

CREDIT RISK MANAGEMENT

Introduction

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.

The term **credit risk** is defined, “as the potential that a borrower or counter-party will fail to meet its obligations in accordance with agreed terms”.

In simple terms it is the probability of loss from a credit transaction.

Loans are the largest and most obvious source of credit risk. Loans are given by banks in the form of corporate lending, sovereign lending, project financing and retail lending. However other sources of credit risk exists throughout the activities of banks, including in the banking book and in the trading book and both on and off the balance sheet. Banks are increasingly facing credit risk in various 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.

Credit risk encompasses both default risk and market risk. Default risk is the objective assessment of the likelihood that counterparty will default. Market risk measures the financial loss that will be experienced should the client default.

Credit risk includes not only the current replacement value but also the potential loss from default.

The components of credit risk are:

- ❖ Credit growth in the organization and composition of the credit folio in terms of sectors, centers and size of borrowing activities so as to assess the extent of credit concentration.
- ❖ Credit quality in terms of standard, sub-standard, doubtful and loss-making assets.
- ❖ Extent of the provisions made towards poor quality credits.
- ❖ Volume of off-balance-sheet exposures having a bearing on the credit portfolio.

Thus credit involves not only funds outgo by way of loans and advances and investments, but also contingent liabilities. Therefore, credit risk should cover the entire gamut of an organisation's operations whose ultimate 'loss factor' is quantifiable in terms of money.

According to Reserve Bank of India, the following are the forms of credit risk:

- ❖ Non-repayment of the principal of the loan and/or the interest on it.
- ❖ Contingent liabilities like letters of credit/guarantees issued by the bank on behalf of the client and upon crystallization – amount not deposited by the customer.
- ❖ In the case of treasury operations, default by the counter-parties in meeting the obligations.
- ❖ In the case of securities trading, settlement not taking place when it is due.
- ❖ In the case of cross-border obligations, any default arising from the flow of foreign exchange and/or due to restrictions imposed on remittances out of the country.

Credit Risk Management Framework

Banks need to manage credit risk inherent in the entire portfolio as well as risk in individual credits or transactions. The effective management of credit risk is a critical component of a comprehensive approach of risk management and essential to long term of any banking organization. Banks for this purpose incorporates proper framework for credit risk management (CRM), which includes,

- (a) Policy framework
- (b) Credit risk rating framework
- (c) Credit risk limits
- (d) Credit risk modeling
- (e) RAROC pricing
- (f) Risk mitigants
- (g) Loan review mechanism/credit audit

A. Policy framework:

Given the fast changing, dynamic world scenario experiencing the pressure of globalisation, liberalisation, consolidation and disintermediation, it is important that banks must have robust credit risk management policies (CRMPs) and procedures, which are sensitive and responsive to these changes. In any bank, the corporate goals and credit culture are closely linked and an effective CRM framework requires the following distinct building blocks: (1) Strategy and policy, (2) organization, and (3) operations/systems.

1. Strategy and policy:

Strategy and policies includes defining credit limits, the development of credit guidelines and the identification and assessment of credit risk. Banks should develop its own credit risk strategy defining the objectives for the credit granting function. This strategy should spell out clearly the organisation's credit limits and acceptable level of risk-reward trade-off at both macro and micro levels. The credit risk strategy should provide continuity in approach, and take into account the cyclical aspects of any economy and the resulting shifts in the composition and quality of the overall credit portfolio. This strategy should be viable in the long run and through various credit cycles.

Credit policies and procedures should necessarily have the following elements:

- ❖ Banks should have written policies that define target markets, risk acceptance criteria, credit approval authority, credit origination and maintenance procedures and guidelines for portfolio management and remedial management.
- ❖ Sound procedures to ensure that all risks associated with requested credit facilities are promptly and fully evaluated by the relevant lending and credit officers.

- ❖ Banks should establish proactive CRM practices like annual/half yearly industry studies and individual obligor reviews, periodic credit calls that are documented, periodic plant visits, and at least quarterly management reviews of troubled exposures/weak credits.
- ❖ Procedures and systems, which allow for monitoring financial performance of customers and for controlling outstanding within limits.
- ❖ Systems to manage problem loans to ensure appropriate restructuring schemes. A conservative policy for the provisioning of non-performing advances should be followed.
- ❖ Banks should have a consistent approach towards early problem recognition, the classification of problem exposures, and remedial action and maintain a diversified portfolio of risk assets in line with the capital desired to support such a portfolio.

2. Organisational structure:

Banks should have an independent group responsible for the CRM. The responsibilities of this team are the formulation of credit policies, procedures and controls extending to all of its credit risk arising from corporate banking, treasury, credit cards, personal banking, trade finance, securities processing, payments and settlement systems.

3. Operations/systems:

Banks should have in place an appropriate credit administration, measurement and monitoring process.

The credit process typically involves the following phases:

- ❖ Relationship management phase, that is, business development,
- ❖ Transaction management phase to cover risk assessment, pricing, structuring of the facilities, obtaining internal approvals, documentation, loan administration and routine monitoring and measurement, and
- ❖ Portfolio management phase to entail the monitoring of portfolio at a macro level and the management of problem loans.

The banks should have systems in place for reporting and evaluating the quality of the credit decisions taken by the various officers.

Banks must have a MIS to enable them to manage and measure the credit risk inherent in all on and off-balance sheet activities. It should provide adequate information on the composition of the credit portfolio, including identification of any concentration of risk.

B. Credit risk-rating framework:

A credit risk-rating framework deploys a number/alphabet/symbol as a primary summary indicator of risks associated with a credit exposure. These rating frameworks are logic-based, utilize responses made on a specified scale and promote the accuracy and consistency of the judgement exercised by the banks.

