



## EFFECT OF ASSET-LIABILITY-MANAGEMENT ON COMMERCIAL BANKS PROFITABILITY IN INDIAN FINANCIAL MARKET - A CASE STUDY OF TWO PUBLIC SECTOR BANKS

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### **ABSTRACT**

*This study examined the effect of Asset-Liability-Management (ALM) on Commercial banks profitability in Indian financial market by taking into consideration the two Public Sector Banks namely Union Bank of India and Indian Bank. Asset Liability Management is an attempt to match the assets and liabilities in terms of their maturities and interest rate sensitivities so that the risk arising from such mismatches mainly—interest rate risk and liquidity risk can be managed within the desired limit. As far as ALM in Indian banking system is concerned, it is still in a beginning stage. Against this backdrop, a study has been carried to analyze the status of ALM approach in the Indian banking system. For this purpose, two nationalized banks operating in the Indian environment have been chosen and the multivariate statistical technique and ratio analysis have been conducted to study the nature and strength of relationship between the assets and liabilities in these two banks. From the analysis, it is found that the two banks have a good ALM framework in practice. The study also indicates a strong relationship between fixed assets and net worth for both the banks.*

**Keywords: Assets, Liability, Profitability.**

### **INTRODUCTION**

Asset-Liability Management (ALM) is concerned with strategic management of assets (uses of funds) and liabilities (sources of funds) of banks, against various risks such as liquidity risk, interest rate risk, exchange rate risk, credit risk and contingency risks. ALM has gained significance in the financial services sector in recent years with the dramatic changes that have occurred in the post-liberalization period. There has been a vast shift in the borrowers' profile, the industry profile, interest rate structure for deposits and advances, and so on. This has been accompanied by increased volatility of markets, diversification of bank product profiles, and intensified competition between banks on a global scale, all adding to the risk exposure of banks. Thus, banks increasingly need to match the maturities of the assets and liabilities, balancing the objectives of profitability, liquidity, and risk to this end. The Bank of International Settlements (BIS) has suggested a framework for the banks to tackle the market risks that may arise due to rate fluctuations and excessive credit risk.

The Reserve Bank of India (RBI) has implemented the Basel II norms for the regulation of Indian banks, providing a framework for banks to develop ALM policies. At the macro-level, ALM leads to the formulation of critical business policies, efficient allocation of capital, and designing of products with appropriate pricing strategies, while at the micro-level, the objective of the ALM is two-fold: it aims at profitability through price matching while ensuring liquidity by means of maturity matching. An effective ALM technique aims to manage the volume, mix, maturity, rate sensitivity, quality and liquidity of the assets and liabilities as a whole so as to attain a predetermined acceptable risk-reward ratio. The purpose of ALM is to enhance the asset quality, quantify the risks associated with the assets and liabilities and further manage them, in order to stabilize the short-term profits, the long-term earnings and the long-run sustenance of the bank.

### **NEED FOR ALM IN BANKS**

The Changes in the financial markets in recent years as foreign players have gained access to the domestic market, and risks associated with the operations of banks have become complex. Now the management requires strategic management to operate banks successfully. Competition within the banks has increased after the entry of foreign banks into the country. The volatile interest rates and exchange rate have put the pressure on the banks to design their asset liability portfolio in such a way that the risk in the portfolio is minimized. Banks management

needs to maintain a good balance between profitability and stability. The most important thing for bank management is to manage market liquidity risk and interest rate risk. Hence banks need a framework which enables them to combat these risks and help them to optimize the performance of the banks. In this scenario ALM is very useful and helpful tool to analyze the liquidity and interest rate risk for the banks.

## LITERATURE REVIEW

The amount of literature available about the asset liability management in banks is considerably high. Various researchers have made significant contributions in the field of asset liability management by studying it in different contexts.

**Hester & Zoellner (1966)** had employed statistical cost accounting (SCA) method on US banks and through their research they found statistically significant coefficients for most of the categories of assets and liabilities and rejected the null hypothesis that there is no relationship between them.

**Berger & Humphrey (1997)** through their study states that the whole idea of measuring bank performance is to separate banks that are performing well from those which are doing poorly.

**Gardner and Mills (1991)** discussed the principles of asset-liability management as a part of banks' strategic planning and as a response to the changing environment in prudential supervision, e-commerce and new taxation treaties. Their text provided the foundation of subsequent discussion on asset-liability management.

**According to Vaidyanathan (1999)** the most important thing which banks require to manage now days is interest risk. He analyzed various types of risks and found that earlier banks were liquidity managed but now we can identify them as liability managed.

**Haslem et al (1999)** found that the least profitable very large banks have the largest proportions of foreign loans, yet they emphasize domestic balance sheet (asset/liability) matching strategies. Conversely, the most profitable very large banks have the smallest proportions of foreign loans, but, nonetheless, they emphasize foreign balance sheet matching strategies.

**Vaidya and Shahi (2001)** concluded that interest rate risk and liquidity risk are two key inputs in business planning process of banks.

**According to Bikram De (2003)** ownership does not seem to have any effect on the Return on Assets but, public sector banks do seem to have higher Net Interest Margin and Operating Cost Ratio.

**Ranjan and Nallari (2004)** used canonical analysis to examine asset-liability management in Indian banks in the period 1992-2004. They found that SBI and associates had the best asset-liability management in the period 1992-2004. They also found that, other than foreign banks, all other banks could be said to be liability-managed. Private sector banks were mostly focused on profit generation, while nationalized banks followed a conservative approach about maintaining high liquidity. The Basel committee for banking supervision provides important guidelines for measuring interest rate risk sensitivity.

