

Credit Risk Management In India

Risk Based Models

By

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The authors can be contacted for further details and Case Studies, and Models used by various banks

THE NEED FOR RISK MANAGEMENT

"All of life is the management of risk, not its elimination."

Walter Wriston, former chairman of Citicorp

Corporations are in the business of managing risks. The most adept ones succeed; others fail. Whereas some firms passively accept financial risks, others attempt to create a competitive advantage by judicious exposure to financial risks. In both cases, however, these risks should be monitored carefully because of their potential for damage.

The primary function of financial institutions is to manage financial risks actively. The purpose of financial institutions is to assume, intermediate, or advise on financial risks. These institutions realize that they must measure sources of risk as precisely as possible in order to control and properly price risks. Understanding risk means that financial managers can consciously plan for the consequences of adverse outcomes and, by doing so be better prepared for the inevitable uncertainty.

Risk comes from many resources. Risk can be human-created, such as business cycles, inflation, changes in government policies, and wars. Risks also occur from unforeseen natural phenomena, including weather and earthquakes. Risk also arises from technological innovations, which can render existing technology obsolete and create dislocations in employment. Thus risk and the willingness to take risk are essential to the growth of an economy.

What is exactly risk?

Risk can be defined as the volatility of unexpected outcomes, generally the value of assets or liabilities of interest. In statistical terms, risk is defined as the degree of variability of possible outcomes for a particular event. In financial terms, risk is always associated with loss that is expected to be incurred due to the happening or non-happening of certain events or activities

"The fact is that bankers are in the business of managing risk, pure and simple, that is the business of banking."
-Walter Wriston, former chairman of Citicorp

Assumption and management of risk is the very essence of banking business. Risk here refers to the sensitivity of a bank's profitability to spatial and temporal dispersion of market parameters (e.g. interest rates, exchange rates, loan default, etc.) around their expected values.

Globalization, liberalization and deregulation of financial markets have resulted in enhanced volatility in interest and exchange rates, rapid growth of innovations and a reduction in barriers relating to business diversification. All of this has been aided by rapid technological development. Consequently, the risks in financial markets and availability of instruments to analyze / manage them have multiplied.

A typical bank accepts large number of short-term deposits and tries to lend medium to long-term. The leftover money is used for investment purposes. Thus, a bank has deposits and equity on liability side and loans and investments on assets side of its balance sheet. The value of each of these components is subject to uncertainties.

For financial institutions and corporations, asset and liability management includes those activities that attempt to control exposure to financial and other price risks. The main purpose of asset and liability management is to make the consideration of risk explicit in the planning process and to enable decision makers to control risk exposure.

Any entity or investment project is bound to be exposed to price risks, and investment planning always involves assumptions about the movements of these prices. It aims at controlling the variability of future cash flows. Banks examine the risk exposure of their assets and liabilities to borrowers' default rates and future asset price movements to obtain a summary of their risk exposure profile. By entering into a set of financial transactions, they attempt to minimize any unexpected decline in profits. While importance of these activities has been broadly recognized in the developed countries, applications to the banks in countries like India have been limited.

As part of the primary activity of financial intermediation, banks borrow and lend money. The price at which these funds are made available depends essentially on two parameters – the time for which the funds are made available and the creditworthiness of the person to whom

the funds are made available. Considering that the long-term funds are priced higher than short-term funds and a high-risk borrower pays high interest rate, banks will have to take liquidity risk or credit risk to earn the spreads. However, in the process of earning spreads, banks cannot enhance their risks beyond a certain manageable level.

Risk manifest themselves in many ways and the risks in banking are a result of many diverse activities, executed from many locations, and by numerous people. The volatile nature of the bank's operating environment will aggravate the effect of these risks. The most prominent financial risks to which banks are exposed to are:

❖ **Liquidity Risk**

Liquidity risk is the potential inability of a bank to generate sufficient cash to meet its normal operating requirements (cash expenses and repayment of liabilities). A mismatch in the assets and liabilities causes a bank to have a liquidity risk. A bank often promises greater liquidity in its liabilities than its assets can provide directly. To deal with such contingencies, a bank must have sources of liquidity - ways it can lay its hands on cash whenever it needs it. However, excess liquidity is also costly for the bank because idle cash carries a cost as the bank pays interest on its deposits. So, banks seek to achieve a reasonable trade-off between overtly liquid and relatively illiquid.

❖ **Interest Rate Risk**

Interest rate risk is the risk of an adverse effect of interest rate movements on a bank's profits or balance sheet. Interest rates affect a bank in two ways - by affecting the profits and by affecting the value of its assets or liabilities. If the money borrowed is on floating rate basis the bank faces the risk of lower profits in an increasing interest rate scenario. Similarly fixed rate assets face the risk of lower value of investments in an increasing interest rate scenario. Interest rate risk becomes prominent when the assets and liabilities of the bank do not match in their exposure to interest rate movements.

❖ Foreign Exchange Risk

Foreign Exchange Risk is the chance that a fluctuation in the exchange rate will change the profitability of a transaction from its expected value. It is the risk that arises due to unanticipated changes in exchange rates, which arises due to the presence of multi-currency assets and liabilities in a bank's balance sheet. Fluctuations occur over the medium and long-term and also during a dealing session on a moment to moment basis.

Foreign exchange exposure in a bank might arise due to the operations of the treasury (the dealing room) or due to unmatched assets and liabilities (in terms of currency and maturity) on the balance sheet. In addition, banks making markets and dealing in currency forwards, swaps and options take on foreign exchange exposure and relevant risks.

Foreign exchange operations of a bank can function properly only if the risks associated with such operations are correctly identified and measures are taken to manage / limit those risks.

❖ Operations Risk

Operations risk is the risk that deficiencies in information systems or internal controls will result in unexpected loss. This risk is associated with human error, system failures and inadequate procedures and controls. Operations Risk exist for any organization arising out of day to day business activities. The operations risk that a bank faces include the risk of fraud, theft, etc.

To counter these risks, the banks have to maintain strict vigil and have to have tight control systems. This becomes very important due to the fact that the bank is basically investing somebody else's money. The banks typically operate by having employee specific exposure limits to ensure that the risk taken by the bank is not too much. There exists a risk of the mismatch in the risk taking ability of the organization

as a whole (as decided by the top management) and that of the employee who is actually handling operations which can lead to problems.

❖ Credit Risk

Credit risk or default risk involves inability or unwillingness of a customer or counterparty to meet commitments in relation to lending, trading, hedging, settlement and other financial transactions. The credit risk of a bank's portfolio depends on both external and internal factors. The external factors are the state of the economy, wide swings in commodity/equity prices, foreign exchange rates and interest rates, trade restrictions, economic sanctions, Government policies, etc. The internal factors are deficiencies in loan policies/administration, absence of prudential credit concentration limits, inadequately defined lending limits for Loan Officers/Credit Committees, deficiencies in appraisal of borrowers' financial position, excessive dependence on collaterals and inadequate risk pricing, absence of loan review mechanism and post sanction surveillance, etc.

