

Asset-Liability Management to Control the Volatility in Net Interest Income and Economic Value through Gap Analysis of Selected Public and Private Sector Banks

Middi Appala Raju

Christ University, India

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Abstract

The formation of WTO has resulted in the integration of economies and markets and led to the creation of competitive environment across different markets in the world. Financial Markets as an integral part of the economic system has been subject to phenomenal changes in their structure and functioning, brought in new products, services and exposed to new business propositions. The change in the systems, compelled and inevitable exposure to news avenues of business, also make them exposed to new forms of market risk i.e. interest rate risk and exchange rate risk, transfer risk etc. over and above the conventional risk, credit risk under repressed markets. Due to the changes happening, there is tremendous pressure on the banks and financial institutions to manage their Assets and Liabilities and the associated risk in a scientific way to minimize the volatility in Interest Income and Economic value and to maximize the return. The recent financial crises that shook the entire global financial system is a clear testimony for the poor and inadequate attention given for Assets and Liabilities management. Three public sector banks and three private sector banks were taken for the study. According to the study based On facts and figures collected, private sector banks ALM is better than public sector banks.

Key words: Integration of Economies; Risk Management; Repressed Markets; Economic Value; Recession; Testimony; economic systems

Economic liberalization in the entire world across different nations has brought in unforeseen changes in the structure and functioning of financial markets. Banking system as one of the important functionaries has undergone a lot of changes and severe competition has emerged with the entry of new domestic private players and foreign players in to the banking business. Due to inevitable competition, it has become imperative for the banks to come out of the traditional and conventional business activities into a more dynamic and vibrant system. The technology and the advanced products and professional practices compelled the Indian banks and banking system to look for advancements and sophistication in their products and services and complete reorientation of business on modern lines of business. Banks have started exploring new lines of business, new products and services, new technology to compete and

withstand the new challenges from the new players. The operational performance, assets and liability management is influenced by interest rate and exchange rate volatility. Unlike in the yester years, under regulatory and protected environment, the focus of the banks' functioning was mostly on credit risk management. But now under contemporary business environment, it is not only credit risk but as well the liquidity risk, exchange rate risk commodity risk etc. have taken prominence in the functioning of banks.

Asset Liability Management has been a greater concern for banks due to uncertainties and volatility in the market and the influence of market forces which are very much unpredictable due to the influence of macro factors both in domestic as well in global markets. Technology advancement, new product innovations, latest management practices brought in new private players and foreign banks adding further stress on the functioning of public sector banks. Under these compelling situations, ALM objective is to control volatility of Net Interest Income and Net Economic Value of respective banks. The supplementary objectives is to cover and control volatility of all target accounts, control of liquidity risk and ensure an acceptable balance between profitability and growth rate. The banking sector need to introduce measures in order to compete in a competitive environment , so that risk can be minimized. The recent collapse of the banking system and the systemic risk is a clear testimonial for inadequate attention given for risk management. The success of banking system depends on the appropriate Asset Liability Management which in turn depends on the effective policies, governance and risk management practices.

Risk Management system

In view of the increasing market risks in banking operations, banks should introduce well-structured risk management system for measuring, monitoring and controlling risks. Out of different methods that are in vogue to analyse the risk, GAP analysis is the most important technique. It measures the difference between a bank's assets and liabilities and off-balance sheet positions, which will be repriced or will mature within a predetermined period. GAP is the difference between the rate sensitive assets and rate sensitive liabilities.

LITERATURE REVIEW

Asset Liability Management in Banks and Financial Institutions - case study of IDBI. (2001) MIHIR DASH & RAVI PATHAK The process of ALM will differ from bank to bank and the success of the technique depends upon how effectively banks are able to forecast and manage the risks they carry and are exposed to. Efficient liquidity and interest rate management are the two important activities of the banks and financial institutions in maximizing their income while controlling the risk exposure. Efficient liquidity and interest rate management would be the two important activities of the banks and the financial institutions in maximising their income while controlling the risk exposure. **Asset Liability Management in Indian Banking Industry - with special reference to Interest Rate Risk Management in ICICI Bank.** Dr. B. Charumathi₂ (2008) This paper entitled "A Study on the Assets and Liabilities Management (ALM) Practices with special reference to Interest Rate Risk Management at ICICI Bank" is aimed at measuring the Interest Rate Risk in ICICI Bank by using Gap Analysis Technique Banks can also use sensitivity

analysis for risk management purpose. This study used gap analysis for measuring the interest rate risk under different assumptions such as introduction of negative and positive interest rate shock, adjusting and counter balancing the portfolio. The findings revealed that the bank is exposed to interest rate risk.

