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COMPARATIVE ANALYSIS OF EMPLOYEES' PERSPECTIVE ON ASSET-LIABILITY MANAGEMENT IN BANKS

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ABSTRACT

Asset-Liability Management is critical for the successful working of banks. The Indian Financial system is very dynamic and growing rapidly. Banks focus on both the assets and liabilities due to liquidity risk, interest rate risk and foreign exchange risk. The implementation and understanding of ALM policies, and procedures will provide insight into the approach of banks towards ALM. A primary survey is conducted among employees of twelve public and twelve private banks to collect data related to employees' experience, understanding, and knowledge about the ALM. The questionnaire used in the study carries Yes/No type questions, multiple-choice questions, checklist questions, scaled questions. The data is analyzed using SPSS. The results suggest that public and private banks' employees have a similar understanding and knowledge of the ALM. Both types of banks follow identical practices and policies in the implementation of ALM with few deviations. The employees of the banks were hesitant to answer complex questions, and therefore questionnaire has to be kept generic and straightforward. This paper studies ALM in banks using primary data. All other studies have been conducted using secondary data or literature surveys. These studies did not feature the banks' approach in ALM policies, practices, and procedures.

Keywords: Banking, Assets-Liabilities Management, Risk Management, Interest Rate risk, Liquidity Risk.

JEL Classification Codes: E58, E43, G33, G32, D81.

INTRODUCTION

Most banks in international economies started strategic planning for asset and liabilities management in the 1970s (Goodman & Langer, 1983). At that time, Indian banks were free from interest rate risk as it was regulated and governed by the Reserve Bank of India (Chatterjee & Dutta, 2016). When other economies were planning for deregulation and Asset-Liability Management (ALM), Indian banks were getting nationalization (in 1969). The restructuring phase that started in 1991 brought a paradigm shift in the banking sector. The purpose of the reform was to make the banking system sensitive to the changes happening in the market environment (Tanwar et al., 2020). To achieve the purpose, the function of RBI as micromanagement of banks' operation needs to be switched to macro governance (Das & Ghosh, 2001).

Prior to liberalization, banks were required to manage their balance sheets in accordance with regulatory and government directives. Following liberalization in 1991, interest rates were deregulated, and banks were granted complete control over their balance sheets. Hence, the ALM rules became critical for banks to assist them in avoiding major losses by aligning asset and liability mismatches. In February 1999, the Reserve Bank of India issued the first ALM implementation directions, which took effect on April 1, 1999 (Singh & Tandon, 2012).

The ALM procedure was carried out by banks in accordance with RBI rules. The successful adoption of ALM relied heavily on information technology and information system management. Banks had to rethink their tactics to address future difficulties. Asset Liability Management (ALM) is a monetary arrangement process in which strategies for maintaining the firm's assets and obligations are planned, implemented, monitored, and scrutinized. It aids in the achievement of organizational financial goals by analyzing risks and restrictions (Romanyuk, 2010).

ALM is also regarded as an essential tool banks use to conduct risk management activities such as market risk, financial risk, interest rate risk, and others (Fabozzi & Konishi, 1991). It is responsible for performing economic activities such as risk management of liquidity, project planning, trading, growth projection, capital planning, funding, and market risks (Adebisi et al., 2020; Haddad et al., 2019; Riyazahmed & Baranwal, 2021). The ALM practices are implemented through a three-tier structure:

- ALM information system,
- ALM organization (structure and responsibilities) and
- ALM process (recognizing risks, estimation, administration, and setting of policies) (Chaturvedi, 2014; Jayanthi & Umarani, 2014; Joshi & Sontakay, 2017; Singh, 2013).

This paper discusses the ALM policies and their implementation in Public and Private Banks in India. The paper presents an extensive literature review of ALM and finds gaps that are addressed here. The other sections describe the methodology, results, findings, and lastly, the conclusion.

LITERATURE REVIEW ON ASSET LIABILITY MANAGEMENT IN BANKING

Asset and liability management (ALM) is a practice used by financial institutions to mitigate financial risks resulting from a mismatch of assets and liabilities. ALM strategies employ a combination of risk management and financial planning and are often used by organizations to manage long-term risks that can arise due to changing circumstances. It helps in attaining organizational financial objectives by estimating the risks and constraints. (Romanyuk, 2010). ALM is also regarded as an essential tool banks use to conduct risk management activities such as market risk, financial risk, interest rate risk, and others (Fabozzi & Konishi, 1991).

Efficient management of interest rate risk and liquidity risk are two main activities of banks managed by ALM. Umarani and Jayanthi (2015) analyzed ALM in SBI & Associate banks. The liquidity position of banks is determined through the maturity profiling method, and the maturity gap was analyzed and compared to measure the liquidity risk in banks. Meena and Dhar (2014) and Vij (2001) studied few banks in India using traditional gap analysis to measure liquidity risk and interest rate risk. Mismatch in assets and liabilities exposes the balance sheet to liquidity risk. Dash et al. (2011) used maturity gap analysis to determine and compare the liquidity position of public, private,

and foreign sector banks. Chattha et al. (2020) used duration gap analysis to comparative analyze ALM practices in Islamic Commercial Banks (ICBs) and Conventional Commercial Banks (CCBs). The findings report that ICBs have 2.41 times more variation than CCBs and are exposed to liquidity risk.

Antony And Manimegalai (2018) studied the impact of ALM on profitability using ratios such as the current asset to deposit ratio, credit-deposit ratio, debt-equity ratio, current ratio, and quick ratio. Nugroho et al. (2020) studied the effect of ALM on the financial performance of banks using the CAMEL approach. Chakraborty and Mohapatra (2009) studied ALM in banks and applied canonical correlation to explore the relationship and strength between assets and liabilities. Abou-el-sood and El-ansary (2017) also determined the interdependencies between asset and liability portfolios in Islamic banking using canonical correlation. It was analyzed that decision for a funding source depends on an asset portfolio. Islamic banking depends less on equity to finance investment during an economic boom than in financial turmoil. Kosmidou et al. (2004) applied the statistical cost accounting method to investigate the correlation between profitability and asset-liability composition. It was found that high-profit banks manage to procure funds at lower cost, which helps manage losses from lower returns on assets. Jain et al. (2010) presented a fuzzy programming model for pensioners to control the risk of underfunding. It dealt with unusual uncertainty of return on investment and future liabilities.