**Kosmidou et al (2004)** who found through his research that liability management contributes more in creating the profitability

**Tarawneh (2006)** study measured the performance of Oman commercial banks using financial ratios and accordingly ranked the banks based on their performance..

**Charumathi (2008)** in her study on interest rate risk management finally concluded that balance sheet risks include interest rate and liquidity risks.

**Chkrabraborty and Mohapatra (2008)** stated in their study that public sector banks have an efficient asset-liability maturity pattern. Also they found that the interest rate risk and liquidity risks are the significant risks that affect the bank's balance sheet and therefore, they should be regularly evaluated and managed.

**Kajal Chaudhary and Monika Sharma (2011)** stated that public banks must pay attention on their functioning. These banks should select borrower very cleverly and also public banks should decrease the NPA level. Sometimes the perspective of management also defines the risk profile of banks which further determines the liquidity and profitability tradeoff.

**Dash and Pathak (2011)** proposed a linear model for asset-liability assessment. They found public sector banks are having the best asset-liability management positions. In turn, They found that public sector banks had a strong short-term liquidity position, but with lower profitability, while private sector banks had a comfortable short-term liquidity position, balancing profitability.

**Prathap (2013).** Ownership and structure of the banks do have a major bearing in the ALM procedure. It is further observed that SBI and its Associates have the best correlation, thereby indicating the best asset-liability maturity pattern. Most of the Indian banks, unlike foreign banks, are liability-managed banks because they all borrow from money market to meet their maturing liabilities. The private banks are highly aggressive for profit generation and use the short-term funds for long-term investments.

**Amit Kumar Meena, Joydip Dhar(2014).** Overall the liquidity structure of banks in India is stable but the amount of cash they maintain with them can create problems in long run as it is deteriorating their profits.

**Manish Roy Tirkey & Shaban. E. A. Salem** in their study used Ratio analysis in order to compare asset/liability management in ICIC bank and HDFC bank and found better asset/liability management in ICICI bank.

### OBJECTIVES OF THE STUDY

- i) To explore strength of asset liability linkages for banks.
- ii) To evaluate the impact of ALM on profitability of banks

### RESEARCH METHODOLOGY

**Type of Research:** The research methodology is descriptive in nature as it involves fact-finding enquiries and reporting of what has happened or what is happening.

**Data Collection:** Secondary data has being used for the analysis.

**Source of the secondary data** the study Covered the two public sector banks (Indian bank, Union bank of India) operating in India. The data for the study is collected from the major financial details (balance sheets, annual reports) of the sample banks and the RBI website for the period of 2009-10 to 2013-14. The study is conducted on the basis of the Asset-Liability guidelines issued by RBI to individual banks. In addition to the above sources, some more information was collected from different issues of Economic Survey published by the Government of India.

**Statistical Tools:** The multivariate statistical technique and Ratio analysis was used to interpret the financial statements and analyze the data

The calculations are based upon the following formulas,

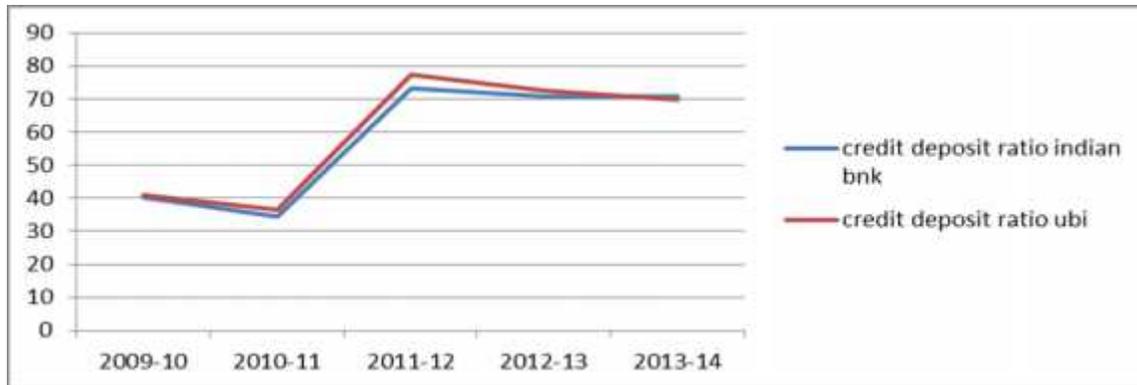
- Current Ratio = Total Current Assets/ Total Current Liabilities
- Quick Ratio = (Cash + accounts receivables + marketable securities)/ Total Current Liabilities
- Quick Assets = Quick Assets / Total Current
- Credit Deposit Ratio : Total advances / Customer Deposits (i.e. Total Deposits minus Inter Bank Deposits)
- Earnings per Share : Net Income – Dividends on preferred stock / Average outstanding shares
- Capital Adequacy ratio= (Tier one capital + tier two capital)/Risk Weighted Assets
- Operating margin = Operating income/ Net sales
- Gross profit margin= (Revenue - COGS)/Revenue
- Net profit margin= (Net Income after Taxes ÷ Revenue)

### ANALYSIS OF CREDIT DEPOSIT RATIO

**Table: 1**

BANKS/YEARS	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Indian Bank	40.17	34.37	73.07	70.81	70.65
Union Bank of India	40.81	36.55	77.32	72.56	69.91

