CHAPTER SIX

FINDINGS & RECOMMENDATIONS

6.1 FINDINGS

The findings of the research on ALM practices in Banks in India are as under:-

- Public Sector Banks (PSBs) have ALCO & a well documented ALM Policy
- In PSBs, ALCO meet at least once a month (in all of sample New Generation Private/Foreign Banks, the periodicity is less than a week)
- PSBs have Loan Review Mechanism
- PSBs do not use credit derivatives for mitigation of credit risk (all of sample Foreign Banks use credit derivatives)
- PSBs carry out Maturity Gap Analysis (all of sample New Generation Private/Foreign Banks, carry out Maturity Gap Analysis)
- Less than 50 per cent PSBs carry out Duration Analysis (all of sample New Generation Private/Foreign Banks, carry out Duration Gap Analysis)
- PSBs carry out Maturity Profile (Liquidity Gap) preparation (all of sample New Generation Private/Foreign Banks, carry out Maturity Profile preparation)
- Less than 50 per cent PSBs carry out Liquidity Planning under alternative scenario (all of sample New Generation Private/Foreign Banks, carry out Liquidity Planning under alternative scenario)
- PSBs do not use Stock/Index options and Future contracts (all of sample New Generation Private/Foreign Banks use these products)
- Less than 70 per cent PSBs (leading) have international exposures (all of sample New Generation Private/Foreign Banks have international exposures)
- PSBs set up OPEN POSITION and GAP LIMITS exposures (all of sample New Generation Private/Foreign Banks have such a practice)
- Less than 80 per cent PSBs use currency swaps (all of sample New Generation Private/Foreign Banks use currency swaps)
- Less than 30 per cent PSBs have system of risk measurement, assessment and monitoring (all of sample Foreign Banks do have and New Generation Private Banks are progressing in this direction)
- PSBs impart Risk Education amongst their employees (all of sample New Generation Private/Foreign Banks also do so)
• PSBs do not follow on-line method (instead manual method) of compilation of ALCO information (all of sample New Generation Private/ Foreign Banks have on-line system of data compilation)

• Less than 60 per cent of PSBs are using consultant services (all of sample New Generation Private/ Foreign Banks use such services)

The findings of the research project highlight the current status of Asset Liability Management in Indian banks. These are summed up below:-

• awareness has built up on the need of an management of Asset Liability Management, as these banks have documented Asset Liability Management Policy

• appropriate technological backbone support is yet to develop to adequately address ALM

• default data build up has to be aggressively pursued

• quantitative techniques for measurement of risks are at preliminary stages

• sophisticated modelling techniques are yet to be acquired by Public Sector Banks

• RAROC and VaR approaches are yet to be fully put into use

• derivative products though being introduced by RBI in phases, need to be actively embraced by the banks for managing their risks

• skilled risk managers need to be developed by the banks

6.2 RECOMMENDATIONS

The Indian banking system has to respond to the new needs of the liberalised financial environment. Each bank will have to graduate to the complexities of changing risk profile in banking business. The recommendations/ suggestions for prudent Assets and Liability management by Indian banks are covered under the following headings:-

➢ Credit Risk Management
Interest Rate Risk Management
Liquidity Risk Management
Operational Risk Management
Integrated Risk Management (IRM)
Role of Information Technology (IT) in ALM
Best Corporate Governance Practices

6.2.1 CREDIT RISK MANAGEMENT

Lack of appropriate lending disciplines and inadequate systems of control generally results into setbacks to the banks. Banks have also suffered from poor transaction management, incomplete credit information, poor documentation and gross inadequacy in pricing risks.

In the light of major areas of weakness of banks as regards credit risk management, it is suggested that the banks avoid indulgence in the following practices:-

- **non-emphasis on due diligence and financial analysis**, which can result into credit related frauds
- resorting to simple indicators of credit assessment, for the sake of gaining a competitive foot holding; globalisation of credit markets have increased the need for timely financial information and in absence of inaccessibility to such information, **banks should not dispense the much needed financial and economic analysis to support major credit decisions**
- **giving a go-by to risk-sensitive pricing**
- **subjective decision making** by senior executive of the banks

Narasimham Committee I & II have also stated that the causes ‘for high level of NPA are varied at a range from poor credit appraisal, inadequate credit monitoring and policy directions’. Subsequent to Verma Committee recommendations for weak banks, serious discussions on the issue, has led to
the realisation of the fact that Indian banks have been suffering from some of the generic limitations in credit risk management system.

6.2.1.1 15 Essentials of Credit Culture

A bank's credit culture forms the bedrock for risk taking. Its objective is to provide quality assurance and portfolio integrity. Even the best credit system can be undermined if the credit disciplines are compromised. At the same time, the credit culture need to be imbued with sufficient flexibility to compensate for change. A bank credit culture is built with: a) policy, b) process, c) audit and d) values.

These elements are closely linked and interactive. Policy is the conscience of risk taking and a bank's policy is used to set objectives, performance and also values. It provides the basis of managing the loan portfolio. A strong credit process will enable to maintain the integrity of the credit system and manage risk taking within set policies. The role of audit function is to review conformance with policies, procedures and business plans as also to evaluate the risk-taking practices and specific risks. The values of bank personnel must exemplify the bank's risk taking attitude and its commitment to excellence.

