# Asset Liability Management in Indian Banking Industry - with special reference to Interest Rate Risk Management in ICICI Bank

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*Abstract* - **Assets and Liabilities Management (ALM) is a dynamic process of planning, organizing, coordinating and controlling the assets and liabilities – their mixes, volumes, maturities, yields and costs in order to achieve a specified Net Interest Income (NII). The NII is the difference between interest income and interest expenses and the basic source of banks profitability. The easing of controls on interest rates has led to higher interest rate volatility in India. Hence, there is a need to measure and monitor the interest rate exposure of Indian banks. 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. Using publicly available information, this paper attempts to assess the interest rate risk carried by the ICICI bank in March 2005, 2006, & 2007. The findings revealed that the bank is exposed to interest rate risk.**

***Index Terms*— Interest volatility, risk, Indian banks.**

## I. INTRODUCTION

Banks are always aiming at maximizing profitability at the same time trying to ensure sufficient liquidity to repose confidence in the minds of the depositors on their ability in servicing the deposits by making timely payment of interest/returning them on due dates and meeting all other liability commitments as agreed upon. To achieve these objectives, it is essential that banks have to monitor, maintain and manage their assets and liabilities portfolios in a systematic manner taking into account the various risks involved in these areas. This concept has gained importance in *Indian conditions* in the wake of the ongoing financial sector reforms, particularly *reforms relating to interest rate deregulation.* The technique of managing both assets and liabilities together has come into being as a strategic response of banks to inflationary pressure, volatility in interest rates and severe recessionary trends which marked the global economy in the seventies and eighties. This paper aims to measure the interest rate exposure of the ICICI Bank from 2004-2007, using Gap Analysis.

## II. TRENDS IN DOMESTIC RATES AND YILED CURVE

The major focus of prudential regulation in developing countries has traditionally been on credit risk. While banks and their supervisors have grappled with non-performing loans for several decades, interest rate risk is a relatively new problem. *Administrative restrictions on interest rates in India have been steadily eased since 1993.* This has led to increased interest rate volatility. Table I shows the trends in domestic interest rates in India during the study period. It is clear that the rates are increasing.

Table I - Trends in Domestic Interest Rates in India (in %)

| Effective since | Reverse Repo Rate(%) | Repo Rate (%) | CRR (%) |
|---|---|---|---|
| Mar 31, 2004 | 4.50 | 6.00 | 4.50 |
| Sep 18, 2004 | 4.50 | 6.00 | 4.75 |
| Oct 2, 2004 | 4.50 | 6.00 | 5.00 |
| Oct 27, 2004 | 4.75 | 6.00 | 5.00 |
| Apr 29, 2005 | 5.00 | 6.00 | 5.00 |
| Oct 26, 2005 | 5.25 | 6.25 | 5.00 |
| Jan 24, 2006 | 5.50 | 6.50 | 5.00 |
| Jun 9, 2006 | 5.75 | 6.75 | 5.00 |
| Jul 25, 2006 | 6.00 | 7.00 | 5.00 |
| Oct 31, 2006 | 6.00 | 7.25 | 5.00 |
| Dec 23, 2006 | 6.00 | 7.25 | 5.25 |
| Jan 6, 2007 | 6.00 | 7.25 | 5.50 |

Source: RBI Bulletin, 2007

The yield curve has shifted upward since March '04, with the 10-year yields moving from 5% to 7% (Fig.I). However, the longer end of the curve has flattened. The significant drop in turnover in 2004-05 and 2005-06 could be due to a 'buy and hold' tendency of the participants other than commercial banks (like insurance companies) and also due to the asymmetric response of investors to the interest rate cycle. In the absence of a facility of short selling in government securities, participants generally refrained from taking positions which resulted in volumes drying up in a falling market. The Reserve Bank's efforts to elongate the maturity profile resulted in a smooth and reliable yield curve to act as a benchmark for the other markets for pricing and valuation purposes. The weighted average maturity of securities increased from 5.5 years in 1995-96 to 14.6 years during 2006-07. The weighted average yield of securities also declined to 5.7 per cent in 2003-04 and since then, it has increased to 7.3 per cent in 2005-06 and further to 7.9 percent in 2006-07.The Indian yield curve today compares with not only emerging market economies but also the developed world.