Black et al. (2003) determined the essential factors for instigating ALM transformation, i.e., market risk management, amendments in accounting and regulatory rules, and lastly, technological advancements. Fiedler et al. (2002) described that due to advancement in software, earnings and value could be supported by a single, integrated, and analytical framework to determine earnings sensitivity and future market valuation across dynamically modeled balance sheets. Tanwar et al. (2021, 2020) used a goal programming model to optimize the asset and liabilities of the banks while compiling the various constraints.

The 1991 banking system reorganization, together with various worldwide developments, exposes banks to liquidity risk, foreign exchange risk, credit risk, interest rate risk, and other risks, all of which have a direct impact on bank productivity and profitability. There is a need to evaluate interest rate exposure since loosening interest rate controls has exacerbated market volatility. Interest rate risk was quantified by Charumathi (2008) and Singh (2013) using re-pricing gap analysis and duration analysis. Seshadri et al. (1999) studied strategic asset-liability management by building a simulation model that can generate dividends, market value, and capital duration for arbitrarily generated interest rate scenarios. Asset-liability strategies can be developed, tested, and refined using this method.

The ALM process has a direct impact on financial institutions' financial performance, thus having an effective ALM process that can closely monitor and manage both assets and liabilities is critical. The importance of the ALM manifold has grown because of the complexities of our economy and its growing scale. As a result, this topic is being studied (Vossen, 2010). Hence to effectively guarantee the highest growth, it is critical to investigate the interrelationship between the asset and liability sides of the balance sheet (Singh & Tandon, 2012).

RESEARCH GAP

Based on our exhaustive literature search, we have not found any study that conducts a primary survey of ALM. The breadth of the literature reviewed necessitates a better understanding of the extent to which banks are applying ALM strategies and policies. We also want to look into how bank personnel in various bank departments comprehend the ALM process. Previous research on ALM is based on secondary data.

RESEARCH QUESTIONS

- Do employees of banks in India understand ALM policies and implement those policies as prescribed by the RBI?
- Is there a difference between public and private banks in understanding and implementing ALM strategies, function, and importance?

RESEARCH OBJECTIVES

The objectives related to the study are:

- To study, understand, and analyze strategies employed by banks to manage their assets and liabilities.
- To determine whether Public and Private Banks follow a similar approach towards ALM.

RESEARCH METHODOLOGY

RBI lays down ALM strategies, policies, and procedures in circular 'Asset Liability Management (ALM) System (1999)' and 'Guidelines on ALM System- Amendments (2007)'. These rules establish a standard of practice for banks to follow. The RBI, on the other hand, established a basic framework and procedure. Depending on their risk management techniques, banks have the freedom to improve and extend them. Hence, a questionnaire is issued to banks' risk departments, ALM cells, Treasury departments, and Balance Sheet management departments to learn about ALM techniques used by public and private banks.

Yes/No questions, multiple-choice questions, checklist questions, and scaled questions are all included in the study's questionnaire. In multiple-choice questions, the respondent selects one response from a list of alternatives, but in checklist questions, the respondent has the option of selecting numerous options. Answers to scaled questions are rated on a scale, such as the Likert scale.

Pretesting the questionnaire for Reliability and Validity was done using a pilot survey. Pretesting aids in ensuring that the questions are phrased correctly and in plain English. It specifies that the order of the questions is correct. Pretesting allows you to make sure the respondent understands the questions and that the directions for filling out the questionnaire are clear. During pretesting, unnecessary and repetitive questions can be removed, and extra required questions can be added to the final questionnaire.

A statistical test called Cronbach's- [alpha] is applied to test internal Reliability. Most literature argues that the acceptable value of Cronbach's- alpha is 0.7. A value between 0.6-0.7 is an acceptable level of Reliability, and 0.8 or greater is considered a very good level (Hulin et al., 2001; Ursachi et al., 2015). Hinton et al. (2004) mentioned that alpha value from 0.5 to 0.7 shows moderate Reliability, whereas 0.5 and below is considered low. Cronbach's- alpha] value for Yes/No questions is 0.634, where inquiries related to the ALM, and risk management are covered. The ALM Significance and ALCO functions have scores of 0.790 and 0.701, respectively. The questionnaire is internally reliable, according to the literature.

Sampling Techniques

Judgmental non-probability sampling, also known as the purposive non-probability sampling technique, is used in the current study. Only relevant opinions/views are required for the study job; hence this sampling method involves the deliberate selection of candidates. Quota sampling is used in this study because samples are divided into private and public sector banking groups, and banks were chosen based on the ease of obtaining replies. Banks from both the public and private sectors are chosen as target banks.

Data Collection and Sample

The primary methods are used for the overall data collection process to examine the ALM and risk management strategies and policies followed by private and public banks. The data collecting tool for primary data gathering is a questionnaire-based survey method. Surveys of officials from the Risk Department, the Balance Sheet Management Department, and other bank divisions were used to gather primary data.

Banks from both the public and private sectors are targeted. The questionnaire is delivered to the bank's headquarters, regional offices, and branches. The survey is given to 400 public and private sector bank workers who work in the risk department, balance sheet unit, treasury department, and other departments. The study takes into account all 264 responses. The questionnaire was distributed to 16 public banks before the merger in 2019-2020, and 12 public banks responded.

The questionnaire was also sent to 17 private banks, and responses from 14 banks were received. Only 12 private banks were taken in the study as two banks declined to answer most of the questions in the questionnaire. A non-probability purposive sampling technique was employed to collect data of 264 employees for the study. A sample of 264 was adequate considering one item/question to five responses ratio (Hair et al., 2014; Israel, 1992; Ruparel, 2020) for the questionnaires.