Source: Secondary data



**Figure: 1 Credit Deposit Ratio**

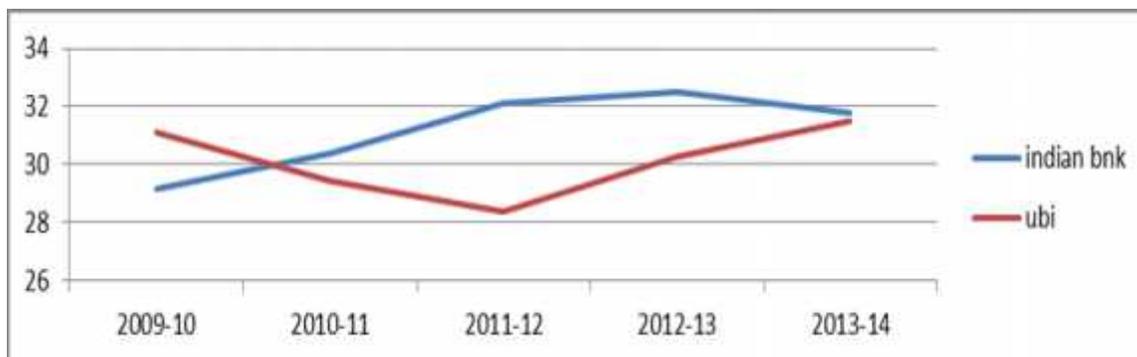
Credit deposit ratio is the ratio with which it could be analyzed of how much a bank lends out of the deposits it has mobilized. It indicates how much of a bank's core funds are being used for lending, the main banking activity. The ratio gives the first indication of the financial health of the bank. Thus it can be inferred that Union bank of India is more healthy than when compared to Indian bank from the credit deposit ratio point of view.

### ANALYSIS OF INVESTMENT DEPOSIT RATIO

**Table: 2**

BANKS/YEARS	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Indian Bank	29.16	30.36	32.11	32.50	31.76
Union Bank of India	31.09	29.43	28.39	30.28	31.52

Source: Secondary data



**Figure: 2 Investment deposit ratio**

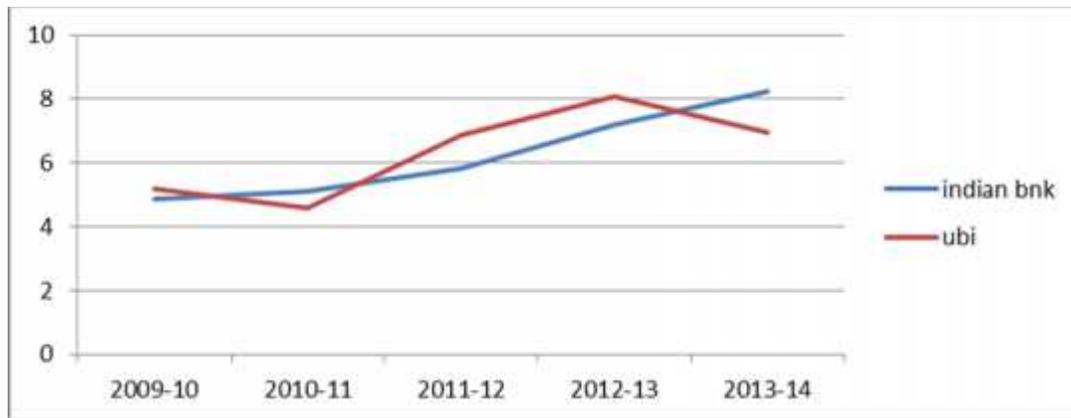
Investment deposit ratio basically gives information about how the bank is using their deposits, into better investment outcomes so that their can earn higher rate of interest. Thus it can be inferred that Indian bank is performing well when compared to that of the Union bank of India from the point of Investment deposit ratio.

### ANALYSIS OF CASH DEPOSIT RATIO

**Table: 3**

BANKS/YEARS	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Indian Bank	4.87	5.09	5.82	7.18	8.25
Union Bank of India	5.20	4.60	6.88	8.07	6.95

Source: Secondary data



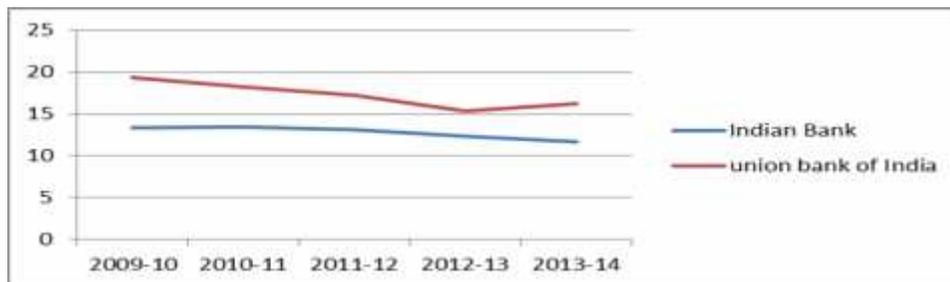
**Figure: 3 Cash deposit ratio**

Cash Deposit ratio depicts the amount of money a bank should have as a percentage of the total amount of money its customers have paid into the bank. This amount is calculated so that customers can be sure that they will be able to take their money out of the bank if they want to. Thus it can be stated that union bank is maintaining a higher cash reserve ratio when compared with Indian Bank. This trend is in fact well maintained by both the banks indicating the healthy state of both the banks and the effective utilization of the funds, which is in fact a positive sign.