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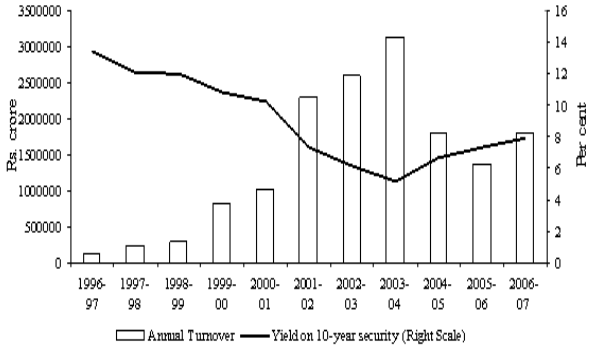
Figure I - Yield and Annual Turnover in India




Source: Reserve Bank of India Report.

## III. RESEARCH METHODOLOGY

This is an analytical research study. It selected ICICI Bank, one of the biggest private sector banks (Second largest) in India. The bank is listed in BSE Sensex and NSE Nifty. Primary data required were collected through personal discussions with the staff to know the actual ALM practices followed in ICICI Bank and the problems faced in the course of exchanging information required for the management. The secondary data were collected from the annual reports of ICICI Bank, circulars of the ICICI Bank, reading material on ALM provided by the Bankers Staff College, websites and various journals. In this study, *Gap Analysis Technique* (prescribed by RBI) has been used for measuring the interest rate risk.

## IV. INTEREST RATE RISK IN BANKS

ALM is a system of matching cash inflows and outflows, and thus of liquidity management. Balance sheet risk can be categorized into two major types of significant risks, which are liquidity risk and interest rate risk. The ALM system rests on three pillars, i.e., a) ALM Information system (MIS) b) ALM organization (Structure and responsibilities) and c) ALM Process (Risk parameters, identifying, measuring, managing risks and setting risk policies and tolerance levels).

Interest rate risk is the risk to earnings or capital arising from movement of interest rates. It arises from differences between the timing of rate changes and the timing of cash flows *(repricing risk*); from changing rate relationships among yield curves that affect bank activities *(basis risk);* from changing rate relationships across the spectrum of maturities *(yield curve risk);* and from interest-rate-related options embedded in bank products *(option risk*). The value of a bank's assets, liabilities, and interest-rate-related, off-balance-sheet contracts is affected by a change in rates because the present value of future cash flows, and in some cases the cash flows themselves, is changed. For measuring interest rate risk, banks use a variety of method such as gap analysis, the duration gap method, the basis point value (BPV) method, and simulation methods.

## V. INTEREST RATE RISK MANAGEMENT IN ICICI BANK

The bank has three dedicated groups, the Global Risk Management Group (GRMG), the Compliance Group and the Internal Audit Group which are responsible for assessment, management and mitigation of risk in the bank. In addition, the Credit and Treasury Middle Office Groups and the Global Operations Group monitor operational adherence to regulations, policies and internal approvals. These groups are accountable to the Risk and Audit Committees of the Board of Directors. GRMG is further organised into the Global Credit Risk Management Group and the Global Market & Operational Risk Management Group.

Interest rate risk is measured through the use of re-pricing gap analysis and duration analysis. Liquidity risk is measured through gap analysis. Since the bank's balance sheet consists predominantly of rupee assets and liabilities, movements in domestic interest rates constitute the main source of interest rate risk. Exposure to fluctuations in interest rates is measured primarily by way of gap analysis, providing a static view of the maturity and re-pricing characteristics of balance sheet positions. An interest rate gap report is prepared by classifying all assets and liabilities into various time period categories according to contracted maturities or anticipated re-pricing date. The difference in the amount of assets and liabilities maturing or being re-priced in any time period category, would then give an indication of the extent of exposure to the risk of potential changes in the margins on new or re-priced assets and liabilities. ICICI Bank prepares interest rate risk reports on a fortnightly basis. These reports are submitted to the Reserve Bank of India on a monthly basis. Interest rate risk is further monitored through interest rate risk limits approved by the Asset Liability Management Committee.