The public sector banks included in the study are Allahabad Bank, Bank of India, Bank of Baroda, Canara Bank, Corporation Bank, Indian Bank, Indian Overseas Bank, Oriental Bank of Commerce, Punjab National bank, Punjab and Sind Bank, State Bank of India, and UCO Bank. The private sector banks included in this study are the Federal Bank, HDFC Bank, ICICI Bank, IndusInd Bank, Axis Bank, Yes Bank, Kotak Mahindra Bank, DCB Bank, IndusInd Bank, South Indian Bank, RBL Bank, and IDBI bank. The data collected is then analyzed with the help of IBM SPSS software.

Data Analysis

Data analysis holds vital importance in the overall interpretation of the collected data. Data analysis involves the use of several statistical tools that allows efficient computation of the data. The study is exploratory and descriptive as it attempts to study the strategies and procedures applied by banks for the asset-liability management practice. Herein data analysis would mainly be attempted with the help of a statistical tool like the Mann-Whitney U test, mean, rank, frequency, etc.

When two independent sets of dependent variables are ordinal or continuous but not normally distributed, the Mann-Whitney U test is used to compare them. The Mann-Whitney U test is a nonparametric test. The test provides an opportunity to make conclusions about data based on assumptions about data distribution. It helps in determining whether there is a difference between the two compared groups or not. The shape of the distribution of data determines the results.

The null and two-sided research hypotheses for the *nonparametric test* are stated as follows:

H_0: The two populations are equal versus
H_1: The two populations are not equal.

Descriptive statistics describe the quantitative characteristics of the data set. It includes frequency analysis. The repetition of an event is referred to as frequency. Frequency analysis determines the number of occurrences of an item and calculates the central tendency, dispersion, percentile, etc.

RESULTS AND ANALYSIS OF THE STUDY

Respondents' Profile

The respondents are both male and female bank employees. Male respondents are 66.7%, and female respondents are 33.3% of the total sample size, i.e., 264 (as shown in figure 1). Most of the respondents are aged 31-40 years (52.7%), followed by 41-50 years (30.7%), 21-30 years and 51-60 years as 8.3% each (figure 2). Most respondents have a master's degree (66.7%) as the highest education. Few respondents also have professional qualifications (33.33%), i.e., Chartered Accountants, CAIIBs, etc. The respondents are well qualified and experienced in their field of banking. At present, given the educational level, employees are even eligible for a higher position at the age of 31-40 years.

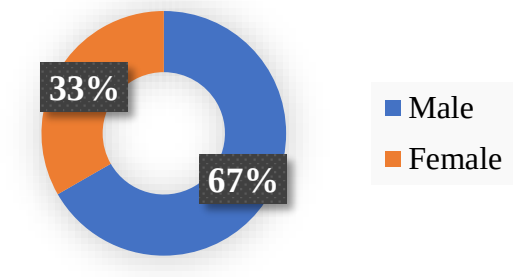

Figure 1. Gender of the Respondents

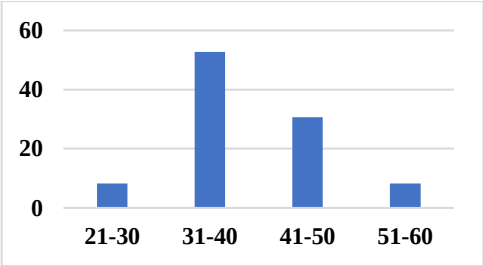

Figure 2. Age of Respondents

The data for the study was gathered from a number of top bank executives. Assistant General Managers, Assistant Vice Presidents, and Managers make up the majority of the respondents. Employees in roles such as Chief Manager, Branch Manager, Senior Trader, and Regional Manager are also eligible to participate in the survey. The respondents were chosen from a variety of characteristics to have a better understanding of the policy process from start to finish. The majority of respondents have worked at their present bank for at least five years. Respondents' terms range from one year to fifteen years. Twelve public sector banks and twelve private sector banks were chosen as respondents.

Structure and Resources

A Separate Risk Management Function

As per RBI guidelines, banks must have separate risk management functions supervised by the board of directors. They meet with other executive-level committees to ensure that the bank has accepted the risk management principle and regulations. The Board of Directors of each of the banks chosen for the survey (i.e., 100 percent) has its own risk management function.

Availability of Chief Risk Officer

According to the RBI circular, all scheduled commercial banks (except Local Area Bank and Regional Rural Bank) are required to frame a board-approved policy that should state the roles and responsibilities of the Chief Risk Officer (CRO). CROs' have professional qualifications or experience in risk management. 100% of the respondents said their bank has a chief risk officer.

Independent ALM Function

As a mandatory requirement from RBI, all Scheduled Commercial banks are advised to have independent ALM function. ALM function of bank keep check on whether ALCO adhere to the limits set by the Board, design the business strategy of the bank (on the assets and liabilities sides) after incorporating the bank's budget and risk management objectives. 100% of the respondents said their bank had a separate asset-liability management function.

Reporting of Independent Asset-Liability Management

Table 1. Frequency table for reporting of independent asset-liability management

Response	Frequency	Percent	Cumulative Percent
Balance sheet management unit	11	4.17	4.17
Risk department or ALM cell in Risk department	187	70.83	75
Treasury and Risk department	11	4.16	79.16
Treasury department, Treasury operations	55	20.84	100
	264	100	

From table 1, it is evident that all the respondents are engaged in ALM-related work. However, as the question is open-ended and responses are captured from their replies, many of the respondents might be handling multiple tasks, and all of them are aware of the ALM process. 70.83% of the respondents said their bank's independent asset-liability management reporting area is the Risk Management Department or ALM cell in Risk Management Department. Then 20.84% of the respondents said it is the treasury department or treasury operations, where they work on ALM-related issues. The rest of the respondents said it was the Balance Sheet Management Unit, Treasury and Risk department that looked after the independent asset-liability management.

