

A

Seminar report

on

Asset-liability management

Submitted in partial fulfillment of the requirement for the award of degree
of MBA

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Preface

I have made this report file on the topic **Asset-liability management**; I have tried my best to elucidate all the relevant detail to the topic to be included in the report. While in the beginning I have tried to give a general view about this topic.

My efforts and wholehearted co-corporation of each and everyone has ended on a successful note. I express my sincere gratitude towho assisting me throughout the preparation of this topic. I thank him for providing me the reinforcement, confidence and most importantly the track for the topic whenever I needed it.

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Introduction

This paper discusses issues in asset-liability management and elaborates on categories of risk that require to be managed. It examines strategies for asset-liability management from the asset side as well as the liability side, particularly in the Indian context. It also discusses the specificity of financial institutions in India and the new information technology initiatives that beneficially affect asset-liability management. The emerging contours of conglomerate financial services and their implications for asset-liability management are also described.

Asset-liability management basically refers to the process by which an institution manages its balance sheet in order to allow for alternative interest rate and liquidity scenarios. Banks and other financial institutions provide services which expose them to various kinds of risks like credit risk, interest risk, and liquidity risk. Asset liability management is an approach that provides institutions with protection that makes such risk acceptable. Asset-liability management models enable institutions to measure and monitor risk, and provide suitable strategies for their management.

It is therefore appropriate for institutions (banks, finance companies, leasing companies, insurance companies, and others) to focus on asset-liability management when they face financial risks of different types. Asset-liability management includes not only a formalization of this understanding, but also a way to quantify and manage these risks. Further, even in the absence of a formal asset-liability management program, the understanding of these concepts is of value to an institution as it provides a truer picture of the risk/reward trade-off in which the institution is engaged (Fabozzi & Kanishi, 1991), Asset-liability management is a first step in the long-term strategic planning process. Therefore, it can be considered as a planning function for an intermediate term. In a sense, the various aspects of balance sheet management deal with planning as well as direction and control of the levels, changes and mixes of assets, liabilities, and capital.

Earlier phase

In the 1940s and the 1950s, there was an abundance of funds in banks in the form of demand and savings deposits. Because of the low cost of deposits, banks had to develop mechanisms by which they could make efficient use of these funds.

Hence, the focus then was mainly on asset management. But as the availability of low cost funds started to decline, liability management became the focus of bank management efforts.

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Liability management essentially refers to the practice of buying money through cumulative deposits, federal funds and commercial paper in order to fund profitable loan opportunities. But with an increase in volatility in interest rates and with a severe recession damaging several economies, banks started to concentrate more on the management of both sides of the balance sheet.

Categories of risk

Risk in a way can be defined as the chance or the probability of loss or damage.

In the case of banks, these include credit risk, capital risk, market risk, interest rate risk, and liquidity risk. These categories of financial risk require focus, since financial institutions like banks do have complexities and rapid changes in their operating environments.

Credit risk: The risk of counter party failure in meeting the payment obligation on the specific date is known as credit risk. Credit risk management is an important challenge for financial institutions and failure on this front may lead to failure of banks. The recent failure of many Japanese banks and failure of savings and loan associations in the 1980s in the USA are important examples, which provide lessons for others. It may be noted that the willingness to pay, which is measured by the character of the counter party, and the ability to pay need not necessarily go together.

The other important issue is contract enforcement in countries like India. Legal reforms are very critical in order to have timely contract enforcement. Delays and loopholes in the legal system significantly affect the ability of the lender to enforce the contract. The legal system and its processes are notorious for delays showing scant regard for time and money that is the basis of sound functioning of the market system. Over two million cases are pending in 18 High Courts alone and more than 200,000 cases are pending in the Supreme Court for admission, interim relief or final hearing.

