Assessing the Financial Health of Select Automobile Companies in India: A Quantitative approach Using the Z-Score Multi-discriminant Financial Analysis Model

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Abstract. This paper has attempted to study the financial health of automobile companies in India. Assessing the financial health has been done for a long period. The study is done for the period of 10 years from 2003-04 to 2011-12. Altman's Z Score is applied to assess the financial performance of the companies selected, the efficiency of its financial operations etc. Automobile industry is the barometer to measure the economic strength of any country. And it is one of the industries which are hit hard in the global recession. The study reveals that on an average the companies are in safe zone. But the performance of the companies except Maruti Suzuki is below the industry average. Research on financial health using Altman's Score is very limited in India. So, this paper focuses on applying and interpreting the financial performance of automobile industry using Altman's Z Score.

Key words: Financial health, Altman, Z score, Automobile industry.

Assessing the financial distress or the financial health is under research for a long period. Since 1940, many researches were done to predict corporate financial distress. Many researchers attempted to give accurate results and they also tried to frame a model which will be a solution to predict the financial health or the chance of bankruptcy of corporate. Edward Altman was one of the researchers who framed a model and tested its accuracy. Since then many researches have been done to improve it. The need to study the financial health of a company was not given importance in developing economies. Although corporate failures are perceived to be a problem of developed economic environments (Altman et al., 1979), firms operating in emerging economies are no exception. Global financial crisis and economic slowdown has resulted in failure of many financially strong companies. This was due to many reasons such as various economic reforms, challenges of global markets, change in technology, taste of the customers, etc. Financial distress is the result of inability to pay off bills within the stipulated time period. The total debt may be higher than the total assets in possession. It is advisable to have debt for some of the activities. But the extent of debt should not exceed the value of the assets. Then, the company may not be in a position to sustain and continue its operations.

Frequent analysis of financial statements and the company's position will give the real picture of its financial status. Applying a model to analyze the financial condition of a company may help the management to predict its future and take corrective actions. It may reduce the chances of bankruptcy. A predictive model may warn an auditor of company's vulnerability and help to protect them against charges of negligence of duties in not disclosing the possibility of corporate failure (Jones, 1987). The creditor, the shareholders, and regulatory agencies will be curious to find the financial status of a company. There are a number of researches carried on to estimate the financial health of a company. After the establishment of Altman's Z score model, abundant studies have done further research on the Z score model, including Deakin(1972), Taffler (1983), Goudie (1987), Agarwal and Taffler (2007), Sandin and Porporato (2007). Many studies also have been done relevant to the Ohlson model, including Lau (1987), Muller, Steyn-Bruwer, and Hamman (2009). Of these researches Edward Altman's Z Score is popular even after 40 years of its formulations. Z Score is a multidiscriminate analysis. While doing the review of literature, it was found that very limited studies are conducted using Z Score in India. Therefore this study focuses on measuring the financial health of select public limited automobile companies which are listed in National Stock Exchange.

REVIEW OF LITERATURE

Jonah Aiyabei (2002) examined the financial performance of small business firms based in Kenya using Z score model. Ben McClure (2004) had confirmed the Z score model through his research study .and he concluded that investors should consider checking their companies' Z-score on a regular basis. Gupta (1999) attempted a refinement of Beaver's method with the objective of predicting the business failure. 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. Chang(2008) studied the corporate governance characteristics of financially distressed firms in Taiwan. Hui and Jhao(2008) explored the dynamics of financial distress of 193 companies which have experienced financial distress in China during 2000-2006. Zulkarnian (2006) analyzed the corporate financial distress among Malaysian listed firms during Asian financial crisis.

Ugurlu and Hakan(2006) conducted a research to predict corporate financial distress for the manufacturing companies listed in Istanbul stock exchange for the period 1996-2003. Chiung-Ying Lee and Chia-Hua Chang (2010) analyzed the financial health of public companies listed in Taiwanese stock exchange using Logistic Regression model of early warning prediction. Beneda (2006) investigated returns, bankruptcies and firm distress for new US public companies that issued IPOs from 1995 through 2002. Beneda found that the average first year returns for IPO companies underperformed the market and that Ohlson's model was effective in identifying companies that had a higher probability of bankruptcy and financial distress and earned lower than average returns. Almilia (2006) studied three financial ratios -- profit margin, financial leverage and liquidity ratio (current assets to current liabilities) -- which affected corporate financial distress in Jakarta Stock Exchange during 1998-2001, where many companies got into financial difficulties following Asian Financial Crisis in 1997-1998. Sukana (2006) studied financial ratios of manufacturing companies in Indonesia Stock Exchange (IDX) to predict bankruptcy.

