



## Credit Risk Management and Insurance Practices - An Overview

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### Abstract

In this article it mentioned about credit risk, explosion of credit risk, credit risk raisers, inclusion of credit risks, default probability of credit risks, Evaluation Factors Credit Risks, Altman's Z Score of credit scoring, Credit Rating, Functions of Credit Ratings, Benefits of credit instruments, Disadvantages of credit rating, Types of credit rating, Sovereign Vs. Corporate Credit Rating, Credit Risk Management & Techniques and Principles for the Assessment of Banks' Management of Credit Risk.

**Keywords:** Credit Risk; Rating of Credit Risk and Credit Risk Management.

### Introduction

Credit risk, explosion of credit risk, credit risk raisers, inclusion of credit risks, default probability of credit risks, Evaluation Factors Credit Risks, Altman's Z Score of credit scoring, Credit Rating, Functions of Credit Ratings, Benefits of credit instruments, Disadvantages of credit rating, Types of credit rating, Sovereign Vs. Corporate Credit Rating, Credit Risk Management & Techniques and Principles for the Assessment of Banks' Management of Credit Risk are very important for each and every one of the insurance product of the insurance company.

### Credit Risk

Credit risk is the potential loss due to the nonperformance of a financial contract, or financial aspects of nonperformance in any contract. It is the likelihood of a loss arising from default or failure of another individual/ organization.

### Who can be exposed to Credit risk? Why?

Financial institutions, such as banks, investment dealers, trust companies, insurance companies, and credit unions, typically have significant credit exposure due to their emphasis on lending and trading of financial service.

### Credit Risk Raisers

Conventional credit risk arises from:

- Lending
- Investing
- Credit granting activities
- Payment for goods sold
- Performance of counterparties in contractual agreements such as derivatives.

When a financial obligation is not fully discharged, because the counterparty unable or unwilling to fulfill its obligations, a loss may result.

### Inclusion of Credit Risks:

- i. Default risk: It involves the default on a payment, typically related to lending or sales.

- ii. Counterparty pre-settlement risk: It arises from the possibility of counterparty default once a contract has been entered into but prior to settlement.
- iii. Counterparty settlement risk: It is the risk that payment is made but not received, and it may result in large losses because the entire payment is potentially at risk during the settlement process. is often associated with foreign exchange trading, where payments in different money centers are not made simultaneously
- iv. Legal risk: It is the risk that an organization is not legally permitted or able to enter into transactions. It is closely related to sovereign risk, since the activities of the sovereign government may alter the legal rules under which transactions are undertaken.
- v. Sovereign or country risk: It arises from legal, regulatory, and political exposures in international transactions. Example: a counterparty or debt issuer with a high-quality credit rating can become problematic if the sovereign government makes it difficult to do business.
- vi. Concentration risk: It raised from exposure that is poorly diversified by region or sector. Example : A bank with a large number of borrowers in a particular industry sector is vulnerable to industry concentration risk.

## Default Probability

It is the degree of likelihood that the borrower of a loan or debt will not be able to make the necessary scheduled repayments. The higher the default probability a lender estimates a borrower to have, the higher the interest rate the lender will charge the borrower (as compensation for bearing higher default risk). To arrive at the probability of default, two kinds of factors must be evaluated: borrower specific and market specific.

## Evaluation Factors Credit Risks

Borrower specific factors include:

- Collateral
- Leverage
- Volatility of earnings/cash flows
- Reputation

Market specific factors include:

- industry conditions
- interest rates
- exchange rates

## Illustration: 1

A portfolio consists of 5 bonds with a probability of default of 1% each. What is the probability that there will be no default? What is the probability that there will be at least one default? What is the probability of exactly one default? What is the probability of exactly two defaults?

$$\text{Prob. of No Default} = (0.99)^5 = \underline{0.951}$$

$$\text{Prob. of at least one default} = 1 - 0.951 = \underline{0.049}$$

$$\text{Prob. of exactly one default} = 5C_1 (.99)^4 (.01) = \underline{0.0480}$$

$$\text{Prob. of exactly two default} = 5C_2 (.99)^3 (.01)^2 = \underline{0.00097}$$