15 essentials of a strong credit culture, mentioned below, must be adhered to by the Indian banks:-

1. Commitment to excellence coupled with respect to credit basics
2. Sound value system that will cope with change
3. Bank comes first and ahead of every profit center; an understanding of what the bank expects and the reasons behind its policies
4. Conversant with historical perspective of the bank’s credit experience
5. Development of common credit language; each bank must bring qualitative transformation of credit management skills of its personnel by making them learn new instruments and new modes of financial engineering

6. Good communication at all levels

7. Uniform approach to risk taking that provides stability and consistency

8. Awareness of every transaction’s effect on the bank; constant mindfulness of the bank’s risk taking parameters

9. A portfolio with integrity and appreciation of what properly belongs in it

10. Accountability for decisions and actions

11. Long-term as well as short-term business perspective

12. Reconciliation of market practice with use of common sense; realistic approach to markets and risk taking

13. Use of independent judgment and not herd instinct

14. Credit risk management framework with early warning system

15. Initiation of appropriate preventive/ corrective action at the right time

The good credit culture will protect the bank from the shortcomings and risks. The measure of quality of the best credit culture of a bank is eventually seen in its bottom line.

6.2.1.2 Use of Covenants as a Pre-emptive Device

The banks may use covenants effectively as a pre-emptive device before credit standing deteriorates or losses occur. The rationale behind use of covenants is as under:

- they help to protect the banks from any significant deterioration in the risk profile of the borrower transactions without prior agreement
- they allow banks to do restructuring of the loans in such instances
- covenants make it costlier for the borrower to default, because he loses the value of continuing operations
covenants are incentives against moral hazard, since they restrict borrowers from taking additional risk that would increase bank's risk. Banks may effectively use either financial (like minimum value of ratios or key parameters) or qualitative covenants.

Default and credit event provision act as event-triggered clauses rather than obligations limiting 'ex ante' the risk of such events. Such clauses make the entire debt immediately due and payable under certain conditions.

The 'pari passu' covenant stipulates that the default on any debt triggers default events on all other debts. Effective violation of such a covenant automatically makes full payment due immediately or accelerates all loan repayments. This pre-emptive clause allows bankers to take corrective timely actions that would become impossible once the deterioration materialises.

Covenants fit well with active credit management and enhance the effectiveness of proactive credit risk management.

6.2.1.3 Collateralisation in Credit Risk Mitigation

A prudent collateralisation practice can be effectively used to mitigate credit risk. Collateral is also an incentive for the borrower to fulfill debt obligations effectively. Collaterals may be in the form real assets, securities, goods, receivables and margin borrowing—the value of the collaterals vis a vis the loan amount, would depend upon the credit worthiness of the borrower and the level of risk associated with the credit facility.
In case the borrower fails to perform the debt obligations, the original credit risk turns into a recovery risk plus an asset value risk, which could be: a) accessibility risk (difficulty to effectively seize the collateral), b) integrity risk (the risk of damage to the collateral), c) legal risk (risk of disputes arising from various laws in connection with asset seizure) and d) valuation risk (the liquidation value of a collateral depends on the existence of a secondary market and the price volatility of such a market). These aspects need to be examined while deciding on the nature and extent of the collaterals.

6.2.1.4 Managing Concentrations

Banks in India will have to develop a conscious strategy to manage concentration risk in their credit portfolio. Concentrations arise because banks identify rapidly growing industries and use overly optimistic assumptions about an industry’s future prospects, especially asset appreciations and the potential to earn above-average fees and/or spreads.

Credit concentrations (as per Basel Committee) can be grouped into two categories: a) conventional credit concentrations which include concentrations of credits to single borrowers or counterparties, a group of connected counterparties and sector or industries and b) concentrations based on common or correlated risk factors to reflect subtler or more situation-specific factors can only be uncovered through analysis.

Overlooking the dangers in such situations result into susceptibility to concentration risk.

6.2.1.5 Capital Allocation and Risk Contributions

The risk management framework of the Indian banks need to lay emphasis on prudent capital allocation system. Risk contributions are the foundation of the
capital allocation system and of the risk-adjusted performance measurement system. Capital allocation defines meaningful keys for tracing back the overall risk to its sources. The capital allocation system allows us to break down and aggregate risk contributions according to any criteria as long as individual transaction risk contributions are available. The capital allocation system provides the risk contributions for individual facilities for both credit risk and market risk.

Marginal risk contributions serve essentially for risk-based pricing with an 'ex ante' view of risk decisions, while absolute risk contributions are the basis for the capital allocation system (and are 'ex post' measure). The goal of risk-based pricing is to ensure a minimum target return on capital, in line with shareholders' requirements. A hurdle rate serves as a benchmark for risk-based pricing and for calculating creation or destruction of value with 'Shareholders Value Added' (SVA). Pricing on marginal risk contribution captures both the incremental risk and the increased diversification.

Without risk-based pricing, we do not know the required revenues. Without 'ex post' risk-adjusted performances based on absolute risk contributions, we cannot compare the risk-return profiles of facilities or sub-portfolios. Hence, both are necessary because they serve different purposes.

Vendors' models provide different outputs in terms of risk contributions. KMV Portfolio Manager calculates absolute risk contributions, while Credit Metrics calculates marginal risk contributions.

6.2.1.6 Risk Return Optimisation

Risk return optimisation shows how to trade-off risk across exposures to enhance the overall portfolio return. There is a potential for enhancement because income
is proportional to size while risk is not. Portfolio optimisation under global funding constraint means:

- reducing risk, at a constant return
- increasing revenue, at the same time

Enhancing the risk-return profile of the portfolio can minimise risk given return, increase return at constant risk, or improve both if the portfolio structure is inefficient. In addition, when removing funding constraints, it is no longer necessary to trade-off risks and return within the portfolio by changing the exposures. It becomes necessary to decide along which direction portfolio expansion is more efficient.