There are also a number of careful research studies using data from United States firms that provide various methods to identify failing firms. But in a developing country like India, the research in this context is very limited.

Objectives of the Study
1. To study the overall financial performance of the industry
2. To predict the financial health and viability of the companies used for research
3. To know the efficiency of financial operations

Current Scenario of Automobile Industry

The world has been recovering from the global financial crisis which devastated the economies of so many countries and 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.

The automobile industry in India has long been recognized as a core manufacturing sector with the potential to drive national economic growth and foster the development of technological capabilities through its powerful backward and forward linkages, and the localization of high value added manufacturing processes within domestic economies. India is one of the key players in the international automobile market. One of the fastest growing sectors in India is the automobile industry. High demand for cars, two wheelers and other vehicles has driven the growth of the automobile sector. Introduction of easy repayment and finance schemes has given a boost to the automobile companies in India. This move is further enhanced by Government's support towards setting up centers for development and innovation. Tata Nano's successful entry in the Indian market has steamed up the opportunities of growth available in alternative segments like electric cars, vehicles run on natural gas, etc.

The auto sector reported a robust growth rate of 26 percent in the last two years (2010-2012). The BSE AUTO Index outperformed the benchmark Nifty by 79%, 12% and 19% in FY10, FY11 and FY12, respectively. However, the sector has shown a sluggish growth of 12 percent in 2012. The trend is likely to stay with a 10 percent growth outlined for 2013 citing high ownership costs (fuel costs, cost of registration, excise duty, road tax) and slow rural income growth. Solid but cautious growth is expected over the next few years. However, from a long-term perspective, rising incomes, improved affordability and untapped markets present promising opportunities for automobile manufactures in India. According to Macquaire equities research, sale of passenger vehicles is expected to double in the next four years and growth anticipated is higher than the 16 percent achieved in the past 10 years. The Government recognizes the impact of the sector on the nation's economy, and consequently, the Automotive Mission Plan 2016 launched by it seeks to grow the industry to a size of US $145bn by 2016 and make it contribute 10 percent to the nation's GDP.

RESEARCH DESIGN

Method of Data Collection

Secondary data is used for the study. Published financial statements are used for analysis. The period for which the study is done is 10 years, starting from 2003 to 2012. The data required for calculating Z Score is obtained from CMIE Prowess Database. The company information is collected from their official website and NSE.

Sampling Design

This research focuses on a comparative analysis of financial performance of automobile companies. For this purpose the four wheeler automobile companies listed in National Stock exchange (CNX Auto) is selected.

Method of Analysis:

Quantitative analysis is done using Multi discriminate data analysis. Altman's Z Score is used to analyze the financial statements of the companies.

An overview of the Companies selected for Study:

This research focuses on a comparative analysis of financial performance of automobile companies. A brief summary of the companies is given below:

Maruti Suzuki India Ltd

Maruti Suzuki is the largest car manufacturer in India and holds 37% market share in the passenger car segment (as of Nov 2012). This automobile giant is a subsidiary of the Japanese automobile firm Suzuki Motor Corp. Since its inception in 1981, the company has sold over 10 million cars till date. Alto, Swift, Estilo and SX4 are some of the popular Maruti cars.

Tata Motors Ltd

Tata Motors is one of the largest vehicle manufacturing companies in the world. This Indian multi-national company manufactures a variety of automobiles including passenger cars, trucks, buses and military vehicles. In the past decade, this Tata subsidiary has acquired international automotive firms like Jaguar Land Rover and Daewoo. Popular Tata automobiles include Nano, Indigo, Starbus and Sumo.

Mahindra & Mahindra Limited

Mahindra is a well known automobile company in India, famous for its utility vehicles. Starting with selling jeeps in 1947, the company today manufactures and exports tractors, passenger cars, buses and trucks. It has associations with global auto firms like Renault and Ford. Xylo, Bolero, XUV 500 and Maxximo are popular Mahindra automobiles.

Ashok Leyland

Ashok Leyland is a leading manufacturer of commercial vehicles in India. Headquartered in Chennai, the company was found in 1948. The company had a great progress rate since then and is the second largest commercial vehicle company in India in the medium and heavy commercial vehicle and also owns almost 28 percent of market share.