As per the RBI Guidance Note, October 2002

“Credit risk is defined as ***the possibility of losses associated with diminution in the credit quality of borrowers or counterparties. In a bank's portfolio, losses stem from outright default due to inability or unwillingness of a customer or counterparty to meet commitments in relation to lending, trading, settlement and other financial transactions.***

Alternatively, losses result from reduction in portfolio value arising from actual or perceived deterioration in credit quality. “

Credit risk emanates from a bank's dealings with an individual, corporate, bank, financial institution or a sovereign. Credit risk may take the following forms:

- ✓ In the case of direct lending: principal/and or interest amount may not be repaid;
- ✓ In the case of guarantees or letters of credit: funds may not be forthcoming from the constituents upon crystallization of the liability;
- ✓ In the case of treasury operations: the payment or series of payments due from the counter parties under the respective contracts may not be forthcoming or ceases;

- ✓ In the case of securities trading businesses: funds/ securities settlement may not be effected;
- ✓ In the case of cross-border exposure: the availability and free transfer of foreign currency funds may either cease or restrictions may be imposed by the sovereign.

In this backdrop, it is imperative that banks have a robust credit risk management system, which is sensitive and responsive to these factors. The effective management of credit risk is a critical component of comprehensive risk management and is essential for the long-term success of any banking organisation.

Credit Risk Management

Risk is inherent in all aspects of a commercial operation and covers areas such as customer services, reputation, technology, security, human resources, market price, funding, legal, regulatory, fraud and strategy. However, for banks and financial institutions, credit risk is the most important factor to be managed.

According to Mark Dorfman risk management is "*the logical development and execution of a plan to deal with potential losses*". It is a dynamic process, which changes according to the evolving scenario. The aim of risk management is to maintain overall and specific risks at the desired levels, at the minimum possible cost. Risk management is the process by which various risk exposures are identified, measured, and controlled.

For a bank the risk management process primarily involves Asset-Liability Management. Although bank would have managed a major portion of its risks by having in place a proper ALM framework, Credit Risk is also an essential part of the integrated risk management process as the profitability and liquidity of a bank depends largely on the forecasted cash flows. If there is any delay in cash inflows by ways of non-payment of installments or loan repayment etc, all estimates regarding the interest rate risk levels and the liquidity may go haywire. Thus the interest rate risk management and the liquidity risk management policies of a firm should be supplemented by a well laid down credit policy to manage the credit risk.

Credit risk management enables banks to identify, assess, manage proactively, and optimise their credit risk at an individual level or at an entity level or at the level of a country. Given the fast changing, dynamic world scenario experiencing the pressures of globalisation, liberalization, consolidation and disintermediation, it is important that banks have robust credit risk management policies and procedures, which are sensitive and responsive to these changes.

The goal of credit risk management is to maximise a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Banks need to manage the credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Banks should also consider the relationships between credit risk and other risks. The effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organisation.

The quality of the credit risk management function will be the key driver of the changes to the level of shareholder return. Industry analysts have demonstrated that the *average shareholder return of the best credit performance US banks during 1989 – 1997* was 56% higher than their peers. Low loan loss banks stage a quicker share price recovery than their peers, and in a credit downturn, the market rewards the banks with the best credit performance with a moderate price decline relative to their peers.

BUILDING BLOCKS OF CREDIT RISK MANAGEMENT

As per the RBI Guidance Note, October 2002: In a bank, an effective credit risk management framework would comprise of the following distinct building blocks:

- a) Policy and Strategy
- b) Organisational Structure
- c) Operations/ Systems

Policy and Strategy

The Board of Directors of each bank shall be responsible for approving and periodically reviewing the credit risk strategy and significant credit risk policies.

Credit Risk Policy

- ✓ Every bank should have a credit risk policy document approved by the Board.
- ✓ Credit risk policies should also define target markets, risk acceptance criteria, credit approval authority, credit origination/ maintenance procedures and guidelines for portfolio management.
- ✓ The credit risk policies approved by the Board should be communicated to branches/controlling offices. All dealing officials should clearly understand the bank's approach for credit sanction and should be held accountable for complying with established policies and procedures.
- ✓ Senior management of a bank shall be responsible for implementing the credit risk policy approved by the Board.

Credit Risk Strategy

- ✓ Each bank should develop, with the approval of its Board, its own credit risk strategy or plan
- ✓ The strategy would include a statement of the bank's willingness to grant loans based on the type of economic activity, geographical location, currency, market, maturity and anticipated profitability.
- ✓ The credit risk strategy should provide continuity in approach as also take into account the cyclical aspects of the economy and the resulting shifts in the composition/ quality of the overall credit portfolio.
- ✓ Senior management of a bank shall be responsible for implementing the credit risk strategy approved by the Board.

Organisational Structure

Sound organizational structure is essential for successful implementation of an effective credit risk management system. The organizational structure for credit risk management should have the following basic features:

- ✓ The **Board of Directors** should have the overall responsibility for management of risks. The Board should decide the risk management policy of the bank and set limits for liquidity, interest rate, foreign exchange and equity price risks.
- ✓ The **Risk Management Committee** will be a Board level Sub committee including CEO and heads of Credit, Market and Operational Risk Management Committees. It

will devise the policy and strategy for integrated risk management containing various risk exposures of the bank including the credit risk.

- ✓ Each bank may, depending on the size of the organization or loan/ investment book, constitute a high level **Credit Risk Management Committee (CRMC)**. The Committee should be headed by the Chairman/CEO/ED, and should comprise of heads of Credit Department, Treasury, Credit Risk Management Department (CRMD) and the Chief Economist.
- ✓ Concurrently, each bank should also set up **Credit Risk Management Department (CRMD)**, independent of the Credit Administration Department. The CRMD should measure, control and manage credit risk on a bank-wide basis within the limits set by the Board/ CRMC, Enforce compliance with the risk parameters and prudential limits set by the Board/ CRMC, lay down risk assessment systems, develop MIS, monitor quality of loan/ investment portfolio, identify problems, correct deficiencies and undertake loan review/audit. Large banks could consider separate set up for loan review/audit etc.

Operations / Systems

Banks should have in place an appropriate credit administration, credit risk measurement and monitoring processes. The credit administration process typically involves the following phases:

- ✓ *Relationship management phase* i.e. business development.
- ✓ *Transaction management phase* covers risk assessment, loan pricing, structuring the facilities, internal approvals, documentation, loan administration, on going monitoring and risk measurement.
- ✓ *Portfolio management phase* entails monitoring of the portfolio at a macro level and the management of problem loans.

Process of credit risk management

The process of credit risk management begins with a scientific identification of the risk involved in the loan transactions along with the nature and frequency of such risk factors, understanding and analyzing the causes of the risk, formulating

strategies and taking actions to avoid the risk and continuously monitoring the situation to ensure that the risk avoidance succeeds to a larger extent.

Broadly, the process of credit risk management comprises the following functions:

- Risk identification
- Risk measurement or quantification
- Risk control
- Monitoring
- Risk pricing

Risk identification: involves the understanding of the nature of various kinds of risk, the circumstances, which lead a situation to become a risk situation, and causes due to which the risk can arise. It is important that the risk should be categorized in various categories, so that while formulating the risk management strategies, the focus should be on exact risk factor.

