

## **PREFACE**

1 0 **INTRODUCTION:** After the financial sector reforms of 1991 encompassing privatisation (reduction of government control and ownership), liberalisation (the process whereby a nation aligns itself to the rest of the world in terms of political, social, cultural and economic dimensions) and globalisation (several countries resorting to liberalisation and integrating several national markets into a unified single world market) the Indian banking sector has been going through a period of transformation from a mere domestic existence to a truly international presence, with cross border diversification making an impact on the balance sheets of banks. Various risk factors associated with banks have surfaced since then. Risks and returns have a direct relationship in as much as higher risks yield higher return. Therefore to increase the returns, banks need to take higher risks. But banks cannot take unlimited risks with a view to maximizing profits. The risks need to be effectively managed. Therefore, the Reserve Bank of India (RBI) and the managements of individual banks are now emphasizing the need for putting in place risk management techniques. One such technique of risk management is Asset - Liability Management (ALM). It is the technique of managing the balance sheet of a bank, including off balance sheet items (contingent assets and liabilities that appear in the balance sheet as memorandum items, the value of which depends on the outcome on which the claim is based). There is a need for banks to put in place effective ALM techniques with a view to enhancing their capacities of profit maximization.

## 1.1 KEY TERMS USED IN THE STUDY:

**Risk** is the degree of variability / volatility of possible outcomes over time. In financial parlance, risk is associated with the loss that is expected to be incurred due to the happening or non-happening of certain events. In finance theory, risk is dispersion of unexpected outcomes due to movements in financial variables.

**Credit risk** arises due to the failure of the borrower to discharge his repayment obligations as per the contracted terms. It is the risk of erosion in value due to simple default by the borrower/ collapse of a particular commodity and a business for which the bank has lent.

**Liquidity risk** refers to the inability to meet cash flow obligations, which can force early liquidation. This risk arises from the potential inability of a bank to generate cash to cope with the falling liabilities and increasing assets. Default by large number of borrowers could result in illiquidity. Extreme illiquidity can result in insolvency.

**Interest rate risk** is the risk of decline in earnings owing to changes in the interest rates. It covers the risk of loss due to changes in the market interest rates, whether in the form of reduced and negative interest margins on outstanding loans or in the form of falls in capital values of realizable assets. A sizeable portion of the bank revenue and costs are dependent on interest rates (rate sensitive). If the interest rates are not stable, the earnings are also unstable.

**Foreign exchange (currency) risk** arises out of fluctuations in exchange rates. It is the variations in the domestic currency value of an asset and liability and income, which can be attributed to unanticipated changes in the exchange rates

**Operational Risk** is associated with human errors, inadequate procedures and controls, checks and balances. It also includes, losses arising from frauds, system failures, losses due to natural disasters and accidents involving key individuals

**Contingent risk** is a risk dependent upon the happening of some uncertain event in the future. Such a risk arises out of off balance sheet items. Contingency risk arises only when the contingency commitment materialises

**Human risk** is a risk of separation of an employee with specialised knowledge disrupting the system. When an employee with specialised knowledge leaves the bank on superannuation (retirement on reaching a specific age) or resignation, there is bound to be a vacuum in the organisational set up. The human risk can also arise in the case of employees with misplaced trust

**Legal risk** is the risk that the legal system will expropriate (take away for public use without payment to the owner) value from the shareholders of the bank.

**Asset-Liability Management (ALM)** involves the management of the assets and liabilities and brings within its fold, the tools available for the management of various risks. In banks, it refers to the coordinated management of a bank's balance sheet to allow for alternative interest rate and liquidity scenarios. It is choosing a mix of assets to maximise profit while maintaining liquidity

**Statutory Liquidity Ratio (SLR)** As per section 24 of the Banking Regulation Act, 1949, banks are required to maintain a certain percentage (at present 25 percent) of their net demand and time liabilities (deposits, borrowings and other liabilities) in eligible assets (government and other approved securities, cash on hand and with banks)

**Cash Reserve Ratio (CRR)** As per section 42 of the Reserve Bank of India Act, 1934, banks are required to maintain a certain percentage (at present 4.75 percent) of their net demand and time liabilities in current account with RBI

