# A STUDY ON FINANCIAL HEALTH OF MARUTI SUZUKI LTD USING Z-SCORE-

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***Abstract:*** *The world has been recovering from the global financial crisis which devastated the economies of so many countries and so many business sectors. The automobile industry has always been a barometer for the economic strength of a nation. It is therefore not surprising that this sector was amongst the worst-hit industrial sectors during the period of this global meltdown. Automotive sales in North America, Continental Europe and the United Kingdom were particularly hard-hit in 2008-09, due mainly to the rise in fuel prices and the collapse of the banking institutions. Sales of cars in the United States declined by 21.5% over the previous year while sales in Europe and the United Kingdom declined by 11.9% and 6.4% respectively. This resulted in dramatic changes in the structure of global auto makers. Two of the 'Big Three' U.S. car companies filed for bankruptcy in mid-2009 and re-emerged with substantial federal funds, a lower cost base, and lower debt. The new structure and the related government-led financial packages, along with market incentives helped the industry to survive this crisis. Today, auto makers the world over are concentrating on new technologies to meet the stringent forthcoming emission goals which are being set.*

*The global automobile industry seems to be recovering – in line with the world's improving economic climate. Market sentiment has improved. Many accounting ratios used to predict the financial performance of the company, gives a warning only when it is too late to take a corrective action. Anyhow such bankruptcy or the financial health of the concern can be forecasted using Altman's Z-Score Model. Keeping the above view in mind, the Z-Score analysis has been adopted to monitor the financial health of the company to predict as well as to avoid business failure and subsequent bankruptcy. In addition to that, the study used statistical tools like mean, correlation and Chi square. This paper deals with measuring the financial health of Maruti Suzuki ltd using Z-Score* **.**

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**OBJECTIVES OF THE STUDY:**

1. To know the financial status of the company.
2. To forecast its financial health using Z Score.
3. To determine its financial status in a long run.
4. And to measure the efficiency of the concern**.**

**HYPOTHESIS OF THE STUDY**

NULL HYPOTHESIS ($H_0$)

$H_0$(1): There is no significant relationship between working capital and total asset.

$H_0$(2): There is no significant relationship between retained earnings and total asset.

$H_0$(3): There is no significant relationship between EBIT and total asset.

$H_0$(4): There is no significant relationship between sales and total asset.

## RESEARCH METHODOLOGY

This study was concerned with automobile and it has been confined to only one private ltd MARUTI SUZUKI ltd. This study was on the secondary data, which was obtained from the published sources ie annual reports for the period of five years from 2005-2006 to 2009-2010. The collected data was analyzed with the help ratio analysis. The many accounting ratios used to predict financial performance of the company, gives a warning only when its too late to take corrective action. Keeping the above view in mind, the Z-Score analysis has been adopted to monitor the financial health of the company to predict as well as to avoid business failure and subsequent bankruptcy. In addition to that, the study used statistical tool like mean co-relation chi-square etc.

### LIMITATIONS OF THE STUDY

The following are the limitations of the study.

1. The study was limited to 5 years.
2. The study was limited to one company
3. The data of this study has been primarily taken from published annual reports only.
4. The time period of the study is limited
5. Since secondary data is used for the study we cannot completely rely upon it.

## ABOUT THE COMPANY:

Maruti Suzuki India Limited (MSIL, formerly Maruti Udyog Limited), a subsidiary of Suzuki Motor Corporation of Japan, is India's largest passenger car company, accounting for over 50 per cent of the domestic car market. More than half the number of cars sold in India wear a Maruti Suzuki badge. Right from inception, Maruti brought to India, a very simple yet powerful Japanese philosophy 'smaller, fewer, lighter, shorter and neater'

Maruti Suzuki exports entry-level models across the globe to over 100 countries and the focus has been to identify new markets. Some important markets include Latin America, Africa and South East Asia. It was the first company in India to mass-produce and sell more than a million cars. It is largely credited for having brought in an automobile revolution to

India. It is the market leader in India and on 17 September 2007, **Maruti Udyog Limited** was renamed **Maruti Suzuki India Limited**. The company's headquarters is located in New Delhi.

Maruti Suzuki is India's number one leading automobile manufacturer and the market leader in the car segment, both in terms of volume of vehicles sold and revenue earned.

**REVIEW OF LITERATURE:**

1. Jonah Aiyabei (2002) , examined the financial performance of small business firms based in Kenya using Z score model.

2.Ben McClure (2004) had confirmed the „Z score model through his research study .and he concluded investors should consider checking their companies' Z-score on a regular basis.