A Linear Programming Model for assessing asset liability management in banks (2009) Bank asset-liability management (ALM) may be defined as the simultaneous planning of all asset and liability positions on the bank's balance sheet under consideration of the different bank management objectives and legal, managerial and market constraints, for the purpose of enhancing the value of the bank, providing liquidity, and mitigating interest rate risk (Gup and Brooks, 1993). An efficient asset-liability management system aims to manage the volume, mix, maturity, rate sensitivity, quality and liquidity of the assets and liabilities as a whole, so as to earn a predetermined, acceptable risk/reward ratio. The framework of asset-liability management broadly covers area of interest rate risk, liquidity risk, exchange risk and credit risk.

Canonical Correlation analysis of Asset-Liability Management of Indian Banks (2009) MIHIR DASH RAVI PATHAK Bank asset-liability management (ALM) may be defined as the simultaneous planning of all asset and liability positions on the bank's balance sheet under consideration of the different bank management objectives and legal, managerial and market constraints, for the purpose of enhancing the value of the bank, providing liquidity, and mitigating interest rate risk. An efficient asset liability management system aims to manage the volume, mix, maturity, rate sensitivity, quality and liquidity of the assets and liabilities as a whole, so as to earn a predetermined, acceptable risk/reward ratio.

Asset-liability Management of Life-Insurance Companies in Southeast Europe Elma Agić-Šabeta, MA (2009) Author find evidence that stock insurer managers are more likely than their mutual counterparts to engage in this type of risky asset substitution. Their findings provide rich ground for future research as the subprime mortgage and credit default swap debacles unfold, as well as public policy implications for insurance regulators concerned with the fiscal health of the insurance industry.

An Empirical Study of Asset Liability Management Approach by the Indian Banks (2009) Suman Chakrabarty and Subhalaxmi Mohapatra. One of the ways for managing the risks is Asset Liability Management (ALM). ALM 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 contained within the desired limit. As far as ALM in Indian banking system is concerned, it is still in a nascent stage. Against this backdrop, the objective of the paper is to study and analyze the status of ALM approach in the Indian banking system. For this purpose, a sample consisting of nationalized, private, and foreign banks operating in the Indian environment was taken and the multivariate statistical technique, canonical correlation has been done to capture the nature and strength of relationship between the assets and liabilities in these banks.

Asset-Liability Management for Pension Funds in a Time-Varying Volatility Environment (2010) Spyridon D. Vrontos, Ioannis D. Vrontos, Loukia Meligkotsidou In this paper author develop a framework for asset-liability management for pension funds in a time varying volatility environment. This study addresses the issue of time-varying variances and covariances/correlations of asset returns and concentrates on the potential impacts in terms of asset-liability management.

Asset-liability management under time-varying investment opportunities (2010) Robert Ferstla*, Alex Weissensteinerb In this paper, we address the question of time-varying investment