**ANALYSIS OF TOTAL DEBT TO OWNERS FUND Table: 4**

BANKS/YEARS	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Indian Bank	13.33	13.40	13.12	12.30	11.70
Union Bank of India	19.31	18.28	17.17	15.35	16.22

Source: Secondary data



**Figure: 4 Total debts to owners fund**

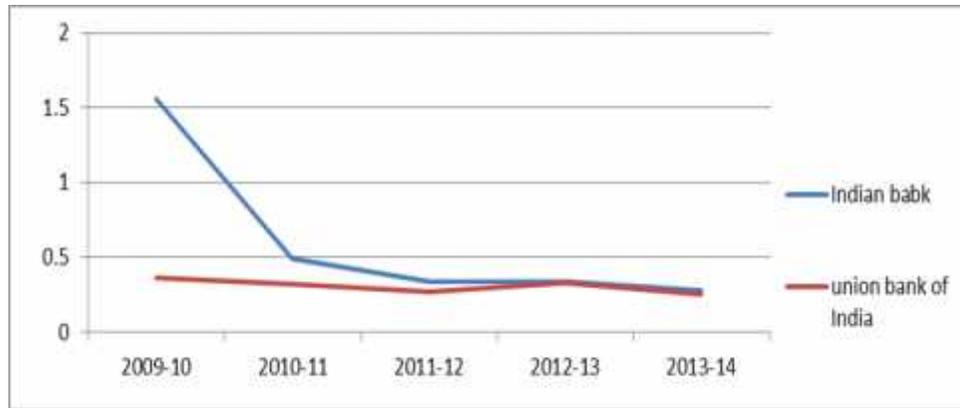
Total Debt to Owners Fund is a measurement of a bank's financial leverage. From the above analysis it is stated that in comparison between Indian bank and union bank of India total debt to owners fund is lower in Indian bank compared to union bank of India, which indicates the risk factor to the lenders is less in the case of Union Bank.

**ANALYSIS OF FINANCIAL CHARGES COVERAGE RATIO**

**Table: 5**

BANKS/YEARS	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Indian Bank	1.56	0.49	0.34	0.34	0.28
Union Bank of India	0.36	0.32	0.27	0.33	0.25

Source: Secondary data



**Figure: 5 financial charges coverage ratio**

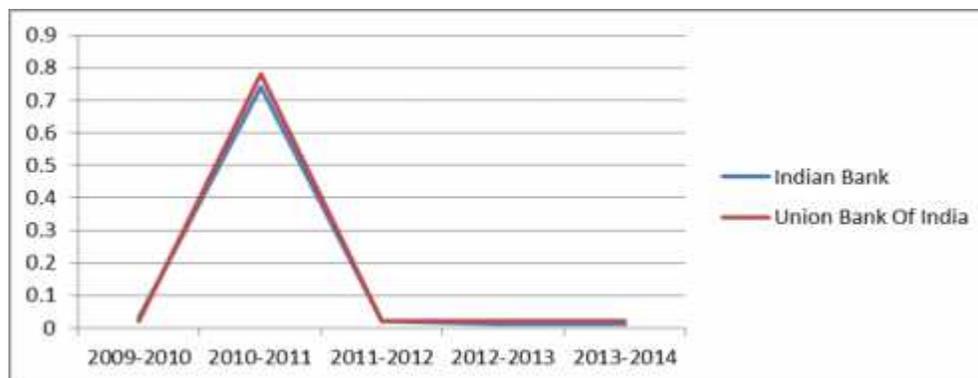
This ratio is used to determine how easily a bank can pay interest on their outstanding debt. From the above analysis it is explicable that total debt to owners fund is higher in the case of Indian bank when compared to Union bank of India which indicates that Indian bank sounds better in their perf

### ANALYSIS OF CURRENT RATIO

**Table: 6**

BANKS/YEARS	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Indian Bank	0.03	0.74	0.02	0.01	0.01
Union Bank of India	0.02	0.78	0.02	0.02	0.02

Source: Secondary data



**Figure: 6 Current ratio**

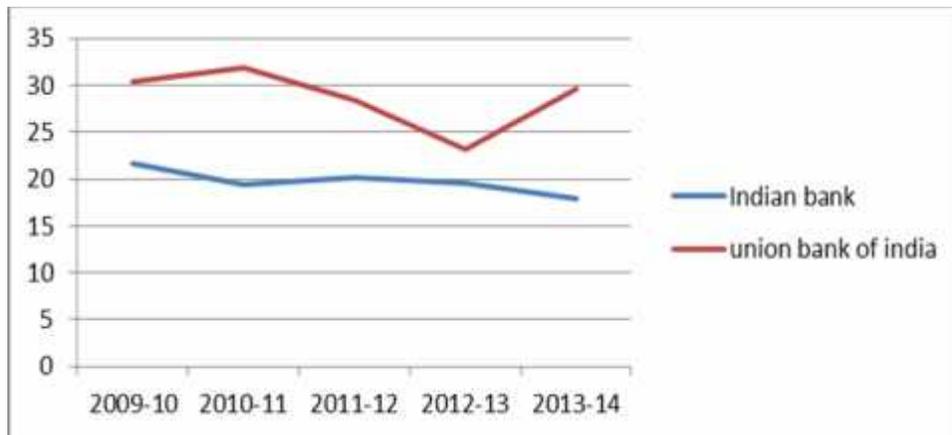
Current ratio is a useful test of the short-term-debt paying ability of any business. A ratio of 2:1 or higher is considered satisfactory for most of the companies. Both banks current ratio is not satisfactory as it is below 2:1. This shows that both the banks liquidity position is not good. In this context it is advisable for both the banks to make sure that they focus more on their liquidity position to minimize the risk.