Formal Committee for Asset-Liability Management

As per RBI guidelines, all commercial banks must form an Asset Liability Management Committee comprising senior management. The ALCO in banks is responsible for balance sheet planning from the risk-return perspective that undertakes interest rate risk management and liquidity risk management. The Board of Directors decides the role and responsibilities of ALCO. ALCO is responsible for the decisions taken by it. ALCO ensures that it incorporates the risk management practices and parameters set by the board while making decisions. ALCO works on product pricing of deposits and advances, and maturity profile of assets and liabilities, etc. ALCO also reviews the work of the ALM desk related to the progress and results of the implementation of decisions made in the previous meetings. The committee is headed by either the Managing Director or Chief Executive officer. Also, the Chiefs of other departments such as Investment, Credit, Funds, International Banking, Economic Research, and Information Technology Department are committee members. Depending upon the complexity of the bank hierarchy, some banks also have sub-committees to assist ALCO.

All the respondents (i.e., 100 percent of respondents) said they have a formal committee for asset-liability management.

Statement of Principles and Objectives Concerning Asset-Liability Management

A member of the Risk Management Committee, which is made up of members of the bank's Board of Directors, sets the objectives and principles. Other executive committees are informed of these objectives, principles, boundaries, and targets. ALCO is also one such committee that follows the goals and targets set by the board of directors and incorporates them in planning. The ALCO recommends the action needed to stay within the bank's internal boundaries based on the risk profiles' analysis, monitoring, and reporting by the ALM cell.

100% of the respondents said their banks had statements of principles and objectives concerning asset-liability management.

Frequency of Asset-Liability Management Committee Meet

When asked about the frequency of the asset-liability management committee meetings, 50% of the respondents said ALM committee members meet every quarter for an asset-liability management meeting, whereas 33.3% of the banks have monthly meetings. Further, only 16.7% of respondents

ticked others which shows that these banks comply with the minimum requirements of 4 meetings in a year (see figure 3). However, such banks also conduct meetings as and when required to discuss important matters.

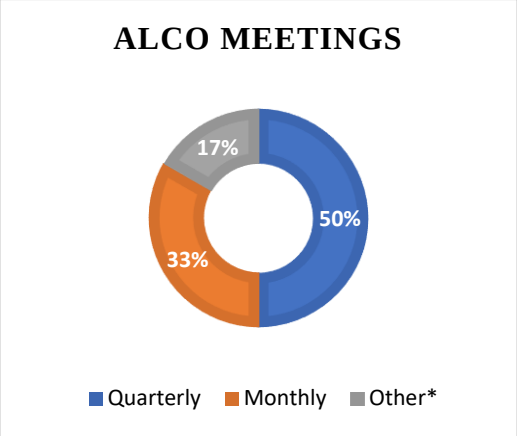

Figure 3. ALCO meeting

It should also be emphasized that all banks meet regularly to discuss the monitoring, progress, and execution of ALCO decisions.

Indicate the measure that the ALM financial objectives are based on

Table 2. Measurement of ALM Financial Objectives

		Responses		**Percent Of Cases**
		Frequency	**Percent**	
Financial objectives are based on	Economic Value	209	51.4%	79.2%
	Accounting Earnings	187	45.9%	70.8%
	Other	11	2.7%	4.2%
Total		407	100.0%	154.2%

The profit produced by the bank is subtracted from the cost of financing the company's capital. It is a widely used management technique for assessing a bank's performance. Economic value is built on ideas including maximizing the return on existing assets, investing in a portfolio with a return greater than the cost of capital, and freeing up cash flows. Economic value is defined in banks as free cash flow and its present value. Deducting the mark-to-market value of liabilities from the assets yields Economic Value. A risk premium is included in the funding cost.

Respondents were given the option of selecting multiple options. According to the survey, table 2 shows that 79.2 percent of respondents indicated their bank used economic value to measure financial asset-liability management objectives.

Accounting profit is net income after all explicit expenditures have been deducted. Accounting earnings were used as a metric of financial objectives in asset-liability management by 70.8 percent of respondents. Risk limit, ratio, and regulatory criteria are also taken into account when measuring ALM financial objectives, according to 4.2 percent of respondents.

Level at which ALM is performed

Table 3. Frequency table for level at which ALM is performed

		Responses		Percent of Cases
		Frequency	**Percent**	
Indicate level at which ALM is performed	For each financial product/asset segment separately	187	60.7%	70.8%
	At the divisional level	33	10.7%	12.5%
	at the total organization company /business unit level	88	28.6%	33.3%
Total		308	100.0%	116.6%

We need to understand the organizational structure of private and public sector banks before we can analyze the responses in Table 3. A vertical system governs the operation of private sector banks. Each vertical system has a product, or a function associated with it. Capital market or wholesale banking operations, for example, are examples of verticals. Public sector banks, on the other hand, follow a pyramid form (see Figure 4).

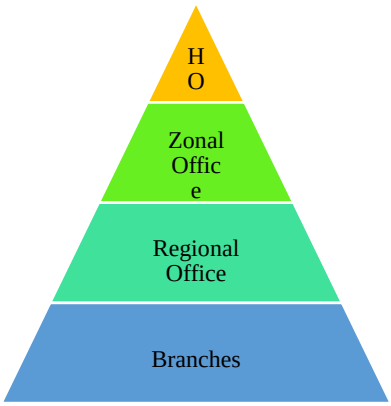

Figure 4. Structure of Public Sector Banks

ALCO is the apex committee, and product-wise (whether asset or liability) targets at the HO level are selected based on ALCO, Treasury, and finances department recommendations, and then disaggregated using a top-down or bottom-up strategy. Within limits, targets are disaggregated down to the branch office level. When the HO establishes boundaries, criteria, and aims, the other units are ordered to meet those goals. Each controlling level takes care of deviations. The branch office/regional office/Zonal Office, on the other hand, plays a minor role in determining ALM.