opportunities with the main focus on an asset-liability management problem typical for a pension fund. We consider multi-stage stochastic linear programming as an appropriate numerical method, because it can handle features that reflect real investment practice very effectively. **Asset liability management modelling with risk control by stochastic dominance (2011)**Xi Yang, Jacek Gondzio , Andreas Grothey An Asset Liability Management model with a novel strategy for controlling the risk of underfunding is presented in this article. The basic model involves multi-period decisions (portfolio rebalancing) and deals with the usual uncertainty of investment returns and future liabilities. Therefore, it is well suited to a stochastic programming approach.**An analysis of Asset-Liability Management in Indian Banks (2012)** Mihir Dash, K.A. Venkatesh&Bharghav B.D ALM has gained significance in the financial services sector in recent years due to the dramatic changes that have occurred in the post-liberalization period. The objective of the ALM is two-fold: it aims at profitability through price matching while ensuring liquidity by means of maturity matching. 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.**An assessment - asset Liability Management of Scheduled Commercial Banks in India (2012).** (2012)**Dr.N.Kavitha** This paper examines management of asset-liability in banking sector. The main objective of the study is to present the optimal mix of asset and liability of Scheduled Commercial Banks in India. The paper mainly discusses on the SBI Group, Nationalised Banks Group and Private Banks Group selected as the parameter. The increase in the profitability of a bank is always preceded by the composition of assets and liability.. The research has concluded that banking sector has to take greatest care on the variables which relate to Asset Liability Management. All the banking groups have to take necessary steps to improve the overall performance of the banking sector. A Study of the impact of Asset-Liability Management on the profitability of Banks in India. (2013)**Mihir Dash**,Asset-liability management is concerned with the strategic management of assets and liabilities aimed to optimize bank profitability, while ensuring liquidity, and protecting the bank against interest rate risk, exchange rate risk, liquidity risk, credit risk, and contingency risk. The objective of the present study is to examine the impact of asset-liability management on the profitability of the banks. **Interest Rate Risk in Banking: a Theoretical and Empirical Investigation through a Systemic Approach (Asset & Liability Management) (2013)****Enzo Scannella Dario Bennardo** Interest rate risk management in banking has assumed such importance during the last decades in relation to the higher interest rate volatility. The paper has compared the maturity and duration models to measure, manage, and control interest rate risk in banking. The duration models are based on the economic value approach. **Asset-Liability Management in Banks (2013)****Prof. (Dr) Kanhaiya Singh** The study suggests much scope for banks to improve profitability by monitoring and reducing short term liquidity. The further break up of data into smaller time buckets indicates negative gap. To fill the short term liquidity gap, banks resort to market borrowings at higher rate of interest which reduces interest margin and profitability of banks, Banks have greater scope to manage interest rate risk through various techniques. This paper is an attempt to analyze the impact of measures and strategies banks undertook to manage the composition of asset-liability and its impact on their

performance in general and profitability in particular. **Asset Liability Management of a Commercial Bank- A Study on Prime Bank Limited (2014)** Mohammad Omar Faruk (Corresponding Author), Rokshana Alam Asset Liability Management (ALM) is the core part of the bank with the intention to reduce the risk of the bank and maximizing total revenue. This paper concentrates on the asset (uses of funds) and liabilities (sources of funds) management process of Prime Bank Limited (PBL) and the process of managing different risk of the bank. The main process of ALM is to manage the liquidity risk and the market risks (including Interest Rate Risk).

Specific introduction about the study

Rate Sensitive Assets (RSA) to Fixed Rate Assets (FRA) trend of the banks stand at 80:20. Uniform Rate of interest has been assigned for RSA and FRA and this has been followed for Rate Sensitivity Liability (RSL) and Fixed Rate Liability (FRL).

Interest rate for assets has been arrived at taking into account advances & investment portfolio and the interest earning of the bank for the respective years.

Interest Rate = (Interest Earned) / (Total Advances – NPA + Total Investment).

Interest rate for liability has been arrived at taking into account the deposit & borrowings portfolio and the interest expenditure of the bank for the respective years.

Interest Rate = (Interest Expended) / (Total Deposit + Total Borrowings).

The Procedure followed for calculating the items in Table V, VI, and VII is given below:

From Table III, the initial position measures regarding the Net Interest Income (NII), Net Interest Margin (NIM), GAP and Net Income (NI) for 2010-2011 are arrived. The Formulae used are:

$$\text{NII} = (\text{Rate of RSA} * \text{Volume of RSA}) + (\text{Rate of FRA} * \text{Volume of FRA}) \\ - (\text{Rate of RSL} * \text{Volume of RSL}) - (\text{Rate of FRL} * \text{Volume of FRL})$$

$$\text{NIM} = \text{NII} / \text{Total Performing Assets}$$

$$\text{GAP} = \text{RSA} - \text{RSL}$$

$$\text{NI} = \text{NII} - \text{Provisions \& Contingencies.}$$

Portfolio Adjustment to rate changes: RSL increases to RSA as Non-Interest Bearing Liabilities and Fixed Rate Liabilities decline. Thus the new GAP is 0. The performance measures such as NII, NIM, and NI are arrived after portfolio rebalancing.

