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## A study on Risk management Altman Z Score: A Tool to Measure Credit Risk

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### **Abstract**

*Risk is the fundamental element that drives financial behavior. Risk management is an activity which integrates recognition of risk, risk assessment, developing strategies to manage it, and mitigation of risk using managerial resources. Financial risk management, on the other hand, focuses on risks that can be managed using traded financial instruments. The future of banking will undoubtedly rest on risk management dynamics. The effective management of credit risk is a critical component of Comprehensive risk management essential for long-term success of a banking institution. Objective of paper is to make an attempt to identify the risks faced by the banking industry and the process of risk management. For the purpose of the study two companies are taken as sample Maruthi Suzuki and GMR infra. Further data has been collected from two companies and secondary sources i.e., from Books, journals and online publications, identified various risks faced by the banks, developed the process of risk management and analyzed different risk management techniques. Altman z score is applied to test credit worthiness of company. It can be concluded from the study that the banks take risk more consciously, anticipates adverse changes and hedges accordingly; it becomes a source of competitive advantage, and efficient management of the banking industry.*

**Keywords:** Risk management, credit risk, Altman Z score model, financial risk management

### **1. Introduction**

Credit risk refers to the risk that a borrower will default on any type of debt by failing to make required payments. The risk is primarily that of the lender and includes lost principal and interest, disruption to cash flows, and increased collection costs. 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 encompasses identification, measurement, monitoring and control of the credit risk exposures.

In a bank, an effective credit risk management framework would comprise of the following distinct building blocks:

- Policy and Strategy
- Organisational Structure
- Operations/ Systems

### **2. Review of Literature**

Risk management is an activity which integrates recognition of risk, risk assessment, developing strategies to manage it, and mitigation of risk using managerial resources. Objective of risk management is to reduce different risks related to a pre-selected domain to an acceptable.

Risk is defined in many ways, one of the definition is risk refers to the uncertainty that surrounds future events and outcomes. It is the expression of the likelihood and impact of an event with the potential to influence the achievement of an organization's objectives. For each risk, two calculations are required: its likelihood or probability; and the extent of the impact or consequences. (Heinz-Peter Berg, 2010). Brian C. Murray Sheryl J. Kelly Investment (equity) risks: Effect of environmental liabilities on value of companies in which investment banks or their clients own equity. Upstream liability if the bank is a principal or general partner or owner. Banks' Current Environmental Risk Management Emphasis Is on Pre-Commitment due Diligence on Debt Transactions. With more emphasis on

environmental risk management programs, a noticeable increase has occurred in the amount of screening and due diligence efforts to gather information on potential environmental risks.

Jayanth R Varma in the article Indian Financial Sector and the Global Financial Crisis in July 2008 states that though the Indian financial sector had very limited exposure to the toxic assets at the heart of the global financial crisis, it suffered a severe liquidity crisis after the Lehman bankruptcy. Looking ahead, the paper argues that the crisis is a wake-up call for the Indian banks and financial system for better managing their liquidity and credit risks, re-examining the international expansion policies of banks, and reviewing risk management models and stress test methodologies. Managing market risk: today and tomorrow (Amit Mehta, Max Neukirchen) expressed that Market risk refers to the risk of losses in the bank's trading book due to changes in equity prices, interest rates, credit spreads, foreign-exchange rates, commodity prices, and other indicators whose values are set in a public market. To manage market risk, banks deploy a number of highly sophisticated mathematical and statistical techniques. Chief among these is value-at-risk (VAR) analysis, which over the past 15 years has become established as the industry and regulatory standard in measuring market risk. Jyoti Gupta, Suman Jain (2012) in his article A study on Cooperative Banks in India with special reference to Lending Practices expressed that The cooperative financial institution is facing severe problems which have restricted their ability to ensure smooth flow of credit Prior approval of RBI is mandatory for opening of new branches of SCBs. The SCBs are required to submit the proposal for opening of new branches to RBI through NABARD, whose recommendation is primarily taken into consideration while according permission. Banks and similar financial institutions need to meet forthcoming regulatory requirements of risk measurement and capital. Managers need reliable risk measurements to direct capital to best risk/reward ratios. They need the estimates of the size of potential losses to stay within the limits imposed by readily available liquidity by creditors, customers, and regulators. (David H.Pyle in Bank Risk Management: Theory)

### 3. Need of the Study

Credit risk is most simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. The goal of credit risk management is to maximize a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. 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 counterparties, 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 counterparties. It is needed to study how risk model will help in minimizing credit risk.

### 4. Objective of Study

The following are the objectives of the study.

- To identify the risks faced by the bank when credit is provided to a company.
- To list out different risks faced in banking sector.
- To analyze how credit risk is managed using Altman Z score Model

### 5. Methodology

For the purpose of analysis data is collected through primary data from BSE and NSE website about market capitalization and secondary sources from companies' financial statements, annual reports, periodicals, journals and published reports.

Method of calculation:

TOOL FOR RISK CALCULATION:

ALTMAN Z SCORE MODEL:

The output of a credit-strength test that gauges a publicly traded manufacturing company's likelihood of bankruptcy. The Altman Z-score, is based on five financial ratios that can be calculated from data found in a company's annual 10K report. The Altman Z-score is calculated as follows:

$$Z\text{-Score} = 1.2A + 1.4B + 3.3C + 0.6D + 0.99E$$

Where:

A = Working Capital/Total Assets

B = Retained Earnings/Total Assets

C = Earnings Before Interest & Tax/Total Assets

D = Market Value of Equity/Total Liabilities

E = Sales/Total Assets

A score below 1.8 means the company is probably headed for bankruptcy, while companies with scores above 3.0 are not likely to go bankrupt. The lower/higher the score, the lower/higher the likelihood of bankruptcy.

