

# A COMPREHENSIVE KNOWLEDGE ON ASSET LIABILITY MANAGEMENT

**Seema Kumari, Prof. Silender Singh**

Phd. research scholar,  
Department of Commerce  
Chaudhary Devi Lal University Sirsa, Haryana (India)  
**Email-** seemaphd216@cdu.ac.in  
Contact details: - 9466307110

Supervisor, Professor of Commerce Department, Chaudhary Devi Lal University, Sirsa, Haryana(India)  
**Email** – silendersingh@cdu.ac.in  
Contact Details: - 9416964754

## **Abstract**

*In the study, basic ideas of the management process and ALM framework are covered. Furthermore, the requirements, goals, and organizational structure of ALCO are discussed in detail in this paper, which is essential to lowering the risk to any institution. The study in general places a strong emphasis on the theoretical application of the ALM components. In addition, the research concentrated on risk mitigation strategies that organizations employ to lessen the negative consequences of risk. A fundamental understanding of the ALM is presented in this work. In an attempt to provide new academics and asset liability management practitioners with a better understanding of the framework and methods used in asset liability management.*

**Keywords:** Asset liability management, ALM process, techniques

## **INTRODUCTION**

The structure of the financial markets, particularly in banks, has changed quickly as a consequence of the worldwide financial sector reforms. There has also been an increase in the integration of domestic and international markets and the complexity and size of the risks associated with bank operations, necessitating strategic management. The changes in the environment forced the Banks to independently decide the interest rates on deposits and advances in both domestic and foreign currencies. A fierce rivalry for business that includes both assets and liabilities, as well as rising fluctuation in both domestic and foreign exchange rates, has put pressure on bank management to maintain an adequate equilibrium between propagates, economic viability, and sustainability over the long haul. Prudent liquidity management methods can put banks' profits and reputations at greater risk by demanding structured and all-encompassing procedures rather than merely spontaneous measures. Credit risk, interest rate risk, foreign currency risk, equity or commodity price risk, liquidity risk, and operational risk to which banks are exposed. As a result, banks must implement effective systems for risk management to deal with the root causes of the issues, to solve those types of issues a concept of asset liability management was introduced.

The main causes of the increasing importance of ALM are the turbulence of the operating environment, product innovations, regulatory requirements, a greater consciousness of managerial personnel, and the high percentage of NPAs, which are linked to the rigorous asset portfolio allocation standards that banks follow. Asset liability management (ALM) is the strategic balance sheet management of risks brought on by fluctuations in interest rates, currency exchange rates, and the bank's liquidity situation. Based on their product profiles and operating styles, banks will need to create appropriate models to manage these risks.

Asset Liability Management is the appropriate technique to evaluate the risk. The goal of ALM is to match assets and liabilities in terms of maturity dates and interest rate sensitivity to reduce interest rate risk and liquidity risk that result from asset and liability mismatches and keep them within the intended bounds. ALM is still in its infancy in the financial system. The need of this concept:

ALM has been present for quite some time. This idea first became popular in the US in the middle of the 1970s, when fluctuating interest rates compelled banks to create effective plans for the balance sheet's structure. The risk that was created by interest rate fluctuations became the biggest problem for banks. Liquidity risk, credit risk, and interest rate risk are all types of inherent risk. Understanding these concerns propelled asset-liability management to the forefront of financial discourse.

### The Rising Need for ALM

- At macro level
- At micro level

At Macro Level: - Establishment of crucial business policies, effective distribution of capital, and product innovation with a realistic price approach.

At Micro Level:- The ALM goal functions are split into two categories at the micro scale. Liquidity through maturity matching and profitability through price matching.

Profitability is ensured by price matching that the allocation of liabilities will occur at a rate greater than the costs, price matching essentially tries to sustain spreads. This analysis would indicate whether the institution is in a position to profit from increasing interest rates by having a positive gap (assets>liabilities) or if it is in a position to benefit from falling interest rates by having a negative gap (liabilities>assets).