Market Force Counter Balance: Market Forces drive RSA to increase as (Non-Earning Assets) NEA and FRA decline. The performance measures such as NII, NIM and NI are arrived after portfolio counterbalancing.

6.4 Analysis and interpretation

SBI BANK : Select Items from the P & L A/C and Balance Sheet for the Years 2010-2011, 2011-2012 & 2012-2013

Items	2010-11	2011-12	2012-13
Interest Expended	48,867.96	63,230.37	75,325.80
Interest Earned	81,394.36	1,06,521.45	1,19,657.10
Provisions & Contingencies	17,071.05	19,866.25	16,976.74
Deposits	9,33,932.81	10,43,647.36	12,02,739.57
Borrowings	1,19,568.96	1,27,005.57	1,69,182.71
Advances	7,56,719.45	8,67,578.89	10,45,616.55
Investments	2,95,600.57	3,12,197.61	3,50,927.27
Gross Non Performing Assets (NPA)	25,326.29	39,676.46	51,189.39

Table 1 To 1.8

Interpretation:

Table III: The Gap of Initial position at Rs -945.50 Crores, the NII at Rs 3318.35 Crores, NIM at 3.20% and NI at Rs -13752.70 for the year 2010-2011. when negative shock applied (interest rate) of 2% was applied it increased because of negative gap the NII to 3337.25 Crores, there was no change in NIM to 3.30% and NI to Rs -13733.80 Crores. However, when Interest Rate Positive shock of 2% was applied it decreased because of negative gap value to Rs 3299.44 Crores, NIM to 3.26% and NI to Rs -13771.61 Crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table IV: The Gap of Initial position at Rs 7298.86 Crores, the NII at Rs 72261.97 Crores, NIM at 6.12% and NI at Rs 52395.72 for the year 2011-2012. when negative shock applied (interest rate) of 2% was applied it decreased the NII to 72115.99 Crores, there was a change in NIM to 6.11% and NI to Rs 52249.74 Crores. However, when Interest Rate Positive shock of 2% was

applied it was increased to Rs 72407.94 Crores, NIM to 6.13% and NI to Rs 52541.69 Crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have helped the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table V: The Gap of Initial position at Rs 19697.23 Crores, the NII at Rs 73995.51 Crores, NIM at 5.50% and NI at Rs 57018.77 for the year 2012-2013. when negative shock applied (interest rate) of 2% was applied it decreased the NII to 73601.92 Crores, there was a change in NIM to 5.55% and NI to Rs 56625.18 Crores. However, when Interest Rate Positive shock of 2 % was applied it was increased to Rs 74389.45 Crores, NIM to 5.54% and NI to Rs 57412.71 Crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table VI, VII and VIII: This contains residual maturity statement covering a period from 1-14 days to 6 months - 1 year for all three years. And it is clear that the time buckets of 1-14 days, 15-29 days, 29-3 months, 3months-6months and 6months-1year are vulnerable paving way to negative gaps of high volumes.

This trend may lead to call money borrowing to fill in the liquidity gap and may reduce the interest margin substantially in the increasing interest rate scenario.

Thus it is concluded that the bank is exposed to interest rate risk.

BANK OF BARODA

**Select Items from the P & L A/C and Balance Sheet for the Years
2010-2011, 2011-2012 & 2012-2013**

Items	2010-11	2011-12	2012-13
Interest Expended	13,083.66	19,356.71	23,881.39
Interest Earned	21,885.92	29,673.72	35,196.65
Provisions & Contingencies	2,739.93	3,573.67	4,518.43
Deposits	3,05,439.48	3,84,871.11	4,73,883.34
Borrowings	22,307.85	23,573.05	26,579.28
Advances	2,28,676.36	2,87,377.29	3,28,185.76
Investments	71,396.59	83,209.40	1,21,393.72
Gross Non Performing Assets (NPA)	3,152.50	4,464.75	7,982.58

Table 2.1 to 2.8

Interpretation:

In Table III: The Gap of Initial position at Rs -22139.50 Crores, the NII at Rs 14039.38 crores, NIM at 4.67% and NI at Rs – 11299.45 crores for the year 2010-2011. when negative shock applied (interest rate) of 2% was applied it increased because of negative gap the NII to Rs 14482.17 crores, there was no change in NIM to 4.83 % and NI to Rs 11742.24 crores. However, when Interest Rate Positive shock of 2 % was applied it decreased because of negative gap value to Rs 13596.59 crores, NIM to 4.53 % and NI to Rs 10856.66 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table IV: The Gap of Initial position at Rs 30285.98 crores, the NII at Rs 18499.39 crores, NIM at 5.00 % and NI at Rs 14925.72 for the year 2011-2012. when negative shock applied (interest rate) of 2% was applied it decreased the NII to 19105.11 crores, there was a change in NIM to 5.16% and NI to Rs 15531.44 crores. However, when Interest Rate Positive shock of 2 % was applied it was increased to Rs 17893.67 crores, NIM to 4.83% and NI to Rs 14320 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table V: The Gap of Initial position at Rs -40706.52 Crores, the NII at Rs 21403.73 crores, NIM at 4.76 % and NI at Rs 16885.30 crores for the year 2012-2013. when negative shock applied (interest rate) of 2% was applied it increased because of negative gap the NII to Rs 22217.86 crores, there was no change in NIM to 4.94% and NI to Rs – 17699.43 crores. However, when Interest Rate Positive shock of 2 % was applied it decreased because of negative gap value to Rs 20589.60 crores, NIM to 4.58 % and NI to Rs 16071.17 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table VI, VII and VIII : Which contains residual maturity statement covering a period from 1-14 days to 6 months - 1 year for all three years. And it is clear that the time buckets of 1-14 days, 15-29 days, 29-3 months, 3months-6months and 6months-1year are vulnerable paving way to negative gaps of high volumes.

This trend may lead to call money borrowing to fill in the liquidity gap and may reduce the interest margin substantially in the increasing interest rate scenario.

Thus it is concluded that the bank is exposed to interest rate risk.

PUNJAB NATIONAL BANK

Select Items from the P & L A/C and Balance Sheet for the Years 2010-2011, 2011-2012 & 2012-2013

Items	2010-11	2011-12	2012-13
Interest Expended	15,179.14	23,103.59	27,036.82
Interest Earned	26,986.48	36,428.03	41,893.33
Provisions & Contingencies	4,622.20	5,730.09	6,159.70
Deposits	3,12,898.73	3,79,588.48	3,91,560.06
Borrowings	31,589.69	37,264.27	39,620.92
Advances	2,42,106.67	2,93,774.76	3,08,725.21
Investments	95,162.35	1,22,629.47	1,29,896.19
Gross Non Performing Assets (NPA)	4,379.39	8,719.62	13,465.79

Table 3.1to 3.8

Interpretation:

Table 3: The Gap of Initial position at Rs -5775.52 Crores, the NII at Rs 18224.29 crores, NIM at 5.40% and NI at Rs -13602.09 crores for the year 2010-2011.when negative shock applied (interest rate) of 2% was applied it increased because of negative gap the NII to Rs 18339.80 crores , there was no change in NIM to 5.43% and NI to Rs – 13717.60 crores. However, when Interest Rate Positive shock of 2 % was applied it decreased because of negative gap value to Rs 18108.77 crores, NIM to 5.36% and NI to Rs -13486.57 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increased the NI .The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table 4: The Gap of Initial position at Rs -358.82 Crores, the NII at Rs 49983.30 crores, NIM at 12.00% and NI at Rs - 44253.21 crores for the year 2011-2012.when negative shock applied (interest rate) of 2% was applied it increased because of negative gap the NII to Rs 50342.12

crores , there was no change in NIM to 12.08% and NI to Rs – 44612.03 crores. However, when Interest Rate Positive shock of 2 % was applied it decreased because of negative gap value to Rs 49976.12 crores, NIM to 12.00% and NI to Rs -44246.03 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increased the NI .The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table 5: The Gap of Initial position at Rs 5952.34 crores, the NII at Rs 59024.82 crores, NIM at 13.45% and NI at Rs 52865.12 for the year 2012-2013.when negative shock applied (interest rate) of 2% was applied it decreased the NII to 58905.77 crores , there was a change in NIM to 13.24% and NI to Rs 52864 crores. However, when Interest Rate Positive shock of 2 % was applied it was increased to Rs 59143.87 crores, NIM to 13.48% and NI to Rs 52866 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increased the NI .The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table VI, VII and VIII: This contains residual maturity statement covering a period from 1-14 days to 6 months - 1 year for all three years. And it is clear that the time buckets of 1-14 days, 15-29 days, 29-3 months, 3months-6months and 6months-1year are vulnerable paving way to negative gaps of high volumes.

