of 9 years been examined. The research concluded with a finding that the insolvency risk of public sector banks is less as compared to private and foreign banks.The author also discusses the role of regulatory bodies in minimizing the risks.

III.   DATA AND METHODOLOGY

Objectives of the Study:

1.   To study and compare the liquid assets to total assets ratio of selected public and private sector Banks.

2.   To study and compare the liquid assets to total deposits ratio of selected public and private sector Banks.

3.   To study and compare the liquid assets to demand deposits ratio deposits of selected public and private sector Banks.

4.   To study and compare the approved securities to total assets ratio of selected public and private sector Banks.

5.   To find out and compare the Interest rate Risk by calculating Net Interest Income and Net Interest Margin of selected public and private sector Banks.

Sampling Technique and Sample Size: For this study, stratified sampling method is used as Banks are categorized into public and private sector banks and then Banks with highest Capital Adequacy ratio in both the sectors have been selected.

 10 (Including 5 Public Sector Banks and 5 Private Sector Banks)

- **Public Sector Banks:**

State Bank of India

Bank of Baroda

Indian Bank

IDBI Bank

UCO Bank

- **Private Sector Banks:**

Axis Bank

HDFC Bank

ICICI Bank

Kotak Mahindra Bank

Yes Bank

Data Collection: To calculate various ratios data is obtained from annual reports and published data of selected Banks and website of rbi (www.rbi.org.in).

Period of Study: 2006-2015

Hypotheses: Null hypotheses framed for the Research

H_{01}:   There is no significant difference between liquid assets to total assets of selected private and public sector Banks.

H_{02}:   There is no significant difference between liquid assets to total deposits of selected private and public sector Banks.

H_{03}:   There is no significant difference between liquid assets to demand deposits of selected private and public sector Banks.

H_{04}:   There is no significant difference between approved securities to total assets of selected private and public sector Banks.

H_{05}:   There is no significant difference between Net Interest Income of selected public and private sector Banks.

H_{06}:   There is no significant difference between Net Interest Margin of selected public and private sector Banks.

T-test is used for the testing of hypothesis.

   IV.   Data Analysis:

H_{01}:   **There is no significant difference between liquid assets to total assets of selected private and public sector Banks.**

Table 1: Liquid Assets to Total Assets Ratio of Public Sector and Private Sector Banks from the year 2006-2015

Liquid Assets to Total Assets		
Year	Public Sector Banks	Private Sector Banks
2006	8.49	6.9
2007	9.1	9.68
2008	12.02	8.1
2009	9.12	6.58
2010	8.21	9.21
2011	8.62	7.74
2012	7.26	5.47
2013	7.43	5.81
2014	8.78	6.93
2015	9.56	6.39

Table 2: t-Test: Two-Sample Assuming Unequal Variances

Ratio	Banks	Mean	Variance	df	t-stat	t-Critical Two-Tail
Liquid Assets to Total Assets	Public Sector Banks	8.86	1.759	18	2.598	2.101
	Private Sector Banks	7.28	1.928			

On the basis of results of independent t-test, as the t-stat value (2.598) is more than the t-critical two tail value (2.101), the null hypothesis (H_{01}) is rejected. It can be concluded that there is a significant difference between Liquid Assets to Total Assets Ratio of public and private sector banks.

H_{02}: **There is no significant difference between liquid assets to total deposits of selected private and public sector Banks.**

Table 3: Liquid Assets to Total Deposits Ratio of Public Sector Banks and Private Sector Banks from the year 2006-2015

Liquid Assets to Total Deposits Ratio		
Year	Public Sector	Private Sector
2006	12.93	9.65
2007	12.46	13.76
2008	16.75	13.12
2009	11.32	11.59
2010	9.99	13.5
2011	10.33	11.34
2012	8.61	8.63
2013	8.58	8.95
2014	10.61	10.28
2015	11.37	9.52

Table 4: t-Test: Two-Sample Assuming Unequal Variances

Ratio	Banks	Mean	Variance	df	t-stat	t-Critical Two-Tail
Liquid Assets to Total Deposits	Public Sector Banks	11.29	5.720	18	0.269	2.101
	Private Sector Banks	11.03	3.685			

On the basis of results of independent t-test, as the t-stat value (0.269) is less than the t-critical two tail value (2.101), the null hypothesis (H_{02}) is accepted. It can beconcluded that there is no difference between Liquid Assets to Total Deposits Ratio of public and private sector banks.

H₀₃: There is no significant difference between liquid assets to demand deposits of selected private and public sector Banks.

Table 5: Liquid Assets to Demand Deposits Ratio of Public Sector Banks and Private Sector Banks from the year 2006-2015

Liquid Assets to Demand Deposits		
Year	Public Sector	Private Sector
2006	112.65	69.03
2007	118.71	130.68
2008	179.36	89.09
2009	127.28	90.32
2010	112.79	81.86
2011	136.35	70.8
2012	114.08	58.79
2013	99.55	63.71
2014	130.09	74.16
2015	137.69	67.12

Table 6: t-Test: Two-Sample Assuming Unequal Variances

Ratio	Banks	Mean	Variance	df	t-stat	t-Critical Two-Tail
Liquid Assets to Demand Deposits	Public Sector	126.86	483.298	18	4.947	2.101
	Private Sector	79.56	431.032			

On the basis of results of independent t-test, as the t-stat value (4.947) is more than the t-critical two tail value, the null hypothesis (H_{03}) is rejected. It can be concluded that there is a significant difference between Liquid Assets to Demand Deposits Ratio of public and private sector banks.