Parallel liquidity is ensured, with assets and liabilities being classified based on their maturing characteristics. The gap is then evaluated to determine the upcoming financial obligations.

Banks are now concentrating on managing the fund's asset and liability sides and controlling risk. The following are the main points of this strategy:-

- ❖ It controls the volume, mix, and return/cost of both sides of the balance sheet.
- ❖ Coordinating assets and liabilities effectively to increase the spread and
- ❖ Both the asset and liability sides are impacted by revenues and expenses. In light of this, the suggested strategy is to maximize profits and reduce expenses.

ALM is a crucial component of the current environment because of the uncertainty of interest rates and other risk factors, changes in the technological landscape and financial innovation products, and fierce competition in the financial sector.

As a result, ALM may be described in general terms as follows:

- A hierarchy (to carry out the Procedure),
- A process (to track, report, and monitor risk management),
- A tool (to analyze pertinent data),
- A method (to quantify risk and provide alternatives), and so on.

### Objectives of ALM

#### Insightful goals for business:-

- Supervision of the tolerance level and the asset-liability portfolio
- ALM position and risk profile early warning signs
- Identify the challenge issues and
- Modern approaches to solving critical issues

#### Compliance goals:-

- Asset Liability Committee (ALCO) strategy and
- Reports are submitted to the bank's governing body.

### Process of ALM

ALM has 3 important pillars:-

1. ALM information system
2. ALM organisation
3. ALM process

1. **ALM Information System:-** A management philosophy that outlines the risk strategies and tolerance limits that must be adopted to reinforce ALM. The essential component of the entire ALM activity is ensuring the accessibility of sufficient and reliable information with promptness; therefore, the

forementioned structure needs to be constructed on a strong methodology with the appropriate supporting information system. Information is therefore essential to the ALM approach. There are several techniques that are widely used to measure hazards. These might be gap statements or as complex and data-intensive as risk-adjusted profitability methods for measurement. According to current standards, creating reports on the liquidity gap and interest rate gap would require a considerably simpler information system.

**2. ALM Organisation :-** The function of ALM organisation establishing asset liability management committee and organisation structure at various levels.



Figure 1. Framework of ALM organization in banks

**Board of Directors:-** For the risk management process to be effective, top management in the FI must be fully committed to embedding risk management into regular activities and strategic decision-making. The Board decides on the risk management strategy and establishes caps for the risks associated with stock price, interest rate, foreign exchange, and liquidity.

**ALCO :-** The ALCO is a decision-making body made up of the senior management of the FI, comprising the CEO, and is in charge of strategic handling of interest rate and liquidity issues as well as integrated balance sheet management from a risk-return perspective. Each FI will need to determine the function of its ALCO, but its powers and duties, as well as the choices to be made by it, would typically include:

- Make sure that the measurement and reporting systems of the bank appropriately reflect the levels of market risk and liquidity.
- Keep surveillance on how the bank's assets and liabilities are organised and highlight any balance sheet management problems that are hampering performance.
- Examine the maturity profiles of assets and liabilities.
- Define the bank's interest rate perspective, and on that basis, make the future balance sheet strategy.
- Accept and analyse the bank's transfer pricing policy on a regular basis.
- Assess the market risk associated with the introduction of new products.

- Examine the deposit-pricing plan, and
- Review the bank's plan for dealing with a liquidity emergency.