For loans to individuals or small businesses, credit quality is typically assessed through a process of **credit scoring**. Prior to extending credit, a bank or other lender will obtain information about the party requesting a loan. In the case of a bank issuing credit cards, this might include the party's annual income, existing debts, whether they rent or own a home, etc. A standard formula is applied to the information to produce a number, which is called a credit score. Based upon the credit score, the lending institution decides whether or not to extend credit. The process is formulaic and highly standardized.

Many forms of credit risk—especially those associated with larger institutional counterparties—are complicated, unique or are of such a nature that that it is worth assessing them in a less formulaic manner. The term **credit analysis** is used to describe any process for assessing the credit quality of counterparty. While the term can encompass credit scoring, it is more commonly used to refer to processes that entail human judgement. One or more people, called **credit analysts**, review information about the counterparty. This might include its balance sheet, income statement, recent trends in its industry, the current economic environment, etc. They may also assess the exact nature of an obligation. For example, secured debt generally has higher credit quality than does subordinated debt of the same issuer. Based upon their analysis, they assign the counterparty (or the specific obligation) a **credit rating**, which can be used for making credit decisions.

Many banks, investment managers and insurance companies hire their own credit analysts who prepare credit ratings for internal use. Other firms—including Standard & Poor's, Moody's and Fitch—are in

the business of developing credit ratings for use by investors or other third parties. Institutions that have publicly traded debt hire one or more of them to prepare credit ratings for their debt. In the United States, the National Association of Insurance Commissioners publishes credit ratings that are used for calculating capital charges for bond portfolios held by insurance companies.

Exhibit 1 indicates the system of credit ratings employed by Standard & Poor's. Other systems are similar.

Standard & Poor's Credit Ratings	
Exhibit 1	
AAA	Best credit quality—Extremely reliable with regard to financial obligations.
AA	Very good credit quality—Very reliable.
A	More susceptible to economic conditions—still good credit quality.
BBB	Lowest rating in investment grade.
BB	Caution is necessary—Best sub-investment credit quality.
B	Vulnerable to changes in economic conditions—Currently showing the ability to meet its financial obligations.
CCC	Currently vulnerable to nonpayment—Dependent on favorable economic

<p>conditions.</p> <p>CC</p> <p>Highly vulnerable to a payment default.</p> <p>C</p> <p>Close to or already bankrupt—payment on the obligation currently continued.</p> <p>D</p> <p>Payment default on some financial obligation has actually occurred.</p>
<p>This is the system of credit ratings Standard & Poor's applies to bonds.</p> <p>Other credit rating systems are similar.</p>

C. Credit risk limits:

For managing credit risk, a bank generally sets an exposure credit limit for each counterparty to which it has credit exposure. This is standard procedure in many contexts. It could be a corporate loan, individual loan or a derivative dealer transacting with counterparties. All entail credit risk. All are contexts where credit exposure limits are used. A bank may also use aggregate credit exposure limits. A bank might set credit exposure limits by industry. It might also set a total exposure credit limit for all its corporate lending activities. Exposures are calculated with the help of credit risk models.

Depending on the assessment of the borrower (commercial as well as retail) a credit exposure limit is decided for the customer, however, within the framework of a total credit limit for the individual divisions and for the company as a whole. Also within the limit as per RBI, i.e. not more than 20% of capital to individual borrower and not more than 40% of capital to a group borrower.

Threshold limit is set depending on the:

- ❖ Credit rating of the borrower

- ❖ Past financial records
- ❖ Willingness and ability to repay
- ❖ Borrower's future cash flow projections.

D. Credit risk modeling:

Credit risk models used by banks are (1) Altman's Z score model, (2) Credit metrics model, (3) Value at risk model, (4) KMV Model.

1. Altman's Z score Model

Altman's Z score predicts whether or not a company is likely to enter into bankruptcy within one or two years. Edward Altman developed the "ALTMAN Z-SCORE" by examining 85 manufacturing companies in the year 1968. Later, additional "Z-Scores" were developed for private manufacturing companies (Z-Score - Model A) and another for general/service firms (Z-Score - Model B).

The Z-Score Bankruptcy-Predictor combines several of the most significant variables in a statistically derived combination. It was originally developed on a sampling of manufacturing firms. However, the algorithm has been consistently reported to have a 95 % accuracy of prediction of bankruptcy up to two years prior to failure on non-manufacturing firms as well. There has been many other bankruptcy predictors developed and published. However, none has been so thoroughly tested and broadly accepted as the Altman Z-Score.

The Altman Z-Score variables influencing the financial strength of a firm are: current assets, total assets, net sales, interest, total liability, current liabilities, market value of equity, earnings before taxes and retained earnings.

Value of Z is as follows

$$Z = 0.012X1 + 0.014X2 + 0.033X3 + 0.006X4 + 0.999X5$$

Where,

$$X1 = \text{working capital/Total assets}$$

X2 = Retained earnings/Total assets

X3 = Earnings before interest and taxes/Total assets

X4 = Market value of equity/Book value of total liabilities

X5 = Sales/Total assets

When Z score of the firm is

3.0 Or more: Most likely safe based on the financial data. Mismanagement, fraud, economic downturns, and other factors may cause an unexpected reversal.

2.8 to 3.0: Probably safe to predict survival, but this is a portion of the gray area and is below the threshold of relative safety.

1.8 to 2.7: Likely to be bankrupt within two years. This is the lower portion of the gray area and dramatic action may be required.

Below 1.8: Highly likely headed for bankruptcy. Rarely would a firm be expected to recover from a financial condition generating this or lower scores.

2. Credit Metrics Model

Credit Metrics is a statistical model developed by J.P Morgan, the investment bank, in the year 1995 for internal use, but now it's being used all around the world by hundreds of banks. This model works on the statistical concepts like probability, means, and standard deviation, correlation, and concentrations. This model was developed with 3 objectives in the forefront:

- ❖ To develop a Value at Risk (VAR) framework applicable to all the institutions worldwide those carry the credit risks in the course of their businesses.
- ❖ To develop a portfolio view showing the credit event correlation which can identify the costs of concentrations and the benefits of diversification in a mark to market framework?