This trend may lead to call money borrowing to fill in the liquidity gap and may reduce the interest margin substantially in the increasing interest rate scenario.

Thus it is concluded that the bank is exposed to interest rate risk.

PRIVATE BANKS: ICICI BANK:

Select Items from the P & L A/C and Balance Sheet for the Years 2010-2011, 2011-2012 & 2012-2013

Items	2010-11	2011-12	2012-13
Interest Expended	16,957.15	22,808.50	26,209.18
Interest Earned	25,974.05	33,542.65	40,075.60
Provisions & Contingencies	3,896.17	3,921.22	4,873.76
Deposits	2,25,602.11	2,55,499.96	2,92,613.63
Borrowings	1,09,554.28	1,40,164.91	1,45,341.49
Advances	2,16,365.90	2,53,727.66	2,90,249.44
Investments	1,34,685.96	1,59,560.04	1,71,393.60
Gross Non Performing Assets (NPA)	10,034.26	9,475.33	9,607.75

Table 4.1 to 4.8

Interpretation:

Table III: The Gap of Initial position at Rs 12716.38 crores, the NII at Rs 16625.24 crores, NIM at 4.73 % and NI at Rs 12729.07 crores for the year 2010-2011. when negative shock applied (interest rate) of 2% was applied it decreased the NII to 16370.91 crores, there was a change in NIM to 4.66% and NI to Rs 12474.74 crores. However, when Interest Rate Positive shock of 2 % was applied it was increased to Rs 16879.57 crores, NIM to 4.80% and NI to Rs 12983.40 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table IV: The Gap of Initial position at Rs 14098.26 crores, the NII at Rs 20771.14 crores, NIM at 5.02 % and NI at Rs 16849.92 crores for the year 2011-2012. when negative shock applied

(interest rate) of 2% was applied it decreased the NII to 20489.17 crores , there was a change in NIM to 4.95% and NI to Rs 16567.95 crores. However, when Interest Rate Positive shock of 2 % was applied it was increased to Rs 21053.11 crores, NIM to 5.09% and NI to Rs 17131.89 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increased the NI .The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table V: The Gap of Initial position at Rs 18950.33 crores, the NII at Rs 25120.97 crores, NIM at 5.44 % and NI at Rs 20247.21 for the year 2012-2013.when negative shock applied (interest rate) of 2% was applied it decreased the NII to 24741.96 crores , there was a change in NIM to 5.35% and NI to Rs 19868.20 crores. However, when Interest Rate Positive shock of 2 % was applied it was increased to Rs 25499.98 crores, NIM to 5.52% and NI to Rs 20626.22 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increased the NI .The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table VI, VII and VIII : Which contains residual maturity statement covering a period from 1-14 days to 6 months - 1 year for all three years. And it is clear that the time buckets of 1-14 days, 15-29 days, 29-3 months, 3months-6months and 6months-1year are vulnerable paving way to negative gaps of high volumes.

This trend may lead to call money borrowing to fill in the liquidity gap and may reduce the interest margin substantially in the increasing interest rate scenario.