Risk quantification: is an assessment of the degree of the risk, which a particular transaction or an activity is exposed to. Though the exact measurement of risk is not possible but the level of the risk can be determined with the help of the risk rating models. When an organization, is considered for extending financial support, the bank or institutions are required to examine a number of aspects concerning the activity/business being conducted or proposed to be undertaken. Such verification may also include visits to the work-sites and discussions with the people at operational level and collection of opinion reports about the promoters/owners, the industry, and the unit etc. based on such information and its analysis, the officials can come out with preliminary findings about the performance and prospects.

Risk control: is the stage in risk management where the financing institutions take steps to control the risk with the help of various tools. This may involve policy

formulation. Policy is a long-term framework to tackle risk, given the standard level of exposures that the bank will have to maintain in order to protect cash flows. Setting policies for risk management will depend on the bank's objective and its risk tolerance level.

Risk monitoring: in monitoring, the bankers have to fix up the parameters on which performance of a supported business is to be tested to be sure that there is no risk to viable existence of the finance unit or investment of the bank. The bankers have to be in continuous touch with the assisted organization to understand their problems for timely support and advice. Information requirements in such cases will be important as it is flow of regular information from borrowing entity to the bank that will enable the bankers to know about the viability or otherwise of the operations.

Risk pricing: fixation of price based on the degree of risk is a fundamental tenet of risk management. The borrowers with weak financial position and placed in high credit risk category are required to be priced higher than the one carrying lower risk. The pricing of loans normally should be linked to risk rating or credit quality.

INSTRUMENTS OF CREDIT RISK MANAGEMENT

Credit Risk Management encompasses a host of management techniques, which help the banks in mitigating the adverse impacts of credit risk.

- ◆ Prudential Limits
- ◆ Risk Rating
- ◆ Risk Pricing
- ◆ Portfolio Management
- ◆ Loan Review Mechanism (LRM)

PRUDENTIAL LIMITS

In order to limit the magnitude of credit risk, prudential limits should be laid down on various aspects of credit:

- a) Stipulate benchmark current/debt equity and profitability ratios, debt service coverage ratio or other ratios, with flexibility for deviations. The conditions subject to which deviations are permitted and the authority therefore should also be clearly spelt out in the Loan Policy;
- b) Single/group borrower limits, which may be lower than the limits prescribed by Reserve Bank to provide a filtering mechanism;
- c) Substantial exposure limit i.e. sum total of exposures assumed in respect of those single borrowers enjoying credit facilities in excess of a threshold limit, say 10% or 15% of capital funds. The substantial exposure limit may be fixed at 600% or 800% of capital funds, depending upon the degree of concentration risk the bank is exposed;
- d) Maximum exposure limits to industry, sector, etc. should be set up. There must also be systems in place to evaluate the exposures at reasonable intervals and the limits should be adjusted especially when a particular sector or industry faces slowdown or other sector/industry specific problems. The exposure limits to sensitive sectors, such as, advances against equity shares, real estate, etc., which are subject to a high degree of asset price volatility and to specific industries, which are subject to frequent business cycles, may necessarily be restricted. Similarly, high-risk industries, as perceived by the bank, should also be placed under lower portfolio limit. Any excess exposure should be fully backed by adequate collaterals or strategic considerations; and
- e) Banks may consider maturity profile of the loan book, keeping in view the market risks inherent in the balance sheet, risk evaluation capability, liquidity, etc.

RISK RATING

Credit rating is one of the important tools of credit risk management as it helps the banking and lending institutions to understand various dimensions of risk involved in different credit transactions. Risk rating or credit risk analysis is essentially a default risk analysis or making decision about credit worthiness of the borrowers or estimating the probability of repayment. The aggregation of such credit rating across the borrowers, activities and lines of business can give broader assessment of the quality of the credit portfolio of a branch, region, zone or a bank.

As per the RBI Guidance Note, October 2002

“A Credit-risk Rating Framework (CRF) is necessary to avoid the limitations associated with a simplistic and broad classification of loans/exposures into a “good” or a “bad” category. The CRF deploys a number/ alphabet/ symbol as a primary summary indicator of risks associated with a credit exposure. Such a rating framework is the basic module for developing a credit risk management system and all advanced models/approaches are based on this structure. In spite of the advancement in risk management techniques, CRF is continued to be used to a great extent. These frameworks have been primarily driven by a need to standardise and uniformly communicate the “judgment” in credit selection procedures and are not a substitute to the vast lending experience accumulated by the banks' professional staff.

Broadly, CRF can be used for the following purposes:

- a. Individual credit selection, wherein either a borrower or a particular exposure/ facility is rated on the CRF.
- b. Pricing (credit spread) and specific features of the loan facility. This would largely constitute transaction-level analysis.
- c. Portfolio-level analysis.
- d. Surveillance, monitoring and internal MIS
- e. Assessing the aggregate risk profile of bank/ lender. These would be relevant for portfolio-level analysis. For instance, the spread of credit exposures across various CRF categories, the mean and the standard deviation of losses occurring in each CRF category and the overall migration of exposures would highlight the aggregated credit-risk for the entire portfolio of the bank.”

Credit rating is vital for decision making at both the pre and post sanction stage:

- At the pre-sanction stage rating helps the sanctioning authority to decide whether to lend, what should be the price (Interest Rate) for which the lending should be considered, what should be the type of credit facilities which the lender can extend, what are the various risk mitigation tools (such as security, documentation, credit enhancement etc.) available with the lender with the use of which he can cap his risk. At the corporate level, the leading bank or institution can also decide, as to what should be the level of delegation of lending powers linked to rating.
- At the post-sanction level rating helps the bank to decide about the depth of the review or renewal, periodicity of the review, periodicity of the rating and other precaution required to be taken.

Granting or rejecting of loans must be objective, fair and rigorous. Banks should have a comprehensive risk scoring / rating system that serves as a single point indicator of diverse risk factors of counter party and for taking credit decisions in a consistent manner. To facilitate this, a substantial degree of standardisation is required in ratings across borrowers. The risk rating system should be designed to reveal the overall risk of lending, critical input for setting pricing and non-price terms of loans as also present meaningful information for review and management of loan portfolio. The risk rating, in short, should reflect the underlying credit risk of the loan book. The rating exercise should also facilitate the credit granting authorities some comfort in its knowledge of loan quality at any moment of time.