- ❖ To apply it in making the following decisions: Investment decisions, risk mitigating actions, determining the risk based credit limits across the portfolio, and rational risk based capital allocations.

Credit Metrics is a tool for assessing portfolio risk due to changes in debt value caused by changes in obligor credit quality. This model includes the changes in value caused not only by possible default events, but also by upgrades and down grades in credit quality, because the value of a particular credit varies with the corresponding credit quality. Credit Metrics also assess the Value-at-risk (VAR) – the volatility of value- not just the expected losses. The model assesses the risk within the full context of a portfolio addressing the correlation of credit quality moves across obligors. This allows to directly calculating the diversification benefits or potential over concentrations across the portfolio.

The transition table for the various categories of bonds is determined and then joint probability for both these under different combinations. Then the NPV of the portfolio is determined for all the combinations and a probability distribution is constructed. These probabilities are actually an analysis of past migrations and same is the case with default probability. In the case of default a recovery rate is taken as the portfolio value. This distribution gives us 2 measures of credit risk: standard deviation and percentile level.

Credit Metrics has the following applications:

- ❖ **Reduce the portfolio risk:** There are 3 options available: reevaluate obligors having the largest absolute size arguing that a single default among these would have the greatest impact, reevaluate obligors having the highest percentage level of risk arguing that these are the most likely to contribute to portfolio losses, reevaluate obligors contributing the largest absolute amount of risk arguing that these are the single largest contributors to portfolio risk. The last categories are the "fallen angels" whose large exposures were created when their credit ratings were better, but who now have much higher percentage risk due to recent downgrades.
- ❖ **Limit setting:** Of course, what types of risk measure to use for limits, as well as what type of policy to take with regard to the limits are management decisions. A user might use the credit

metrics for 2 different purposes namely what type of limit to set, which risk measure to use for the limits and what policy to employ with regard to the limits. These limits could be set in terms of percentage risk, exposure size and absolute risk.

- ❖ Identifying the correlations across the portfolio so that the potential concentration may be reduced and the portfolio is adequately diversified across the uncorrelated constituents. Concentration may lead to an undue accumulation of risk at one point.

This model has some limitations regarding the data availability but it doesn't require any changes as such for application in the Indian scenario.

3. Value at Risk Model

This model is being used in some of the banks currently in India.

Value at risk (VAR) is a statistical risk measure, which is used extensively for measuring the market risk of portfolios of assets and/or liabilities. Suppose a portfolio's value at risk is 2Mn\$ with a 95% confidence level, then it means that the portfolio is expected to lose a maximum of 2Mn\$ 95% of the times. The Value at risk is calculated by constructing a probability distribution of the portfolio values over a given time horizon. The values may be calculated on the daily, weekly or monthly basis.

4. KMV Model

This model was developed by KMV Corporation based on Merton's (1973) analytical model of firm's value. This model uses stock prices and the capital structure of the firm to estimate its probability. The starting point of this model is the proposition that a firm would default only if its asset value falls below 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 opinion theoretic framework. Using these two values, a metric (distance from default or DFD) is constructed that represents the number of standard deviation that the firm's asset value is away from the default point. Finally, a mapping is done between the default values and actual default rate, based on historical default experience. The resultant probability is called Expected Default Frequency (EDF).

Thus EDF is calculated in following three steps:

- I. Estimation of asset value and asset volatility from equity value and volatility of equity return,

II. Calculation of DFD,

$$\text{DFD} = (\text{Asset value} - \text{Default point}) / (\text{Asset value} * \text{Asset volatility})$$

III. Calculation of expected default frequency.

E. Risk Adjusted Return On Capital (RAROC):

As it became clearer that banks needed to add an appropriate capital charge in the pricing process, the concept of risk adjusting the return or risk adjusting capital was born. RAROC is based on a mark-to-market concept. As defined by Bankers Trust, RAROC allocates a capital charge to a transaction or a line of business at an amount equal to the maximum expected loss (at a 99 percent confidence level) over one year on an after-tax basis. As may be expected, the higher volatility of the returns, the more the capital allocated. The higher capital allocation means that the transaction has to generate cash flows larger enough to offset the volatility of returns, which results from the credit risk, material risk, and other risks taken.

The RAROC process estimates the asset value that may prevail in the worst case scenario and then equates the capital cushion to be provided for the potential loss.

There are four basic steps in this process:

- ❖ Analyse the activity or product and determine the basic risk categories that it contains, for example, interest rate (country, directional, basis, yield curve, optionality), foreign exchange, equity, commodity, and credit and operating risks.
- ❖ Quantify the risk in each category by a market proxy.

Using the historical price movements of the market proxy over the past three years, compute a market risk factor, given by the following equation:

$$\text{RAROC risk factor} = 2.33 * \text{weekly volatility} * \text{square root of 52} * (\text{I} - \text{tax rate})$$

In this equation, the multiplier **2.33** gives the volatility (expressed as per cent) at the 99 per cent confidence level. The term **52** converts the weekly price movement into an amount movement. The term **(1 – tax rate)** converts the calculated value to an after-tax basis.

- ❖ Compute the rupee amount of capital required for each category by multiplying the risk factor by the size of the position. Establishing the maximum expected loss in each product line and linking the capital to this loss makes it possible to compare products of different risk levels by stating the risk side of the risk-reward equation in a consistent manner. The risk-to-reward ratio becomes comparable.

The RAROC is an improvement over the traditional approach in that it allows one to compare two businesses with different risk (volatility of returns) profiles. Using a hurdle rate, a lender can also use the RAROC principle to set the target pricing on a relationship or a transaction. Although not all assets have market price distribution, RAROC is a first step towards examining an institution's entire balance sheet on a mark-to-market basis if only to understand the risk-return trade offs that have been made.

F. Risk mitigants

Credit risk mitigation means reduction of credit risk in an exposure by a safety net of tangible and realisable securities including third-party approved guarantees/insurance.