The bank's core business is deposit taking and lending and these activities expose it to interest rate risk. The bank's primary source of funding is deposits and, to a smaller extent, borrowings. Effective January 1, 2004, the bank has moved to a single benchmark prime rate structure for all loans other than specific categories of loans advised by the Indian Banks' Association, with lending rates comprising the benchmark prime rate, term premia and transaction-specific credit and other charges. The bank generally seeks to eliminate interest rate risk on undisbursed commitments by fixing interest rates on rupee loans at the time of loan disbursement.

## VI. GAP ANALYSIS TECHNIQUE

Gap analysis is a technique of asset-liability management that can be used to assess interest rate risk or liquidity risk. It measures at a given date the gaps between rate sensitive liabilities (RSL) and rate sensitive assets (RSA) (including off-balance sheet positions) by grouping them into time buckets according to residual maturity or next repricing period, whichever is earlier. An asset or liability is treated as rate sensitive if i) within the time bucket under consideration, there is a cash flow; ii) the interest rate resets/reprices contractually during the time buckets; iii) administered rates are changed and iv) it is contractually

prepayable or withdrawal allowed before contracted maturities. Thus, Gap = RSA – RSL; Gap Ratio = RSAs/RSLs. This gap is used as a measure of interest rate sensitivity. The positive or negative gap is multiplied by the assumed interest changes to derive the Earnings at Risk (EaR). A bank benefits from a positive Gap (RSA>RSL), if interest rate rises. Similarly, a negative Gap (RSA<RSL) is advantageous during the period of falling interest rate. The interest rate risk is minimized if the gap is near zero.

Gap analysis was widely adopted by financial institutions during the 1980s. When used to manage interest rate risk, it was used in tandem with duration analysis. Both techniques have their own strengths and weaknesses. Duration analysis summarizes, with a single number, exposure to parallel shifts in the term structure of interest rates. Though gap analysis is more cumbersome and less widely applicable, it addresses exposure to other term structure movements, such as tilts or bends. It also assesses exposure to a greater variety of term structure movements.

## VII. RESULTS AND DISCUSSION

Table – II
Select Items from the P&L A/c and Balance Sheet
for the years 2004-05, 2005-06 & 2006-07
(Rs. in crores)

| Items | 2004-05 | 2005-06 | 2006-07 |
|---|---|---|---|
| Interest Expended | 6570.89 | 9597.45 | 16358.50 |
| Interest Earned | 9409.89 | 13784.50 | 22994.29 |
| Provisions & Contingencies | 950.80 | 2150.59 | 2764.19 |
| Deposits | 99818.78 | 165083.17 | 230510.19 |
| Borrowings | 33544.50 | 38521.91 | 51256.03 |
| Advances | 91405.15 | 146163.11 | 195865.60 |
| Investments | 50487.35 | 71547.39 | 91257.84 |
| Gross Non Performing Assets(NPA) | 3.43 | 2.27 | 4.17 |

Source: Annual Reports of ICICI Bank.

Table II provides the base data from which all calculations are done.

*The procedure adopted for breaking up of assets and liabilities and their rates of interest* (Table III):

- Rate Sensitive Assets (RSA) to Fixed Rate Assets (FRA) trend of the bank stands at 80:20. Earning assets have been classified accordingly. Rate Sensitive Liabilities (RSL) have been arrived at from the residual maturity statement contained in the annual reports of respective years by adding the figures under the buckets 1-14 days to 6months to 1 year.
- Uniform rate of interest has been assigned for RSA and FRA and this has been followed for RSL and Fixed Rate Liabilities (FRL).
- Interest rate for assets has been arrived at taking into account advances & investment portfolio and the interest earnings of the bank for the respective years. i.e., Interest Rate = (Interest Earned) / (Total Advances – NPA + Total Investment).
- Interest rate for liabilities has been arrived at taking into account the deposits & borrowings portfolio and the interest expenditure of the bank for the respective years.i.e., Interest Rate = (Interest Expended) / (Total Deposits + Total Borrowings).