Thus it is concluded that the bank is exposed to interest rate risk

HDFC BANK

Select Items from the P & L A/C and Balance Sheet for the Years 2010-2011, 2011-2012 & 2012-2013

Items	2010-11	2011-12	2012-13
Interest Expended	9,385.08	14,989.58	19,253.75
Interest Earned	19,928.21	27,286.35	35,064.87
Provisions & Contingencies	3,798.97	3,783.32	4,701.34
Deposits	2,08,586.41	2,46,706.45	2,96,246.98
Borrowings	14,394.06	23,846.51	33,006.60
Advances	1,59,982.67	1,95,420.03	2,39,720.64
Investments	70,929.37	97,482.91	1,11,613.60
Gross Non Performing Assets (NPA)	1,694.34	1,999.39	2,334.64

Table5.I to 5.8

Interpretation:

Table III: The Gap of Initial position at Rs 6345.25 crores, the NII at Rs 14239.32 crores, NIM at 6.16 % and NI at Rs 10440.35 for the year 2010-2011.when negative shock applied (interest rate) of 2% was applied it decreased the NII to 14112.15 crores , there was a change in NIM to 6.11% and NI to Rs 10313.18 crores. However, when Interest Rate Positive shock of 2 % was applied it was increased to Rs 14366.25 crores, NIM to 6.22% and NI to Rs 10567.255 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increased the NI .The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table IV: The Gap of Initial position at Rs 17879.98 crores, the NII at Rs 18311.82 crores, NIM at 6.25 % and NI at Rs 14528.4 for the year 2011-2012.when negative shock applied (interest rate) of 2% was applied it decreased the NII to 17954.12 crores , there was a change in NIM to 6.12%

and NI to Rs 14170.8 crores. However, when Interest Rate Positive shock of 2 % was applied it was increased to Rs 18669.32 crores, NIM to 6.37% and NI to Rs 14886 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increased the NI .The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table V: The Gap of Initial position at Rs 17664.53 crores, the NII at Rs 23675.39 crores, NIM at 6.70 % and NI at Rs 18974.05 for the year 2012-2013.when negative shock applied (interest rate) of 2% was applied it decreased the NII to 23322.099 crores , there was a change in NIM to 6.63% and NI to Rs 18620.759 crores. However, when Interest Rate Positive shock of 2 % was applied it was increased to Rs 24028.681 crores, NIM to 6.83% and NI to Rs 19327.341 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increased the NI .The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table VI, VII and VIII : Which contains residual maturity statement covering a period from 1-14 days to 6 months - 1 year for all three years. And it is clear that the time buckets of 1-14 days, 15-29 days, 29-3 months, 3months-6months and 6months-1year are vulnerable paving way to negative gaps of high volumes.

This trend may lead to call money borrowing to fill in the liquidity gap and may reduce the interest margin substantially in the increasing interest rate scenario.

Thus it is concluded that the bank is exposed to interest rate risk

AXIS BANK:

Select Items from the P & L A/C and Balance Sheet for the Years 2010-2011, 2011-2012 & 2012-2013

Items	2010-11	2011-12	2012-13
Interest Expended	8,591.82	13,976.90	17,516.31
Interest Earned	15,154.81	21,994.65	27,182.57
Provisions & Contingencies	3,027.20	3,188.66	4,123.70
Deposits	1,89,237.80	2,20,104.30	2,52,613.59
Borrowings	26,267.88	34,071.67	43,951.10
Advances	1,42,407.83	1,69,759.54	1,96,965.96
Investments	71,991.62	93,192.09	1,13,737.54
Gross Non Performing Assets (NPA)	1,599.42	1,806.30	2,393.64

Table 6.1 to 6.8

Table III: The Gap of Initial position in the initial position at Rs -884.98 Crores, the NII at Rs 10179.52 crores, NIM at 4.74 % and NI at Rs 7152.32 crores for the year 2010-2011. When negative shock applied (interest rate) of 2% was applied it increased because of negative gap the NII to Rs 10197.22 crores, there was no change in NIM to 4.75% and NI to Rs 7170.02 crores. However, when Interest Rate Positive shock of 2 % was applied it decreased because of negative gap value to Rs 10161.82 crores, NIM to 4.73 % and NI to Rs 7134.62 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table IV: The Gap of Initial position at Rs 7020.52 crores, the NII at Rs 13852.63 crores, NIM at 5.26 % and NI at Rs 10663.97 for the year 2011-2012. When negative shock applied (interest rate) of 2 % was applied it decreased the NII to 13712.22 crores, there was a change in NIM to 5.21% and NI to Rs 10523.66 crores. However, when Interest Rate Positive shock of 2 % was applied it was increased to Rs 13993.04 crores, NIM to 5.32% and NI to Rs 10804.38 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increase the NI