Banks use a number of techniques to mitigate the credit risks to which they are exposed. Exposures may be collateralised by first priority claims, in whole or in part with cash or securities, a loan exposure may be guaranteed by a third-party, or a bank may buy a credit derivative to offset various forms of credit risk.

Additionally banks may also net the loans owned to them against deposits from the same counter-party.

The various credit risk mitigants laid down by Basel Committee are as follows: **(Refer to page no.17 for detail information)**

1. Collateral (tangible, marketable) securities
2. Guarantees
3. Credit derivatives

4. On-balance-sheet netting

The extent to which a particular credit risk mitigant helps depends on the quantum of exposure, or the strength of the mitigant.

There are certain conditions to be met for the use of credit risk mitigants, which are as follows:

- ❖ All documentation used in collateralized transactions and for documenting on-balance-sheet netting, guarantees, and credit derivative must be binding on all parties and must be legally enforceable in all relevant jurisdictions.
- ❖ Banks must have properly reviewed all the documents and should have appropriate legal opinions to verify such, and ensure its enforceability.

G. Loan review mechanism/credit audit

Credit audit examines the compliance with extant sanction and post-sanction processes and procedures laid down by the bank from time to time. The objectives of credit audit are:

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

CREDIT RISK MITIGANTS AS PER BASEL 2 ACCORD

Recommendations of BASEL II

The Basel II principles are intended to achieve an ongoing improvement of risk management procedures in the loan business. The regulatory treatment of credit risk mitigation has widely been

acknowledged as needing substantial updating. Basel establishes a framework for recognizing the various mitigation techniques of collateral, netting, guarantees and **credit derivatives**.

As per BASEL committee any valid 'hedge' should attract regulatory capital relief. However, hedges are rarely perfect: there will generally be a residual risk element, including an element of operational risk, which will attract a regulatory capital charge.

The various credit risk mitigants laid down by Basel Committee are as follows:

1. Collateral (tangible, marketable) securities
2. Guarantees
3. Credit derivative
4. On-balance-sheet netting.

1. Collateral

A collateralised transaction is one in which: banks have a credit exposure or potential credit exposure in the form of loan of cash or securities, securities posted as collateral or the exposure under the over-the-counter derivative contract, to a counter-party; and

- ❖ that credit exposure is hedged in whole or in part by collateral posted by the counter-party or by a third-party on behalf of the counter-party.

The following requirements must be met:

- ❖ The collateral must be pledged for at least the life of exposure and it must be marked to market and revalued with a minimum frequency of six months.
- ❖ The banks must have clear and robust procedures for the timely liquidation of collateral.
- ❖ Where the custodian holds the collateral, banks must take reasonable steps to ensure that the custodian segregates the collateral from its own assets.

The various collateral instruments eligible for recognition are as follows:

- ❖ Cash on deposit with bank including certificates of deposit or comparable instruments issued by the lending bank,
- ❖ Gold,

- ❖ Debt securities issued by sovereigns and public-sector enterprises that are treated as sovereigns by the national supervisor,
- ❖ And also debt securities listed on the recognised exchange, which are issued by banks.
- ❖ Equities.
- ❖ Mutual funds

The amount of credit exposure of the bank to the counter-party will be reduced to the extent of market value of the collateral posted by the counter-party.

2. Guarantees

A guarantee given on behalf of counter-party must represent a direct claim on protection provider and must be explicitly referenced to specific exposures. In the case of default on part of counter-party, the guarantor shall be bound to pay the amount of credit exposure.

In order for a guarantee to be recognised, following must be satisfied:

- ❖ On the qualifying default/non-payment of the counter-party, the bank may in a timely manner pursue the guarantor for the credit outstanding under the documentation governing the transaction.
- ❖ The guarantee is explicitly documented obligation assumed by the guarantor.
- ❖ The guarantor covers all types of payments the underlying obligor is expected to make under the documentation governing the transaction, for example, notional amount, margin payments, etc.

Credit protection given by the following entities is recognised:

- ❖ Sovereign entities, public-sector enterprises, banks and securities firms, having risk weight lower than that of counter-party,
- ❖ Other entities like parent, subsidiary or affiliated companies, which have risk weight lower than that of counter-party.

3. Credit derivative

Credit derivative is an instrument designed to segregate market risk from credit risk and to allow the separate trading of credit risk. Credit derivatives allow a more efficient allocation and pricing of credit risk. Credit derivatives are privately negotiated bilateral contracts that allow users to manage their exposure to credit risk.

For example, a bank concerned that one of its customers may not be able to repay a loan can protect itself against loss by transferring the credit risk to another party while keeping the loan on its books. This mechanism can be used for any debt instrument or a basket of instruments for which an objective default price can be determined.

Credit derivatives are traded over-the-counter (OTC) in developed markets. OTC trades are contracts negotiated between counterparties that take place outside the regulated exchanges. This permits maximum flexibility in structuring a contract that meets the needs of both parties

Types of Credit Derivative

The product menu in the credit derivatives market is changing every day, but there are four major instruments that make up the bulk of the trading volume today:

- ❖ Total Return Swaps
- ❖ Credit Default Swaps
- ❖ Credit Spread Options and
- ❖ Credit Linked Notes.

Terminology varies among market participants, sometimes based on geography. For example, Credit Default Swaps are sometimes called Credit Swaps.

4. On-balance-sheet netting

Banks involved in swap derivatives can reduce risks by netting agreements. Closeout netting is now a standard provision in the legal documentation of the over-the-counter derivative contract.

Bilateral closeout netting agreements cover a set of 'N' derivatives contracts between two parties. In case of default, counter-party cannot stop payments on contracts that have negative value while demanding payment on positively valued contracts.

Net loss in case of default is the positive sum of the market value of all the contracts in the agreement:

$$\text{Net loss} = \max (\sum V_i, 0)$$

$$i = 1 \text{ to } N$$

In contrast without a netting agreement, the potential loss is the sum of all positive value contracts.