3. L.C Gupta (1999) attempted a refinement of Beaver s method with objective of predicting the business failure.

4. Mansur. A.Mulla (2002) made a study in Textile mill with the help of Z score model for evaluating the financial health with five weighted financial ratios

5. Selvam M, and others (2004) had revealed about Cements industry financial health especially India Cements Limited.

6. Krishna Chaitanya (2005) used Z model to measure the financial distress of IDBI and concluded that IDBI is likely to become insolvent in the years to come.

7. Charley Kyd, had made a study on the topic "Using Z Scores with Excel".

8. "Using the Altman Z Screen Performance to Identify Stock Ideas" by Jae.

9." Measuring financial health of Kothari Sugars using Z-Score Model" by Velavan.M, J. J. School of Business Management, Trichy.

10.Measuring Financial Health of a Public Limited Company Using "Z" Score Model- A Case Study by Mr.M.Kannadhasan, Lecturer, Dept. Of Mgmt. Studies, Adhiyamaan College of Engineering, Hosur.

**ABOUT ATMAN'S Z-SCORE Model**

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-Score model is the 1960's brainchild of Professor Edward Altman of NYU.

The Z score consists of 5 variables:

- X1 = Working Capital / Total Assets
- X2 = Retained Earnings / Total Assets
- X3 = EBITDA / Total Assets
- X4 = Market Value of Equity / Total Liabilities
- X5 = Net Sales / Total Assets

**Original Altman Z Score for Public Companies**

The original model to calculate the Z score for public manufacturing companies is as follows.

***Z = 1.2*X1 + 1.4*X2 + 3.3*X3 + 0.6*X4 + 1.0*X5***

**When Z is 3.0 or more,** the firm is most likely safe based on the financial data. However, be careful to double check as fraud, economic downturns and other factors could cause unexpected reversals.

**When Z is 2.7 to 3.0,** the company is probably safe from bankruptcy, but this is in the grey area and caution should be taken.

**When Z is 1.8 to 2.7,** the company is likely to be bankrupt within 2 years. This is the lower portion of the grey area and a dramatic turnaround of the company is needed.

**When Z is below 1.8**, the company is highly likely to be bankrupt. If a company is generating lower than 1.8, serious studies must be performed to ensure the company can survive.

> The Z-score formula may be used to predict the probability that a firm will go into bankruptcy within two years.

Z-scores are used to predict corporate defaults and an easy-to-calculate control measure for

the financial distress status of companies in academic studies. The Z-score uses multiple corporate income and balance sheet values to measure the financial health of a company.

**TABLE 1:**

**WORKING CAPITAL TO TOTAL ASSETS**

| YEARS | WORKING CAPITAL | TOTAL ASSET | RATIO |
|---|---|---|---|
| 2005-2006 | 1685.90 | 5524.30 | 0.30 |
| 2006-2007 | 1176.90 | 784.70 | 0.15 |
| 2007-2008 | 102.10 | 9315.60 | 0.01 |
| 2008-2009 | 1938.40 | 10043.80 | 0.19 |
| 2009-2010 | 67.60 | 12656.50 | 0.005 |
| **AVERAGE** | | | 0.655 |
| Source: computed from the published annual reports of the company from 2005-2006 to 2009-2010 | | | |

**INTERPRETATION**

This table shows the ratio between working capital and total asset. From this table we can understand that in the year 2005-2006 the ratio between working capital and total asset is 0.30 and it shows a decreasing trend up to 2007-2008. In the year 2006-2007 it was 0.15 and in 2007-2008 it was 0.01. and there after in the of 2008-2009 it shows a little increase in the ratio it came around 0.19 and after that in the year of 2009-2010 it again shows a decrease that is the ratio becomes 0.005. The average of ratio comes around 0.655

**RETAINED EARNINGS TO TOTAL ASSETS**

| YEAR | RETAINED EANINGS | TOTALASSET | RATIO |
|---|---|---|---|
| 2005-2006 | 5308.10 | 5524.30 | 0.96 |
| 2006-2007 | 6709.40 | 7484.70 | 0.89 |
| 2007-2008 | 8270.90 | 9315.60 | 0.88 |
| 2008-2009 | 9200.40 | 10043.80 | 0.91 |
| 2009-2010 | 11690.60 | 12656.50 | 0.92 |

| | | | |
|---|---|---|---|
| **AVERAGE** | | | 4.56 |
| Source: computed from the published annual reports of the company from 2005-2006 to 2009-2010 | | | |

**INTERPRETATION**

This table shows the ratio between retained earnings and total asset. From this table we can understand that in the year 2005-2006 the ratio between retained earnings and total asset is 0.96 and it shows a decreasing trend up to 2007-2008. That is in the year 2006-2007 it was 0.89 and in 2007-2008 it was 0.88 and there after in the of 2008-2009 it shows a little increase in the ratio that is it came around 0.90 and after that in the year of 2009-2010 it again shows a increase that is the ratio becomes 0.92. The average of ratio comes around 4.56