AS per the RBI Guidance Note, October 2002 the architecture of a credit risk framework should comprise of the following:

1. Grading system for calibration of credit risk
 - Nature of grading system
 - Number of grades used
 - Key outputs of CRF
2. Operating design of CRF
 - Which exposures are rated?
 - The risk rating process
 - Assigning and monitoring risk ratings
 - The mechanism of arriving at risk ratings
 - Standardisation and benchmark for risk ratings

- Written communications and formality of procedures
3. CRFs and Portfolio Credit Risk
- Portfolio surveillance and reporting
 - Adequate levels of provisioning for credit events
 - Guidelines for asset build up, aggregate profitability and pricing
 - Interaction with external credit assessment institutions

COMPONENTS OF A RISK RATING MODEL

Taking a few of the above stated factors into consideration the key factors that need to be considered in a risk rating model are:

RATING SCALE

The rating scale indicates the level of risk; a particular borrowing transaction carries with it. It begins from minimum risk category and ends with loss asset category. A rating model helps to make distinction between various stages of a loan transaction and to draw appropriate conclusion. While there cannot be any prescription on the number of such spans but it should take into account different stages or levels of risk association with a borrowing entity. RBI prescribed that the overall score for risk should be placed on a numerical scale between 1-6 or 1-8 (or any other) on the basis of a credit profile of the bank concerned. For each category, a quantitative definition of the borrowers, the loan's underlying quality and an analytic representation of the underlying financial of the borrower should be presented. Also as a prudent risk management policy, each bank should prescribe the minimum standards and conditions for relaxations. Authority, therefore, should be clearly articulated in the loan policy.

RATING PARAMETERS

The rating parameters are those aspects of the loan transaction, which are required to be put to test and then aggregated to draw final rating. The rating parameters generally take into consideration the following aspects:

1. Business Analysis

Industry Risk – Nature and basis of competition, key success factors, demand supply position, structure of industry, cyclical/ seasonal factors, government policies, etc.

Market position of the company within the industry – market share, competitive advantage, selling and distribution arrangements, product and customers' diversity, etc.

Operating efficiency of the company – Locational advantages, labour relationships, cost structure, technological advantages and manufacturing efficiency as compared to competitors, etc.

Legal position – Terms of prospectus, directors and their responsibilities' systems for timely payment and for protection against forgery/ fraud, etc.

2. Financial Analysis

Accounting quality – overstatement/ understatement of profit, audit qualifications, method of income recognition' inventory valuation and depreciation policies, of – balance liabilities, etc.

Earnings protection – Sources of future earnings growth, profitability ratio, and earnings in relation to fixed income charges, etc.

Adequacy of cash flow – In relation to debt and fixed and working capital needs, sustainability of cash flow, capital spending flexibility, working capital management, etc.

Financial flexibility – alternative financing plans in times of stress, ability to raise funds, asset redeployment potential, etc.

3. Management Evaluation

Track record of management – planning and control systems, depth of managerial talent and success plans, and capacity to overcome adverse situations, goals, philosophy and strategies.

4. Regulatory and competitive environment

Structural and regulatory framework of the financial system, trends in regulation/deregulation and their impact on the company

5. Fundamental analysis

Assessment of true net worth of the company, its adequacy in relation to the volume of business and the risk profile of assets.

Asset quality– Quality of the company's credit risk management, system for monitoring credit, sector risk, exposure to individual creditors, management of problem credits, etc.

Liquidity management – Capital structure, term matching of assets and liabilities, policy on liquid assets in relation to financial commitments and maturing deposits.

Profitability and financial position – Historic profits, spreads on funds development, revenues on non-fund based services, accretion to reserves, etc.

Interest and tax sensitivity – Exposure to interest rate changes, tax law changes and hedge against interest rate risk, etc.

The risk rating system should be drawn up in a structured manner, incorporating, inter alia, financial analysis, projections and sensitivity, industrial and management risks. The banks may use any number of financial ratios and operational parameters and collaterals as also qualitative aspects of management and industry characteristics that have bearings on the creditworthiness of borrowers. Banks can also weigh the ratios on the basis of the years to which they represent for giving importance to near term developments. Within the rating framework, banks can also prescribe certain level of standards or critical parameters, beyond which no proposals should be entertained. Banks may also consider separate rating framework for large corporate / small borrowers, traders, etc. that exhibit varying nature and degree of risk. Foreign exchange exposures assumed by corporates who have no natural hedges have significantly altered the risk profile of banks.

WEIGHTAGE OF RISK PARAMETERS

Another important aspect relating to parameters is the weightage an individual parameter gets in the overall rating. Some model may give high weightage to operational aspects another may give high weightage to financial or industry or to promoters. The weightage

given to each parameter will have an affect on the effectiveness on the rating model. For instance if the major portion of the weightage goes to operational parameters alone, a borrower with good financial prospects, working in an industry with better prospects and with good management, may be found to be a more risky proposition. On the other hand, allocation of higher weightage to financial positions may ignore the conducting of business affairs, the strength of the management, positive track record of the Industry etc. There cannot be a uniform prescription for weightage and each lender has to take into consideration its experience, exposure and other factors while deciding on the weightages.

Banks should, therefore, factor the unhedged market risk exposures of borrowers in the rating framework. The overall score for risk is to be placed on a numerical scale ranging between 1-6, 1-8, etc. on the basis of credit quality. For each numerical category, a quantitative definition of the borrower, the loan's underlying quality, and an analytic representation of the underlying financials of the borrower should be presented. Further, as a prudent risk management policy, each bank should prescribe the minimum rating below which no exposures would be undertaken. Any flexibility in the minimum standards and conditions for relaxation and authority therefore should be clearly articulated in the Loan Policy.

The credit risk assessment exercise should be repeated biannually (or even at shorter intervals for low quality customers) and should be delinked invariably from the regular renewal exercise. The updating of the credit ratings should be undertaken normally at quarterly intervals or at least at half-yearly intervals, in order to gauge the quality of the portfolio at periodic intervals. Variations in the ratings of borrowers over time indicate changes in credit quality and expected loan losses from the credit portfolio. Thus, if the rating system is to be meaningful, the credit quality reports should signal changes in expected loan losses. In order to ensure the consistency and accuracy of internal ratings, the responsibility for setting or confirming such ratings should vest with the Loan Review function and examined by an independent Loan Review Group. The banks should undertake comprehensive study on migration (upward – lower to higher and downward – higher to lower) of borrowers in the ratings to add accuracy in expected loan loss calculations.

RATING MODELS

As the rating helps the lending banks or financial institution in different ways to maintain the quality of loan assets it becomes imperative to develop a credit rating model with utmost care. While adopting such models, the lender should ensure that the rating model serves the objectives, for which such model has been put to use. The model should not be a one time affair and is required to be modified and updated periodically to factor the frequent changes taking place in the risk elements. While a bank or institution can adopt available universally accepted models to be effective, they can also adopt these models with suitable modifications. Alternatively, keeping in view the profile of their loan portfolio, the environment in which they are functioning, they can also have customized models.

As per the RBI Guidance note, October 2002 the commonly used techniques of credit rating are:

- (a) **Econometric Techniques** such as linear and multiple discriminant analysis, multiple regression, logic analysis and probability of default, etc.
- (b) **Neural networks** are computer-based systems that use the same data employed in the econometric techniques but arrive at the decision model using alternative implementations of a trial and error method.
- (c) **Optimisation models** are mathematical programming techniques that discover the optimum weights for borrower and loan attributes that minimize lender error and maximize profits.
- (d) **Rule-based or expert systems** are characterised by a set of decision rules, a knowledge base consisting of data such as industry financial ratios, and a structured inquiry process to be used by the analyst in obtaining the data on a particular borrower.
- (e) **Hybrid Systems** In these systems simulation are driven in part by a direct causal relationship, the parameters of which are determined through estimation techniques.