## Illustration: 2

The cumulative probability of default of an instrument over two years is 5%. The probability of default in the first year is 2%. What is the probability of default in the second year?

$$\text{Prob. of no default over the two years} = 1 - 0.05 = \underline{0.95}$$

$$\text{Prob. of no default during the 1<sup>st</sup> year} = 1 - 0.02 = \underline{0.98}$$

Let prob. of default in the second year be  $p$

In order that there is no default over the two years, there must be no default at in year 1 or year 2.

$$\text{Then } (0.98)(1-p) = 0.95$$

$$\Rightarrow P = 1 - (0.95/0.98) = 0.0306$$

Thus, probability of default: = 3.06%

### Altman's Z Score of credit scoring

Altman's Z score is a tool of a credit scoring based on data available in financial statements.

The Z score is calculated as:

$$Z = 1.2x_1 + 1.4x_2 + 3.3x_3 + 0.6x_4 + .999x_5$$

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

Once Z is calculated, the credit risk is assessed as follows:

$Z > 3.0$  means low probability of default (Safe zone)

$2.7 < Z < 3.0$  means an alert signal (Grey zone)

$1.8 < Z < 2.7$  means a good chance of default (Grey zone)

$Z < 1.8$  means a high probability of default (Distress zone)

## Credit Rating

Credit rating is an evaluation of the credit worthiness of a debtor, especially a business companies or a government. It is an evaluation made by a credit rating agency of the debtor's ability to pay back the debt and the likelihood of default. The credit rating is used by individuals and entities that purchase the bonds issued by companies and governments to determine the likelihood that the company & government will pay its bond obligations.

It is a mechanism of reliability and viability of a credit instrument is brought out. Usually lender interest to know the credit worthiness of the borrower in the present and in the future. Credit rating always reveals the soundness of various business concerns for the purpose of financing their business.

In credit rating, the investor is able to know the soundness of the credit instrument to analyses between different credit instruments which will help to make a trade off between risks and return.

## Functions of Credit Ratings

Credit rating provides superior information on credit risk for three reasons. They are, an independent rating agency, unlike brokers, financial intermediaries, underwriters who have vested interest in an issue, is likely to provide an unbiased opinion; due to professional and highly trained staff, their ability to assess risk is better, and finally and the rating firm has access to a lot of information which may not be publically available. The main functions are,

**Low Cost Information** – Rating firm gathers, analyses, interprets and summarizes complete information in a simple and readily understood formal manner. It is highly welcome by most investors who finds it prohibitively expensive and simply impossible to do such credit evaluation of their own.

**Basis for a Proper Risk and Return** – If an instrument is rated by a credit rating agency, then such instrument enjoys higher confidence from investors. Investors have some idea as to what is the risk associated with the instrument in which he / she is likely to take investment is done in that security.

**Healthy Discipline on Corporate Borrowers** – Higher credit rating to any credit investment tends to enhance the corporate image and visibility and hence it induces a healthy discipline on corporates.

**Greater Credence to Financial and other Representation** – When credit rating agency rates a security, its own reputation is at stake. So it seeks financial and other information, the quality of which is acceptable to it. As the issues complies with the demands of a credit rating agency on a continuing basis, its financial and other representations acquires greater credibility.

**Formation of Public Policy** – Public policy guidelines on what kinds of securities are eligible for inclusions in different kinds of institutional portfolios can be developed with greater confidence if debt securities are rated professionally.