Altman's Z Score:

The Z score, developed by Professor Edward I. Altman, is perhaps the most widely recognized and applied model for predicting financial distress (Bemmann, 2005). Altman developed this intuitively appealing scoring method at a time when traditional ratio analysis was losing favor with academics (Altman, 1968). Altman Z scores model requires a firm to have a publicly traded equity and be a manufacturer. Altman (1968) collected data from 33 bankruptcies and 33 non-bankruptcies, during the period 1946-1965, to find discriminating variables for bankruptcy prediction. In his seminal paper, Altman evaluated 22 potentially significant variables of the 66 firms by using multiple discriminant analysis to build the discriminant function with five variables. This model was later modified to Altman model (1993) that uses the same variables multiplied by different factors. Individual financial ratio to predict the financial performance of an enterprise may only provide caution when it is too late to take a corrective action .Further, a single ratio does not convey much of the sense.

There is no internationally accepted standard for financial ratios against which the result can be compared. Edwin Altman, therefore, combines a number of accounting ratios (liquidity, leverage, activity and profitability) to form an index of the probability, which was effective indicator of corporate performance in predicting bankruptcy. The Z score is a set of financial ratios in a multivariate context, based on a multiple discriminated model for the firms, where a single measure is unlikely to predict the complexity of their decision making.

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
- · ● $X3$ = EBIT / 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. Eidleman (1995) defines each of the above ratios as follows:

X1 is a liquidity ratio , the purpose of which is to measure the liquidity of the assets 'in relation to firm's size' .It is the measure of net liquid asset of a concern to the total capitalization which measures the firm's ability to meet its maturing short-term obligations.

X2 is an indicator of the 'cumulative profitability' of the firm over time which indicates the efficiency of the management in manufacturing, sales, administration and other activities.

X3 is a measure of firm's productivity which is crucial for the long-term survival of the company. It is a measure of productivity of an asset employed in an enterprise. The ultimate existence of an enterprise is based on earning power. It measures how effectively a firm is using its resources. It measures the management's overall effectiveness as shown by the returns generated on sales and investment.

X4 defines how the market views the company. The assumption is that with information being transmitted to the market on a constant basis, the market is able to determine the worth of the company. This is then compared to firm's debt. It is reciprocal of familiar debt equity ratio. Equity is measured by the combined market value of all shares, while debt includes both current and long term liabilities. This measure shows how much of an asset can decline in values before liabilities exceed the assets and the concerns become insolvent. It measures the extent to which the firm has been financed by debt. Creditors look to the equity to provide the margin of safety, but by raising fund through debt, owners gain the benefit of marinating control of the firm with limited investment.

X5 is defined as a 'measure of management ability to compete'. The capital turnover ratio is the standard financial measure for illustrating the sales generating capacity of the assets.

INTERPRETATION OF RESULTS

Table 1: Computation of Z Score for Maruti Suzuki Limited

(Rs.in Cr.)

Ratio/Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Avg
Current assets	2782.8	2018.9	2972.0	3740.9	4405.0	3097.9	5510.0	3772.4	5624.6	6324.9	4024.9
Current liabilities	1478.6	1531.8	1608.0	1977.1	3072.4	2825.7	3416.5	3567.8	3848.5	5310.7	2863.7
Net Working Capital	1304.2	487.1	1364.0	1763.8	1332.6	272.2	2093.5	204.6	1776.1	1014.2	1161.2
Total assets	3554.0	3903.1	4686.4	5524.3	7484.7	9315.6	10043.8	12656.5	14412.2	16689.2	8827.0
X_1=Net Working Capital/Total Assets	0.4	0.1	0.3	0.3	0.2	0.0	0.2	0.0	0.1	0.1	0.2
Retained earnings	2953.5	3446.7	4234.3	5308.1	6709.4	8270.9	9200.4	11690.6	13723.0	15042.9	8058.0
Total assets	3554.0	3903.1	4686.4	5524.3	7484.7	9315.6	10043.8	12656.5	14412.2	16689.2	8827.0
X_2=Retained Earnings/Total Assets	0.8	0.9	0.9	1.0	0.9	0.9	0.9	0.9	1.0	0.9	0.9
EBIT	334.8	813.2	1340.9	1770.4	2317.4	2562.6	1726.8	3626.0	3133.8	2201.4	1982.7
Total assets	3554.0	3903.1	4686.4	5524.3	7484.7	9315.6	10043.8	12656.5	14412.2	16689.2	8827.0
X_3=EBIT/Total Assets	0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.1	0.2
Market Value of Equity	4702.0	14357.9	12157.8	25261.7	23682.8	23967.4	22394.2	40915.4	36506.5	38978.2	24292.4
Total liabilities	2373.4	2152.5	2151.0	2247.8	3980.8	3995.6	4349.4	4609.8	4408.9	6932.4	3720.2
X_4=Market Value of Equity/ Total Liabilities	2.0	6.7	5.7	11.2	5.9	6.0	5.1	8.9	8.3	5.6	6.5
Net sales	7393.7	9449.5	11046.3	12197.9	14806.4	18066.8	20729.4	29317.7	36561.5	35558.2	19512.7
Total assets	3554.0	3903.1	4686.4	5524.3	7484.7	9315.6	10043.8	12656.5	14412.2	16689.2	8827.0
X_5=Net Sales/ Total Assets	2.1	2.4	2.4	2.2	2.0	1.9	2.1	2.3	2.5	2.1	2.2
Z Score	*5.2*	*7.7*	*8.3*	*11.7*	*8.0*	*7.7*	*7.3*	*9.9*	*9.7*	*7.3*	*8.3*