The models specified above are used in a variety of domains including:

- (a) **Credit approval**: Models are used on a stand alone basis or in conjunction with a judgemental override system for approving credit in the consumer lending business. The use of such models has expanded to include small business lending. They are generally not used in approving large corporate loans, but they may be one of the inputs to a decision.

(b) **Credit rating determination:** Quantitative models are used in deriving 'shadow bond rating' for unrated securities and commercial loans. These ratings in turn influence portfolio limits and other lending limits used by the institution. In some instances, the credit rating predicted by the model is used within an institution to challenge the rating assigned by the traditional

credit analysis process.

(c) Credit risk models may be used to suggest the **risk premia** that should be charged in view of the probability of loss and the size of the loss given default. Using a mark-to-market model, an institution may evaluate the costs and benefits of holding a financial asset. Unexpected losses implied by a credit model may be used to set the capital charge in pricing.

(d) **Early warning:** Credit models are used to flag potential problems in the portfolio to facilitate early corrective action.

(e) **Common credit language:** Credit models may be used to select assets from a pool to construct a portfolio acceptable to investors at the time of asset securitisation or to achieve the minimum credit quality needed to obtain the desired credit rating. Underwriters may use such models for due diligence on the portfolio (such as a collateralized pool of commercial loans).

(f) **Collection strategies:** Credit models may be used in deciding on the best collection or workout strategy to pursue. If, for example, a credit model indicates that a borrower is experiencing short-term liquidity problems rather than a decline in credit fundamentals, then an appropriate workout may be devised.

ADVANCED CREDIT RISK RATING MODELS

A brief overview of the four credit risk models that have received global acceptance as benchmarks for measuring stand-alone as well as portfolio credit risk are given below:

- ✓ Altmans' Z Score Model
- ✓ KMV Model for measuring default risk
- ✓ Credit metrics
- ✓ Credit risk+

The first two models were developed to measure the default risk associated with an individual borrower. The Z score model separates the bad firms or the firm's in distress from the set of good firms, which are able to service their debt obligations in time. The KMV model, on the other hand, estimates the default probability of each firm. Thus, the output of this model can be used as the input for risk based pricing mechanism and for allocation of economic capital. The other two models are the most frequently used models in credit risk literature. The two models are intended to measure the same risk, but impose different restrictions, make different distributional assumptions and use different techniques for calibration.

Z Score Model

Altman's Z score model is an application of multivariate discriminant analysis in credit risk modeling. Discriminant analysis is a multivariate statistical technique that analyses a set of variables in order to differentiate two or more groups by minimizing the within group variance and maximizing the between group variance simultaneously. Altman started with twenty variables(Financial Ratios) and finally five of them were found to be significant. The resulting discriminant function was

$$Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5$$

Where,

X_1 = Working Capital / Total Assets

X_2 = Retained Earnings/Total Assets

X_3 = Earnings Before Interest And Taxes/Total Assets

X_4 = Market Value Of Equity/Book Value Of Total Liabilities

X_5 = Sales/Total Assets

Altman found a lower bound value of 1.81 (Failing Zone) and an upper bound value of 2.675 (Non Failing Zone) to be optimal. Any score in between 1.81 and 2.675 was treated as being in the zone of ignorance.

KMV Model

KMV Corporation has built a credit risk model that uses information on stock prices and the capital structure of the firm to estimate its default probability. The starting point of this model is the proposition that a firm will default only if its asset value falls below a certain level (Default Point), which is a function of its liability. It estimates the asset value of the firm and

its asset volatility from the market value of equity and the debt structure in the option theoretic framework. Using these two values, a metric (Distance from default or DD) is constructed that represents the number of standard deviations that the firm's assets value is away from the default point. Finally, a mapping is done between the DD value and the actual default rate, based on the historical experience. The result probability is called Expected Default Frequency (EDF).

Credit Metrics Approach

In April 1997, J.P Morgan releases the credit metrics technical document that immediately set a new benchmark in the literature of portfolio risk management. This provides a method for estimating the distribution of value of assets in a portfolio subject to changes in the credit quality of individual borrower. A portfolio consists of different stand along assets, defined by a stream of future cash flows each asset has over the possible range of future rating class. Starting from its initial rating, an asset may end in any one of the possible rating categories. Each rating category has a different credit spread, which will be used to discount the future cash flows. Moreover, the assets are correlated among themselves depending on the industry they belong to. It is assumed that the asset returns are normally distributed and change in the asset returns cause the change in rating category in the future. Finally, the simulation technique is used to estimate the value distribution of the assets.

Credit Risk+

Introduced by Credit Suisse Financial Products, Credit Risk+ is a model of default risk. Each asset has only two possible end of period states: Default and Non-default. In the event of default, the lender recovers a fixed proportion of the total exposure. The default rate is considered as a continuous random variable. It does not try to estimate the default correlation directly. The default correlation is assumed to be determined by a set of risk factors. Conditional on these risk factors, default of each obligor follows a Bernoulli distribution. To get the unconditional probability generating function for the number of defaults, it assumes that the risk factors are independently gamma-distributed random variables. The final step is to obtain the probability generating function for losses. Conditional

on the number of default events. The losses are entirely determined by the exposure and recovery rate.

As per the RBI Guidance Note, October 2002: “The literature on quantitative risk modelling has two different approaches to credit risk measurement. The first approach is the development of statistical models through analysis of historical data. This approach was frequently used in the last two decades. The second type of modelling approach tries to capture distribution of the firm's asset-value over a period of time.”

RISK PRICING

The lender must assign an interest rate to each prospective loan facility, based on its credit scoring and other characteristics. Risk-return pricing is a fundamental tenet of risk management. In a risk-return setting, borrowers with weak financial position and hence placed in high credit risk category should be priced high. Thus, banks should evolve scientific systems to price the credit risk, which should have a bearing on the expected probability of default. The pricing of loans normally should be linked to risk rating or credit quality. The probability of default could be derived from the past behaviour of the loan portfolio, which is the function of loan loss provision/charge offs for the last five years or so. Banks should build historical database on the portfolio quality and provisioning / charge off to equip themselves to price the risk. But value of collateral, market forces, perceived value of accounts, future business potential, portfolio/industry exposure and strategic reasons may also play important role in pricing. Flexibility should also be made for revising the price (risk premia) due to changes in rating / value of collaterals over time.

Comparison Pricing – Comparison Pricing is market pricing of credit with identical risk rating and with similar terms. The prime lending rates announced by most of the banks in India is typical of comparison pricing.

Intrinsic Value Pricing – under the intrinsic value pricing, the lender calculates the risk cost and other cost of the prospective loan such as cost of funds, loan servicing and non-current expenses and then sets an interest that, in effect, achieves an appropriate mark up over

cost. The risk cost generally comprises premia for default, portfolio, maturity and collateral risks.