**EBIT TO TOTAL ASSET**

| **YEAR** | **EBIT** | **TOTAL ASSET** | **RATIO** |
|---|---|---|---|
| 2005-2006 | 1848.70 | 5524.30 | 0.33 |
| 2006-2007 | 2294.10 | 7484.70 | 0.30 |
| 2007-2008 | 2439.20 | 9315.60 | 0.26 |
| 2008-2009 | 1744.80 | 10043.80 | 0.17 |
| 2009-2010 | 3530.60 | 12656.50 | 0.27 |
| AVERAGE | | | 1.33 |
| Source: computed from the published annual reports of the company from 2005-2006 to 2009-2010 | | | |

**INTERPRETATION**

This table shows the ratio between EBIT to total asset. In this in the year of 2005 to 2006 the ratio was 0.33 and thereafter it shows a decline up to 2008-2009 that is in the year of 2006-2007 it was 0.30 and in 2007-2008 it was 0.26 and in 2008-2009 it was 0.17 in the year of 2009-2010 it shows a slight increase the ratio for the year was 0.27 the average of ratio comes around 1.33.

**SALES TO TOTAL ASSETS**

| YEAR | SALES | TOTAL ASSETS | RATIO |
|---|---|---|---|
| 2005-2006 | 12197.90 | 5524.30 | 2.20 |
| 2006-2007 | 14806.40 | 7484.70 | 1.97 |
| 2007-2008 | 18066.80 | 9315.60 | 1.93 |
| 2008-2009 | 20729.40 | 10043.80 | 2.06 |
| 2009-2010 | 29317.70 | 12656.50 | 2.31 |
| AVERAGE | | | 10.47 |
| Source: computed from the published annual reports of the company from 2005-2006 to 2009-2010 | | | |

**INTERPRETATION**

This table shows the ratio between sales and total asset. From this table we can understand that in the year 2005-2006 the ratio between sales and total asset is 2.20 and it shows a decreasing trend up to 2007-2008. That is in the year 2006-2007 it was 1.97 and in 2007-2008 it was 1.93 and there after in the of 2008-2009 it shows a little increase in the ratio that is it came around 2.06 and after that in the year of 2009-2010 it again shows a increase that is the ratio becomes2.31. The average of ratio comes around 10.47

**TABLE SHOWING THE SUMMARY OF CHI-SQUARE INFERENCES**

| RELATIONSHIP | CALCULATED VALUE | DEGREE OF FREEDOM | TABLE VALUE @5% CONFIDENCE | REMARK |
|---|---|---|---|---|
| Relationship between Working Capital and Total Assets | 8.735 | 4 | 9.49 | Not Significant |
| Relationship between Retained Earnings and Total Assets | 0.311 | 4 | 9.49 | Not Significant |
| Relationship between | 0.390 | 4 | 9.49 | Not |

| | | | | |
|---|---|---|---|---|
| EBIT and Total Assets | | | | Significant |
| Relationship between Sales and Total Assets | 0.152 | 4 | 9.49 | Not Significant |

**SUMUP CORRELATION TABLE**

| INGREDIENTS | FINANCIAL RATIOS | 2005-06 | 2006-07 | 2007-08 | 2008-09 | 2009-10 | r |
|---|---|---|---|---|---|---|---|
| $X_1$ | Working capital/ Total Assets | 0.30 | 0.15 | 0.01 | 0.19 | 0.005 | -0.6 |
| $X_2$ | Retained Earnings/Total Assets | 0.96 | 0.89 | 0.88 | 0.96 | 0.92 | 1 |
| $X_3$ | EBIT/ Total assets | 0.33 | 0.30 | 0.26 | 0.17 | 0.27 | 0.5 |
| $X_5$ | Sales/Total Asset | 2.20 | 1.97 | 1.93 | 2.06 | 2.31 | 0.6 |