## Benefits of Credit Instruments

### ➤ Benefit from the point of view of investors

- i. The investor can choose their investments on the basis of credit rating.
- ii. As the credit rating is done by professionals, the investors can rely on the credit rating.
- iii. It gives scope for the investors to forecast about the future of their investments.
- iv. A comparative study between different credit instruments enables the investors to choose their investments.
- v. Even unknown securities could be purchased based on credit rating. It also enables the investors to go for a diversified investment.
- vi. As there is a periodical review of the companies by credit rating agencies, the investors have the opportunity of swapping their weakness investment with a stronger investment, based on the credit rating.
- vii. The investors can minimize their existing loss by choosing effective future investment. Thus, it acts as hedge for the investors.
- viii. Liquidity, safety and profitability are duly considered through credit rating mechanism by investors.

### Benefit From the Point of View of Companies

- i. Companies will be able to raise funds from the market as their debt instruments are backed by credit rating.
- ii. Credit rating acts as a motivation for companies to either improve their position or maintain their existing position, if they are in a higher level of credit rating.
- iii. When companies of equal standing are issuing their credit instruments, better-placed companies are identified with a positive signal on the credit rating such as A+.
- iv. In the market, companies with a higher rating will be in a position to provide better liquidity for their credit instruments.
- v. When companies are raising funds in the overseas market, credit rating enables them to mobilize more funds.
- vi. Credit rating will provide better security from the lenders' point of view. This will enable the companies to sell their credit instruments easily.

### Benefit from the Point of View of Regulating Authorities

- i. The regulatory authorities such as SEBI and RBI can discipline financial institutions by insisting on credit rating before going for public issue.
- ii. By imposing various conditions in credit rating, the financial soundness of the companies is maintained.
- iii. Any down-grading of credit rating will send clear signals to the regulating authorities to closely monitor the functioning of the company concerned.
- iv. The general economic condition in the country could also be analysed by the regulating authorities from the credit rating of various companies.
- v. Credit rating also provides authority, responsibility and accountability to the regulating authorities.

### Benefit from the Point of View of Public

- i. Any unknown company or infant company cannot try to cheat the public by offering an unusually higher rate of interest, as without credit rating, the reliability of the company will be in question.
- ii. Proper credit rating also channelises the savings of the public to productive purposes and prevents unwanted conspicuous consumption, such as investing in gold.
- iii. Public can also discriminate their investments and go in for better credit instruments on the basis of credit rating.

- iv. Off-shore savings can be attracted through credit rating, Indian settled abroad can choose investment in domestic companies based on credit rating.
- v. Legal action could be taken when credit rating companies fail to fulfil their obligations. This will instill confidence in the minds of the investors.

### Credit Rating of Individuals, Companies and Countries

**(a) Rating of Individuals:** Individuals go for credit rating when they want to borrow from recognized institutions. In India, we have 'Onida Individual Credit Rating Agency' (ONICRA) which gives credit rating for individuals.

**(b) Rating of Companies:** As per the guidelines of SEBI and RBI, companies have to resort to credit rating when they,

- Accept public deposits
- Issue credit instruments in domestic market
- Issue credit instruments in overseas market

**(c) Rating of Countries:** Credit rating is resorted to by countries for borrowing in international market or for attracting foreign investments or for raising funds from the international institutions like IMF and IBRD. 'Standard and Poor' is a lead international credit rating agency.