Default Risk Premium – If the expected probability of default is 'd' the expected probability of receiving payment is (1-d). A profitable loan contract rate 'R' must compensate the lender for the time value of money, as reflected by risk free rate of interest 'r' and the risk of default. The equation is:

$$R = \frac{1+r}{1-d} - 1$$

Clearly 'R' compensates for default risk. For a particular borrower, the difference between the profitable loan contract rate 'R' and the risk free rate 'r' is the default risk premium required by the lender for assuming the risk exposure the balance sheet.

Portfolio Risk Premium - Lenders can not assess the riskiness of individual loan in isolation rather, this riskiness must be evaluated with respect of other loans in the portfolio. If additional or marginal loan added to the portfolio is highly correlated with the existing loans, then the lender is taking one more portfolio risk. If 'p' is the portfolio risk, the default and portfolio risks premia can be worked out with the help of the following formula:

$$R = \frac{1+r}{1-d-P} - 1$$

Maturity Risk Premium – The longer is the maturity of the loan, the greater is the interest rate risk and that borrowers' creditworthiness might deteriorate. A variable rate loan can be used to offset interest rate risk. Maturity risk premium still might be required to compensate the potential deterioration in borrowers' creditworthiness.

Collateral Risk Premium – Substantial changes in the financial environment generally bring about significant volatility in the value of physical assets mainly real estate, aircrafts, restaurant material, equity and debt instruments, etc. Thus a premium to hedge deterioration in value of collaterals is necessary.

Large sized banks across the world have already put in place Risk Adjusted Return on Capital (RAROC) framework for pricing of loans, which calls for data on portfolio behaviour and allocation of capital commensurate with credit risk inherent in loan proposals. Under RAROC framework, lender begins by charging an interest mark-up to cover the expected loss – expected default rate of the rating category of the borrower. The lender then allocates enough capital to the prospective loan to cover some amount of unexpected loss- variability of default rates.

PORTFOLIO MANAGEMENT

The existing framework of tracking the Non Performing Loans around the balance sheet date does not signal the quality of the entire Loan Book. Banks should evolve proper systems for identification of credit weaknesses well in advance. The portfolio quality could be evaluated by tracking the migration (upward or downward) of borrowers from one rating scale to another. This process would be meaningful only if the borrower-wise ratings are updated at quarterly / half-yearly intervals. Data on movements within grading categories provide a useful insight into the nature and composition of loan book.

The banks could also consider the following measures to maintain the portfolio quality:

- 1) Stipulate quantitative ceiling on aggregate exposure in specified rating categories, i.e. certain percentage of total advances should be in the rating category of 1 to 2 or 1 to 3, 2 to 4 or 4 to 5, etc.;
- 2) Evaluate the rating-wise distribution of borrowers in various industry, business segments, etc.;
- 3) Exposure to one industry/sector should be evaluated on the basis of overall rating distribution of borrowers in the sector/group. In this context, banks should weigh the pros and cons of specialisation and concentration by industry group. In cases where portfolio exposure to a single industry is badly performing, the banks may increase the quality standards for that specific industry;

- 4) Target rating-wise volume of loans, probable defaults and provisioning requirements as a prudent planning exercise. For any deviation/s from the expected parameters, an exercise for restructuring of the portfolio should immediately be undertaken and if necessary, the entry-level criteria could be enhanced to insulate the portfolio from further deterioration;
- 5) Undertake rapid portfolio reviews, stress tests and scenario analysis when external environment undergoes rapid changes (e.g. volatility in the forex market, economic sanctions, changes in the fiscal/monetary policies, general slowdown of the economy, market risk events, extreme liquidity conditions, etc.). The stress tests would reveal undetected areas of potential credit risk exposure and linkages between different categories of risk. In adverse circumstances, there may be substantial correlation of various risks, especially credit and market risks. Stress testing can range from relatively simple alterations in assumptions about one or more financial, structural or economic variables to the use of highly sophisticated models. The output of such portfolio-wide stress tests should be reviewed by the Board and suitable changes may be made in prudential risk limits for protecting the quality. Stress tests could also include contingency plans, detailing management responses to stressful situations.
- 6) Introduce discriminatory time schedules for renewal of borrower limits. Lower rated borrowers whose financials show signs of problems should be subjected to renewal control twice/thrice a year.

Banks should evolve suitable framework for monitoring the market risks especially forex risk exposure of corporates who have no natural hedges on a regular basis. Banks should also appoint Portfolio Managers to watch the loan portfolio's degree of concentrations and exposure to counterparties. For comprehensive evaluation of customer exposure, banks may consider appointing Relationship Managers to ensure that overall exposure to a single borrower is monitored, captured and controlled. The Relationship Managers have to work in coordination with the Treasury and Forex Departments. The Relationship Managers may service mainly high value loans so that a substantial share of the loan portfolio, which can alter the risk profile, would be under constant surveillance. Further, transactions with

affiliated companies/groups need to be aggregated and maintained close to real time. The banks should also put in place formalised systems for identification of accounts showing pronounced credit weaknesses well in advance and also prepare internal guidelines for such an exercise and set time frame for deciding courses of action.

Loan Review Mechanism (LRM)

LRM is an effective tool for constantly evaluating the quality of loan book and to bring about qualitative improvements in credit administration. Banks should, therefore, put in place proper Loan Review Mechanism for large value accounts with responsibilities assigned in various areas such as, evaluating the effectiveness of loan administration, maintaining the integrity of credit grading process, assessing the loan loss provision, portfolio quality, etc. The complexity and scope of LRM normally vary based on banks' size, type of operations and management practices. It may be independent of the CRMD or even separate Department in large banks.

As per the RBI Guidance Note, October 2002, the main objectives of LRM could be:

- Improvement in the quality of credit portfolio
- Review sanction process and compliance status of large loans
- Feedback on regulatory compliance
- Independent review of Credit Risk Assessment
- Pick-up early warning signals and suggest remedial measures
- Recommend corrective action to improve credit quality, credit administration and credit skills of staff, etc.

The credit audit / loan review mechanism may be assigned to a specific Department or the Inspection and Audit Department.

Functions of Credit Audit Department

- To process Credit Audit Reports
- To analyse Credit Audit findings and advise the departments/ functionaries concerned

- To follow up with controlling authorities
- To apprise the Top Management
- To process the responses received and arrange for closure of the relative Credit Audit Reports
- To maintain database of advances subjected to Credit Audit

The focus of credit audit needs to be broadened from the account level to look at the overall portfolio and the credit process being followed. The important areas are:

- Portfolio Review: Examine the quality of Credit & Investment (Quasi Credit) Portfolio and suggest measures for improvement, including reduction of concentrations in certain sectors to levels indicated in the Loan Policy and Prudential Limits suggested by RBI.
- Loan Review: Review of the sanction process and status of post-sanction processes/ procedures (not just restricted to large accounts):
 - ✓ all fresh proposals and proposals for renewal of limits (within 3 – 6 months from date of sanction)
 - ✓ all existing accounts with sanction limits equal to or above a cut off depending upon the size of activity
 - ✓ randomly selected (say 5-10%) proposals from the rest of the portfolio
 - ✓ accounts of sister concerns/group/associate concerns of above accounts, even if limit is less than the cut off

Action Points for Review

- Verify compliance of bank's laid down policies and regulatory compliance with regard to sanction
- Examine adequacy of documentation
- Conduct the credit risk assessment
- Examine the conduct of account and follow up looked at by line functionaries
- Oversee action taken by line functionaries in respect of serious irregularities
- Detect early warning signals and suggest remedial measures thereof

Frequency of Review

The frequency of review should vary depending on the magnitude of risk (say, for the high risk accounts - 3 months, for the average risk accounts- 6 months , for the low risk accounts- 1 year).