Organisation structure of ALCO

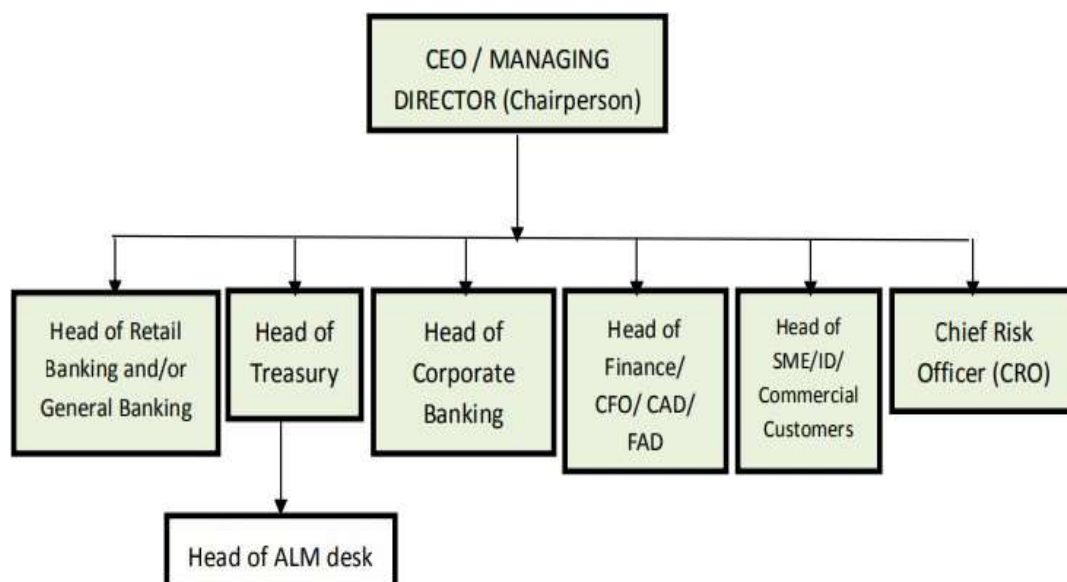


Figure 2. Structure of ALCO

**Composition of ALCO:** The composition of ALCO depends on the business, the institution, and the complexity of the organization. The CEO, CMD, or ED should be in charge of the Committee in order to guarantee the commitment of the Top Management and prompt reaction to market dynamics. The Committee may include the heads of international banking, investment, credit, planning, funds management and treasury (forex and domestic), and economic research. For the development of MIS and associated computerization, the Head of the Technology Division should also be invited. Furthermore, support groups and subcommittees might appear at some institutions.

**Management Committee:-** The function of the committee is to examine the ALM system and assess its function regularly.

3. **ALM Process:-** Identifying, assessing, and managing risk criteria are all part of the ALM process .  
Scope of ALM function: -

- ✓ Liquidity risk management
- ✓ Interest rate risk
- ✓ Currency risk
- ✓ Funding and capital planning
- ✓ Profit planning and growth projection

1. **Liquidity risk :-** There is an imminent risk that the bank will not be able to pay its debts when they are due without negatively harming its financial situation. From an ALM standpoint, the emphasis is on the bank's financing liquidity risk, or its capacity to satisfy its present and future cash flow projections and collateral needs, both anticipated and unanticipated.