**Prudential Norms:** In line with international practice and as per the recommendations of the Committee on the Working of the Financial System (CFS) set up to suggest ways of improving the banking industry in India, the Reserve Bank of India has introduced in a phased manner, a set of norms collectively called the 'Prudential Norms'. They cover the definition of **non performing assets (NPA)**, **income recognition**, **asset classification**, **provisioning** and **capital adequacy**. A NPA is an asset in respect of which the interest and /or instalment has remained overdue or an overdraft account has remained out of order (continuously overdrawn / credits in the account not sufficient to meet the debit of interest) for a period of 180 days or more (to be eventually changed to 90 days). All assets of a bank are required to be classified as performing (**Standard**) and NPA. The NPAs are further to be classified as **Substandard** (non performing for not more than 18 months and adequately secured), **Doubtful** (non performing for more than 18 months and the security cover is less than 50 percent) and **loss assets** (non performing and unsecured or security cover is marginal). The income on non-performing assets is to be reckoned only on

receipt basis (taken to profit and loss account only if it is actually received). Provision is required to be made on the assets at prescribed rates (0.25 percent on standard assets, 10 percent on Substandard, 20 to 50 percent on doubtful and 100 percent on loss assets). Further the capital and free reserves of the bank (collectively called its owned funds) are required to form a certain percentage of its risk weighted assets (calculated by assigning certain RBI prescribed risk factors to each of the assets)

## **1.2 NEED FOR THE STUDY AND IT'S IMPORTANCE:**

Banks serve as financial intermediaries between the people who have money to save and those that require it. In this process of intermediation, banks earn a spread (difference between interest earned on assets and interest paid on deposits) which is the most important factor affecting the profitability of banks. In order to increase profits, banks first need to maximize spread. In this process they are exposed to various risks. Higher the risks, higher the return implies that if no risks are taken, there can be no returns. Hence risks need to be managed and not avoided. The efficiency of a bank depends on its ability to manage risks. Therefore risk management can be construed as an integral part of modern day banking. Evaluation of the banks based on their ability to manage risks is crucial. Hence the importance of this study.

The study provides an insight into the performance of the three selected banks in India, Corporation Bank (CORP), Karnataka Bank Limited (KBL) and Standard Chartered Grindlays Bank (STANCHART, erstwhile ANZ Grindlays Bank), in the area of ALM based on twenty one (seven in chapter III, one in chapter IV and thirteen in chapter V) selected financial indicators.

### **1.3 SCOPE OF THE STUDY:**

It has been customary for economists to consider profit optimisation as the primary goal of any type of organisation. With the introduction of the reforms, this became true even in the case of a bank (both in the public and the private sector). Considering the strong competition that a bank encounters in a post reformative era, it is necessary for it to aim at profit maximisation. Profits can be maximized by spread maximization. With the help of the secondary data and using ratio analysis, the performance of the three selected banks, has been analysed over a period of eleven years (1991-92 to 2001-02), on the basis of twenty one indicators, in order to ascertain the effectiveness of ALM in optimising the spread of those banks.

This study also compares the relative efficiency of the said three banks (in maximising spread) with the 'best' in the industry using data envelopment analysis (a statistical tool) and tests a model to arrive at the efficient mix of assets and liabilities to optimize the spread.

### **1.4 REVIEW OF LITERATURE:**

A comprehensive review of the literature relating to risks and profitability, risk management and asset liability management is compiled under the following heads- foreign studies, Indian studies, magazines and journals, newspaper articles, committee and annual reports, conference papers and doctoral dissertations. The review reveals that the concept of ALM is well developed abroad, even though it is a fairly new concept for banks in India. A lot of research has taken place in this direction in foreign countries. A plethora of literature is available in the area of funds management and active risk management from the west, especially from the United States of America. A general scan of the literature available in India and review of the bibliography of doctoral dissertations submitted to the Indian Universities published by the Association of Indian Universities (AIU), New Delhi, indicates that much of the research done in different areas of banking is related to the financial performance of

banks. Since the introduction of the financial sector reforms, ALM is receiving greater attention from academicians and practitioners alike. In this connection, the contribution of National Institute of Bank Management (NIBM) is noteworthy. A number of articles are appearing in their journals like Prajnan and Vikalpa besides the Journal of the Indian Institute of Bankers (JIIB), the Indian Banks' Association (IBA) bulletin and other financial journals.

### 1.5 **OBJECTIVES:**

This study has the following objectives:

- To identify and analyse the key measures of return and risk (especially credit, liquidity and market) and to demonstrate the relationship of return and risk.
- To analyse the performance of the three selected banks based on certain indicative parameters which can be managed using ALM techniques and to study the impact of risk on margins using these indicators.
- To measure the relative efficiency of the three selected banks with the 'best' in the industry.
- To test a model for efficient asset and liability allocation in banks to help earn an optimal spread, to indicate the achievement of the bank as against the optimal spread and thereby to ascertain the efficacy of a scientific asset liability management in improving the profits of banks.

### 1.6 **RESEARCH HYPOTHESES:**

This study is based on the premise that ALM plays an important role in maximizing spread and thereby increasing the profits of banks. Accordingly, certain hypotheses are developed for further study and analysis such as - the correlation between spread and deposits and spread and priority sector advances of banks is highly positive and significant at 5 percent level of significance, the quality of the loans has a direct bearing on the spread of the

bank, an increase in loans increases the income of the bank, liquid assets are low yielding assets and a higher liquid ratio reduces the margins and an efficient allocation of assets and liabilities increases the spread of the banks.