Table 3 shows a similar result, with 70.8 percent of respondents stating that ALM is carried out independently for each product/asset. Only 10.7% of respondents indicate that ALM is performed at the divisional level, while 28.6% claim that it is performed at the organizational/business unit level.

Significance of asset-liability management in the banking system

Statistics acquired regarding the significance of asset-liability management in the banking system reveals, 75% of the respondents felt that all the reasons given in the questionnaire are important reasons for having ALM in banking and RBI rigorously monitor it. These reasons are: -

- To minimize the volatility in interest income and economic value.
- The reason for the growing importance of ALM is the rapid innovation taking place in the financial products of the bank.

- It provides a framework for banks to tackle the market risks that may arise due to rate fluctuations and excessive credit risk.
- Recognizes the vision of the management.

In contrast, 16.7% of respondents believed that the most important purpose for asset-liability management in the banking system is to reduce interest revenue and economic value volatility. Additionally, 8.3% of respondents stated that it provides a framework for banks to address market concerns such as rate fluctuations and excessive credit risk (see figure 5).

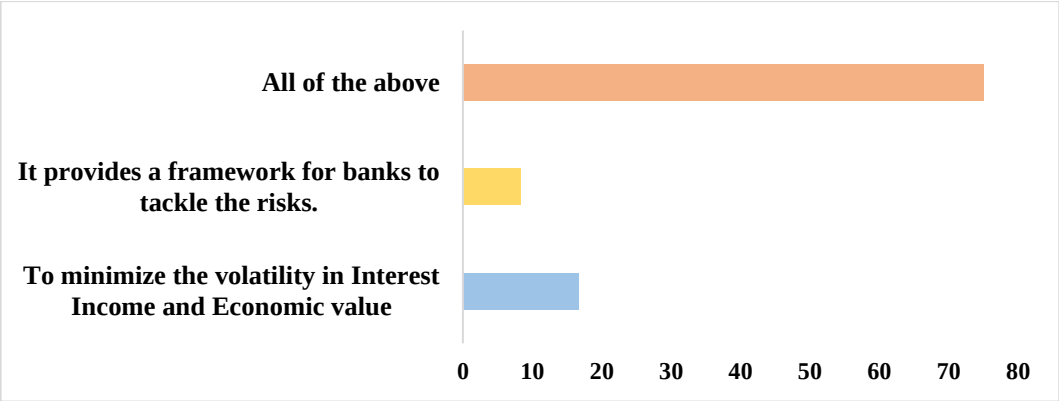

Figure 5. Significance of ALM in banking

Department Responsible for the Asset-Liability Management

All other bank departments, such as the credit department, loan department, finances department, and so on, are linked to ALM. ALCO is a high-level executive body that reports to the Risk Management department. 66.7 percent of respondents indicated their bank's risk department is in charge of asset-liability management. Furthermore, 33.3 percent of respondents claimed that ALM in their institutions is handled by the treasury department, which deals with market risk (see figure 6).

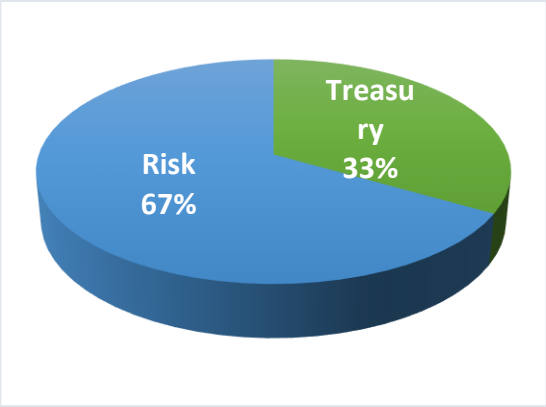

Figure 6. Department Responsible for the Asset liability Management

Key Driver for Change in Strategic Asset Allocation

Asset allocation depends on goal factors, risk tolerance, age-based asset allocation, etc. According to the reasons described above, the most important motivator for change in strategic asset allocation is matching liabilities with assets, according to 66.7 percent of respondents. While 29.2 percent of those surveyed stated that the shift in strategic asset allocation was made to reduce risk. Furthermore, 4.2 percent of respondents reported that a move in asset allocation was caused by an increase in return.

Other Drivers to Be Considered While Changing Asset Allocation

Table 4. Frequency table showing other drivers for change in asset allocation

Drivers For Change in Asset Allocation	Responses		Percent of Cases
	Frequency	Percent	
Lowering risk	176	28.1%	66.7%
Increasing return	220	35.1%	83.3%
Matching liabilities	99	15.7%	37.5%
Changes in perception of the market	33	5.3%	12.5%
Changes caused by variations in market values	44	7.0%	16.7%
Availability of new asset classes	55	8.8%	20.8%
Total	627	100.0%	237.5%

Respondents were given the option of selecting multiple options if they so desired. Table 4 shows that 83.3% of the respondents considered increasing returns as other drivers for changing asset allocation. 66.7% of the respondents said it was for lowering the rate of risk. Furthermore, 37.5 percent of respondents stated that it was for the purpose of matching the liabilities. Following that, 20.8 percent of respondents stated that a change in asset allocation is prompted to access new asset classes. On the other hand, 16.7% of respondents stated it was because of changes in market valuations, while 12.5 percent said it was because of changes in market perception.

The basic motive for change in asset allocation strategy in the bank

91.7% of the respondents believed that the motive for strategic asset allocation was an asset-liability matching study. Even though 45.8% of respondents disagreed, the decision was made based on the board's knowledge and research. However, 12.5% and 8.3% of respondents said the shift in asset allocation strategy was attributable to corporate influence or actuarial value for employee benefits, respectively.