Source: CMIE Prowess Database

X_1 measures the company's ability to pay its short term debts. It shows the liquidity position of the company. An increase in the ratio indicates the company's efficiency in recovering its debt. The average of this ratio is .17. There is a decrease in the ratio. This is not a positive sign. And most of the results are below or just above the average.

X_2 measures the efficiency of the company to accumulate its profits to finance its total assets. The above table shows that Maruti Suzuki is able to finance its total assets up to 80% on an average. The balance is procured through long term debts. An increasing trend is identified, which shows that the company is able to retain more earnings.

X_3 indicates the company's ability to utilize its fixed assets to earn profits. 2011-12 shows the lowest ratio. Next to it 2008-09 shows 0.17. This is due to the financial crisis happened in that year. On an average it shows a decrease trend. EBIT is totally ruled by sales. So sales have to be hiked to mark an increase in this ratio.

X_4 shows a very good result against the normal scale of 200%. The market value of equity is increasing. It has performed over the normal standards of this ratio. This shows the financial strength and popularity of Maruti Suzuki. X_5 indicates the company's ability to utilize

The results of Z Score are above 3, which means the financial performance of the company is good. It shows an increasing trend up to 2006-07 and after that there is a dip and a sudden decrease is seen in the last year. On the whole the financial performance of the company is satisfactory as it is above 3.

Table 2: Computation of Z Score for Tata Motors Limited

(Rs. in Cr.)

Ratio/Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Avg
Current assets	2982.0	3695.7	7086.0	9487.8	10512.1	10360.3	9540.3	11506.6	10885.7	11122.7	8717.9
Current liabilities	3491.2	4658.8	6540.7	6941.9	7728.0	10633.1	10841.0	17372.6	12689.0	14226.1	9512.2
Net Working Capital	-509.2	-963.1	545.4	2546.0	2784.1	-272.9	-1300.8	-5866.0	-1803.3	-3103.4	-794.3
Total assets	4055.5	4849.5	6606.8	8473.9	10878.9	14120.0	25395.7	31560.0	39478.3	38187.8	18360.6
X1=Net Working Capital/Total Assets	-0.1	-0.2	0.1	0.3	0.3	0.0	-0.1	-0.2	0.0	-0.1	0.0
Retained earnings	2277.3	3236.8	3749.6	5154.2	6484.3	7454.0	11716.1	14394.9	19375.6	18991.3	9283.4
Total assets	4055.5	4849.5	6606.8	8473.9	10878.9	14120.0	25395.7	31560.0	39478.3	38187.8	18360.6
X2=Retained Earnings/Total Assets	0.6	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
EBIT	819.7	1494.8	1869.7	2346.9	2941.7	3002.1	1824.7	4075.8	3580.2	2559.7	2451.5
Total assets	4055.5	4849.5	6606.8	8473.9	10878.9	14120.0	25395.7	31560.0	39478.3	38187.8	18360.6
X3=EBIT/Total Assets	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.2
Market Value of Equity	4666.3	15787.0	14039.3	32998.6	26109.6	22745.9	9142.4	43300.0	78756.9	87198.8	33474.5
Total liabilities	2373.4	2152.5	2151.0	2247.8	3980.8	3995.6	4349.4	4609.8	4408.9	6932.4	3720.2
X4=Market Value of Equity/Total Liabilities	2.0	7.3	6.5	14.7	6.6	5.7	2.1	9.4	17.9	12.6	8.5
Net sales	8841.6	12895.6	17088.6	20293.3	27185.8	28538.0	25149.9	35024.7	47088.4	54306.6	27641.2
Total assets	4055.5	4849.5	6606.8	8473.9	10878.9	14120.0	25395.7	31560.0	39478.3	38187.8	18360.6
X5=Net Sales/Total Assets	2.2	2.7	2.6	2.4	2.5	2.0	1.0	1.1	1.2	1.4	1.9
Z Score	4.1	6.1	5.4	6.7	6.0	4.3	2.0	2.7	3.8	4.0	4.5