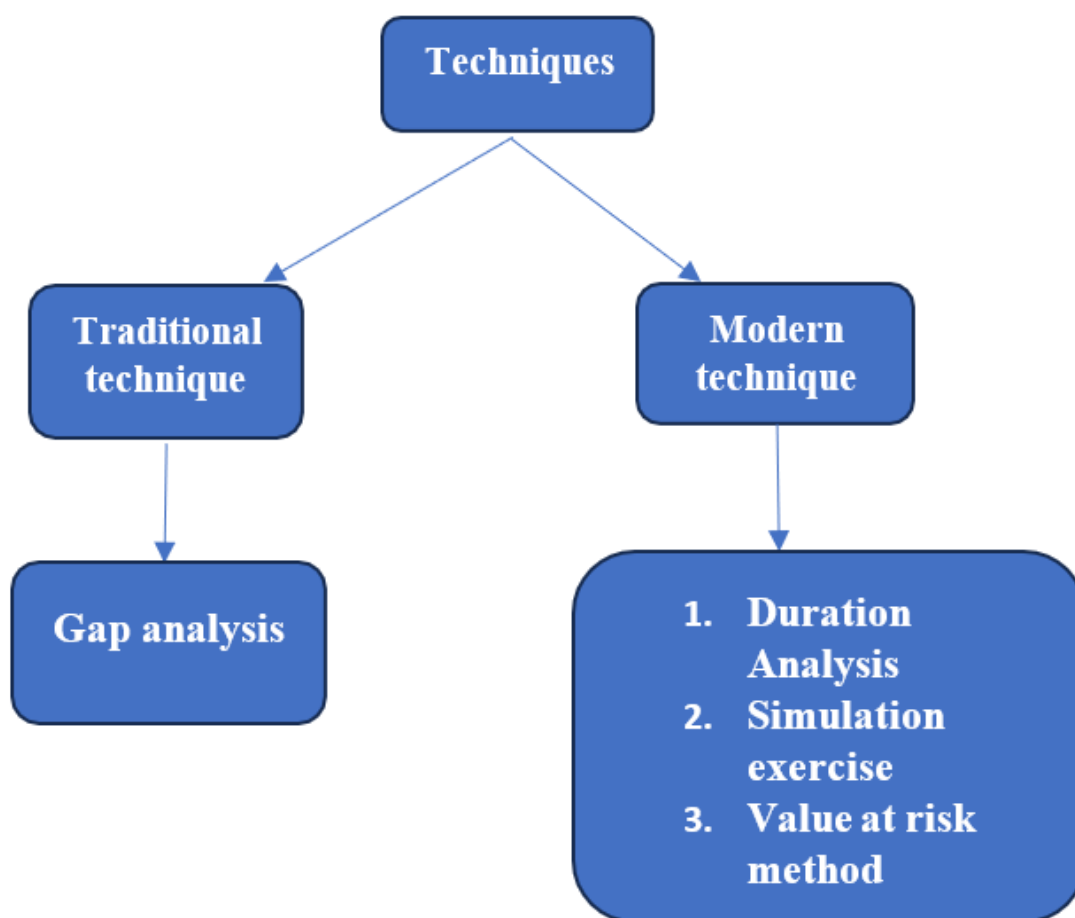
2. **Interest rate risk :-** The potential repercussions of volatile market interest rates on a bank's earnings and net asset values are known as interest rate risk. When the re-pricing dates of a bank's principal and interest cash flows (which incorporate terminal maturities), both on and off the balance sheet, are out of sync, interest rate risk results. The extent and trajectory of interest rate manoeuvres, as well as the duration and profile pattern of the mismatch position, ascertain the amount at risk. Interest rate risk emerges from bank lending, financing, and investing activities.

3. **Currency risk: -** An additional element to the risk profile of financial institutions balance sheets has been disclosed by the significant instability that a floating exchange rate arrangement has triggered.

Deregulation led to a rise in capital movements across open economies, which has been instrumental in broadening the number of transactions. The balance sheets of the FIs are now becoming more vulnerable to variances in inflation and exchange rates due to large international transfers and turbulence. Trading in multiple currencies has benefits and drawbacks. Depending on how much obligations in a certain currency exceed the amount of assets in that same currency, the currency discrepancy can either increase or decrease in value. The balance sheet is exposed to nation risk as well as settlement risk due to the mismatched currency position, in addition to exchange rate variability. Be certain that mismatches, if any, are reduced to zero or close to zero in order to alleviate currency risk as easily as possible. It might not be conceivable to entirely avoid currency mismatch nevertheless, regardless of the techniques used.

4. **Funding and capital planning:** - In addition to being embedded in a bank's overall strategy and planning cycles, it is a fluid and persistent process that requires taking into consideration both short-term and long-term capital demands.