*The procedure followed for calculating the items in Tables V, VI, and VII is given below*:

*Initial Performance Measures:* From Table III, the initial position measures regarding the Net Interest Income (NII), Net Interest Margin (NIM), Gap and Net Income (NI) for 2004-05 to 2006-07 are arrived. The formulae used are

NII = (Rate of RSA * Volume of RSA)
+ (Rate of FRA * Volume of FRA)
- (Rate of RSL * Volume of RSL)
- (Rate of FRL * Volume of FRL)
NIM = NII/Total Performing Assets
GAP = RSA – RSL
NI = NII – Provisions & Contingencies

*Comparative – Static Experiment:* Both negative and a positive shock of 200 basis points (2%) were introduced with out any balance sheet adjustment, ie., volumes and mix remain constant. The new performance for NII, NIM and NI are calculated for 2004-05 to 2006-07

*Portfolio Adjustment to Rate Changes:* RSL increases to RSA as non-interest bearing liabilities and fixed rate liabilities decline. Thus, the new GAP = 0. The performance measures such as NII, NIM and NI are arrived after portfolio rebalancing in Table IV.

*Market Force Counter Balance:* Market forces drive RSA to increase as (Non Earning Assets) NEA and FRA decline. The GAP after market counter balance is arrived. The performance measures such as NII, NIM and NI are arrived after portfolio counterbalancing in Table IV.

Table V reveals that the GAP in the initial position at Rs. 47617 crores, the NII at Rs.2832 crores, NIM at 2% and NI at Rs.1882 crores for the year 2004-05. When interest rate negative shock of 2% was applied, it reduced the NII to Rs.1880 crores, NIM to 0.86% and NI to Rs.929 crores. However, when interest rate positive shock of 2% was applied, it increased the NII to rs.3785 crores, NIM to 2.67% and NI to Rs.2834 crores. Then the portfolio adjustment is done. Even after the portfolio adjustment, the initial position could not be attained. Therefore, portfolio adjustment should be carried out in a better way (i.e.,) by aiming at high yielding advances. When counter balancing market forces are 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 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 III - Break up of Assets and Liabilities - Initial conditions for Balance Sheet items (Rs. in Crores)

| Items | 2004-05 | | | 2005-06 | | | 2006-07 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Volume Rs. | Rate (%) | Mix (%) | Volume Rs. | Rate (%) | Mix (%) | Volume Rs. | Rate (%) | Mix (%) |
| RSA | 113511.30 | 6.63 | 68 | 174166.60 | 6.33 | 69 | 229695.40 | 8.01 | 67 |
| FRA | 28377.81 | 6.63 | 17 | 43541.65 | 6.33 | 17 | 57423.85 | 8.01 | 17 |
| NEA | 25770.34 | 0 | 15 | 33680.72 | 0 | 14 | 57538.84 | 0 | 16 |
| Total/ Average | 167659.40 | 4.42 | 100 | 251389.00 | 4.22 | 100 | 344658.10 | 5.34 | 100 |
| RSL | 65894.01 | 4.93 | 39 | 97811.59 | 4.71 | 39 | 126129.60 | 5.81 | 37 |
| FRL | 67469.27 | 4.93 | 40 | 105793.5 | 4.71 | 42 | 155636.60 | 5.81 | 45 |
| NIBL | 34296.13 | 0 | 21 | 47783.87 | 0 | 19 | 62891.89 | 0 | 18 |
| Total/ Average | 167659.40 | 3.29 | 100 | 251389.00 | 3.14 | 100 | 344658.10 | 3.87 | 100 |

Source: Annual Reports of ICICI Bank. Values Computed. Note: NIBL-Non-Interest Bearing Liabilities

Table IV – Portfolio Adjustment due to a) Rate Changes, and b) Market Forces Counter Balancing

| | Portfolio Adjustments due to | | | | | |
|---|---|---|---|---|---|---|
| | Rate Changes (Rs. in Crores) | | | Market Forces Counter Balancing (Rs. in crores) | | |
| Year/Changes in | RSL | FRL | NIEL | RSA | FRA | NEA |
| 2004-05 | 113511 | 24148 | 30000 | 127659 | 20000 | 20000 |
| 2005-06 | 174167 | 37222 | 40000 | 191389 | 35000 | 25000 |
| 2006-07 | 229695 | 54963 | 60000 | 249658 | 47500 | 47500 |

Results Computed.