### ANALYSIS OF QUICK RATIO

**Table: 7**

BANKS/YEARS	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Indian Bank	21.67	19.43	20.10	19.49	17.93
Union Bank of India	30.41	31.85	28.45	23.22	29.65

Source: Secondary data



**Figure: 7 Quick ratios**

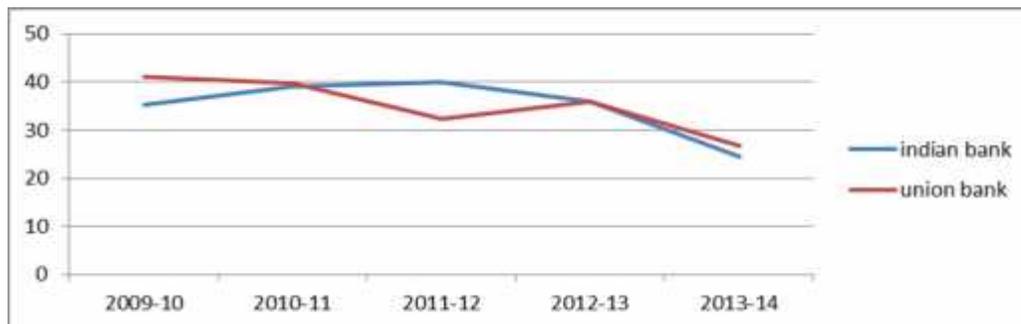
Quick ratio is considered a more reliable test of short-term solvency than current ratio because it shows the ability of the business to pay short term debts immediately. A quick ratio of 1:1 is considered satisfactory. It was found from the analysis that quick ratio of union bank is higher when compared to Indian bank. Therefore it can be stated that the liquidity position of Union bank is better, this indicates that union bank is in a sound financial position when compared to Indian bank.

#### ANALYSIS OF EARNING PER SHARE

**Table: 8**

BANKS/YEARS	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Indian Bank	35.25	38.95	39.91	35.94	24.37
Union Bank of India	41.08	39.61	32.27	36.00	26.75

Source: Secondary data



**Figure: 8 Earnings per share**

Earning per Share is the most widely relied indicator to measure the profitability of a bank from the investor's point of view. The higher the EPS the better is the measure of profitability of the banks. A high EPS is the sign of higher earnings, strong financial position and, therefore, a reliable bank to invest money. The above data shows that union bank is more reliable bank for investment. One thing that needs to be noted is that the EPS of union bank is continuously decreasing, which is not an advisable situation for union bank. But since this is a comparative study, Union bank EPS is higher than Indian bank.

#### Capital adequacy ratio

Capital Adequacy Ratio is a measure of a bank's capital. It is expressed as a percentage of a bank's risk weighted credit exposures.

- Capital Adequacy ratio= (Tier one capital + tier two capital)/Risk Weighted Assets

### ANALYSIS OF CAPITAL ADEQUACY RATIO

Table: 9

BANKS/YEARS	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Indian Bank	12.71	13.56	13.47	13.08	13.10
Union Bank of India	12.51	12.95	11.85	11.45	10.80

Source: Secondary data

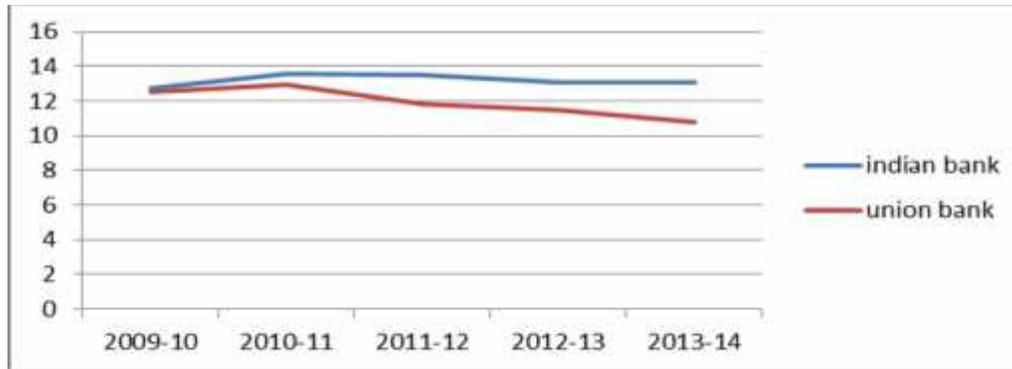


Figure: 9 capital adequacy ratio

Capital adequacy ratio (CAR) is a specialized ratio used by banks to determine the adequacy of their capital keeping in view their risk exposures. Banking regulators require a minimum capital adequacy ratio so as to provide the banks with a cushion to absorb losses before they become insolvent. This improves stability in financial markets and protects deposit-holders.