.The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table V: The Gap of Initial position at Rs 11311.02 crores, the NII at Rs 16834.70 crores, NIM at 5.41 % and NI at Rs 12700 for the year 2012-2013. when negative shock applied (interest rate) of 2% was applied it decreased the NII to 16608.48 crores , there was a change in NIM to 5.34% and NI to Rs 12484.78 crores. However, when Interest Rate Positive shock of 2 % was applied it was increased to Rs 17060.92 crores, NIM to 5.49% and NI to Rs 12937.22 crores. When Counter Balancing Market force applied, negative shock increased the NI marginally; the positive shock increased the NI more than the original position. Thus the negative shock has brought down the NI and positive shock has increased the NI. The Portfolio adjustment in this case could not increase the NI. The portfolio adjustment in this case could not increased the NI .The portfolio adjustment in this case could not increase the NI to its original position. However, the counter balancing market forces have enabled the NI to restore to its near original position (negative shock) and to increase (positive shock).

Table VI, VII and VIII : Which contains residual maturity statement covering a period from 1-14 days to 6 months - 1 year for all three years. And it is clear that the time buckets of 1-14 days, 15-29 days, 29-3 months, 3months-6months and 6months-1year are vulnerable paving way to negative gaps of high volumes.

This trend may lead to call money borrowing to fill in the liquidity gap and may reduce the interest margin substantially in the increasing interest rate scenario.

Thus it is concluded that the bank is exposed to interest rate risk

Findings

- The analysis of residual maturities statements of 2010-11, 2011-12 and 2012-13 covering a period from 1- 14 days to 6 months- 1 years reveals substantial negatives in one or more maturity categories.
- In Public sector bank that is SBI Bank in the year 2011-2012 and 2012-2013 the negative shock has brought down the NI and the portfolio adjustment could not increase the NI to its original position and during 2012-2013 Punjab National Bank has brought down the NI and the portfolio modification could not increase the NI to its original position.
- During 2010-11, 2011-12 and 2012-13 ICICI and HDFC banks have brought down the NI in the case of negative shock and the portfolio adjustment could not increase the NI to its original position. But in the case of ICICI bank in the year 2010-11 they have increased the portfolio adjustment too.
- In 2010-11 SBI banks, the negative and positive shocks have increased the NI. The portfolio adjustment in this case has improved the NI. Further, the counter balancing market forces have enabled NI increase both in case of negative and positive shocks.
- When compare with SBI banks in public sector banks, Bank of Baroda and Punjab National Bank were lagging behind because of negative GAP as well as the negative NI.
- In private sector banks all the three banks were equally increasing their NI every year.

- In all the banks, Interest Rate Risk is measured through the use of re-pricing gap analysis and duration analysis. Liquidity risk is considered through gap analysis.
- Banks also uses derivatives for interest rate to manage assets and liability positions. The bank is an active member in the interest rate swap market.
- The banks are exposed to interest rate risk.

Conclusion

Asset-Liability Management has evolved as a vital activity of all financial institutions and to some extent other industries too. It has become the major focus in the banking industry, with all banks trying to maximize yield and reduce their risk coverage. The Reserve Bank of India has issued strategy to banks operating in the Indian environment to regulate their asset-liability positions in order to maintain stability of the financial system. Banks should see all kinds of risk especially through balance sheet that is Interest rate risk and Liquidity risks, o that they can take the key input in their strategic planning process. While increasing the size of financial statements, the degree of asset liability mismatch should be kept in control. Because, the excessive mismatches would lead to volatility in earnings and banks can also try sensitivity analysis for risk management purpose. Gap analysis is used in the study for measuring the risk under different assumptions such as negative and positive interest rate shocks, adjusting and counter balancing the portfolio. It is clear from the calculations that SBI and ICICI Banks are more efficient than other banks. Overall it is found that the banks are exposed to interest rate risk. If banks concentrates on high yielding advances and using interest rate swap could make the banks to improve its net income.

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Dr. M. Appala Raju

Professor

Department of Management Studies

CHRIST UNIVERSITY

Bangalore, Karnataka, India

Email: rajumar25@rediffmail.com

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