KMV Portfolio Manger and Credit Metrics illustrate the two philosophies. The first model embeds a constrained optimisation module providing various optimized outputs, such as:

- optimization at constant risk
- optimization at constant return
- in addition, it visualises the efficient frontier given the funding constraint

Modeling the efficient frontier under no expansion guides the rebalancing of the portfolio retained by the leading bank and securitisations are examples of business transactions that rebalance the portfolio.

Credit metrics does not offer optimisation functions. However, it provides the marginal risk contribution, rather than the absolute risk contribution. This is theoretically more adequate when considering expansion of exposures along various segments or individual obligors.

*Indian banks should make use of Models as the Models provide valuable insights for restructuring and expanding, or contracting, some portfolio segments or*
individual exposures. In fact without such models there is no way to compare various 'what if' scenarios and rank them in terms of their risk-return profiles.

6.2.1.7 Effective use of Credit Risk Models

Credit risk events, defaults and migrations, result in changes in value of credit facilities. The Indian banks need to make effective use of various credit risk models, depending on the size of portfolio :-

- For default-only models, the distribution of values for each facility collapses to two states, default and non-default. Credit risk is a default model.

- For full valuation models, migrations to a different risk class than the original result in changes in values because the risk changes. The most prominent models, KMV Portfolio Manager, Credit Metrics and Credit Portfolio View (CPV) are full economic valuation models.

- Credit risk models value credit risk only, considering that other risks, market risk and interest rate risk, are taken care of by other tools. They use 'mark-to-model' technique, restricting the 'mark-to-market' of assets to migrations of credit risk only.

- Valuation at horizon uses the credit spreads of various risk classes for discounting contractual cash flows, or, alternatively, expected cash flows that are lower because of default probabilities. This is a future valuation, or 'mark-to-future', using the entire spectrum of possible credit states at a future time point.

- Valuation is a key building block for determining the value distribution at a forward horizon. In risk models, valuation is forward, at the horizon, for all
possible credit risk scenarios, in order to derive a distribution of future values. *Matrix valuation* refers to the usage of credit spreads for valuing any asset at some horizon, using the array of credit states. Most portfolio models use the matrix technique.

- Implementing the risk-neutral valuation is more challenging because of the need to have risk-neutral probabilities (for risk aversion). Only KMV Portfolio Manager provides risk-neutral valuation as an alternative option to matrix valuation.

### 6.2.1.8 Progression towards Stress Testing

Stress tests make risks more transparent by estimating the potential losses on a portfolio in abnormal markets. They complement the internal models and management systems used by banks globally for capital allocation decisions. Simply speaking, stress testing is a way to produce alternative scenarios using sensitivity analysis.

*Indian banks must strive to put in place sound stress testing processes for use in the assessment of capital adequacy. It should involve identifying possible events or future changes in economic conditions that could have unfavourable effects on a bank's credit exposures and assessment of the bank's ability to withstand such changes.*

The New Basel Capital Accord uses more quantitative approaches—methods where assumptions can be empirically evaluated. Stress testing should be able to link dramatically changes in the economic environment to the bank's portfolio. There are, however, issues such as data availability, portfolio diversity and standardisation of model inputs and outputs, which need to be addressed.
6.2.1.9 Effective use of Derivatives

Derivatives help to customise the term structure of credit risk, independent of the underlying assets, bonds or loans. Credit derivatives allow better utilisation of the current credit capacity, even though there are no cash deals meeting eligibility and maturity criteria. The application of credit risk derivatives stem from two main features:

- the capacity to trade credit risk only, in isolation
- the ability to do so in a liquid fashion, with low transaction costs, since these are off-balance sheet

Tailoring and customizing exposures is a major function of credit derivatives. This helps to reshape individual and credit risk profiles so that they meet eligibility criteria, for both lenders and investors.

Credit derivatives allow us to engineer the credit risk quality and spreads using baskets. It is possible to engineer any credit standing independent of what exists in the market by customizing the basket so that it has the desired credit standing. Forward credit swaps provide protection against downside moves in credit quality. If a bank fears that the spread on a subset of its loans might widen in the future, it can offset the loss in (mark-to-market) value by entering into a credit spread derivative with a protection seller.

Indian banks need to make prudent use of derivatives for successful management of credit risk.

6.2.1.10 Securitisation in Credit Risk Management

The motivations for banks in securitisations lie in the following potential benefits:

- arbitraging the cost of funding in the market with funding on-balance sheet for a bank
- the second motivation is off-loading credit risk to free capital for new operations
- to modify the risk-return profile of the loan portfolio of the banks

The issue, when off-loading risks, is whether freeing up capital in this way is economically acceptable. The solution lies in finding out whether this makes the risk-return profile of the banking portfolio more efficient (higher return for the same risk or lower risk for the same return).