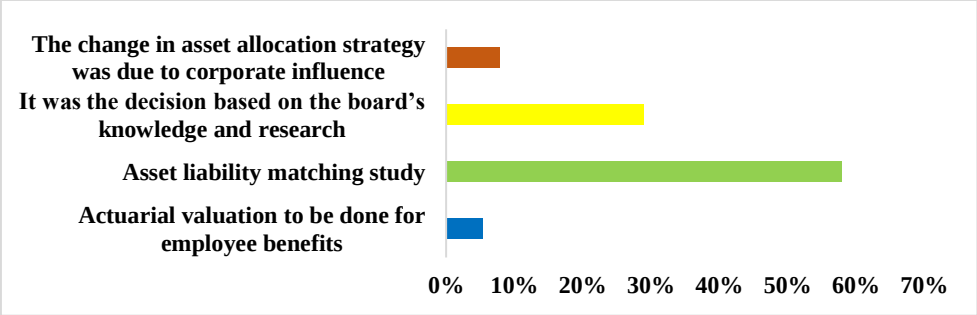

Figure 7. The basic motive for change in asset allocation strategy in the bank

Asset-Liability Management Functions

The bank must comply with all the statements made in the questionnaire about ALCO functions. ALCO's functions are decided by the board of directors. All functions are determined in accordance with RBI directives. Even though all of ALCO's functions are essential and useful for balance sheet planning, respondents were asked about their opinions on the importance of ALCO services (see table 5).

Table 5. Significance of Asset Liability Management

Statements Related to the Asset Liability Management Responses		**Count**	**Percentage %**
1. Asset liability management comprises of managing effectively both the assets and liabilities sides of the bank balance sheet	Neutral	46	17.4%
	Agree	127	48.1%
	Strongly Agree	91	34.5%
2. Asset liability management comprises of managing liquidity risk and market risks in an effective manner	Neutral	57	21.6%
	Agree	112	42.4%
	Strongly Agree	95	36.0%
3. Asset liability management consists of managing maturity gaps and mismatches	Neutral	57	21.6%
	Agree	113	42.8%
	Strongly Agree	94	35.6%
4. Asset liability management involves managing structural, static, and dynamic gap	Neutral	46	17.4%
	Agree	115	43.6%
	Strongly Agree	103	39.0%
5. Management of overall liquidity of the bank	Neutral	29	11.0%
	Agree	87	33.0%
	Strongly Agree	148	56.1%
6. Facilitates, coordinates, communicates and control balance sheet risk planning	Neutral	44	16.7%
	Agree	109	41.3%
	Strongly Agree	111	42.0%
7. Ensures bank’s risk lies within parameters set by the Board	Neutral	50	18.9%
	Agree	118	44.7%
	Strongly Agree	96	36.4%
8. Undertakes regular maturity analysis of assets and liabilities to identify liquidity gaps	Neutral	42	15.9%
	Agree	101	38.3%
	Strongly Agree	121	45.8%

Respondents' opinions about their practice, expertise, and experience are based on their responses. 34.5 percent of the total respondents strongly agreed that asset-liability management entails properly managing both the assets and liabilities sides of a bank's balance sheet, while 48.1 percent simply agreed (Table 5). It was already mentioned in the literature study before.

When asked whether asset-liability management comprises managing liquidity risk and market risks effectively, 36% of the respondents strongly agreed to it, whereas 42.4% only agreed to it. 35.6% of the respondents strongly agreed that asset-liability management consists of managing maturity gaps and mismatches, whereas 42.8% agreed (Table 5) ALM is used to manage the risks that are faced by the banks in the form of a mismatch of the asset and liabilities.

In addition, 39% of respondents strongly agreed that asset-liability management entails addressing structural, static, and dynamic gaps. The remaining 43.6 percent and 17.4 percent either agreed or were unsure. When asked if ALM oversees the bank's overall liquidity, 56.1 percent said yes, while 33 percent said no. Asset-liability management facilitates, coordinates, communicates, and manages balance sheet planning, according to 42 percent of respondents, while 41.3 percent agreed. 16.7% of respondents were undecided, meaning they didn't agree or disagree (Table 5).

According to 36.4 percent of respondents, asset-liability management guarantees that the bank's risk is within the board's guidelines, and 44.7 percent of respondents agree to it. The remaining 18.9% of respondents, on the other hand, are split between agreeing and disagreeing. Furthermore,

45.8% of respondents strongly agreed that ALM conducts regular asset and liability maturity analyses to identify liquidity gaps, whilst 38.3% just agreed (Table 5).

To obtain ranks for the significance of ALM that primarily define ALM, the sum and mean are determined. ALM is defined as the management of the bank's overall liquidity, according to the significance that is rated first. ALM also conducts frequent maturity analyses of assets and liabilities to identify liquidity gaps, according to respondents.

Table 6. Mann Whitney Test Results- Significance of ALM

TEST STATISTICS[a]								
	1	2	3	4	5	6	7	8
Mann-Whitney U	7939.5	8533.5	8688.0	8577.0	8216.0	8504.0	8200.0	7117.5
Wilcoxon W	16717.5	17311.5	17466	17355	16994	17282	16978	15895.5
Z	-1.357	-.309	-.042	-.236	-.902	-.364	-.892	-2.798
Asymp. Sig. (2-tailed)	.175	.757	.967	.814	.367	.716	.372	.005
a.Grouping Variable: bank								

H_0: There is no difference between public banks and private banks regarding the understanding and implementation of ALM.
H_1: There is a difference between public banks and private banks regarding the understanding and implementation of ALM.

In Table 6, the p-value is less than 0.05, showing that public and private banks have a similar understanding and implementation of ALM and use the same ALM approach. The p-value for the last statement on ALM, however, is less than 0.05. Hence, it can be concluded that Public Banks and Private Banks hold contrary opinions on whether ALM should conduct regular maturity analyses of assets and liabilities to identify liquidity gaps. According to a private sector bank, asset-liability management is functional beyond maturity analysis. It is not limited to maturity analysis only.