- Feedback on general regulatory compliance.
- Examine adequacy of policies, procedures and practices.
- Review the Credit Risk Assessment methodology.
- Examine reporting system and exceptions thereof.

Procedure to be followed for Credit Audit

Credit Audit is conducted on site, i.e. at the branch, which has appraised the advance and where the main operative credit limits are made available. Report on conduct of accounts of allocated limits are to be called from the corresponding branches. Credit auditors are not required to visit borrowers' factory/ office premises.

RBI GUIDANCE NOTE ON CREDIT RISK MANAGEMENT

In October 1999 RBI brought out a circular covering broad contours for management of credit, liquidity, interest rate, foreign exchange and operational risks. These guidelines, together with the guidelines on Asset-Liability Management were purported to serve as a benchmark to those banks, which till then had not established integrated risk management systems.

As a step towards enhancing and fine-tuning the existing risk management practices in banks, a Working Group on Credit Risk was constituted in Reserve Bank of India drawing experts from select banks and FIs for preparing detailed Guidance Notes on Credit Risk Management by banks. The Working Group identified further steps which are required to be taken by the banks for improving their existing risk management framework, suiting to Indian conditions. On the basis of the feedback received from the members of the Working Group, a draft Guidance Note on Credit Risk was prepared and issued on September 20, 2001.

According to the guidelines the management of credit risk should receive the prime attention of the top management. The banks should put in place the loan policy, approved by the board of directors covering the methodologies for measurement, monitoring and control of credit risk. Banks should also evolve comprehensive risk rating system that serves as a single point indicator of diverse risk factors of counterparties in relation to credit and investment decisions. The Reserve Bank guidelines have stated that the activities of asset-liability management committee (ALCO) and credit policy committee (CPC) for management of credit and market risks need to be integrated.

The guidelines also require banks to evaluate portfolio quality on an on-going basis rather than near about balance sheet date. The proposals for investment should be subjected to the same degree of credit risk analysis as loan proposals. The risk evaluation should also include balance sheet exposure. The current and potential credit exposures may be measured on a daily basis. Banks have also been asked to evolve a suitable framework to provide a centralized overview of the aggregate exposure on other banks, and endeavor to develop an internal matrix that reckons the counterparty and country risks. To manage liquidity risk, banks have been asked to consider putting in place prudential limits on inter-bank borrowings, especially call fundings, purchased funds, core deposits to core assets, off-balance sheet commitments, swapped funds, etc.

The guidelines on risk management have placed the primary responsibility of laying down risk parameters and establishing the risk management and control system on the board of directors. They have, however, stated that the implementation of the integrated risk management could be assigned to a risk management committee or a committee of top executives that reports to the board. The risk management guidelines also require banks to constitute a high-level credit policy committee to deal with issues pertaining to credit sanction, disbursement and follow-up procedures and to manage and control credit risk on a whole bank basis. The Reserve Bank has further asked banks to concurrently set up an independent credit risk management department to enforce and monitor compliance of the risk parameters and prudential limits set by the board/credit policy committee.

The Reserve Bank has, however, stated that due to the diversity and varying size of balance sheet items between banks, it may neither be possible nor may it be necessary to adopt

uniform risk management system. The design of risk management framework should, therefore, be oriented towards the bank's own requirement dictated by the size and complexity of business, risk philosophy, market perception and the existing level of capital. In other words, banks can evolve their own systems compatible with the type and size of operations as well as risk perception. While doing so, banks may critically evaluate their existing risk management system in the light of the guidelines issued by the Reserve Bank and put in place a proper system for covering the existing deficiencies and requisite upgradation.

Given the diversity of balance sheet profile, it is difficult to adopt a uniform framework for management of risks in India. The proposed guidelines only provide broad parameters and each bank may evolve their own systems compatible to their risk management architecture and expertise.

Country Risk

Country risk is the possibility that a country will be unable to service or repay its debts to foreign lenders in a timely manner. In banking, this risk arises on account of cross border lending and investment. The risk manifests itself either in the inability or the unwillingness of the obligor to meet its liability.

Country risk comprises of the following risks:

Transfer risk which is the core risk under country risk, arises on account of the possibility of losses due to restrictions on external remittances. Consequently, an obligor may be able to pay in local currency, but may not be able to pay in foreign currency. This type of risk may occur when foreign exchange shortages either close or restrict a country's cross border foreign exchange market.

Sovereign risk is associated with lending to government of a sovereign nation or to taking government guarantees. The risk lies in the fact that sovereign entities may claim immunity from legal process or might not abide by a judgement, and it might prove impossible to secure redressal through legal action. Ordinarily, it is assumed that there will be no default

by a sovereign. This, however, does not mean that there is no risk involved in sovereign lending, for the risk may manifest itself in terms of rehabilitation of an indebted country in terms of financial solvency and liquidity for which there may be rescheduling of country debt or external debt.

Non-sovereign or political risk arises when political environment or legislative process of a country leads to Government taking over the assets of the financial entity (e.g. nationalisation) and preventing discharge of its liabilities in a manner that had been agreed to. It is also referred to as risk of appropriation and expropriation. Nonsovereign risk includes, in addition to sovereign risk, private claims and direct investments like lending to corporates and project finance lending and includes risks associated with legal frameworks and economic environment.

Cross border risk arises on account of the borrower being a resident of a country other than the country where the cross border asset is booked, and includes exposures to local residents denominated in currencies other than the local currency.

Currency risk is the possibility that exchange rate changes will alter the expected amount of principal and return of the lending or investment. At times, banks may try to cope with this specific risk on the lending side by shifting the risk associated with exchange rate fluctuations to the borrowers. The risk however does not get extinguished, but gets converted to credit risk.

Macroeconomic and Structural Fragility Risk has come into prominence after the East Asian crises of 1990s. In these crises firms could purchase foreign exchange to service foreign debt but collapse of exchange rates and surge in interest rates due to severe government restrictions on firms owning external debt resulted in highly unfavourable exchange rates and very high interest costs on domestic borrowings for these firms. This severely impaired these firms' ability to service foreign debt. The structural fragility risk can also include that associated with poor development of domestic bankruptcy laws and weak courts for their enforcement.

Broad Contours of Country Risk Management (CRM)

The broad contours of CRM are:

- Risk Categories
- Country Risk Assessments
- Fixing of country limits
- Monitoring of country exposures

Risk Categories

Countries can be broadly classified into six risk categories – insignificant, low, moderate, high, very high and off-credit. IBA would be assigned the responsibility of developing a mechanism for assigning countries to the six risk categories specified above. Banks may be allowed to adopt a more conservative categorisation of the countries.