This is not the full story. Since thousands of cases are pending in the lower courts, legal experts suggest that the average time taken by Indian courts for deciding a civil I case is around 7 to 10 years (Shah, 1998), if not more. The right of the lessor to repossess the leased asset, in case of default by the lessee was not very clear until the Bombay High Court ruled (and the Supreme Court upheld) that the *lessor has a right* to so repossess (in the case of Twentieth Century Finance Corporation vs. SLM Maneklal Industries Ltd.). Hence the required rate of return due to feeble contract enforcement mechanisms becomes larger in countries like India. Therefore, a good portion of non-performing assets of commercial banks in India is related to deficiencies in contract enforcement mechanisms. Credit risk is also linked to market risk variables. In a highly volatile interest rate environment, loan defaults could increase thereby affecting credit quality.

The expansion of banking sector was phenomenal during the 1970s and 1980s. Mobilization of deposits was one of the major objectives of commercial banks. "Vaidyanathan: *Asset-liability management: Issues and trends in Indian Context* /41 To that extent, performance appraisal and incentive system within the banking sector was more based on deposit mobilization and achievement of deposit targets rather than on lending practices and credit risk assessment mechanisms.

Hence, it is important that the banks reorient their approach in terms of reformulating performance appraisal systems, which focus more on lending practices and credit risk assessments in the changed scenario. Credit rating to some extent facilitates the understanding of credit risk. But the quality of financial information provided by corporates leaves much to be desired. In the case of the unincorporated sector, namely a partnership and proprietorship firm, the task of credit risk assessment is more complicated because of lack of reliable and continuous financial information.

Capital risk: One of the sound aspects of the banking practice is the maintenance of adequate capital on a continuous basis. There are attempts to bring in global norms in this field in order to bring in commonality and standardization in international practices. Capital adequacy also focuses on the weighted average risk of lending and to that extent, banks are in a position to realign their portfolios between more risky and less risky assets.

Market risk: Market risk is related to the financial condition, which results from adverse movement in market prices. This will be more pronounced when financial information has to be provided on a *marked-to-market* basis since significant fluctuations in asset holdings could adversely affect the balance sheet of banks. In the Indian context, the problem is accentuated because many financial institutions acquire bonds and hold it till maturity. When there is a significant increase in the term structure of interest rates, or violent fluctuations in the rate structure, one finds substantial erosion of the value of the securities held.

Interest rate risk: Interest risk is the change in prices of bonds that could occur as a result of change in interest rates. It also considers change in impact on interest income due to changes in the rate of interest. In other words, price as well as reinvestment risks require focus. In so far as the terms for which interest rates were fixed on deposits differed from those for which they fixed on assets, banks incurred interest rate risk i.e., they stood to make gains or losses with every change in the level of interest rates.

As long as changes in rates were predictable both in magnitude and in timing over the business cycle, interest rate risk was not seen as too serious, but as rates of interest became more volatile, there was felt need for explicit means of monitoring and controlling interest gaps. In most OECD countries (Harrington, 1987), the situation was no different from that which prevailed in domestic banking.

The term to maturity of a bond provides clues to the fluctuations in the price of the bond since it is fairly well-known that longer maturity bonds have greater fluctuations for a given change in the interest rates compared to shorter maturity bonds. In other words commercial banks, which are holding large proportions of longer maturity bonds, will face more price reduction when the interest rates go up. Between 42/ *ASCI Journal of*

Management 29(1) 0s and the early part of 1990s, there has been a substantial change in the maturity structure of bonds held by commercial banks.

During 1961, 34% of the central government securities had a maturity of less than 5 years and 27% more than 10 years. But in 1991, only 9% of the securities had a maturity of less than 5 years, while 86% were more than 10 years (Vaidyanathan, 1995). During 1992, when the reform process started and efforts taken to move away from the administered interest rate mechanism to market determined rates, financial institutions were affected because longer maturity instruments have greater fluctuations for a given change in the interest rate structure. This becomes all the grimmer when interest rates move up because the prices of the holding come down significantly and in a marked-to-market situation, severely affect bottomlines of banks.