Table V - Summary of Experiments for the year 2004-05 (Rs. in Crores)

| Performance Measure | Initial Position | Interest Rate Shock | | Portfolio Adjustment | Counter Balancing Market Force | |
|---|---|---|---|---|---|---|
| | | - 2% | + 2% | -2% or +2% | -2% | +2% |
| GAP | 47617.29 | 47617.29 | 47617.29 | 0 | 14,148 | 14,148 |
| Net Interest Income | 2832.438 | 1880.092 | 3784.784 | 2620.645 | 2720.234 | 3286.142 |
| Net Interest Margin | 2.00% | 0.86% | 2.67% | 1.85% | 0.018422 | 0.022255 |
| Net Income | 1881.638 | 929.2925 | 2833.984 | 1669.845 | 1769.434 | 2335.342 |

Results Computed.

Table VI - Summary of Experiments for the year 2005-06 (Rs. in Crores)

| Performance Measure | Initial Position | Interest Rate Shock | | Portfolio Adjustment | Counter Balancing Market Force | |
|---|---|---|---|---|---|---|
| | | - 2% | + 2% | -2% or +2% | -2% | +2% |
| GAP | 76355.01 | 76355.01 | 76355.01 | 0 | 17,222 | 17,222 |
| Net Interest Income | 4191.132 | 2664.032 | 5718.233 | 3824.529 | 4029.573 | 4718.469 |
| Net Interest Margin | 1.93% | 1.22% | 2.63% | 1.76% | 0.017799 | 0.020842 |
| Net Income | 2040.532 | 513.4323 | 3567.633 | 1673.929 | 1878.973 | 2567.869 |

Results Computed.

Table VII - Summary of Experiments for the year 2006-07 (Rs. in Crores)

| Performance Measure | Initial Position | Interest Rate Shock | | Portfolio Adjustment | Counter Balancing Market Force | |
|---|---|---|---|---|---|---|
| | | -2% | +2% | -2% or +2% | -2% | +2% |
| GAP | 103565.8 | 103565.8 | 103565.8 | 0 | 19962 | 19962 |
| Net Interest Income | 428.7793 | 4556.32 | 8698.952 | 6459.599 | 15615.62 | 7662.955 |
| Net Interest Margin | .15% | 1.59% | 3.03% | 2.25% | 0.05255 | 0.025787 |
| Net Income | -2335.41 | 1792.13 | 5934.762 | 3695.409 | 12851.43 | 4898.765 |

Results Computed.

Table VIII - Residual Maturity for the year 2004-05 ( Rs. in Crores)

| Items | 1-14 days | 15-28days | 29days-3m | 3m-6m | 6m-1year |
|---|---|---|---|---|---|
| Loans &Advances | 6051.83 | 806.91 | 6570.97 | 5032.05 | 8408.82 |
| Investments | 7628.34 | 2040.31 | 4875.1 | 4730.27 | 6043.19 |
| Deposits | 5426.22 | 3268.38 | 13297 | 15924.29 | 19540.75 |
| Borrowings | 400.8 | 1231.15 | 3126.45 | 3249.14 | 5698.68 |
| GAP | 7853.15 | *-1652.31* | *-4977.38* | *-9411.11* | *-10787.4* |

Source: Annual Report of ICICI Bank, 2004-05.

Table IX - Residual Maturity for the year 2005-06 ( Rs. in Crores)

| Items | 1-14 days | 15-28days | 29days-3m | 3m-6m | 6m-1year |
|---|---|---|---|---|---|
| Loans &Advances | 7545.02 | 886.52 | 7523.13 | 8985.95 | 14506.6 |
| Investments | 10398.34 | 4499.36 | 8197.61 | 6451.05 | 9326.78 |
| Deposits | 14907.14 | 6919.33 | 25547.35 | 23169.34 | 38840.28 |
| Borrowings | 3123.7 | 1004.94 | 5380.43 | 4666.14 | 5316.02 |
| GAP | *-87.48* | *-2538.39* | *-15207* | *-12398.5* | *-20322.9* |

Source: Annual Report of ICICI Bank, 2005-06.