On-balance sheet netting will be fully recognised for the first time, subject to the following operational conditions:

- ❖ An enforceable legal agreement is in place;
- ❖ All assets and liabilities subject to the netting agreement can be precisely determined at any time;
- ❖ Exposures are monitored and controlled on a net basis;
- ❖ Roll-off risk is monitored and controlled; and
- ❖ Assets and liabilities are maturity matched and hedges meet the minimum 1-year residual maturity requirement.

Credit risk mitigants used by different banks

For decades mitigation of credit risk has been mainly achieved through selecting and monitoring borrowers and through creating a well-diversified loan portfolio. More recently, new financial instruments and risk sharing markets have evolved, in particular, markets for credit derivatives virtually exploded during the 1990s.

The Bank for International Settlements in its annual report said that in the early 1990s, the market for credit-risk transfer from banks on to the buyers of securities and loans involved a few billion dollars-worth of loans; by 2002, that figure had grown to more than \$2 trillion.

The different mitigation techniques used by banks are as under:

1. Collateralisation
2. Guarantees
3. Break trade laws
4. Escrow account
5. Insurance
6. Securitisation
7. Equator principle
8. Credit derivative
9. Settlement through Clearing Corporation of India Limited (CCIL)
10. Netting

1. Collateral and margins

Collateral is asset provided to secure an obligation. Traditionally, banks might require corporate borrowers to commit company assets as security for loans. Today, this practice is called **secured lending** or **asset-based lending**. Collateral can take many forms: cash deposits, property, equipment, receivables, oil reserves, marketable securities, bonds, national saving certificates, etc. Collateral levels may be fixed or vary over time to reflect the market value of the deal.

A more recent development is **collateralization arrangements** used to secure repo securities lending and derivatives transactions. Under such arrangement, a party who owes an obligation to another party posts collateral—typically consisting of cash or securities—to secure the obligation. In the event that the party defaults on the obligation, the secured party may seize the collateral. In this context, collateral is sometimes called **margin**.

An arrangement can be unilateral with just one party posting collateral. With two-sided obligations, such as a swap or foreign exchange forward, bilateral collateralization may be used. In that situation, both parties may post collateral for the value of their total obligation to the other. Alternatively, the net obligation may be collateralized—at any point in time; the party who is the net obligator posts collateral for the value of the net obligation.

In a typical collateral arrangement, the secured obligation is periodically marked-to-market, and the collateral is adjusted to reflect changes in value. The securing party posts additional collateral when the market value has risen, or removes collateral when it has fallen.

The collateral agreement should specify:

- ❖ **Acceptable collateral:** A secured party will usually prefer to receive highly rated collateral such as Treasuries or agencies. Collateral whose market value is volatile or negatively correlated with the value of the secured obligation is generally undesirable.
- ❖ **Frequency of margin calls:** Because both the value of an obligation and the value of posted collateral can change over time, a secured party typically wants to mark-to-market frequently, issuing a **margin call** to the securing party for additional collateral when needed.
- ❖ **Haircuts:** In determining the amount of collateral that must be posted, haircuts are applied to the market value of various types of collateral. For example, if a 1% haircut is applied to Treasuries, then Treasuries are valued at 99% of their market value.
- ❖ **Valuation:** A methodology for marking both the obligation and the collateral to market must be agreed upon. Collateral must be mark-to-market valued
- ❖ **Lien on collateral:** Banks must have the right to seize the collateral in the event of default of the counterparty, without the interference from the courts. Banks must have lien on the collaterals it possesses. In the case of marketable securities, government bonds, national saving certificates, etc; the bank should have right to realize such collateral in the event of default.
- ❖ **Closeout and termination clauses:** The parties must agree under what circumstances the obligation will be terminated. The form of a final settlement in the event of such termination—and the role of the collateral in such settlement—is specified.

Types of collateral, Amount of collateral and margin requirements:

Sr.No	Nature of collateral	Sub nature of collateral	Exposure against collateral (percentage)	Margin requirement (percentage)
1.	Cash deposits	a. Same currency	100%	Nil
		b. Different currency	90% to 95%	10% to 5%
2.	Fixed Assets	a. Plant & Machinery	75% to 80 %	25% to 20 %
		b. Land and building (for commercial as well as residential purpose)	70% to 80%	30% to 20%
		c. Vehicle	70% to 75%	30% to 25%
3.	Fixed deposits	a. With banks	80% to 85%	20% to 15%
		b. National saving certificates	75% to 85%	25% to 15%
		c. Government bonds	80%	20%
4.	Marketable securities		50%	50%

2. Guarantees

Banks take guarantee on behalf of their customer as a credit risk mitigation technique. Guarantees of following entities are approved by the banks:

- ❖ Guarantees from other banks including central bank
- ❖ Guarantees from government
- ❖ Guarantees from parent/associate of that company having stronger entity
- ❖ Guarantees from the director/trustees of the company
- ❖ Guarantees from inter-bank/ inter-branch
- ❖ Guarantee from a third party

The conditions to be met, when issue of loans against guarantees are as follows:

- ❖ All the terms and conditions for a guarantee must be clearly documented and made available to all parties involved in processing loans
- ❖ Care should be taken where guarantees are time bound that the expiry date of the guarantee does not pass without a new guarantee or an extension of the old one is received.

3. Break Trade laws

Banks use technique such as break trade laws/termination clause, i.e. they have a mutual contract whereby they can exit from the trade in the event of any type of default on the part of borrower.

4. Escrow account

Escrow account is one of the techniques used by the banks to recover their repayment from the borrower, thereby reducing their loan exposure.

Escrow account is an amount set aside to keep the money that is owed by one party to another. Bank asks the borrower to open an escrow account with the trustee bank for repayment in the event of default. Both the parties decide when the money is to be transferred in the escrow account, depending on that the borrower puts the money in such account and the escrow agent pays the part of the money to

the lending bank in charge of loan. Escrow account is also maintained by the borrower to pay the lending bank at the expiry of their loan contract. This technique enables bank to recover loan from the escrow account.