Another associated issue is related to the coupon rate of the bonds. Throughout the 1970s and 1980s, the government was borrowing from banks using the statutory obligation route at artificially low interest rates ranging between 4.5% to 8% (The World Bank, 1995). The smaller the coupon rate of bonds, larger is the fluctuation associated with a change in interest rate structure. Because of artificially fixed low coupon rates, commercial banks faced adverse situations when the interest rate structure was liberalized to align with market rates.

Therefore, the banking industry in India has substantially more issues associated with interest rate risk, which is due to circumstances outside its control. This poses extra challenges to the banking sector and to that extent, they have to adopt innovative and sophisticated techniques to meet some of these challenges. There are certain measures available to measure interest rate risk. These include:

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Maturity: Since it takes into account only the timing of the final principal payment, maturity is considered as an approximate measure of risk and in a sense does not quantify risk. Longer maturity bonds are generally subject to more interest rate risk than shorter maturity bonds.

Duration: Is the weighted average time of all cash flows, with weights being the present values of cash flows. Duration can again be used to determine the sensitivity of prices to changes in interest rates. It represents the percentage change in value in response to changes in interest rates.

Dollar duration: Represents the actual dollar change in the market value of a holding of the bond in response to a percentage change in rates.

Convexity: Because of a change in market rates and because of passage of time, duration may not remain constant. With each successive basis point movement downward, bond prices increase at an increasing rate. Similarly if rates increase, the rate of decline of bond prices declines. This property is called convexity.

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In the Indian context, banks in the past were primarily concerned about adhering to statutory liquidity ratio norms and to that extent they were acquiring government securities and holding it till maturity. But in the changed situation, namely moving away from administered interest rate structure to market determined rates, it becomes important for banks to equip themselves with some of these techniques, in order to immunize banks against interest rate risk.

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• *Vaidyanathan: Asset-liability management: Issues and trends in Indian Context /43*

Liquidity risk: Affects many Indian institutions. It is the potential inability to generate adequate cash to cope with a decline in deposits or increase in assets. To a large extent, it is an outcome of the mismatch in the maturity patterns of assets and liabilities. First, the proportion of central government securities with longer maturities in the Indian bond market, significantly increasing during the 1970s and 1980s, affected the banking system because longer maturity securities have greater volatility for a given change in interest rate structure.

This problem gets accentuated in the context of change in the main liability structure of the banks, namely the maturity period for term deposits. For instance in 1986, nearly 50% of term deposits had a maturity period of more than 5 years and only 20%, less than 2 years for all commercial banks. But in 1992, only 17% of term deposits were more than 5 years whereas 38% were less than 2 years (Vaidyanathan, 1995).

In such a situation, we find banks facing significant problems in terms of mismatch between average life of bonds and maturity pattern of term deposits. The Ministry of Finance as well as the RBI have taken steps to reduce the average maturity period of bonds held by commercial banks in the last few years.

In other words, newer instruments are being floated with shorter maturities accompanied by roll over of earlier instruments with shorter maturities. In order to meet short-term liability payments, institutions have to maintain certain levels of cash at all points of time. Thus managing cash flows becomes crucial. Institutions could access low cost funding or could have assets that have sufficient short-term cash flows. Hence, banking institutions need to strike a reasonable trade off between being excessively liquid and relatively illiquid.

The recent failure of many non-banking financial companies can be ascribed to mismatch between asset-liability maturities, since many of them have invested in real estate type of assets with short-term borrowings. Particularly in a declining real estate market, it becomes difficult for non-banking financial companies to exit and meet obligations of lenders. In such a context, liquidity becomes a much more significant variable even at the cost of forgoing some profitability.

Risk measurement techniques

There are various techniques for measuring exposure of banks to interest rate risks:

Gap analysis model: Measures the direction and extent of asset-liability mismatch through either funding or maturity gap. It is computed for assets and liabilities of differing maturities and is calculated for a set time horizon. This model looks at the repricing gap that exists between the interest revenue earned on the bank's assets and the interest paid on its liabilities over a particular period of time (Saunders, 1997). It highlights the net interest income exposure of the bank, to changes in interest rates in different maturity buckets.