FINDINGS OF THE STUDY

The findings of the research on ALM practice in banks in India are:

- Both public and private banks adhere to all of the RBI's mandatory standards. All of the study's banks have well-documented ALM policies, separate risk management functions, autonomous ALM functions, a separate ALM goal, and a formal ALM committee to monitor, manage, and control risk. To manage risk, the banks have hired a chief risk officer.
- With ALM-related issues, bank personnel report to the ALM Cell, Risk Management Department, Treasury Department, Market Risk Department, or Balance Sheet Management Unit. All banks' ALM committees meet at least once a quarter to address ALM policy, investment policy, derivatives policy, and other topics. The market risk management group, on

the other hand, holds regular monthly meetings to discuss any changes to policies, methods, or techniques.

- ALM's financial objectives are measured by economic value, as they are for most banks. According to BIS II, banks must have interest rate measuring systems in place to analyze the effects of rate changes on economic values and earnings.
- Most banks do ALM individually for each product/asset division. The importance of ALM is to reduce interest income and economic value volatility. ALM is required due to rapid innovation in the bank's financial offerings. ALM sets the groundwork for banks to handle market risks such as interest rate volatility and excessive credit risk. It also acknowledges the management's goals.
- To meet liabilities and increase profits, most banks change the strategic allocation of an asset.
- The primary motivation for the bank's asset allocation strategy to alter is the asset-liability matching concept.
- In most banks, interest rate, liquidity, market, and foreign exchange risks are all considered part of ALM.

There is no significant difference between employees of private and public banks concerning the fundamental understanding of ALM and its functions.

CONCLUSION

When a primary survey was conducted, it was found that both public and private banks adhere to the RBI's rules. Regardless of their type or nature, every bank strives to optimize return while also focusing on their risk appetite. In terms of ALM, both private and public banks have formed a formal ALCO committee to examine asset and liability mismatches, rate-sensitive assets and liabilities, and other risks that could affect the bank's performance. The ALCO is regarded as the decision-making unit responsible for balance sheet planning from the risk-return perspectives. It also includes articulating and decision-making related to future business strategies based on current interest rates movement. The decisions regarding the funding policy are based on interest rate movement.

The size of ALCO depends on each financial institution's size, organizational complexity, and business mix. All the executives that belong to the top levels of management are included in the committee. It has a CEO, Chiefs of Investment Fund Managers, Treasury (forex and domestic) head, Officials of International Banking and Economic Research, and managers from the Funds Management section that form an integral part of ALCO. It is advisable to include senior officials of the Information Technology Division in the composition of ALCO so that guidance provided by them will support in developing adequate information systems and computerization. Support groups and sub-committees are also formed depending on the organizational size and need.

All banks have to decide the frequency for holding their ALCO meetings. Management of the bank holds formal and timely meetings to discuss any ALM issues. Banks hold at least four formal meetings every year, with additional meetings held as needed. Banks were discovered to have a proper communication channel, standard procedure, and well documented ALM objectives. Liquidity risk, market risk, foreign exchange risk, credit risk, interest rate risk, legal risk, and so on are all managed by formal policies and departments of banks. Interest rate risk and liquidity risk, on the other hand, are two types of risk that are part of ALM in any bank under investigation. It demonstrates that banks' ALM cells are primarily concerned about the interest rate and liquidity risk. The mitigation of all stated risks are crucial for banks and undertaken by ALM committee while framing policies yet most risks are handled through specific department.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no competing interests.

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REFERENCES

Antony, K. P. P., & Manimegalai, J. A. (2018). A Study on Asset Liability Management in Indian Bank. *International Journal of Business Administration and Management*, *8*(1), 1–9.

Abou-el-sood, H., & El-ansary, O. (2017). Asset-liability management in Islamic banks : evidence from emerging markets. *Pacific Accounting Review*, *29*(1), 55–78. https://doi.org/10.1108/PAR-04-2016-0050

Adebisi, A. J., Alabi, A. W., & Fatimehin, K. (2020). Influence Of Risk Assets Impairment On Performance Of Nigerian Listed Deposit Money Banks. *International Journal of Accounting & Finance Review*, *5*(3), 41–63.

Black, R., Brown, K., & Moloney, J. (2003). Asset and liability management : what does the future have in store ? *Balance Sheet*, *11*(2), 32–38. https://doi.org/10.1108/09657960310480651

Chakraborty, S., & Mohapatra, S. (2009). An Empirical Study of Asset Liability Management Approach by the Indian Banks. *The IUP Journal of Bank ManagementJournal of Bank Management*, *8*(3 & 4), 7–13.

Charumathi, B. (2008). Asset Liability Management in Indian Banking Industry - with special reference to Interest Rate Risk Management in ICICI Bank. *Proceeding of the World Congress on Engineering*, *II*(September).

Chatterjee, C., & Dutta, P. (2016). Exploring the Linkage between Profits and Asset–Liability Management: Evidence from Indian Commercial Banks. *Paradigm*, *20*(2), 131–142. https://doi.org/10.1177/0971890716670707

Chattha, J. A., Alhabshi, S. M., & Meera, A. K. M. (2020). Risk management with a duration gap approach. *Journal of Islamic Accounting and Business Research*, *11*(6), 1257–1300. https://doi.org/10.1108/JIABR-10-2017-0152

Chaturvedi, V. (2014). Asset Liability Management in Banks. *International Journal of Engineering Technology, Management and Applied Sciences*, *1*(2), 2349–4476. Retrieved from http://www.ijetmas.com/admin/resources/project/paper/f201406281403951723.pdf

Das, A., & Ghosh, S. (2001). The Relationship Between Risk and Capital: Evidence from Indian Public Sector Banks. *Reserve Bank of India Occasional Papers*, *22*(1, 2 and 3), 1–20. https://doi.org/10.1111/j.1813-6982.1961.tb02383.x

Dash, M., Venkatesh, K. A., & Bhargav, B. (2011). An Analysis of Asset-Liability Management in Indian Banks. *SSRN Electronic Journal*, 1–13. https://doi.org/10.2139/ssrn.1760786

Fabozzi, F. J., & Konishi, A. (1991). *Asset/liability Management: Investment Strategies, Liquidity Requirements, and Risk Controls for Banks and Thrifts*. Probus Publishing Company.