Analysing the economics of the securitisation transaction requires reviewing all costs and benefits resulting from the specific values of each of the various parameters at the time of securitisation. Several parameters influencing the economics of the securitisation for the seller(bank) are as under:

- only some assets, depending upon their risk and return, are eligible for the securitisations
- the market credit spreads across rating classes—these are market driven
- the potential savings in economic and/or regulatory capital—these depend on the portfolio risk profile of the securitised assets and on their risk contribution to the bank’s portfolio; full assessment of the economic capital savings requires running the portfolio model with and without the securitised assets to get their marginal risk contribution to capital and the assessment of the regulatory capital savings is much quicker since it uses forfeits
- the structuring of the transaction determines the pool composition as well as the profile of the structured notes issued— the first influences capital savings directly and the second influences the cost of funding through securitisation directly
- the costs of creating the structure, of operating the Special Purpose Vehicle (SPV) and of servicing the assets—these increase the all-inclusive cost of funding through securitisation since they add up to the cost of issued notes
It is high time that the Indian banks develop their competency to perform such an analysis to leverage out the potential advantages of the securitisation transactions.

6.2.2 INTEREST RATE RISK MANAGEMENT

The declining interest rate scenario has become a challenge for Indian banks to manage interest rate risk.

6.2.2.1 12 ESSENTIALS OF INTEREST RATE RISK MANAGEMENT

The 12 essentials of interest rate risk management are as under :-
1) A structured framework is *sine qua non* for the banks to manage interest rate volatility, failing which banks may become vulnerable to asset liability mismatch.
2) Banks must have an adequate and timely interest rate risk reporting system— which includes ALM risk data warehouse and reporting aspects.
3) Bank must make a clear distinction between their trading activity and balance sheet exposure. Banks with active trading positions must adopt VaR approach to measure risk associated with such exposures.
4) Banks may try to maintain interest rate risk at a level close to zero, to the extent possible— though an ideal condition, the bank's profitability is affected in an environment of generally low credit/deposit ratio and with high liquidity status. A prudent approach would be accepting some interest rate risk if it helps in improving the profitability growth.
5) If the yield curve is positively sloping, a bank can earn profit by booking longer duration liabilities.
6) Banks can limit their exposure to changes in interest rates by restricting their quantum of mismatch between the re-pricing of assets in
comparison to liabilities. The bank may limit the Gap/ assets or the ratio of rate sensitive liabilities. If risk sensitive assets (RSA) are more than risk sensitive liabilities (RSL), i.e. when Gap is positive, assets should be sold or liabilities added that mature or re-price in the period when the Gap is positive.

7) In a falling interest rate scenario, the Gap should be maintained negative-- as evident from the change in net interest income (NII), which is defined as :-

\[ \Delta \text{NII} = \text{Gap} \times \Delta r \quad (\text{where Gap} = \text{RSA-RSL}, \quad \Delta r = \text{change in interest rate}) \]

In a falling interest rate scenario, banks need to offer low interest rate on long maturities and high interest rates on short maturity deposits — as result the banks do not face any reinvestment risk.

8) Banks may offer longer-term deposits at a floating rate and simultaneously offer fixed rates for similar maturity with higher or lower interest rates based on its perception about the movement of inflation and interest rate over the longer period.

9) The banks should adopt the 'best exposure' position in respect of interest rate risk. It necessitates measurement of interest rate exposure: the interest rate margin is adequate in short-term, market value sensitivities of both assets and liabilities capture the entire stream of future flows and provide a long-term view.

10) The options generate a worst-case situation for banks. The combination of cap values of assets with floor values of liabilities generates a 'scissor effect' on the NPV. The goal of interest rate policies should be to control the risk of the NPV through both duration and convexity gaps.

11) Banks must progress towards simulations -- as without simulations, the ALCO would not have a full visibility on future profitability and risk.

12) Derivatives, be used by the banks to modify the risk-return profile of the balance-sheet as a whole.
6.2.2.2 Interest Rate Risk Reporting System

Interest rate risk reporting system should provide all elements for decision-making purposes to the ALCO. The reporting should provide answers to the following essential questions:-

- Why did the interest income vary in the last period?
- Which interest income drivers caused the variations?

➢ It is necessary to break down risk and performance measures by transaction, product family, market segment and business line. To enable adequate analysis of interest income variations, the reports should break down the variations due to interest income drivers: changes in interest earned or paid, due to both amortisation and effects of new businesses or product mix-changes.

➢ Since the bulk of revenues come from the existing portfolio, it necessitates appropriate and effective actions, which may include incentives for customers to convert some products into others like fixed to floating rates.

➢ New business development policies necessitate projections of risk exposures and revenue levels. Conversely, interest rate and liquidity projections, call for defining new business policies.

➢ Unlike the above on-balance sheet actions, the off-balance sheet actions necessitate hedging policies through derivatives and setting up a hedging programme for both the short and long-term. The hedging policy need arbitrages between revenues level, interest rate risk volatility and the costs of hedging (both opportunity costs and direct costs).

➢ Defining and revising the hedging programme would depend on the expectations with respect the trade-off between hedging risk versus level
of revenues and on the ‘risk appetite’ of the bank, with some willing to neutralize risk while others betting on favourable market movements to various degrees level.

6.2.2.3 Measurement of Interest Rate Risk

In essence, the purpose of interest rate risk is to adopt the ‘best exposure’ position. The prerequisite for which is to measure interest rate exposure, and measures of interest rate risk include the sensitivity of the interest income to shifts in interest rates and that of the net market value of assets and liabilities. Though, the interest rate margin is adequate in short-term, market value sensitivities of both assets and liabilities capture the entire stream of future flows and provide a long-term view.