5. Insurance

Banks lending against collateral, such as lending for housing property, insure such property with the insurance company. Insurance enables banks to recover their loss in the case of uncertain event. Thus, an insurance policy may provide for compensation in the event that a party defaults.

6. Securitisation

The **Securitisation and Reconstruction of Financial Assets Act** enables bank and FIs to recover some of the amounts from the existing NPAs.

Securitisation involves the pooling or repackaging of asset (e.g. a portfolio of loans or a group of accounts) for sale to an entity that then sells securities backed by the assets to the investors. A service is retained by the entity to service the loans or work the accounts, thus providing the entity with the projected and necessary cash flow to pay back the investors within the appropriate time frame. Banks package and sell large corporate loans to the institutional and individual investors. Thus, securitisation enables banks to transfer its loan exposure to other entity. This is also one of the techniques used by banks to reduce their loan exposure.

7. Equator principles

The Equator Principles - a voluntary set of guidelines developed for managing social and environmental issues related to the financing development projects - apply only to projects which cost \$50 million or more, as those costing less represent only 3 per cent of the market.

Banks adopting the Equator Principles undertake to provide loans only to projects whose sponsors can demonstrate their ability and willingness to comply with comprehensive processes aimed at ensuring that projects are developed in a socially responsible manner and according to sound environmental management practices.

Equator principle involves following steps:

- ❖ The banks, to begin with, agree upon a common terminology in categorising projects into high, medium and low environmental and social risk, based on the International Finance Corporation's (IFC) categorisation process. They apply this to projects globally and to all industry sectors such as mining, oil and gas and forestry, so as to ensure consistent approaches in their dealings with high- and medium-risk projects.
- ❖ Banks ask their customers to demonstrate in their environmental and social reviews, and in their environmental and social management plans, the extent to which they have met the applicable World IFC safeguard policies, or to justify exceptions to them. This practice allows them to secure information of the quality required for them to make judgments. And then again, the banks insert into the loan documentation for high- and medium-risk projects covenants for borrowers to comply with their environmental and social management plans.

The Equator Principles enables banks to better assess, mitigate, document and monitor the credit risk and reputation risk associated with financing development projects.

Application of equator principle to Indian banks

As Indian financial institutions (including banks) can hardly be described as major players in the funding of infrastructure projects at a global level, the fact remains that their adoption of the Equator Principles to guide their lending within the country would have given a major fillip to India's environmental initiative, as their lending to infrastructure projects is restricted to those that have secured the environmental clearances mandated by statute.

8. Credit derivative

Credit derivative is an instrument designed to segregate market risk from credit risk and to allow separate trading of credit risk. Credit derivatives allow a more efficient allocation and pricing of credit risk. Credit derivatives are privately negotiated bilateral contracts that allow users to manage their exposure to credit risk. For example, a bank concerned that one of its customers may not be able to repay a loan can protect itself against loss by transferring the credit risk to another party while keeping the loan on its books. This mechanism can be used for any debt instrument or a basket of instruments for which an objective default price can be determined.

Credit derivatives are traded over-the-counter (OTC) in developed markets. OTC trades are contracts negotiated between counterparties that take place outside the regulated exchanges. This permits maximum flexibility in structuring a contract that meets the needs of both parties

Credit derivatives take many forms. Three basic structures include:

- ❖ **Credit default swap:** Two parties enter into an agreement whereby one party pays the other a fixed periodic coupon for the specified life of the agreement. The other party makes no payments unless a specified credit event occurs. Credit events are typically defined to include a material default, bankruptcy or debt restructuring for a specified reference asset. If such a credit event occurs, the party makes a payment to the first party, and the swap then terminates. The size of the payment is usually linked to the decline in the reference asset's market value following the credit event.

- ❖ **Total return swap:** Two parties enter an agreement whereby they swap periodic payment over the specified life of the agreement. One party makes payments based upon the total return coupons plus capital gains or losses—of a specified reference asset. The other makes fixed or floating payments as with a vanilla interest rate swap. Both parties' payments are based upon the same notional amount. The reference asset can be almost any asset, index or basket of assets.

- ❖ **Credit linked note:** A debt instrument is bundled with an imbedded credit derivative. In exchange for a higher yield on the note, investors accept exposure to a specified credit event. For example, a note might provide for principal repayment to be reduced below par in the event that a reference asset defaults prior to the maturity of the note.

The fundamental difference between a credit default swap and a total return swap is the fact that the credit default swap provides protection against specific credit events. The total return swap provides protection against loss of value irrespective of cause—a default, market sentiment causing credit spreads to widen.

Credit derivatives have helped financial organizations to transfer credit risk from one party to another to effectively manage credit risk. Now, banks and investors can isolate credit risk from the inherent influences of the underlying lending relationship. This new opportunity also helps the personal credit sector to expect significantly reduced capital charges. Studies published by the Bank for International Settlements demonstrate that, for a given sample of international banks, capital charges would fall down an average of 33%. Certain banks can expect a much greater reduction. A savings of 33% of capital would permit the extension of 33% more credit, and therefore, lead to significant rise in a bank's profitability.

The benefits associated with credit derivatives:

- ❖ A loan portfolio manager can achieve any of the following objectives through credit derivatives:
- ❖ Control credit risks of any debt instrument or basket of instruments by selling or transferring the credit exposure of the portfolio
- ❖ Reduce a particular risk concentration in the portfolio
- ❖ Create synthetic assets tailored to meet their needs
- ❖ Provide a diverse menu of global exposures to achieve portfolio diversification
- ❖ Gain exposure to another bank's loan portfolio without participating in the syndicate.
- ❖ In credit derivative arrangement for e.g. default swap, the buyer can define all the credit events under which protection buyer can claim such as bankruptcies, failure to pay, restructuring, repudiation/moratorium, obligation default and obligation acceleration.
- ❖ In credit derivative arrangement, specifically to hedge against that risk of loss, the counterparty is obliged to pay the originating party on the occurrence of the credit event whether or not the originating party has actually suffered a loss.