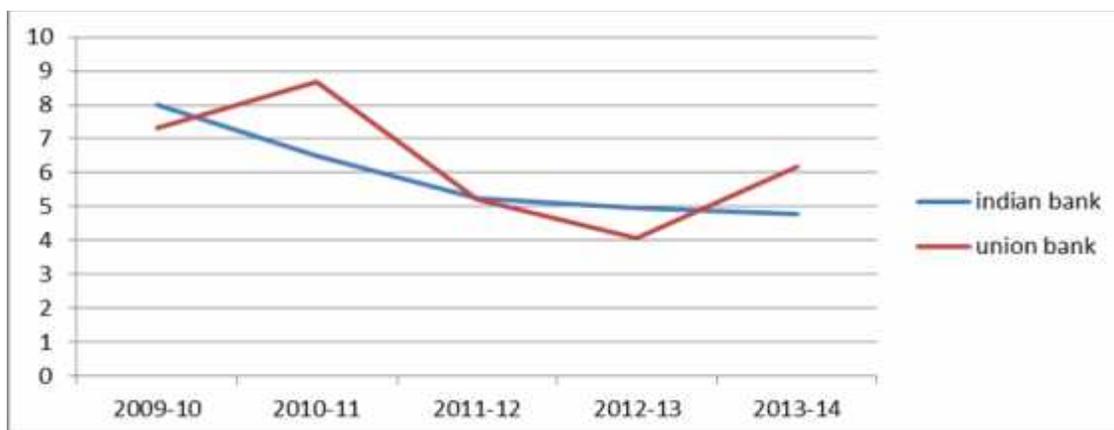
Thus we conclude that Indian bank is maintaining better capital adequacy ratio as compared to Union bank of India, which is a sign of a healthy bank's performance.

### CASH RESERVE RATIO

Table: 10

BANKS/YEARS	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014
Indian Bank	8.00	6.50	5.23	4.97	4.78
Union Bank of India	7.33	8.67	5.22	4.08	6.19

Source: Secondary data



**Figure: 10 Cash reserve ratio**

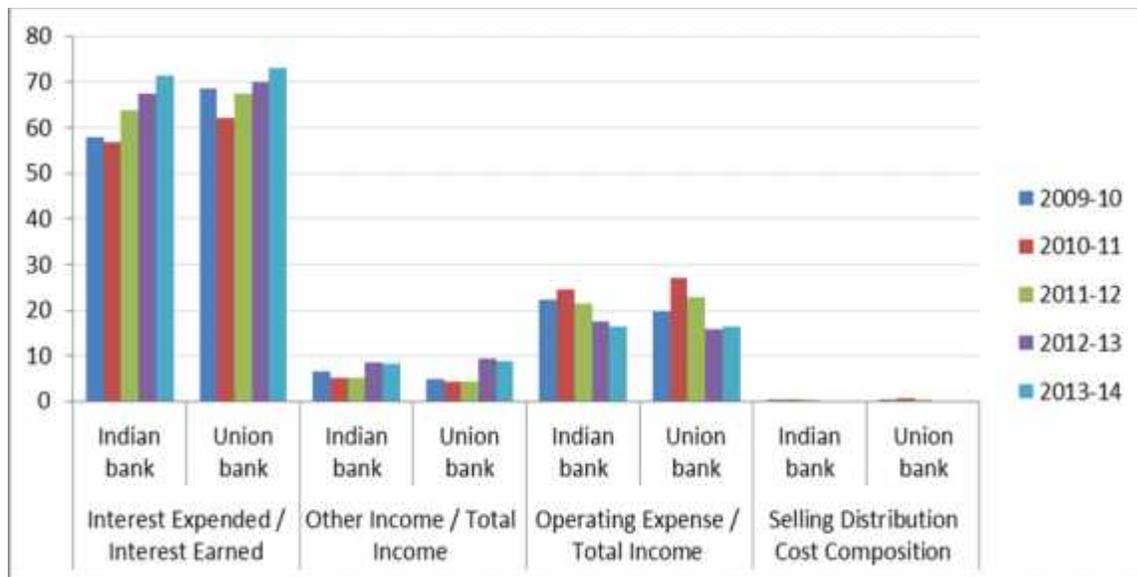
Table 10 depicts that both the banks has maintained minimum cash reserve ratio i.e. 4 percent, which means both the bank are in acceptable position as they have maintained cash reserve ratio more than 4 percent. From the point of comparison union bank stands better in position as far as maintaining cash on hand as percentage of total transactions.

**PROFIT AND LOSS ACCOUNT RATIO**

**Table: 11**

Year	Interest Expended / Interest Earned		Other Income / Total Income		Operating Expense / Total Income		Selling Distribution Cost Composition	
	Indian bank	Union bank	Indian bank	Union bank	Indian bank	Union bank	Indian bank	Union bank
2009-10	57.95	68.48	6.65	4.73	22.29	19.79	0.12	0.26
2010-11	56.88	62.22	5.16	4.23	24.51	26.98	0.10	0.53
2011-12	63.88	67.33	5.05	4.43	21.51	22.85	0.07	0.30
2012-13	67.43	69.98	8.48	9.22	17.52	15.76	-	-
2013-14	71.41	73.15	8.25	8.77	16.41	16.44	-	-
Mean	63.51	68.23	6.71	6.27	20.44	20.36	0.096	0.36
Standard deviation	6.18	4.01	1.63	2.49	3.38	4.66	0.03	0.021
Coefficient of Variation	9.73	5.87	24.29	39.71	16.53	22.88	31.25	5.83

Source: Secondary data



**Figure: 11 Profit and loss account ratio**

From the above analysis it is concluded that Indian bank is more profitable than Union bank of India. i.e. Indian bank has ability to generate higher profits over loss effectively when compared to Union bank of India. Thus investors will be motivated to invest in Indian bank as it is less risky and high profit generation as compared to Union bank of India.