It must be kept in view that :-

- future interest rates of borrowing or lending/investing are unknown, if no hedge is contracted before
- all funding or investing decisions resulting from liquidity gaps have an impact on interest rate risk
- defining the ‘best exposure’ requires understanding the mechanisms driving the yield curve and making choices on views of what future rates could be
- there is no ‘zero’ gain or loss for the bank, when there is movement in interest rate (Exhibit 6.1) — the implication is that there is no escape to interest rate risk, and the only option for the banks is to choose their exposure
- funding or investing decisions require a choice of maturity plus the choice of locking in a rate, or of using floating rates — the choice of a fixed or a floating rate requires a comparison between current and expected future rates, and the interest rate structure is a basic input to make such a
decisions (as it provides the set of rates available across the maturities range, besides embedding information on expected future rates)

6.2.2.4 Interest Rate Arbitrage for Banks

Risk neutrality is a critical concept for arbitrage issues. The difference in rates of different maturities raises the issue of the best choice of maturity for lending or borrowing over a given horizon. In such a situation, the long-term lender could think that the best solution is to lend immediately over the long-term. The alternative choice would be to lend short-term and renew the lending up to the horizon of the lender.

The issue is whether taking interest rate risk leads to an expected gain. The choice depends on the expectations. The short-term lender hopes that interest rates will increase. The interest rate variation, however, may be large enough, either upward or downward.

This necessitates a break-even value of the future rate such that the succession of short-term transactions or a floating rate transaction—with the same frequency of resets as the rollover transaction—is equivalent to a long fixed rate transaction. The choice would depend on whether the expected rates are above or below such break-even rates. The break-even rate is the 'forward rate', derived from the term structure of interest rates (i.e. the set of zero-coupon rates derived from Government or risk-free assets).

6.2.2.5 ALM Simulations

With the globalisation of Indian economy, it has become inevitable for the Indian banks to carry out ALM simulations, which model the behaviour of the balance sheet under various interest rate scenarios to obtain the risk and the expected values of the target variables, interest income or the mark-to-market value of the
balance sheet at market rates. Without simulations, the ALCO would not have a full visibility on future profitability and risk, making it difficult to set up guidelines for business policy and hedging programmes.

Simple Gaps do not capture the risk from options embedded in banking products. Simulations correct the limitations of the simple Gap Model:

- they extend to various business scenarios
- they calculate directly the target variable values, without necessarily relying on gaps only to derive new values of margins when interest rates change. This is feasible by embedding in the calculation any specific condition that influences the interest revenues and costs e.g. exercising prepayment options)

Simulations serve to optimise the risk and return trade-off, measured by the expected values and the distributions of the target variable across scenarios. ALM simulations address both on and off-balance sheet management.

7 steps through which full-blown ALM simulations need to proceed are as under:

i) Select the target variables, interest income and the balance sheet NPV.
ii) Define the interest rate scenarios.
iii) Build business projections of the future balance sheets.
iv) Project margins and net income, or the balance sheet NPV.
v) When considering optional risk, use more comprehensive interest rate scenarios then for direct interest rate risk.
vi) Combine all steps with hedging scenarios to explore the entire set of feasible risk and return combinations.
vi) Select the best business and hedging scenarios according to the risk and return goals of the ALCO.
6.2.2.6 Hedging & Derivatives

Derivatives alter interest rate exposures and allow to hedge exposures and make income independent of rates. Indian banks must take full use of derivative products, with the objectives of :-

- to take prudent advantage of opportunities (and risks)
- prudent management aimed at hedging risks, totally or partially (to avoid adverse market movements)

These derivatives may be forward instruments (forward rate agreements or swaps) and optional instruments, which allow capping the interest rate (caps) or setting a minimum guaranteed rate (floors).

6.2.2.7 Basel Committee’s Interest Rate Risk Management Guidelines

The Indian Banks would take steps in the right earnest after taking into cognisance the Basel Committee' eleven principles for banking supervisory authorities, intended to apply in assessing banks' management of interest rate risk, under the five major areas of a) role of the board and senior management, b) policies and procedures, c) measurement and monitoring system, d) internal controls and e) information for supervisory authorities.

These principles are described in details in the Annexure-I of RBI Guidance Note on Market Risk Management (enclosed).

6.2.3 LIQUIDITY RISK MANAGEMENT

Liquidity Risk, resulting from size and maturity mismatches of assets and liabilities, make banks vulnerable to market liquidity risk. Liquid assets protect banks from market tensions because they are an alternative source of funds for facing the near-term obligations. Controlling liquidity risk implies spreading over time amounts of funding, avoiding unexpected market funding and maintaining a cushion of liquid short-term assets, so that selling them provides liquidity without incurring losses.
6.2.3.1 10 Essentials of Liquidity Risk Management

The present day market scenario necessitates that Indian banks keep in view the following 10 essentials of liquidity risk management:-

1) Liquidity gaps generate funding requirements, or investments of excess funds, in the future. Such financial transactions occur in the future, at interest rates not yet known, unless hedging them today. **Liquidity gaps generate interest rate risk** because of the uncertainty in interest revenues or costs generated by these transactions.

2) **Cash matching** is a basic concept of liquidity risk, implying thereby that the time profiles of amortization of assets and liabilities are identical. The nature of interest applicable and maturities also match i.e., fixed rates with fixed rates and floating rates revised periodically with floating rates revised at the same dates using the same reference rate. With cash matching, Liquidity gaps are equal to zero.

In general, deposits do not match loans, as these results from the customers' behaviour. However, it is feasible to structure the financial debt in order to replicate the assets' time profile.