Growth of Credit derivative in India

Credit derivatives are contracts seeking to transfer an asset's risk and returns from one counter party to another without transferring the ownership. Though these tools currently have a limited presence in

India, their market could see an explosive growth given the needs for the product and thrust from key areas.

Most Indian nationalized banks are saddled with NPAs to the tune of 5-6% of their total asset base. Given the current disbursement patterns and government policies, NPAs are likely to accrue to these banks in the future as well. This creates an obvious need for credit protection for these banks. However, in the Indian context, the sell side market is absent. For the segment to develop, the sellers of credit protection need to be able to hedge their risks, enabling them to quote a price for the protection they are selling. It is in this regard that the government and the local regulators can aid the development of a credit derivative market by providing impetus in the following areas-

- ❖ **Improving the breadth of the Debt Market:** Liquidity in the bond market is a must for the derivative market to take off. Current liberalization measures have led the insurance sector to open up, possibly improving liquidity at the long end of the curve. Due to its long-bond positions, the insurance sector, globally, has been historically a seller of credit derivatives (contributing 23% to the sell side in UK in 1999).
- ❖ **Convertibility of INR:** has been a long-standing demand of most corporates. Once implemented, this would attract more multinational banks to the Indian market. Given the freedom, they would definitely enter the FX option market, through which they can synthetically trace the long-term yield curve. And, as a direct consequence, the Swap market would also take off, given the high correlation between these markets.
- ❖ **Need for Standardization:** The proposed set of new regulations by the BIS seeks to attach a risk weightage commensurate with the credit ratings, giving in to long standing demands of industry insiders. This would force banks to buy protection against lower rated loans, to ensure that they fulfill the 8% adequacy norm. It is also proposed to provide significant capital relief to the protection buyer and capital charge to the seller.
- ❖ **Need for Structured Products:** Securitization is fast gaining acceptance in the Indian markets. Given the coupling with credit derivatives that exists in some securitization deals, the

growth of securitization could possibly signal the entry of the related product. Such a product would look to transfer the credit risk from the bank to the SPV by way of a credit derivative.

- ❖ **Consolidation in the Banking Industry:** One of the major reasons for the success of Credit derivatives in the European markets is the extent of corporate loans. Additionally, a few large banks typically control most of the corporate debt. Therefore, finding a counter party for a credit swap is not too difficult. However, in India, the banking sector is fragmented, with the top 10 players commanding only 45% of the market.

9. Clearing Corporation of India Limited (CCIL)

Clearing Corporation of India Limited (CCIL) has been promoted by leading banks and financial institutions (SBI, IDBI, LIC, ICICI, Bank of Baroda and HDFC Bank) operating in India to address the need for an integrated clearing and settlement system for debt and forex transactions.

For participants in the forex market, CCIL's intermediation provides a structure to mitigate, and manage, the risks associated with the settlement of these high-value transactions. Since the foreign currency leg has necessarily to be settled overseas while the rupee leg gets settled locally, time-zone differences come into the picture, adding to the settlement risk. Besides bringing tangible benefits in the form of improved efficiency and easier reconciliation of accounts with their correspondent banks, CCIL's intermediation in the settlement process brings the benefit of lower cost to the participating banks.

CCIL at present guarantees settlement of trades of its members concluded in the debt and forex market. The debt market trades are the ones that are carried out on the NDS (Negotiated Dealing System) and come to CCIL for settlement. The forex trades carried out by the dealers on their respective trading system are sent to CCIL for settlement.

CCIL clears and settles trades of its members transacted on Reserve Bank of India's NDS. The trades include normal outright trades, forward outright trades, normal repo / reverse repo trades (other than RBI-repo) and forward repo / reverse repo trades for government securities and Treasury Bills. The

settlement of these trades is guaranteed by CCIL through a process called novation whereby CCIL becomes central counterparty for each trade.

CCIL also clears and settles inter-bank forex trades in India. These are initially rupee-based US dollar spot and forward trades, later cash and trades would also get settled through CCIL. In future, CCIL also proposes to handle trades in other currencies. The settlement of these trades will be guaranteed by CCIL through the legal process called novation.

Collateralised borrowing and lending obligation (CBLO) trading system

To expand the depth of the debt market in India, CCIL has provided a trading platform to the market participants for undertaking collateralised borrowing and lending by offering repoable securities and bonds as collateral.

By providing the CBLO trading system, CCIL has achieved the following objectives:

- ❖ Facilitating easy liquidity in the repo market
- ❖ Enhancing the depth of the market through wider participation by corporate, MFs, trusts etc
- ❖ Providing non-bank entities suitable opportunities for short-term investment (other than call money market)
- ❖ Reducing the counter-party and default risk by ensuring suitable settlement mechanism
- ❖ Elimination of market inefficiency in short-term borrowing and lending
- ❖ Development of market-oriented short-term reference rate for inter-bank transactions.

Forex trading system

By providing the forex trading system, CCIL has achieved the following objectives

- ❖ Reduction in the cost of forex transactions by providing cost-efficient trading terminals
- ❖ Enhanced value-added trading feature capability, which would meet the real needs of market relating with forex transactions
- ❖ Enhanced depth of the market through wider participation by banks

- ❖ Mitigating the counter-party and default risk by ensuring suitable settlement mechanism interfacing with the trading system – forex.

Thus by choosing to settle their trades through CCIL, the market participants will be benefited in the following ways:

- ❖ Assurance of settlement on the settlement date
- ❖ Reduction in counterparty exposure. (In case of government securities, the exposure will get extinguished upon acceptance of trades for settlement; in forex clearing and settlement, since a loss allocation procedure is stipulated, the exposure will not get extinguished but will come down from the gross level to the net level.)
- ❖ Operational efficiency
- ❖ Easier reconciliation of accounts (in case of forex trades)
- ❖ Improved liquidity and better leveraging (e.g., shorter holding periods for government securities)
- ❖ Lower operational cost.