## PROFITABILITY RATIOS

Table: 12

Year	Operating margin %		Gross profit margin%		Net profit margin%	
	Indian bank	Union bank	Indian bank	Union bank	Indian bank	Union bank
2009-10	22.67	17.11	21.64	16.02	17.03	13.47
2010-11	20.58	13.94	19.86	13.06	16.35	11.27
2011-12	15.42	12.49	14.78	11.84	13.14	7.63
2012-13	13.41	12.66	12.76	12.06	10.41	7.79
2013-14	10.71	8.82	10.02	8.16	6.97	5.27
Mean	16.55	13.00	15.81	12.22	12.78	9.08
Standard deviation	4.97	2.98	4.85	2.81	4.19	3.25
Coefficient of variation	24.73	8.90	23.56	7.94	17.57	10.58

Source: Secondary data

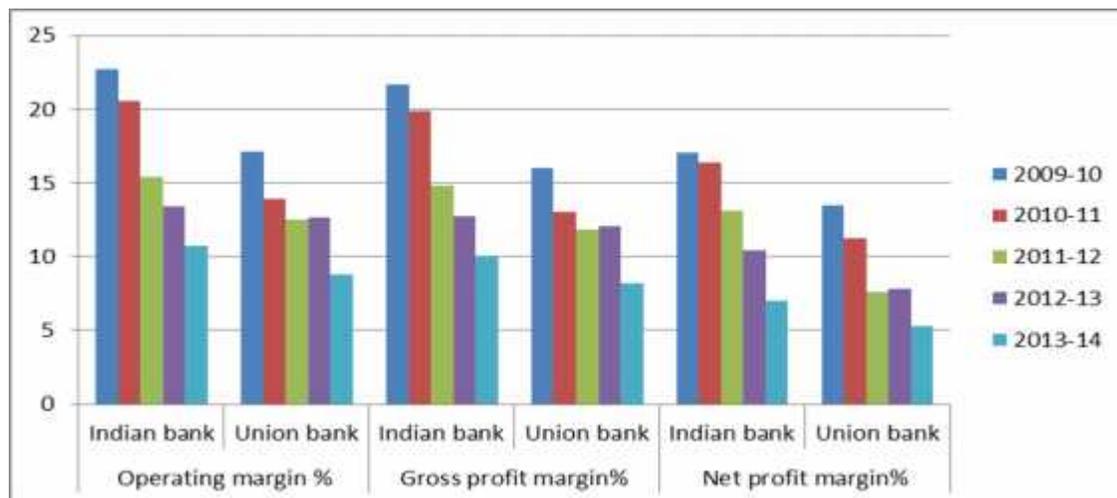


Figure: 12 Profitability Ratios

A profitability ratio tells how good a company is converting business operations into profits. Profit is a key driver of stock price, and it is undoubtedly one of the most closely followed metrics in business, finance and investing. The more the bank is profitable the less would be the risk for the investors as it is a comparative study it can be concluded that Indian bank is more profitable than Union bank of India.

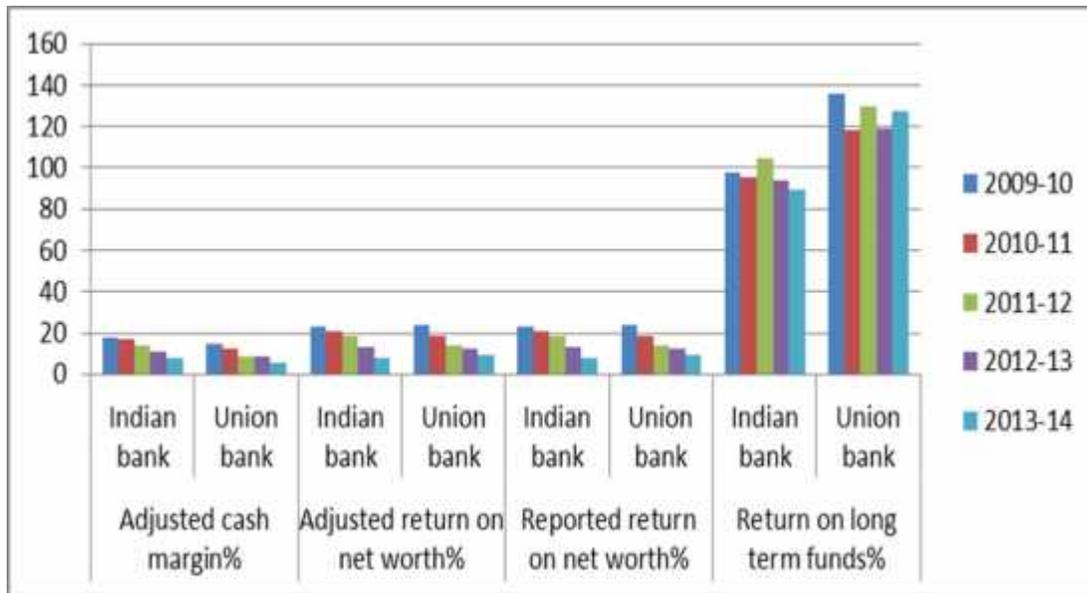
## PROFITABILITY RATIOS

Table: 13

Year	Adjusted cash margin%		Adjusted return on net worth%		Reported return on net worth%		Return on long term funds%	
	Indian bank	Union bank	Indian bank	Union bank	Indian bank	Union bank	Indian bank	Union bank
2009-10	18.00	14.52	22.79	23.56	22.79	23.55	97.98	135.60
2010-11	17.02	12.11	21.10	18.74	21.11	18.74	95.57	117.88
2011-12	13.81	8.25	18.57	13.68	18.47	13.67	104.69	129.38

<b>2012-13</b>	11.01	8.34	13.34	12.50	13.34	12.50	93.50	119.36
<b>2013-14</b>	7.60	5.87	8.16	9.18	8.16	9.18	89.13	127.39
<b>Mean</b>	13.48	9.81	16.79	15.53	16.77	15.52	96.17	125.92
<b>Standard deviation</b>	4.29	3.44	6.00	5.65	5.99	5.65	5.76	7.34
<b>coefficient of variation</b>	18.43	11.89	36.03	31.92	35.96	31.89	33.22	53.87

Source: Secondary data



**Figure: 13 Profitability ratio**

A profitability ratio is a measure of profitability, which is a way to measure a company's performance. For profitability ratio, having a higher value indicates that the company is doing well. Hence overall we can conclude that Indian bank is more profitable than Union bank of India. Therefore Investors would be motivated to invest in a bank which has high profitability ratio.