### Disadvantages of Credit Rating

1. **Biased Rating and Misrepresentations** – In the absence of quality rating, credit rating is a curse for the capital market industry, carrying out detailed analysis of the company, should have no links with the company or the persons interested in the company so that their reports impartial and judicious recommendations for rating committee. The companies having lower grade rating do not advertise or use the rating while raising funds from the public. In such cases the investor cannot get information about the riskness of instrument and hence is at loss.
2. **Static Study** – Rating is done on the present and the past historic data of the company and this is only a static study. Prediction of the company's health through rating is momentary and anything can happen after assignment of rating symbols to the company. Dependence for future results on the rating, therefore defeats the very purpose of risk indicativeness of rating. Many changes take place in economic environment, political situation, government policy framework which directly affect the working of a company.
3. **Concealment of Material Information** – Rating company might conceal material information from the investigating team of the credit rating company. In such cases quality of rating suffers and renders the rating unreliable.
4. **Rating is No Guarantee for Soundness of Company** – Rating is done for a particular instrument to assess the credit risk but it should not be construed as a certificate for the matching quality to the company or its management. Independent views should be formed by the user public in general of the rating symbol.
5. **Human Bias** – Findings of the investigation team, at times, may suffer with human bias for unavoidable personal weakness of the staff and might affect the rating.
6. **Reflection of Temporary Adverse Conditions** – Time factor affects rating, sometimes, misleading conclusions are derived. For example, company in a particular industry might be temporarily in adverse condition but it is given a low rating. This adversely affects the company's interest.
7. **Down Grade** – Once a company has been rated and if it is not able to maintain its working results and performance, credit rating agencies would review the grade and down grade the rating resulting into impairing the image of the company.
8. **Difference in Rating of Two Agencies** – Rating done by the two different credit rating agencies for the same instrument of the same issuer company in many cases would not be identical. Such differences are likely to occur because of value judgment differences on qualitative aspects of the analysis in two different agencies.

### Types of Credit Rating

- i. Equity rating
- ii. Bond / Debenture rating
- iii. Promissory note rating

- iv. Commercial paper rating
- v. Sovereign rating

### Sovereign Vs. Corporate Credit Rating

- Sovereign credit rating indicates the risk level of the investing environment of a country and is used by investors looking to invest abroad. It takes political risk into account.
- Corporate credit rating is the evaluation of financial indicators of companies, to potential investors of debt securities issued by company .
- There are three main rating agencies in US. They are Moody's, Standard & Poor's, and Fitch.
- The Standard & Poor's rating scale is as follows, from excellent to poor: AAA, AA+, AA, AA-, A+, A, A-, BBB+, BBB, BBB-, BB+, BB, BB-, B+, B, B-, CCC+, CCC, CCC-, CC, C, D. Anything lower than a BBB-rating is considered a speculative or junk bond.
- The Moody's rating system is similar in concept but the naming is a little different. It is as follows, from excellent to poor: Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3, Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, C.

### Credit Risk Management

A key credit risk management technique is the reduction of credit exposure. Some techniques that are useful for managing credit exposure are the following:

- Formalize the credit risk function.
- Consider opportunities for credit exposure diversification.
- Require settlement and payment techniques that provide certainty.
- Deal with high-quality counterparties.
- Use collateral where appropriate.
- Use netting agreements where possible.
- Monitor and limit market value of outstanding contracts.

### Techniques

- **Credit Risk Function:** An independent risk management function provides important strategic and tactical support to management and the board of directors.  
The management of credit exposure should include setting appropriate credit exposure limits and monitoring and reporting exposures against limits on an aggregate, legally enforceable basis.
- **Diversification:** Financial institutions diversifies their credit risk to the extent as possible, within the confines of their regional businesses and the regulatory environment.
- **Credit Rationing:** The key principle of credit rationing is that credit is granted where the most attractive risk-to-return tradeoff is available. It involves assigning higher interest rates to higher risk transactions to compensate for the additional risk. It also involves rationing the limited quantity of credit granted between borrowers with varying credit risk.
- **Collateral:** Collateral has long been used to support various lending agreements. It is being used with renewed interest in financial markets due to its risk-reduction potential.
- **Netting Agreements:** When a netting agreement is used, amounts to be exchanged between counterparties are offset, greatly reducing the counterparties' exposure to one another. The development of netting agreements between counterparties has been instrumental in minimizing settlement risk, particularly in derivative transactions.
- **Marking-to-Market:** Marking-to-market is not a credit exposure management technique by itself, but a tool used in conjunction with limits for reducing potential loss.  
Outstanding contracts that have large unrealized gains are monitored closely by periodic marking to market. Marking-to-market may be combined with a pricing reset if the value of a contract goes beyond a predetermined limit. Alternatively, periodically renegotiating the contract at market value on a regular, prescheduled basis is another way to manage the risk of counterparty's default.
- **Contingent Actions:** Contingent actions involve changes to an outstanding contract or agreement based on the occurrence of certain key events.