Repricing gaps are calculated for assets and liabilities of differing maturities. A positive gap indicates that assets get repriced before liabilities, whereas, a negative gap indicates that liabilities get repriced before assets. The bank looks at the rate sensitivity (the time the bank manager will have to wait in order to change the posted rates on any asset or liability) of each asset and liability on the balance sheet. The general formula that is used is as follows:

$$NII = R_i (GAP_i)$$
 While NII is the net interest income, R refers to the interest rates impacting assets and liabilities in the relevant maturity bucket and GAP refers to the differences between the book value of the rate sensitive assets and the rate sensitive liabilities. Thus when there is a change in the interest rate, one can easily identify the impact of the change on the net interest income of the bank.

Interest rate changes have a market value effect. The basic weakness with this model is that this method takes into account only the book value of assets and liabilities and hence ignores their market value. This method therefore is only a partial measure of the true interest rate exposure of a bank.

Duration model: Duration is an important measure of the interest rate sensitivity of assets and liabilities as it takes into account the time of arrival of cash flows and the maturity of assets and liabilities. It is the weighted average time to maturity of all the present values of cash flows. Duration basically refers to the average life of the asset or the liability.

$$DP_p = -D \left(\frac{dR}{1+R} \right)$$
 The above equation describes the percentage fall in price of the bond for a given increase in the required interest rates or yields. The larger the value of the duration, the more sensitive is the price of that asset or liability to changes in interest rates. As per the above equation, the bank will be immunized from interest rate risk if the duration gap between assets and the liabilities is zero. The duration model has one important benefit. It uses the market value of assets and liabilities.

Value at Risk: Refers to the maximum expected loss that a bank can suffer over a target horizon, given a certain confidence interval. It enables the calculation of market risk of a portfolio for which no historical data exists. It enables one to calculate the net worth of the organization at any particular point of time so that it is possible to focus on long-term

risk implications of decisions that have already been taken or that are going to be taken. It is used extensively for measuring the market risk of a portfolio of assets and/or liabilities.

Simulation: Simulation models help to introduce a dynamic element in the analysis of interest rate risk. Gap analysis and duration analysis as stand-alone tools for asset-liability management suffer from their inability to move beyond the static analysis of current interest rate risk exposures. Basically simulation models utilize computer power to provide *what if* scenarios, for example: What if: . *Vaidyanathan: Asset-liability management: Issues and trends in Indian Context /45*

. There are nonparallel yield curve changes . Marketing plans are under-or-over achieved . Margins achieved in the past are not sustained/improved . Bad debt and prepayment levels change in different interest rate scenarios . There are changes in the funding mix e.g.: an increasing reliance on short term funds for balance sheet growth...

This dynamic capability adds value to the traditional methods and improves the information available to management in terms of:

. Accurate evaluation of current exposures of asset and liability portfolios to interest rate risk. . Changes in multiple target variables such as net interest income, capital adequacy, and liquidity.

Asset-liability management

The strategies that can be employed for correcting the mismatch in terms of $D(A) > D(L)$ can be either liability or asset driven. Asset driven strategies for correcting the mismatch focus on shortening the duration of the asset portfolio. The commonly employed asset based financing strategy is securitization. Typically the long-term asset portfolios like the lease and hire purchase portfolios are securitized; and the resulting proceeds are either redeployed in short term assets or utilized for repaying short-term liabilities.

Liability driven strategies basically focus on lengthening the maturity profiles of liabilities. Such strategies can include for instance issue of external equity in the form of additional equity shares or compulsorily convertible preference shares (which can also help in augmenting the Tier I capital of finance companies), issue of redeemable preference shares, subordinated debt instruments, debentures and 46 / *ASCI Journal of Management* 29(1) accessing long term debt like bank borrowings and term loans. Strategies to be employed for correcting a mismatch in the form of $D(A) < D(L)$ (which will be necessary if interest rates are expected to decline) will be the reverse of the strategies discussed above.