#### **1.7 RESEARCH METHODOLOGY AND SOURCES OF DATA:**

This thesis is based on secondary data published by the RBI and the Indian Banks Association (IBA) Besides, various books, periodicals, journals, newspapers and reports of various committees, as well as circulars issued by RBI were referred to by the Research Scholar for the purpose of understanding the relevant concepts and policies The specific data required for the purpose of the study are taken from official sources such as statistical tables relating to banks in India (published by RBI) and the financial statements of the individual banks

#### **1.8 PERIOD OF STUDY:**

The concept of ALM was introduced for the first time in India, following the submission of the report of the Committee on the Working of the Financial System in 1991 (popularly called the Narasimham Committee, headed by Narasimham, M a former Governor of RBI formed to suggest remedial measures for improving the health of the Indian financial system) ALM is a technique for management of risks, which are the products of the reformative era Hence the focus of the study is mainly on the post reformative era from 1991-1992 onwards. However certain data (on movement of NPAs, maturity profile of assets and liabilities) was required to be published in the balance sheet only since 1998 Hence in such cases, the ratios are calculated and compared only for subsequent years.

## 1.9 **SELECTION OF THE SAMPLE:**

Bank profitability can be expressed as the ratio of **profit to working funds**. However, since ALM has a direct bearing on managing of spread, the ratio of **spread to working funds** is taken as a base ratio and the banks have been selected for the study based on this ratio.

As on 31<sup>st</sup> March 2002, there were 294 scheduled commercial banks including 197 Cooperative banks and Regional Rural Banks (RRB's). The Cooperative Banks and the RRBs' have been excluded from the scope of this study since the share of business of such banks is very low and the concept of ALM is yet to be extended to them. Similarly, SBI with its seven subsidiaries is excluded from the study since the size of the SBI group, both in terms of branch network and resources, is much larger than all other commercial banks and their comparison with other banks does not reflect the true position. Out of the remaining 89 banks, 20 are selected based on their performance on the basis of their spread. Testing by hypothesis it is first verified that the sample drawn belongs to the parent population, which has certain specific characteristics. After having selected 20 banks for data envelopment analysis, the performance of 3 banks selected randomly (CORP in the public sector, KBL in the private sector and STANCHART among the foreign banks in India) has been studied using ratio analysis model and their relative efficiency with the 'best' in the industry.

## 1.10 **PLAN OF THE STUDY:**

The thesis is divided into six chapters as detailed below.

### **PART I**

#### **CHAPTER I**

The chapter serves as an Introduction to the study outlining the purpose of the study, hypotheses, plan of the study, period of the

study, research methodology and sources of data, selection of the sample, profile of the sample, scope and limitations of the study A brief review of the foreign and Indian literature on the subject of ALM in banks also features in this chapter

The chapter ends with the conclusion and summary

## **PART II**

### **CHAPTER II**

The chapter titled **Asset-Liability Management: The Concept Explained**, is divided into two sections, A and B Section A traces the growth of the banking industry in India with reference to six time frames- prior to 1913, 1914-1946, 1947-1969, 1970-1985, 1985-1990 and 1991 onwards It examines the changing banking scenario in the country in the light of reforms In section B the concept of risk, its characteristics and its perception is introduced The section then goes on to describe the process of risk management and outlines the role of ALM in the management of these risks

The chapter ends with the conclusion and summary of the chapter

## **PART III**

### **CHAPTER III**

The chapter named **Ancient Risk: Credit risk and Liquidity risk**, highlights two ancient risks- credit and liquidity risks- along with the tools of measuring and managing them The chapter is divided into two sections A and B In section A the tools for measuring the credit risk in the case of individual borrowers such as rating charts and loan pricing are analyzed and a modified equation for this purpose is evolved The section proceeds to highlight the methods of measuring the credit risk of the entire portfolio (advances and investments) of the bank This risk in the

three banks selected for study is measured and compared by using the following indicators

- Gross non-performing assets (NPA) to working funds helps to identify the percentage of assets, which are not generating any income
- Net NPA to total advances is indicative of the quality of credit risk management
- Earnings before tax to NPA gives that level of loss assets at which the entire profits of the bank would be wiped off

In the second section of this chapter, the theories and objectives of liquidity management and the effect of liquidity on profits are highlighted. Liquidity risk is measured in respect of the three banks selected for the study by using the following indicators

- Growth in deposit growth to total working funds growth indicates the percentage of growth of core deposits (which are insensitive to changes in interest rate)
- Time deposits to total working funds gives the level of time deposits which are highly sensitive to changes in interest rates
- Liquid assets to total working funds measures the level of liquid assets, which are low yielding assets. A higher ratio would indicate lower interest margins and lower liquidity risk
- Liquidity Index measures the ratio of total weighted liabilities to total weighted assets (both the assets and liabilities are allotted weights from 1 to 8 depending on the period to maturity)

The chapter ends with the conclusion and summary of the chapter.