3) **The cost of liquidity** for banks often refers to another concept: the cost of maintaining the liquidity ratio at a minimum level. The **liquidity ratio** is the ratio of short-term assets to short-term liabilities, and it should be above one.

When a bank initiates a set of transactions such as borrowing short and lending long, the liquidity ratio deteriorates because the short term-liabilities increase without a matching increase in short-term assets.

4) Excessive **funding concentrations** severely reduce the bank's ability to survive a liquidity crisis. Banks need to take advantage of good economic times to diversify their funding requirements.

5) Banks need to develop a **contingency funding plan**, which includes **triggering guidelines, metrics development, better quantification/ adequacy of projected funding sources and development of common contingency scenarios.**
6) Banks need to progress towards stress testing their funding plans, using various interest rate shocks and adverse economic and competitive scenarios to ascertain their impact on both the funding portfolio and market access.

7) Communication lines between treasury function and operational units, need to be significantly enhanced. Reporting systems need to be more effective. ALCO of the banks must have an appropriate risk management policies and procedures, active MIS reporting, limits and oversight programs.

8) A historical funding patterns of various types of off-balance sheet items, need to be statistically analysed. Incorporating this into calculations of future funding requirements enhances the accuracy of funding projections.

9) Selection of funding source must integrate with the bank's interest rate sensitivity, risk appetite, profit planning, diversification and capital management objectives.

10) A rating services view on the bank's liquidity position need to be taken periodically and deficiencies be corrected in early stages.

6.2.3.2 BEST PRACTICES IN LIQUIDITY MANAGEMENT

The Indian banks vary widely in their funding needs and their appetite for risk. The following strategies are essential for the banks to manage their liquidity risk effectively:

1. Strategic direction: The bank's management must articulate the overall strategic direction of the bank's funding strategy by determining what mix of assets and liabilities will be utilized to maintain liquidity. This strategy should address the inherent liquidity risks, which are generated by the bank's core businesses.

2. Integration: The bank's asset and liability management policy should clearly define the role of liquid assets along with setting clear targets and limits. The liquidity management should be integrated into the day-to-day decision making process of core business line managers.
3. **Measurement systems**: The bank management needs a set of metrics with position limits and benchmarks to quickly ascertain the bank's true liquidity position, ascertain trends as they develop, and provide the basis for projecting possible scenarios rapidly and accurately. The models may be based on:-

- **Cash capital**—this model has a general limit, which is frequently expressed in terms of a management set limit on the percentage of the discounted value of the bank's assets to total short-term funding; this general limit is then broken down more finely with sub-limits set on different types of short-term funding.

- **Liquidity barometers**—this model calculates the length of time a bank can survive by liquidating its balance sheet using just two assumptions—that the bank continues to operate under normal operating conditions or that the bank has suffered a complete loss of access to the money market.

4) **Monitoring**: Banks must be able to track and evaluate their current and anticipated liquidity position and capacity. A monitoring system must be developed, consisting of guidelines, limits, and trend development, that enables management to monitor and confirm that compliance is within the approved funding targets and if not, to pinpoint the variances.

5) **Balance sheet evaluation**: Both the bank's balance sheet and market access trends should be periodically evaluated for emerging patterns that could adversely affect liquidity, and the banks should develop strategies to manage these trends. Because many banks are becoming more reliant on credit sensitive funding, it is vital that the bank be perceived by third party funding sources as being both profitable and managed in a safe and sound manner.

The monitoring program may consist of:a) turn downs and non-renewals, especially among key counter parties, during stressful market periods, b)
unexpected declines in deposit balances, c) adverse turns in rate spreads, d) excessive funding concentrations etc.

7) **Off Balance sheet management practices:** It is considered a best practice to periodically supplement with statistical analysis of historical funding patterns of various types of off-balance sheet items. It enhances the accuracy of future funding projections—assuring management that naturally occurring contingent liabilities will not strain the funding process.

8) **Funds management:** The funding sources could be deposits, capital and purchased funds. The various factors that must be considered in funding source selection include integration with the bank’s interest rate sensitivity, risk appetite, profit planning, diversification and capital management objectives.

9) **Contingency liquidity plan preparation:** Banks should have a formal contingency plan of policies and procedures to use as a blueprint in the event the bank is unable to fund some or all of its activities in a timely manner and at a reasonable cost.

A comprehensive contingency funding plan can provide a useful framework for meeting both temporary and long-range liquidity disruptions. A good plan should emphasise a reliable but flexible administrative structure, realistic action plans, ongoing communications at all levels, and a set of metrics backed by adequate management information systems. Periodic testing of contingency MIS requirements ensures the availability of timely reports for rapid decision making.

**6.2.4 OPERATIONAL RISK MANAGEMENT**

The changing landscape of banking in an era of deregulation, globalisation and technological advancements—has more than earlier necessitated adequate operational risk management framework by the Indian banks.
6.2.4.1 6 ESSENTIALS OF OPERATIONAL RISK MANAGEMENT

With a view to manage the operational risk emanating from sources such as business processes, internal control systems, strategy adopted to carry out the business, environment in which the business is carried out, technology used in processing and ultimately the people who are central to all these operations—the following essentials measures are must for the Indian banks to put into practice:-

1) Every bank has a set of unique features i.e. branch network, volume of business, technologies in use, the top management perception on business strategies, the organizational culture and value systems followed by its personnel to increase the market share of the bank.

Therefore, the exact approach chosen by each bank will depend on a range of factors that include its size, sophistication, nature and complexities of its activities.