**II. Techniques to measure ALM Risk :-**



**Gap analysis:-** A gap analysis calculates the difference between the amount of interest-earning assets and interest-bearing obligations that arise in a certain time period (both on and off the balance sheet).The gap report has to be built up by classifying rate-sensitive liabilities, assets, and off-balance sheet positions into time buckets based on residual maturity or the subsequent repricing period, whichever comes first. This technique defines the disparity between the interest revenue received on the bank's assets and the interest paid on its obligations during a specific time period.

Gap analysis = Rate Sensitive Asset - Rate Sensitive liability  
Gap Ratio = RSAs/RSL

If  
RSA > RSL, Positive gap  
RSA < RSL, Negative gap  
RSA = RSL, Zero gap

- Money at call

- Advance
- Investment

Rate Sensitive Liability

- Deposit excluding commercial deposits
- Borrowing

The Gap identified by following Maturity Buckets:

1. 1-28 days
2. 29 days and up to 3 months
3. Over 3 months and up to 6 months
4. Over 6 months and up to 1 year
5. Over 1 year and up to 3 years
6. Over 3 years and up to 5 years
7. Over 5 years and up to 7 years
8. Over 7 years and up to 10 years
9. Over 10 years
10. Non-sensitive

**Duration Analysis:-** Through this technique measure the interest rate risk sensitivity of asset and liability by taking into consideration maturity of asset and liability and duration of cash flow. In this study, the durations of the bank's assets and liabilities are calculated in order to calculate the impacts of fluctuating interest rates on the market prices of the assets and liabilities. The value of duration is large, and there is a sensitivity in the price of assets and liabilities to volatility in interest risk.

Duration analysis formula:

$$\% \Delta P \approx -DUR \times \frac{\Delta i}{1 + i}$$

$\% \Delta P = (P_{t+1} - P_t) / P_t$  = percent change in market value of the security

$DUR$  = duration

$i$  = interest rate

**Simulation Technique:-** By simulating the analysis of the bank's interest rate sensitivity on a computer, the simulation approach aims to overcome the shortcomings of both static gap and duration measurements. Using this method of monitoring interest rate risk, a bank propagates the performance of its business plans under various interest rate scenarios and evaluates the volatility in net interest scenarios and other goal variables that result.

So, a simulation model is a useful tool for comprehending risk exposure under various interest rate scenarios. Thus, the foundation of the model, the accuracy of the assumptions, the availability of technology, and the technical know-how of the banks all affect the practicality of the simulation approach.

**Value At Risk:** - VaR define the prediction of potential loss in a position, asset, liability, or portfolio of assets, liabilities, or both, over a certain holding term and with a specified level of confidence. VaR calculates the probability of losing a position for a specific amount of time. If the position's holding duration changes, VaR will also change. The liquidity time determinesthe holding period of the instrument.

There are three main approaches to calculate value at risk

- Correlation Method
- Historical Simulation
- Monte Carlo Method

### III. Reports useful for ALM

Structural Liquidity Profile (SLP) Interest Rate Sensitivity  
Maturity and Position (MAP)

Statement of Interest Rate Sensitivity (SIR)

## CONCLUSION

Asset liability management is a necessity for any institution because, due to many types of transactions, various risks arise. To mitigate and control these types of risks and minimize the mismatch between asset and liability, the institution has to implement ALM practices. This study discussed the detailed concept and structure of ALM. In this study, the need, objectives, process, and organizational structure of ALCO, which is implemented in financial institutes, and various types of risk are also discussed. Various techniques are discussed to control the risk and provide reports that are helpful for the ALM system. This study provides a deep awareness of asset and liability management.

## FUTURE RESEARCH SCOPE

This study only explained the theoretical concept of ALM risk and its techniques. For further research, a case study can be done for practical understanding of ALM.

## AUTHOR'S DECLARATION

- a. **Original and not published elsewhere:** The manuscript is original and has not been published anywhere else, in whole or in parts.
- b. **Submission:** The manuscript has not been submitted anywhere else, in whole or in parts.
- c. **Conflict of interest:** No conflict of interest associated with this manuscript.

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