Typically, these events are specified in a clause to a contractual agreement and might include the deterioration of a counterparty's credit quality, the marked-to-market value of an outstanding contract exceeding a predetermined amount, or both.

## **Principles for the Assessment of Banks' Management of Credit Risk**

### **A. Establishing an appropriate credit risk environment**

**Principle 1:** The board of directors should have responsibility for approving and periodically (at least annually) reviewing the credit risk strategy and significant credit risk policies of the bank. The strategy should reflect the bank's tolerance for risk and the level of profitability the bank expects to achieve for incurring various credit risks.

**Principle 2:** Senior mgt should have responsibility for implementing the credit risk strategy approved by the board of directors and for developing policies and procedures for identifying, measuring, monitoring and controlling credit risk. Such policies and procedures should address credit risk in all of the bank's activities and at both the individual credit and portfolio levels.

**Principle 3:** Banks should identify and manage credit risk inherent in all products and activities.

### **B. Operating under a sound credit granting process**

**Principle 4:** Banks must operate within sound, well-defined credit-granting criteria.

**Principle 5:** Banks should establish overall credit limits.

**Principle 6:** Banks should have a clearly-established process in place for approving new credits as well as the amendment, renewal and re-financing of existing credits.

**Principle 7:** All extensions of credit must be made on an arm's-length basis.

### **C. Maintaining an appropriate credit administration, measurement and monitoring process**

**Principle 8:** Banks should have in place a system for the ongoing administration of their various credit risk-bearing portfolios.

**Principle 9:** Banks must have in place a system for monitoring the condition of individual credits, including determining the adequacy of provisions and reserves.

**Principle 10:** Banks are encouraged to develop and utilize an internal risk rating system in managing credit risk. The rating system should be consistent with the nature, size and complexity of a bank's activities.

**Principle 11:** Banks must have information systems and analytical techniques that enable management to measure the credit risk inherent in all on- and off-balance sheet activities.

**Principle 12:** Banks must have in place a system for monitoring the overall composition and quality of the credit portfolio.

**Principle 13:** Banks should take into consideration potential future changes in economic conditions when assessing credit.

### **D. Ensuring adequate controls over credit risk**

**Principle 14:** Banks must establish a system of independent, ongoing assessment of the bank's credit risk management processes and the results of such reviews should be communicated directly to the board of directors and senior management.

**Principle 15:** Banks must ensure that the credit granting function is being properly managed and that credit exposures are within levels consistent with prudential standards and internal limits.

**Principle 16:** Banks must have a system in place for early remedial action on deteriorating credits, managing problem credits and similar workout situations.

### **E. The role of supervisors**

**Principle 17:** Supervisors should require that banks have an effective system in place to identify, measure, monitor and control credit risk as part of an overall approach to risk management. Supervisors should conduct an independent evaluation of a bank's strategies, policies, procedures and practices related to the granting of credit and the ongoing management of the portfolio.

## Conclusion

As we all know that without risk there is no return. There is relations between risk and return in every banking or industrial business. There are so many risk are involved in banking sectors. Credit risk is one of the challenging among all types of risks. Which can be controlled using appropriate mathematical and statically tools calculations. To calculate the credit risk credit rating institutions also so important. All the sensible data must be collected and that has to be used it for the analysis and interpretations purposes. In this article, it mentioned about credit risk, explosion of credit risk, credit risk raisers, inclusion of credit risks, default probability of credit risks, Evaluation Factors Credit Risks, Altman's Z Score of credit scoring, Credit Rating, Functions of Credit Ratings, Benefits of credit instruments, Disadvantages of credit rating, Types of credit rating, Sovereign Vs. Corporate Credit Rating, Credit Risk Management & Techniques and Principles for the Assessment of Banks' Management of Credit Risk. Every banking sector professional must know all these to control the credit risk and to maximize the returns. There is always have a significant between the knowledge of the professionals and avoid the unnecessarily risks for the returns.

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