2) Not withstanding the size and complexities of individual banks, good management information systems, strong internal control culture, dynamic contingency planning and commitment of top management are crucial elements of an effective operational risk management.

3) Four key areas identified (by Basel Committee) to develop the framework for managing operational risk, need be seriously put into practice viz.:
   - Developing an appropriate risk management environment
   - Risk management: identification, monitoring and control
   - Role of supervisors
   - Role of disclosure

4) Banks must strive to map the risk-potential of its staff from time-to-time based on their behavioural exhibits, both in and outside the organizational
context—constantly evaluate their risk potential as it helps the management in picking right people for right job.

Management should monitor against two of the most difficult people related risks viz., 'moral hazard' and risk of 'adverse selection'.

5) Human capability needs can be measured under the following heads:
   • technical competency to carry out the assigned role
   • zeal for learning
   • grasp over the business environment and client profile
   • managerial skills like decision making, sharing of knowledge, training the subordinates, etc.

This will help in matching the required human capabilities for a job. It must be borne in mind that the human capabilities required for a given job are also assessed in the context of organizational strategy.

6) Capability development plan should be drawn to fill up the gaps identified like skill development through training; succession planning and career development; mentoring etc.

6.2.4.2 BEST PRACTICES OF OPERATIONAL RISK MANAGEMENT

The following best practices need to be adopted by the Indian banks with a view to effectively manage operational risk:

1) Risk and control assessment. All the employees of the bank must understand the bank's business objectives and the risk associated with not obtaining those objectives. They must know the controls that mitigate against these risks. The banks must do an assessment of impact and probability and thereafter, devise suitable action plans.

2) Developing operational risk taxonomy. This typically involves developing operational risk taxonomy and then determining which operational risks each
business faces. This can be done qualitatively, by interviewing business managers and asking them about their historical operational losses. This approach results into a traffic light report with operational risk categories on one axis and business lines on the other axis.

These serve as Key Risk Indicators--- measure of progress in operational risk management, providing objective and non-financial measure of risk, and can be updated as frequently as daily.

This type of report is good for raising awareness of operational risk and developing management controls, but it does not help to quantify or capitalise operational risk.

3) Building loss event database. This addresses the capital aspect. This involves recording operational losses and categorising them by type. This is useful in raising awareness of key operational risks like the traffic-light approach. This involves identifying control points in the bank's operations and linking them to losses.

The best approach for large and rare risks is to measure the frequencies and severities of loss events in terms of observable and identifiable parameters. Historical data is important, but only for establishing parameters to the risk model. Turning these indicators into useful management tools is a process, requiring:

- establishing a baseline from past performance
- setting goals for future performance
- setting a threshold for unacceptable performance that will trigger management action

This approach is related to statistical process control or Six Sigma programmes that have been used for tears in manufacturing sector and are being adopted by forward thinking banks.
This allows business lines to be capitalised appropriately and their risk adjusted returns on capital to be more easily compared.

4) Economic capital. This is an important tool for raising awareness and changing behaviour and also for making sure that the banks are making the right investment decisions. A number of internationally active banks have methodology for estimating a measure of economic capital for operational risk.

5) Operational risk alternatives. There are following alternatives to the banks seeking to manage or transfer operational risk:
   - risk mitigation or control through policy and audit
   - insurance
   - capital allocation
   A possible fourth alternative is securitisation and commoditisation of operational risk through the introduction of 'catastrophe' derivatives instruments, such as operational risk-linked bonds.

6.2.5 INTEGRATED RISK MANAGEMENT (IRM)

Integrated or strategic or holistic risk management, is the new approach of looking at managing the risks in an effective and efficient manner. It requires management of the risks based on a robust analysis of aggregate exposures. The biggest problem facing Indian banks, however, is how to measure various risks in terms of their potential likelihood, their possible consequences and their correlation.

Advances in risk methodologies and technologies are introducing a vast array of new tools for measuring and managing enterprise-wide risks, at a higher speed and lower cost. Indian banks need a judicious combination of quantitative as well as qualitative tools, for addressing the complexities of risks faced by them.
6.2.5.1 10 ESSENTIALS OF INTEGRATED RISK MANAGEMENT

There are certain basic essentials for an integrated risk management structure. These relate to structural changes, changes needed in policies and procedures, data capturing, analysis and modeling techniques. The Indian banks need to bring the needed changes without any delay.

The 10 essentials of IRM are mentioned below:-

1) The commitment of the management of the bank—CEO must champion the cause of a vibrant integrated risk management framework in the bank
2) Setting up appropriate policies and systems in the bank
3) A robust Management Information System (MIS)
4) Identification of various risks
5) Measurement / Quantification of risks -- making use of advance tools of measurement of risks
6) Integrating the risk management processes
7) Monitoring / review of risk management programmes
8) Establishing communication channel with stakeholders (internal as well as external)
9) Risk Strategies formulation and Risk Budgeting
10) Building an appropriate organisational culture to manage risks

6.2.5.2 SIX STEPS IN IMPLEMENTING INTEGRATED RISK MANAGEMENT

Implementing an integrated risk management requires a scientific approach of putting in place an appropriate risk management framework. The size of operations of the bank and the prevailing practices, would decide upon how early a compatible framework of managing aggregate risks can be put in place. Following are the necessary steps in this direction:-
1) **IRM Vision and IRM Strategy of the Bank**

An Indian bank depending on the size of its operations, decide on its IRM strategy, *interalia* on its vision and resource commitments. Such a strategy necessitates the full commitment of the Bank's Board and its top executives.