10. Netting

Netting is one of the techniques considered by Basel 2 accord for reduction of credit exposure to counterparties.

Netting means the occurrence of any or all of the followings:

1. The termination or acceleration of payment or delivery obligations or entitlement under one or more qualified financial contracts entered into under netting agreement;
2. The calculation or estimation of a closeout value, market value, liquidation value, or replacement value in respect of each obligation or entitlement terminated and/or accelerated;
3. The conversion of any values calculated under (2) into a single currency;
4. The offset of any values calculated under (2), as converted under (3);

Netting arrangement means:

- ❖ Any agreement between two parties that provides for netting of present or future payment or delivery obligations or entitlements arising under or in connection with one or more qualified financial contracts entered into thereunder by the parties to the agreement, and,
- ❖ Any collateral arrangement related to one or more of the foregoing.

“Qualified financial contract” means any financial contract, including any terms and conditions incorporated by reference in any such financial contract, pursuant to which payment or delivery obligations that have a market or an exchange price are due to be performed at a certain time or within a certain period of time. Qualified financial contract include:

- ❖ A currency, cross-currency or interest rate swap agreement;
- ❖ A basis swap agreement;
- ❖ A spot, future, forward or other foreign exchange agreement;
- ❖ A cap, collar or floor transaction;
- ❖ A commodity swap;
- ❖ A forward rate agreement;
- ❖ A currency or interest rate future;
- ❖ A currency or interest rate option;
- ❖ Equity derivatives;
- ❖ Credit derivatives;
- ❖ Spot, future, forward or other commodity contract;
- ❖ A repurchase agreement;
- ❖ An agreement to buy, sell, borrow or lend securities, such as a securities lending transaction;
- ❖ A title collateral arrangement;
- ❖ An agreement to clear or settle securities transactions or to act as depository for securities;
- ❖ Any agreement or contract designated as such by the Bank under this Act.

Types of netting:

1. Position/payment netting

Position netting (also called as payment netting) is a form of offset under which two banks informally arrange to make one net payment between them, for each currency and value date for which several amounts are due. Because there is no change in their contractual obligations, the credit risks between the parties are unchanged, and they remain legally obligated for the gross amounts of their transactions. However, this does reduce the number of settlement messages and the amount of funds needed for routine settlement of their transactions.

2. Closeout netting

Closeout netting reduces pre-settlement risk. If counterparties have multiple offsetting obligations to one another—for example, multiple interest rate swaps or foreign exchange forward contracts—they can agree to net those obligations.

Netting by closeout relates to the treatment of future obligations between two banks when a defined event of default, such as the appointment of a receiver or liquidator, occurs. Two banks can enter into a formal bilateral agreement stipulating that, if a close-out event occurs, the present value of all future amounts due between them will be calculated to provide amounts due that day, and then be recalculated into a base currency to produce one single payment due to or from the closed bank, which the receiver or liquidator is obliged to honour, so as to satisfy all the outstanding obligations between the two banks. Close-out can apply either to gross liabilities and claims arising under the original contracts between the two banks, or to their novated net liabilities and claims, in the event that they both also participate in an agreement to net by novation. Closeout provisions can be found in both bilateral and multilateral netting arrangements.

Since netting by close-out only operates upon the occurrence of a defined event, it can have no impact upon the number of payment messages passing between the participating banks and their correspondents in their normal trading relationships. Equally, it has no impact on liquidity risk or credit risk in respect of the counterparty's correspondent bank for the currency in question; nor on any intra-day timing difficulties, which might affect the normal settlement process.

3. Netting by novation

Netting by novation (also called obligation netting) provides a means of reducing counterparty credit risk by affecting a discharge of each individual foreign exchange contract, or other obligation, as it is netted. Two banks can enter into a formal agreement under which one running net amount will be due

between them for each future value date in each currency they trade. This is achieved by netting the second, and each subsequent, deal with the first for that particular date and currency, and thereby effecting a new (novated) contract for the net amounts. This novation process may take place automatically within the trading day, on the exchange of confirmations between the two banks: the bilateral agreement can provide that, at the instant the confirmations are matched, the previous contracts shall have been satisfied by means of the novation process and are therefore extinguished and replaced by the novated contract. This process can be repeated an infinite number of times until the cut-off time for a particular settlement date. Then settlement instructions, for the final net amounts, are sent to the participants' correspondent banks in the countries of the currencies concerned.

Netting by novation aims to reduce liquidity risk, on both the counterparty and its correspondent bank, and to reduce counterparty credit risk from a gross to a net basis in respect of each separate forward date. The utility of netting by novation, in terms of reducing these risks, depends entirely on the legal enforceability of the novated net contract having superseded the original gross contracts so that a receiver or liquidator of a counterparty that is closed cannot selectively revive them.

A bilateral agreement for netting by novation can be drawn up so as to provide that the novated net amounts due on each separate forward date for each currency form a single stream of payments due under the master contract between the two banks. If such an agreement is upheld, any receiver or liquidator of one of those banks will be unable to be selective in terms of the currencies or the payments to be received or made on the individual forward dates.

Bilateral netting

With bilateral netting, two counterparties agree to net with one another. They sign a master agreement specifying the types of netting to be performed as well as the existing and future contracts, which will be affected. Bilateral netting is common in the OTC derivatives markets.

Multiple netting

Multilateral netting occurs between multiple counterparties. Typically, it is facilitated through a membership organization such as an exchange. Multilateral netting has the advantage that it reduces credit exposure even more than does bilateral netting. It has the disadvantage that it tends to "mutualize" credit risk. Because credit exposure to each counterparty is spread across all participants, there is less incentive for each participant to scrutinize the credit worthiness of each other counterparty.