## CONCLUSION

Asset-Liability Management is today concerned as a strategic management of assets (uses of funds) and liabilities (sources of funds) of banks, against the risk exposed due to the changing liquidity position in the bank, interest rates and exchange rates, and against credit risk and contingency risk. Financial services in India has been witnessing a significant changes specially after the post- liberalization period, there has been a vast shift in the borrowers profile, the industry profile accompanied by the increase market volatility, diversification of the banks product profile and intensified competition between the public and private banks in India, all is adding to the increased risk exposed by of the banks in India. Thus, banks today need to match their maturities between their assets and liabilities and at the same time balancing their objectives of profitability, Liquidity and risk. This attempt was to analysis the matching strategy on assets and liability by the two banks which have been in existences for a pretty long and had the customer's appreciation. After calculating the various ratios and critically analyzing them, it is evident that both banks are performing satisfactorily in terms of profitability and adequacy, but they are needs to address the immediate concern of liquidity. On critical comparison between Indian bank and Union bank, we are concluding that Indian bank is more profitable with good Asset-Liability Management strategy.

## REFERENCES

1. Basel Committee on Banking Supervision (2001), *Principles for the management and supervision of interest rate risk*, Bank for International Settlements
2. Basel II (2004), *International Convergence of Capital Measurement and Capital Standards: a Revised Framework*, Bank for International Settlements
3. Black, R. and Brown, K. (2002), *Asset and Liability Management: What Does The Future Have In Store?* Balance Sheet, Boston
4. Haslem, J. A., Scheraga, C.A. and Bedingfield, J.P. (1999), "DEA efficiency profiles of U.S. banks operating internationally," *International Review of Economics & Finance*, Vol. 8, Issue 2.
5. Ranjan, R. and Nallari, R. (2004), "Study Study of Asset Liability Management in Indian Banks Canonical Correlation Analysis," *Spandan*.
6. Rao, A.V. (2005), "ALM systems in Banks," *Treasury Management*, April 2005.
7. Ravikumar, T. (2002), *Asset Liability Management*, ICFAI Press
8. Vaidya, P. and Shahi, A (2001), "Asset Liability Management in Indian Banks," *Spandan*.
9. Vaidyanathan, R. (1999), "Asset-Liability Management: Issues and Trends in the Indian Context," *ASCI Journal of Management*, 29(1)
10. 10. Ramachandran.A, "Profits, Profitability and Growth of Commercial Banks, Thesis submitted to Bharathiar University, Coimbatore, 2002.
11. Shilpa Baid, What drives Profitability of Indian Commercial Banks?, *Asian Economic Review (Journal of the Indian Institute of Economics)*, Vol. 48, No.3, 2006.
12. Mishra, M.N., „Analysis of Profitability of Commercial Banks“, *Indian Journal of Banking and Finance*, Vol. 5, 1992.
13. Mohi-ud-Din Sangmi and Tabassum Nazir (2010), "Analyzing financial Performance of Commercial Banks in India: Application of CAMEL Model," *Pak. J. Commer. Soc. Sci.*, Vol. 4 (1), 40-55.
14. Houpt J.V. and J. Embersit (1996): "An Analysis of Commercial Bank Exposure to Interest Rate Risk", *Federal Reserve Bulletin*, February, pp. 115-128.
15. Vasishth, D (1996), "Asset and Liability Management in Banks", *The Journal of the Indian Institute of Bankers*.
16. Kannan, K (1996), "Relevance and Importance of Asset Liability Management in Banks", *The Journal of the Indian Institute of Bankers*, Vol. 67, No. 4.
17. A Handbook of Indian Economics, Reserve Bank of India.
18. Database on Indian Economy, [www.dbie.rbi.org.in](http://www.dbie.rbi.org.in).
19. Chakraborty , S. and Mohapatra, S.(2007), "An Empirical Study of Asset Liability Management Approach by the Indian Banks," *The IUP Journal of Bank Management*, Vol. VIII, Nos. 3 & 4, pp. 7-13, August & November 2009.
20. Dash, M. and Pathak, R. (2011), "A Linear Programming Model for Assessing Asset-Liability management in Banks," *ICFAI Journal of Risk Management* (accepted for publication).
21. Chaudhary, K., Sharma, M. 2011. To Compare the Performance of Public and Private Banks of India and to Find out Trends in NPA level *International Journal of Innovation, Management and Technology*, Vol.2, No. 3, June 2011.
22. Vaidyanathan, R. (1999), "Asset-Liability Management: Issues and Trends in the Indian Context," *ASCI Journal of Management*, 29(1).
23. Gardner, M.J. and Mills, D.L. (1991), *Managing Financial Institutions: An Asset/Liability Approach*, 2nd Ed., the Dryden Press, Chicago.