The 5 financial ratios in the Altman Z-Score and their respective weight factor is as follows:

Sl. No	RATIO	WEIGHTAGE	
1	EBIT/Total Assets	x 3.3	-4 to +8.0
2	Net Sales /Total Assets	x 0.999	-4 to +8.0
3	Market Value of Equity / Total Liabilities	x 0.6	-4 to +8.0
4	Working Capital/Total Assets	x 1.2	-4 to +8.0
5	Retained Earnings /Total Assets	x1.4	-4 to +8.0

Table 1

These ratios are multiplied by the weightage as above, and the results are added together.

$$Z\text{-Score} = A \times 3.3 + B \times 0.99 + C \times 0.6 + D \times 1.2 + E \times 1.4$$

The Interpretation of Z Score:

Z-SCORE ABOVE 3.0 -The company is safe based on these financial figures only.

Z-SCORE BETWEEN 2.7 and 2.99 - On Alert. This zone is an area where one should exercise caution.

Z-SCORE BETWEEN 1.8 and 2.7 - Good chances of the company going bankrupt within 2 years of operations from the date of financial figures given..

Z-SCORE BELOW 1.80- Probability of Financial embarrassment is very high.

## 6. Data Analysis

RISK CALCULATION BY ALTMAN Z –SCORE				
MARUTHI SUZUKI:				
Sl. no	Ratio	weightage	Calculation	Total
1	PBIT/Total Assets	3.3	5042/ 19968.10	0.825
2	Net Sales/Total Assets	0.99	43587.90/ 19968.10	2.1582
3	Working capital/Total assets	1.2	1149.3/ 19968.10	0.06
4	Reserves/Total Assets	1.4	18427.90 /19968.10	1.288
5	Market equity/Total Assets	0.6	368893 /19968.10	2.22
Z-SCORE			6.5512	

Table 2

## GMR INFRASTRUCTURE

Sl. No	RATIO	WEIGHTS	Calculation	Total
1	PBIT/ Total Assets	3.3	465.19/ 10952.76	0.132
2	Net Sales/ Total Assets	0.99	1432.79/ 10952.76	0.1287
3	Workingcapital/ Totalassets	1.2	- 0.071726213	- 0.086071456
4	Reserves/Total Assets	1.4	6796.49/ 10952.76	0.868
5	Marketequity/Total Assets	0.6	13176.89/ 10952.76	0.72
Z score		1.762628544		

Table 3

## INTERPRETATION AND CONCLUSION OF ALTMAN'S Z -SCORE:

The Altman Z-Score is a quantitative balance-sheet method of determining a company's financial health. "Safe" companies, i.e. companies that have a low probability of bankruptcy; have an Altman Z-Score greater than 3.0.

The *Altman Z-Score* is a measure of a company's health and likelihood of bankruptcy. Several key ratios are used in the formulation of an Altman Z-Score Value.

The Z-Scores are helpful in predicting corporate defaults as well as an easy-to-calculate, measure of control for financial distress status of companies in academic studies. A Z-Score above 2.6 (2.9) indicates a company to be healthy. Besides, such a company is also not likely to enter bankruptcy. However, Z-Scores ranging from 1.1-2.6 (1.23-2.9) are taken to lie in the gray area.

The Interpretation of Altman Z-Score:

Z-SCORE ABOVE 3.0 –The Company is considered 'Safe' based on the financial figures only.

Z- SCORE BETWEEN 2.7 and 2.99 – 'On Alert'. This zone is an area where one should 'Exercise Caution'.

Z-SCORE BETWEEN 1.8 and 2.7 – Good chance of the company going bankrupt within 2 years of operations from the date of financial figures given.

Z-SCORE BELOW 1.80- Probability of Financial Catastrophe is Very High.

If the Altman Z-Score is close to or below 3, then it would be as well to do some serious due diligence on the company in question before even considering investing.

## MARUTHI SUZUKI:

The Z-Score of Maruthi Suzuki, Z-Score is 6.55. According to Edward Altman if the company is having Z-score value is greater than 3.00 then it is in SAFE ZONE. So, by this we can say that this company is in safe position and it can borrow required funds from financial institutions (i.e.banks).

## GMR INFRASTRUCTURE:

The Z-Score of GMR infra is 1.76. According to Edward Altman if the company is having Z-Score value is below 1.80 the is in DISASTER ZONE. So, by this we can say that this company is in loss position, there is probability that it may be bankrupt within 2years. The bank is not ready to realize any funds to that company.

CONCLUSION The objective of risk management is not to prohibit or prevent risk taking activity, but to ensure that the risks are consciously taken with full knowledge, clear purpose and understanding so that it can be measured and mitigated. As such, in the process of providing financial services, commercial banks assume various kinds of risks financial and non- financial. Therefore, banking practices, which continue to be deep rooted in the philosophy of securities, based lending and investment policies, need to change the approach and mindset, rather radically, to manage and mitigate the perceived risks, so as to ultimately improve the quality of the asset portfolio.

## 7. Findings &amp; Recommendations

Through research it is found that the Maruthi Suzuki company has Z-score value is greater than 3.00 i.e., Z=6.55. By this we can say that the risk is very low and the financial institutions has high probability of providing the required funds within a shorter span of time. From the above calculations, it is observed that the GMR Infra has Z-score is 1.79. According to Edward Altman if the company has less than 1.80 then the company is having high financial embarrassment and the risk is very low. So, better the bank should not provide any credit to that company.

### 7.1. Recommendations

- Companies and banks should continuously do thorough analysis of risk models
- Though banks have the policies of accepting deposits and lending loans before they give loans should study credit worthiness of customers
- For to assess solvency of company appropriate credit risk models have to be follow and study what is solvency positions of companies thoroughly.

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