**MARUTHI SUZUKI Ltd. "Z- SCORE (Arrived At By Using The Weighted factors)**

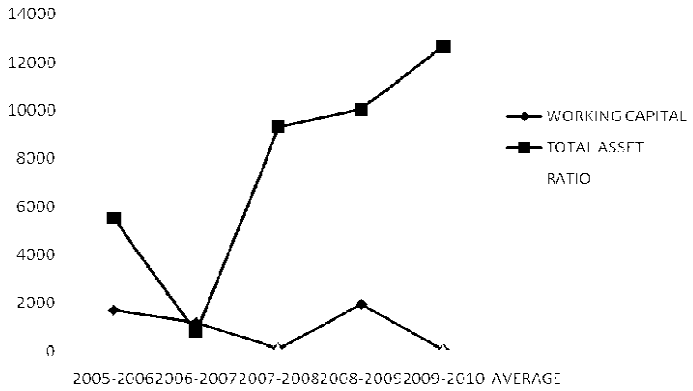
| **INGREDIENTS** | **FINANCIAL RATIOS** | **2005-06** | **2006-07** | **2007-08** | **2008-09** | **2009-10** |
|---|---|---|---|---|---|---|
| $X_1$ | Working capital/ Total Assets | 0.36 | 0.18 | 0.01 | 0.22 | 0.006 |
| $X_2$ | Retained Earnings/Total Assets | 1.34 | 1.24 | 1.23 | 1.34 | 1.28 |
| $X_3$ | EBIT/ Total assets | 1.09 | 0.99 | 0.85 | 0.56 | 0.89 |
| $X_4$ | Value of equity/Total asset | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| $X_5$ | Sales/total assets | 2.2 | 1.97 | 1.93 | 2.06 | 2.31 |
| **Z-SCORE** | | **6.19** | **5.58** | **5.22** | **5.38** | **5.68** |

Z-Score is used to study the financial health of the concern. It is the tool used to study the financial soundness of any concern. In this study Z-Score is used to find its Financial health during the past 5 years. When the results are compared with Atman's Z-Score mode l it is found that the concern is in healthy status. It is found that the Z-Score value of each year during the study is above 3. This depicts that the concern is financially sound and healthy.

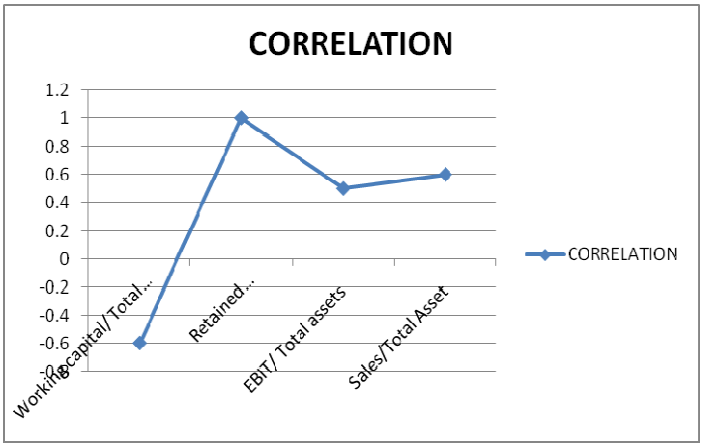
**Conclusion:**

The concern's annual reports are analysed using Atman's Z-Score mode l. And as per the prescribed provisions it is been found that the concern, Maruthi Suzuki limited is financially healthy.

**CHART SHOWING THE RATIO BETWEEN WORKING CAPITAL TO TOTAL ASSETS**



## CHART SHOWING THE CORRELATION OF FINANCIAL RATIOS




## CHART SHOWING THE CALCULATED Z-SCORE FOR THE YEAR 2005-2006

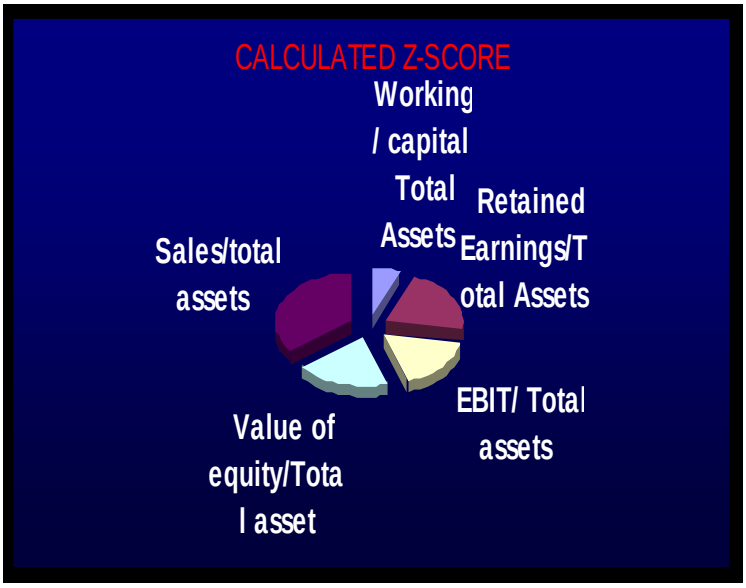


**CHART SHOWING Z-SCORE FOR THE YEAR 2005-2010**