Asset driven strategies focus on lengthening the maturity profile of assets by the employment of available lendable resources in long-term assets such as lease and hire purchase. Liability driven strategies focus on shortening the maturity profile of liabilities, which can include, liquidating bank borrowings which are primarily in the form of cash credit (and hence amenable for immediate liquidation), using the prepayment options (if any embedded in the term loans); and the call options, if any embedded in bonds issued by the company; and raising short-term borrowings (e.g.: fixed deposits with a tenor of one year) to repay long-term borrowings.

Emerging issues in the Indian context

With the onset of liberalization, Indian banks are now more exposed to uncertainty and to global competition. This makes it imperative to have proper asset-liability management systems in place. The following points bring out the reasons as to why asset-liability management is necessary in the Indian context: . In the context of a bank, asset-liability management refers to the process of managing the net interest margin (NIM) within a given level of risk.

Since NII equals interest income minus interest expenses, Sinkey (1992) suggests that NIM can be viewed as the spread on earning assets and uses the term spread management. As the basic objective of banks is to maximize income while reducing their exposure to risk, efficient management of net interest margin becomes essential. . Several banks have inadequate and inefficient management systems that have to be altered so as to ensure that the banks are sufficiently liquid. . Indian banks are now more exposed to the vagaries of the international markets than ever before because of the removal of restrictions, especially with respect to forex transactions. Asset-liability management becomes essential as it enables the bank to maintain its exposure to foreign currency fluctuations given the level of risk it can handle.

An increasing proportion of investments by banks is being recorded on a marked-to-market basis and as such large portion of the investment portfolio is exposed to market risks. Countering the adverse impact of these changes is possible only through efficient asset-liability management techniques. . As the focus on net interest margin has increased over the years, there is an increasing possibility that the risk arising out of exposure to interest rate volatility will be built into the capital adequacy norms specified by the regulatory authorities. This, in turn will require efficient asset-liability management practices.

Conclusion

It is important to note that the *conglomerate* approach to financial institutions, which is increasingly becoming popular in the developed markets, could also get replicated in Indian situations. This implies that the distinction between commercial banks and term lending institutions could become blurred. It is also possible that the same institution involves itself in short-term and long-term lending-borrowing activities, as well as other activities like mutual funds, insurance and pension funds.

In such a situation, the strategy for asset-liability management becomes more challenging because one has to adopt a modular approach in terms of meeting asset liability management requirements of different divisions and product lines. But it also provides opportunities for diversification across activities that could facilitate risk management on an enhanced footing.

Such a scenario need not be considered extremely hypothetical because combined and stronger balance sheets provide much greater access to global funds. It also enhances the capability of institutions to significantly alter their risk profiles at short notice because of the flexibility afforded by the characteristics of products of different divisions. This also requires significant managerial competence in order to have a conglomerate view of such organizations and prepare it for the challenges of the coming decade.

As long as the artificial barriers between different financial institutions exist, asset liability management is narrowly focussed and many a time not in a position to achieve the desired objectives. This is because of the fact that the institutional arrangements are mainly due to historical reasons of convenience and a perceived static picture of the operating world. The integration of different financial markets, instruments and institutions provide greater opportunities *for* emerging markets like India to aim for higher return in the context of minimizing risk.

Hence, it maybe appropriate to think in terms of reorienting our institutional structures (removing the distinctions between commercial banks, non-banking financial companies, and term lending institutions to start with) and having a conglomerate regulatory framework for monitoring capital adequacy, liquidity, Solvency, marketability, etc. This will go a long way in ironing out the mismatches between the assets and the liabilities, rather than narrowly focused asset-liability management techniques for individual banks.

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