Country Risk (CR) Assessment

To begin with, banks may adopt the sovereign ratings of international credit rating agencies. However, banks should eventually put in place appropriate systems to move over to internal assessment of country risk within a prescribed period, say by 31 March 2005. Banks may adopt the ratings of any of the international credit rating agencies during the transition period. In case there is divergence in the ratings accorded to any country by the international credit rating agencies, banks may adopt the lower/ lowest of the ratings.

Banks should also evolve sound systems for measuring and monitoring country risk. The system should be able to identify the full dimensions of country risk as well as incorporating features that acknowledge the links between credit and market risk. Banks should use a variety of internal and external sources as a means to measure country risk. Banks should not rely solely on rating agencies or other external sources as their only country risk-monitoring tool. Banks should also incorporate information from the relevant country managers of their foreign branches into their country risk assessments. However, the rating accorded by a bank to any country should not be better than the rating of that country by the international rating agency.

The frequency of periodic reviews of country risk ratings should be at least once a year with a provision to review the rating of specific country, based on any major events in that country, where bank exposure is high, even before the next periodical review of the ratings is due.

Fixing of country limits

Bank Boards may set country exposure limits in relation to the bank's regulatory capital (Tier I + Tier II) with sub-limits, if considered necessary for products, branches, maturity etc. The basis for setting the limits for the country/ category shall be left to the discretion of the banks' Boards. The country exposure limits set by the Board should be reviewed periodically.

Exposure limit for any country should not exceed its regulatory capital, except in the case of insignificant risk category. In respect of foreign banks, the regulatory capital would be the capital held in their Indian books.

Banks may also set up regional exposure limits for country groups, at the discretion of their Boards. The Board may decide on the basis for grouping of countries and also lay down the guidelines regarding all aspects of such regional exposure limits.

Monitoring of country exposures

Banks should monitor their country exposures on a weekly basis before switching over to real-time monitoring. However, exposures to high-risk (and above) categories should be monitored on a real-time basis. Banks should switchover to real-time monitoring of country exposures (all categories) by 31st March 2004.

Boards should review the country risk exposures at every meeting. The review should include progress in establishing internal country rating systems, compliance with the regulatory and the internal limits, results of stress tests and the exit options available to the banks in respect of countries belonging to 'high risk & above' categories.

Management of country risk should incorporate stress testing as one method to monitor actual and potential risks. Stress testing should include an assessment of the impact of alternative outcomes to important underlying assumptions. Country risk management processes employed by banks would require adequate internal controls that include audits or other appropriate oversight mechanisms to ensure the integrity of the information used by senior officials in overseeing compliance with policies and limits.

THE BASEL COMMITTEE ON CREDIT RISK MANAGEMENT

The Basel Committee, established by the central-bank Governors of the Group of Ten countries at the end of 1974, meets regularly four times a year. It has about thirty technical working groups and task forces, which also meet regularly.

The Committee's members come from Belgium, Canada, France, Germany, Italy, Japan, Luxembourg, the Netherlands, Spain, Sweden, Switzerland, United Kingdom and United States. Countries are represented by their central bank and also by the authority with formal responsibility for the prudential supervision of banking business where this is not the central bank.

It formulates broad supervisory standards and guidelines and recommends statements of best practice in the expectation that individual authorities will take steps to implement them through detailed arrangements - statutory or otherwise - which are best suited to their own national systems. In this way, the Committee encourages convergence towards common approaches and common standards without attempting detailed harmonisation of member countries' supervisory techniques.

PRINCIPLES FOR MANAGEMENT OF CREDIT RISK GIVEN BY THE COMMITTEE

1. While financial institutions have faced difficulties over the years for a multitude of reasons, the major cause of serious banking problems continues to be directly related to lax credit standards for borrowers and counter parties, poor portfolio risk management, or a lack of attention to changes in economic or other circumstances that can lead to a deterioration in the credit standing of a bank's counter parties. This experience is common in both G-10 and non-G-10 countries.

2. Credit risk is most simply defined as the potential that a bank borrower or counter party will fail to meet its obligations in accordance with agreed terms. The goal of credit risk management is to maximise a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. Banks need to manage the credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Banks should also

consider the relationships between credit risk and other risks. The effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organisation.

3. For most banks, loans are the largest and most obvious source of credit risk; however, other sources of credit risk exist throughout the activities of a bank, including in the banking book and in the trading book, and both on and off the balance sheet. Banks are increasingly facing credit risk (or counterparty risk) in various financial instruments other than loans, including acceptances, interbank transactions, trade financing, foreign exchange transactions, financial futures, swaps, bonds, equities, options, and in the extension of commitments and guarantees, and the settlement of transactions.

4. Since exposure to credit risk continues to be the leading source of problems in banks world-wide, banks and their supervisors should be able to draw useful lessons from past experiences. Banks should now have a keen awareness of the need to identify, measure, monitor and control credit risk as well as to determine that they hold adequate capital against these risks and that they are adequately compensated for risks incurred. The Basel Committee is issuing this document in order to encourage banking supervisors globally to promote sound practices for managing credit risk. Although the principles contained in this paper are most clearly applicable to the business of lending, they should be applied to all activities where credit risk is present.

5. The sound practices set out in this document specifically address the following areas: (i) establishing an appropriate credit risk environment; (ii) operating under a sound credit-granting process; (iii) maintaining an appropriate credit administration, measurement and monitoring process; and (iv) ensuring adequate controls over credit risk. Although specific credit risk management practices may differ among banks depending upon the nature and complexity of their credit activities, a comprehensive credit risk management program will address these four areas. These practices should also be applied in conjunction with sound practices related to the assessment of asset quality, the adequacy of provisions and reserves, and the disclosure of credit risk, all of which have been addressed in other recent Basel Committee documents.¹

6. While the exact approach chosen by individual supervisors will depend on a host of factors, including their on-site and off-site supervisory techniques and the degree to which external auditors are also used in the supervisory function, all members of the Basel Committee agree that the principles set out in this paper should be used in evaluating a bank's credit risk management system. Supervisory expectations for the credit risk management approach used by individual banks should be commensurate with the scope and sophistication of the bank's activities. For smaller or less sophisticated banks, supervisors need to determine that the credit risk management approach used is sufficient for their activities and that they have instilled sufficient risk-return discipline in their credit risk management processes. The Committee stipulates in Sections II to VI of the paper, principles for banking supervisory authorities to apply in assessing bank's credit risk management systems. In addition, the appendix provides an overview of credit problems commonly seen by supervisors.

7. A further particular instance of credit risk relates to the process of settling financial transactions. If one side of a transaction is settled but the other fails, a loss may be incurred that is equal to the principal amount of the transaction. Even if one party is simply late in settling, then the other party may incur a loss relating to missed investment opportunities. Settlement risk (i.e. the risk that the completion or settlement of a financial transaction will fail to take place as expected) thus includes elements of liquidity, market, operational and reputational risk as well as credit risk. The level of risk is determined by the particular arrangements for settlement. Factors in such arrangements that have a bearing on credit risk include: the timing of the exchange of value; payment/settlement finality; and the role of intermediaries and clearing houses.