2) **Risk identification**

This, first of all, requires assessing the current level of risk management practices, the risk management structure, processes and technology sophistication.

This would throw light on the gaps in the bank's practices in managing credit, market and operational risks vis-à-vis the best practices in vogue.

3) **Defining Roadmap of IRM**

In the light of IRM strategy and the gaps identified in implementing the best practices, an appropriate roadmap for achieving sustainable competitive advantage is charted viz. :-

- Ensuring Risk Based Supervision requirements
- Ensuring Basel II requirements
- Aligning the IRM strategy with the bank's decision making process in respect of :
  - Capital allocation for risks
  - NPA provisioning
  - Pricing of products
  - Optimising treasury operations
  - Streamlining systems and procedures with emphasis on risk management culture and reduction of costs

4) **Risk measurements including Early Warning Indicators**

Considering the existing gaps, advanced tools for measuring various types of risks should be brought into implementation.
Banks need to capture early warning risk indicators, whereby timely corrective actions can be taken and the impact of risk hazards minimized.

5) Executing IRM requirements
This would require:

- Elaborate check list of key success factors and generation of quantitative benchmarks
- Testing of models and validating them on prototype basis
- Applying weightages depending on the criticality of each activity and benchmark levels specified
- Evaluation scores applied on the benchmark levels specified—thereby building through an aggregation process, risk process implementation score (reflective of the extent of capital optimisation possible)

6) IRM Strategy: Alignment with Bank’ Decision Making Process
This calls for aligning the IRM with the decision making process and involves:-

- Building risk culture through awareness and training
- Developing integrated risk reports and success measures
- Aligning insurance programmes
- Aligning risk strategies and business strategies

The Indian banks may put in practice a basic framework of IRM implementation plan prescribed by CRISIL and further build upon this as per their specific needs and complexities. It describes five phases: a) Definition phase— the bank defines the risk management vision and articulates the objectives; b) Diagnosis phase— the bank compares its IRM vision with its current state and carries out gap analysis; c) Design phase— bank develops milestones, processes and frameworks; d) Development phase— bank builds the systems of design phase and e) Deployment phase— this phase is concerned with roll-out and fine-tuning the systems developed and the task of gathering sophisticated data begins from...
here. The Indian banks may put in practice such a basic framework and further build upon this as per their specific needs and complexities.

6.2.6 ROLE OF INFORMATION TECHNOLOGY (IT) IN ALM

Indian banks need to leverage information technology in an efficient management of ALM. An appropriate technology would help the bank in providing multifarious benefits i.e.:-

- new risk data warehouses required for an effective data gathering process and necessary for building historical data (as required by New Basel Accord) would be facilitated.
- new risk measures like VaR, necessitating models to produce market risk and credit risk measures will be enabled by IT.
- considering the large scale of operations of bank systems, IT would enable creation of the required risk data warehouse with the inputs and outputs of various models, and provide links to front-ends and reporting modules for end-users.
- ‘On-line Analysis and Processing’ (OLAP) systems, critical to forward relevant information to end-users whenever they need it, will be facilitated.
- multiple risk measures, generating several new metrics for risks, which supplement the simple and traditional book exposures for credit risk, would be enabled.
- the risk views extending to expected and unexpected losses, capital and risk allocations, in addition to mark-to-market measures of loan exposures, will be facilitated by IT.
- new generation of IT systems can handle the complex multidimensional views of the bank’s portfolio—such as reporting the risk-adjusted profitability by market segment; finding which transactions and obligors contribute most to the risk; ‘what if’
simulation capabilities to find out the outcomes of various scenarios; conducting sensitivity analysis to find out which risk drivers influence risk more, etc.

6.2.7 BEST CORPORATE GOVERNANCE PRACTICES

With a view to build the basic foundations of governance in the banking industry, the Basel Committee has come out with several papers. These include Principles for the Management of Interest Rate Risk (September, 1997), Framework for Internal Control Systems in Banking Organisations (September, 1998), Enhancing Bank Transparency (September, 1998), etc. These papers have highlighted the fact that strategies and techniques that are basic to sound corporate governance include the clear articulation of corporate values and its

- strong internal control systems, including internal and external audit functions, risk management functions independent of business lines, and other checks and balances
- special monitoring of risk exposures where conflicts of interest are likely, including business relationships with borrowers affiliated with the bank
- appropriate information flows internally and to the public, etc.

- Basel Committee has strongly recommended four important forms of oversight that should be included in the organizational structure of any bank in order to ensure the appropriate checks and balances:
  - oversight by the board of directors or supervisory board
- oversight by individuals not involved in the day-to-day running of the various business areas
- direct line supervision of different business areas
- independent risk management and audit functions

6.3 DIRECTIONS FOR FUTURE RESEARCH

The future direction of research may be in the following areas:-

i) For Indian Banks, non-availability of authenticate historical data, appears a severe handicap in continuous time approach calculation of transition probabilities based on continuously observed histories. A research project, comprehensively addressing this issue, seems to be an essentiality.

ii) During stressful times it is often the case that liquidity dries up. One could model the VaR problem by adding 'liquidity premiums' during times where jumps occur. Hence, a study can be conducted to develop an equilibrium valuation model that includes an explicit 'value of liquidity' component.

In a nutshell, ability to gauge the risks and take appropriate position will be the key to success—more aptly in other words that risk takers will survive, effective risk managers will prosper and risk averse are likely to perish.

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