Table X - Residual Maturity for the year 2006-07 ( Rs. in Crores)

| Items | 1-14 days | 15-28days | 29days-3m | 3m-6m | 6m-1year |
|---|---|---|---|---|---|
| Loans &Advances | 9288.51 | 2456.2 | 9606.31 | 12877.04 | 20800.62 |
| Investments | 4529.29 | 9792.27 | 9702.25 | 8520.84 | 17380.39 |
| Deposits | 22374.32 | 10412.62 | 34198.99 | 32272.48 | 59497.24 |
| Borrowings | 945.33 | 569.41 | 4417.14 | 7042.34 | 8201.66 |
| GAP | *-9501.85* | 1266.44 | *-19307.6* | *-17916.9* | *-29517.9* |

Source: Annual Report of ICICI Bank, 2006-07

Table VI reveals that the GAP in the initial position at Rs. 76355 crores, the NII at Rs.4191 crores, NIM at 1.93% and NI at Rs.2040 crores for the year 2005-06. When interest rate negative shock of 2% was applied, it reduced the NII to Rs.2664 crores, NIM to 1.22% and NI to Rs.513 crores. However, when interest rate positive shock of 2% was applied, it increased the NII to Rs.5718 crores, NIM to 2.63% and NI to Rs.3568 crores. Then the portfolio adjustment is done. Even after the portfolio adjustment, the initial position could not be attained. Therefore, portfolio adjustment should be carried out in a better way (i.e.,) by aiming at high yielding advances. When counter balancing market forces are 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 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 VII reveals that the GAP in the initial position at Rs. 103566 crores, the NII at Rs.429 crores, NIM at 0.15% and NI at Rs. 2335 crores for the year 2006-07. When interest rate negative shock of 2% was applied, it increased the NII to Rs.4556 crores, NIM to 1.59% and NI to Rs.1792 crores. However, when interest rate positive shock of 2% was applied, it further increased the NII to Rs. 8699 crores, NIM to 2.25% and NI to Rs.5935 crores. Then the portfolio adjustment is done. After the portfolio adjustment, the initial position was corrected and it has improved. When counter balancing market forces are applied, negative shock increased the NI marginally, the positive shock increased the NI more than the original position. *Thus, 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 the NI to increase, both in case of negative and positive shocks.*

From Table VIII, which contains residual maturity statement covering a period from 1-14 days to 6months-1year for the year 2004-05, it is revealed that the time buckets of 15-29days, 29days-3months, 3months-6months and 6months-1year are vulnerable paving way to negative gaps of high volumes.

From Table IX, which contains residual maturity statement covering a period from 1-14 days to 6months-1year for the year 2005-06, it is clear that the time buckets of 1-14 days, 15-29days, 29days-3months, 3months-6months and 6months-1year are vulnerable paving way to negative gaps of high volumes.

From Table X, which contains residual maturity statement covering a period from 1-14 days to 6months-1year for the year 2006-07, it is revealed that the time buckets of 1-14 days, 29days-3months, 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.*

## VIII. FINDINGS OF THE STUDY

1) The ALM concept though in vogue since 1997, its inherent complexities in obtaining accurate timely information from the gross root level makes the banks in not getting the full advantage of it.
2) The computerized environment has helped the banks to achieve the objective of MIS in the area of collection of accurate and timely data required for risk management.
3) In ICICI Bank, interest rate risk is measured through the use of re-pricing gap analysis and duration analysis. Liquidity risk is measured through gap analysis.
4) ICICI Bank also uses interest rate derivatives to manage asset and liability positions. The bank is an active participant in the interest rate swap market and are one of the largest counterparties in India.
5) During 2004-05 and 2005-06, the negative shock has brought down the NI and positive shock has increased the NI. The portfolio adjustment 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).
6) In 2006-07, 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 the NI increase both in case of negative and positive shocks.
7) The residual maturity pattern covering one year could not withstand negative shock of 200 basis points in 2004-05 and 2005-06.
8) The general portfolio adjustment could not yield the expected results and calls for aiming at high-yielding advances.
9) The analysis of residual maturity statements of 2004-05, 2005-06, and 2006-07 covering a period from 1-14 days to 6months-1 years reveals substantial negative gaps in one or more maturities.
10) The Bank is exposed to interest rate risk.

## VIII. CONCLUSION

The two types of banks' balance sheet risks include interest rate risk and liquidity risks. Their regular monitoring and managing is the need of the hour. Banks should use the information about these risks as key input in their strategic business planning process. While increasing the size of the balance sheet, the degree of asset liability mismatch should be kept in control. Because, the excessive mismatch would result in volatility in earnings. 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. *It is found that the bank is exposed to interest rate risk.*

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