Source: CMIE Prowess Database

Tata Motors X1 ratio shows negative figures. Major part of its working capital is financed through debt and there is an increase in sundry debtors value throughout the study period. Proper credit policy or collection of overdue on time would increase this ratio. The company is able to maintain it's retained earnings. According to the result of X2, the company is able to generate and retain its profit out of its total assets.

X3 indicates the company's ability to generate profit out of its total assets. But the company has shown a decline trend from 2008-2009. Fluctuations are seen in the trend and last year has marked with 0.19, which is the highest number resulted after 2008-2009. X4 shows the company's market value to overcome its liabilities. The ideal number is 2. Tata Motors X2 ratio is above 2. Till 2005-06, it showed an increasing trend and after that a sudden dip is marked and it is followed by a declining trend. In the year 2010-11 it again regained its position, but that was also followed by a fall. Analyzing X5 ratio, Tata Motors was not able to utilize its fixed assets fully during 2008-2009.

Z Score of Tata Motors is above 3 till 2007-2008. During the next two years it was below 3 and Tata Motors was in the grey area according to the model. But after that, it started gaining and moved above 3.

Table 3: Computation of Z Score for Mahindra and Mahindra Limited

(Rs. In Cr.)

Ratio/Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Avg
Current assets	1147.5	1091.7	1469.4	1775.1	1995.3	2399.4	2739.9	2922.0	3496.5	4977.3	2401.4
Current liabilities	1332.2	1539.6	1980.6	2254.2	2854.2	3468.8	4797.8	5619.0	7245.6	5289.7	3638.2
Net Working Capital	-184.7	-447.9	-511.2	-479.1	-858.9	-1069.4	-2057.8	-2697.0	-3749.1	-312.4	-1236.7
Total assets	2709.7	2504.8	3064.9	3792.3	5188.9	6937.1	9296.7	10710.4	12718.6	15278.9	7220.2
X1=Net Working Capital/Total Assets	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	0.0	-0.2
Retained earnings	1438.3	1644.2	1881.9	2662.1	3302.0	4098.5	4959.3	7527.6	9974.6	11799.3	4928.8
Total assets	2709.7	2504.8	3064.9	3792.3	5188.9	6937.1	9296.7	10710.4	12718.6	15278.9	7220.2
X2=Retained Earnings/Total Assets	0.5	0.7	0.6	0.7	0.6	0.6	0.5	0.7	0.8	0.8	0.7
EBIT	312.9	515.1	683.9	1126.5	1438.3	3768.6	3590.5	2931.1	3590.5	3768.6	2172.6
Total assets	2709.7	2504.8	3064.9	3792.3	5188.9	6937.1	9296.7	10710.4	12718.6	15278.9	7220.2
X3=EBIT/Total Assets	0.1	0.2	0.2	0.3	0.3	0.5	0.4	0.3	0.3	0.2	0.3
Market Value of Equity	1511.4	6761.6	7102.6	17323.2	18478.6	16256.4	8559.7	12179.1	15735.4	16077.6	11998.5
Total liabilities	2472.0	2269.4	3033.2	3137.8	4490.2	6055.8	8850.5	8499.2	9700.8	11941.2	6045.0
X4=Market Value of Equity/Total Liabilities	0.6	3.0	2.3	5.5	4.1	2.7	1.0	1.4	1.6	1.3	2.4
Net sales	3713.2	4931.7	6594.7	8136.6	9921.3	11310.4	13081.1	18516.3	23477.5	31835.2	13151.8
Total assets	2709.7	2504.8	3064.9	3792.3	5188.9	6937.1	9296.7	10710.4	12718.6	15278.9	7220.2
X5=Net Sales/Total Assets	1.4	2.0	2.2	2.1	1.9	1.6	1.4	1.7	1.8	2.1	1.8
Z Score	2.8	5.1	5.0	7.3	6.0	5.7	3.7	4.2	4.5	4.8	4.9

Source: CMIE Prowess Database

The above table depicts a negative trend in X1. It indicates that the working capital is funded by its debts. This is due to increase in current liabilities. X2 shows the ability of M&M Ltd to make out retained earnings from its total assets. The ratio shows an increasing trend. The company is able to increase its contribution to retain earnings during the study period. EBIT to total assets ratio signifies the ability of the company to earn profits out of its total assets. According to our study period, it was very low in the beginning and started to rise and after 2008 there was a decline which was not reached in the remaining period.