H₀₄: There is no significant difference between approved securities to total assets of selected private and public sector Banks.

Table 7: Approved Securities to Total Assets Ratio of Public Sector Banks and Private Sector Banks from the year 2006-2015

Approved Securities to Total Assets		
Year	Public Sector	Private Sector
2006	5.9	0

2007	4.77	0
2008	0.4	0
2009	0.27	0
2010	0.16	0
2011	0.09	0
2012	0.02	0
2013	0.01	0
2014	0.01	0
2015	0.01	0

Table 8: t-Test: Two-Sample Assuming Unequal Variances

Ratio	Banks	Mean	Variance	df	t-stat	t-Critical Two-Tail
Approved Securities to Total Assets	Public Sector	1.16	4.920	18	1.660	2.101
	Private Sector	0.00	0.00			

On the basis of results of independent t-test, as the t-stat value (1.660) is less than the t-critical two tail value, the null hypothesis (H_{04}) is accepted. It can be concluded that there is no difference between Approved Securities to Total Assets Ratio of public and private sector banks.

H_{05}:   **There is no significant difference between Net Interest Income of selected public and private sector Banks**.

Table 9: Net Interest Income (NII) of Public Sector Banks and Private Sector Banks from the year 2006-2015

NII		
Year	Public Sector	Private Sector
2006	44439.62	17602
2007	45325	22730
2008	50302	33347
2009	62978	43004
2010	39575	13438
2011	47527	45016
2012	74705	61265
2013	94014	44399
2014	139586	129875
2015	139586.0566	150234

Table 10: t-Test: Two-Sample Assuming Unequal Variances

Ratio	Banks	Mean	Variance	df	t-stat	t-Critical Two-Tail
Net Interest Income (NII)	Public Sector	73803.85	1474304437	18	0.926	2.101
	Private Sector	56090.98	2188367647			

On the basis of results of independent t-test, as the t-stat value (0.926) is less than the t-critical two tail value, the null hypothesis (H_{05}) is accepted. It can be concluded that there is no difference between Net Interest Income (NII) of public and private sector banks.

H_{06}:   There is no significant difference between Net Interest Margin of selected public and private sector Banks.

Table 11: Net Interest Margin (NIM) of Public Sector Banks and Private Sector Banks from the year 2006-2015

NIM		
Year	Public Sector	Private Sector
2006	2.55	3.32
2007	2	2.97
2008	2	3.38
2009	2	3.52
2010	2	3.53
2011	3	3.41
2012	3	3.27
2013	3	3.39
2014	2	3.46
2015	2.22	3.56

Table 12: t-Test: Two-Sample Assuming Unequal Variances

Ratio	Banks	Mean	Variance	df	t-stat	t-Critical Two-Tail
Net Interest Margin(NIM)	Public Sector	2.40	0.042	18	11.637	2.101
	Private Sector	3.38	0.030			

On the basis of results of independent t-test, as the t-stat value (11.637) is more than the t-critical two tail value, the null hypothesis (H_{06}) is rejected. It can be concluded that there is a significant difference between Net Interest Margin (NIM) of public and private sector banks.

V.　FINDINGS

Table 13: Results of all the hypotheses

S.No.	Parameter	Bank Sector	T-Crit.	T-Calc.	Decision
1	Liquid assets to total assets	Public and Private Sector	2.101	2.598	Rejected
2	Liquid assets to total deposits	Public and Private Sector	2.101	0.269	Accepted
3	Liquid assets to demand deposits	Public and Private Sector	2.101	4.947	Rejected
4	Approved securities to total assets	Public and Private Sector	2.101	1.660	Accepted
5	Net Interest Income (NII)	Public and Private Sector	2.101	0.926	Accepted
6	Net Interest Margin(NIM)	Public and Private Sector	2.101	11.637	Rejected

- The results of the study show that both the private and public sector banks are managing their liquidity quite well.
- The banks are doing smart investments too and so the interest rate risk is also managed well.
- Public sector banks should focus more on Net Interest margin because interest income is major source of income for a bank. Banks should try to maximize this by smartly investing in interest earning securities.
- Banks should try to increase the liquid assets to total assets ratio and liquid assets to demand deposits ratio to make the liquidity position better.
- Liquidity crisis can be a reason of failure of banks.

VI.　CONCLUSION

Liquidity management and interest rate risk management are the practices most often carried out in all the banks. From the above study we can conclude that overall the liquidity structure of banks in India is stable and they are managing their assets and liabilities in a good manner. The study is limited to selected banks. More ratios can be considered for more accurate results.

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