#### **PART IV**

##### **CHAPTER IV**

In the chapter titled Lesser **known risks: Market Risk**, the importance of market risk, which covers **interest rate risk** and **foreign exchange (currency) risk** is explained and the tools for its management are outlined. In section A of this chapter, the components and the theories of interest rate, the method of targeting a gap by rectangularisation of the balance sheet and the tools available for measuring and managing interest rate risk are outlined. The rate sensitive assets and liabilities of the three banks selected for the study are calculated and the gap ratio (ratio of rate sensitive assets to rate sensitive liabilities) of these banks is measured. In the second section of this chapter, the different types of currency risks are explained and the methods available for measuring and managing this risk are studied.

At the end the conclusion and summary are presented.

#### **PART V**

##### **CHAPTER V**

In this Chapter named **Profit planning**, the factors affecting profitability of the banking industry (based on data of the sample population) are identified using multiple regression techniques. The performance of the three banks selected for the study is compared on the basis of the following thirteen indicative parameters over a period of eleven years from 1991- 2002 using ratio analysis model.

- Return on Equity (ROE) calculated as a ratio of net profits to equity measures the return on the equity base of the bank.

- Return on Assets (ratio of net profit to total assets) measures the efficiency of banks in deployment of assets, making their comparison easier
- Equity Multiplier indicates the percentage of debt financing (deposits and borrowings) as compared to the equity.
- Asset utilisation ratio measures the proportion of earning assets thereby indicating the efficiency in utilization of the assets.
- Risk Adjusted Spread on Equity (RASOE) is an improvement over ROE and calculates the ratio of interest income net of provision for any losses in the interest earning assets to total equity
- Incremental NPA to opening gross advances also reveals the quality of the advances. A high ratio indicates poor credit risk management
- Net NPA's to total equity indicates the portion of the NPAs' funded by interest bearing liabilities.
- Net advances to total assets indicates the level of advances to total assets
- Fixed deposits to net advances measures the level of advances funded by fixed deposits
- Investments in short term assets to total assets indicates the percentage of investments in short term assets and helps to measure the liquidity risk

- Mismatch in cash flows measures the mismatch in each time bucket (based on maturity period) against the tolerance level fixed
- Net Interest Margin is a measure of bank's net interest return on income producing assets (advances and investments) and its ability to manage interest rate risk
- Risk Adjusted Net Interest Margin (RANIM) is an extension of the net interest margin and takes into account the interest income net of provision for any losses in the interest earning assets. This indicator is a measure of both credit risk and market risk

With the help of Data Envelopment Analysis (a performance measurement technique used to measure the relative efficiency of decision making units like banks), the relative efficiency of these banks is measured with the 'best' in the industry and the optimal spread for each of these banks is calculated using graphical and mathematical tools. Finally a model for arriving at the efficient allocation of assets and liabilities to achieve the optimal spread is arrived at using simultaneous equations. Using the model the efficient allocation of assets in respect of the three selected banks is arrived at. It is found that at this level of allocation the banks can achieve their respective optimum spread. The actual asset allocation is compared with the efficient allocation in respect of each of the three selected banks so as to ascertain the reasons why the banks have achieved a lower spread.

Finally the chapter conclusion and summary is given

## **PART VI**

### **CHAPTER VI**

This chapter **Summary, Suggestions and Conclusions**, contains the summary and conclusion of the study. The research findings and various recommendations for refining the ALM systems in banks are enumerated. Data is critical and central to the success of an ALM and banks must collect data to study the behavioral pattern of assets and liabilities including of the non maturing classes in order to make a more accurate prediction of the cash flows. Banks should introduce risk focused audit to recognize the risks that affect the banks and assess them. Banks must separate the departments generating risks from those managing it. This is followed by the chapter conclusion and summary.

This chapter also contains the concluding part of the thesis, which outlines the future perspective of ALM in banks in India.

#### 1.11 **CONCLUSION**

Risk management is about managing risk and not eliminating it. ALM provides a competitive and dynamic framework for measuring, monitoring and managing different risks. This thesis measures the various risks in the three banks selected for the study and compares their performance over a period of eleven years using ratio analysis. The mathematical model for ALM developed can be used by any bank to arrive at the efficient allocation of assets, so as to achieve the optimum spread. It is a decision support tool that can help in budgeting and analyzing variations in assets and liabilities.

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