Fiedler, R., Brown, K., & Moloney, J. (2002). The dynamically projected balance sheet : implications for earnings , value and funds transfer pricing. *Balance Sheet*, *10*(2), 17–21.

Goodman, L. S., & Langer, M. J. (1983). Accounting for Interest Rate Futures in Bank Asset-Liability Management. *The Journal of Futures Markets*, *3*(4), 415–427. https://doi.org/10.1002/fut.3990030407

Haddad, A., Ammari, A. El, & Bouri, A. (2019). Impact of the Ownership Structure on the Financial Performance of Banks: Comparative Study between Conventional and Islamic Banks. *International Journal of Accounting & Finance Review*, *4*(2), 50–63. https://doi.org/10.46281/ijafr.v4i2.442

Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, *26*(2), 106–121. https://doi.org/10.1108/EBR-10-2013-0128

Hinton, P. R., Brownlow, C., McMurray, I., & Cozens, B. (2004). *SPSS Explained* (first). Taylor & Francis.

Hulin, C., Netermeyer, R., & Cudeck, R. (2001). Can a Reliability Coefficient Be Too High? *Journal of Consumer Psychology*, *10*(1), 55–58.

Israel, G. D. (1992). Determination of sample size. In *Program Evaluation and Organizational Development* (Vol. 6).

Jain, M. K., Dalela, A. K., & Tiwari, S. K. (2010). Application of Fuzzy Mathematical Model in Assets-Liabilities. *International Journal of Trade, Economics and Finance*, *1*(3), 247–253. https://doi.org/10.7763/ijtef.2010.v1.45

Jayanthi, M., & Umarani, R. (2014). Asset-Liability Management in Banks. *CKPIM Business Review*, *9*(2), 10–25.

Joshi, S. P., & Sontakay, R. V. (2017). Review Paper on Asset Liability Management in Banking System. *Imperial Journal of Interdisciplinary Research*, *3*(6), 670–678.

Kosmidou, K., Pasiouras, F., & Floropoulos, J. (2004). Linking profits to asset-liability management of domestic and foreign banks in the UK. *Applied Financial Economics*, *14*(18), 1319–1324. https://doi.org/10.1080/0960310042000293146

Meena, A. K., & Dhar, J. (2014). An Empirical Analysis and Comparative Study of Liquidity Ratios and Asset-Liability Management of Banks Operating in India. *International Journal of Social, Human Science and Engineering*, *8*(1), 4968–4974.

Nugroho, M., Halik, A., & Arif, D. (2020). Effect of CAMELS Ratio on Indonesia Banking Share Prices. *Journal of Asian Finance, Economics and Business*, *7*(11), 101–106. https://doi.org/10.13106/jafeb.2020.vol7.no11.101

Riyazahmed, K., & Baranwal, G. (2021). Determinants of Credit Risk. *International Journal of Accounting & Finance Review*, *6*(1), 53–71. https://doi.org/10.46281/ijafr.v6i1.1005

Romanyuk, Y. (2010). Asset-Liability Management : An Overview. In *Bank of Canada Discussion Paper*.

Ruparel, N. (2020). *(Re) Thinking Positive Workplace /s : A Multisectoral Cross-Sectional Investigation*. Birla Institute of Technology & Sciences- Pilani.

Seshadri, S., Khanna, A., Harche, F., & Wyle, R. (1999). Method for strategic asset-liability management with an application to the Federal Home Loan Bank of New York. *Operations Research*, *47*(3), 345–360. https://doi.org/10.1287/opre.47.3.345

Singh, A., & Tandon, P. (2012). Asset - Liabilty Management in Indian Banking Industry. *Asia Pacific Journalof Marketing & Management Review*, *1*(3), 121–132.

Singh, K. (2013). Asset-Liability Management in Banks: A Dynamic Approach. *AIMA Journal of Management & Research*, *7*(2), 1–14.

Tanwar, J., Seth, H., Vaish, A. K., & Rao, N. V. M. (2020). Revisiting the Efficiency of Indian Banking Sector: An Analysis of Comparative Models Through Data Envelopment Analysis. *Indian Journal of Finance and Banking*, *4*(1), 92–108. https://doi.org/10.46281/ijfb.v4i1.585

Tanwar, J., Vaish, A. K., & Rao, N. (2021). Optimizing Balance Sheet for Banks in India Using Goal Programming. *International Journal of Accounting & Finance Review*, *6*(2), 81–101. https://doi.org/10.46281/ijafr.v6i2.1082

Tanwar, J., Vaish, A. K., & Rao, N. V. M. (2020). Mathematical Modeling of Asset Liability Management in Banks Using Goal Programming and Ahp. *Indian Journal of Finance and Banking*, *4*(4), 1–19. https://doi.org/10.46281/ijfb.v4i4.899

Umarani, R., & Jayanthi, M. (2015). An Analysis of Asset-Liability Management in Indian Banks. *International Journal of Business and Administration Research Review*, *1*(11), 179–183. https://doi.org/10.2139/ssrn.1760786

Ursachi, G., Horodnic, I. A., & Zait, A. (2015). How Reliable are Measurement Scales? External Factors with Indirect Influence on Reliability Estimators. *Procedia Economics and Finance*, *20*(15), 679–686. https://doi.org/10.1016/s2212-5671(15)00123-9

Vij, M. (2001). Asset Liability Management in Banks and Financial Institutions: A case study of

IDBI. *Journal of Management Research*, *1*(1), 111–120. Retrieved from http://www.businessworld.in/article/Asset-Liability-Management-In-Financial-Institutions/04-11-2018-163493/

Vossen, B. van der. (2010). *Bank Liquidity Management*. Busienss/Business Administration. 39. https://doi.org/10.1007/978-0-230-37048-7_8