Table 4: Computation of Z Score for Ashok Leyland Limited

(Rs. In Cr.)

Ratio/Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Avg
Current assets	1340.5	1463.7	2157.3	2232.4	2697.7	2875.3	3165.6	4152.1	3983.8	4303.9	2837.2
Current liabilities	592.4	832.7	1165.7	1408.5	1755.9	2271.9	2140.8	2960.8	3539.7	4039.2	2070.8
Net Working Capital	748.1	631.0	991.6	823.9	941.9	603.3	1024.8	1191.4	444.0	264.7	766.5
Total assets	1677.0	1550.7	2048.3	2104.4	2535.0	3036.5	5432.0	5949.2	6609.7	7386.2	3832.9
X1=Net Working Capital/Total Assets	0.4	0.4	0.5	0.4	0.4	0.2	0.2	0.2	0.1	0.0	0.3
Retained earnings	840.6	932.9	1048.9	1290.3	1762.2	2016.0	3340.9	3535.7	3829.9	3942.1	2253.9
Total assets	1677.0	1550.7	2048.3	2104.4	2535.0	3036.5	5432.0	5949.2	6609.7	7386.2	3832.9
X2=Retained Earnings/Total Assets	0.5	0.6	0.5	0.6	0.7	0.7	0.6	0.6	0.6	0.5	0.6
EBIT	265.7	345.9	385.4	493.0	633.4	714.5	368.8	646.6	900.7	945.2	569.9
Total assets	1677.0	1550.7	2048.3	2104.4	2535.0	3036.5	5432.0	5949.2	6609.7	7386.2	3832.9
X3=EBIT/Total Assets	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.2
Market Value of Equity	1159.6	3016.1	2497.5	4916.9	5090.4	4696.0	2407.8	7429.7	7569.4	8061.9	4684.5
Total liabilities	1478.4	1513.3	2222.3	2287.8	2610.6	3429.2	4437.4	5651.8	6575.3	7653.3	3785.9
X4=Market Value of Equity/ Total Liabilities	0.8	2.0	1.1	2.1	1.9	1.4	0.5	1.3	1.2	1.1	1.3
Net sales	2757.3	3440.5	4247.7	5329.8	7320.4	7935.5	6098.4	7407.2	11416.9	13317.6	6927.1
Total assets	1677.0	1550.7	2048.3	2104.4	2535.0	3036.5	5432.0	5949.2	6609.7	7386.2	3832.9
X5=Net Sales/ Total Assets	1.6	2.2	2.1	2.5	2.9	2.6	1.1	1.2	1.7	1.8	2.0
Z Score	3.9	5.5	4.7	5.9	6.3	5.4	2.8	3.5	3.8	3.7	4.5

Source: CMIE Prowess Database

X1 of Ashok Leyland shows a declining trend which stands as a result of increase in current liabilities. On an average the company is at least able to retain its earnings equal to 50% of its total assets. X3 shows a declining trend. It shows the company's ability to earn from utilizing its total assets. Market value of equity to total liabilities should be at least equal to 200%. But Ashok Leyland's X4 is below the standard norms. X5 depicts the company's efficiency to make sales out of its total assets. Till 2008 it showed a forward trend and then there is a fall, which is not covered till the end of the study period. Regarding Z Score the company was in the grey zone during 2008-2009. But from the next financial year it started increasing.

Table 5: Computation of the average of the ratios

(Rs. In Cr.)

Ratio/company average	Maruti Suzuki	Tata Motors	M & M Ltd	Ashok Leyland	Average
Current assets	4024.94	8717.9	2401.42	2837.22	4495.37
Current liabilities	2863.71	9512.23	3638.16	2070.75	4521.21
Net Working Capital	1161.23	-794.32	-1236.74	766.47	-25.84
Total assets	8826.98	18360.65	7220.23	3832.9	9560.19
X1=Net Working Capital/Total Assets	**0.17**	**-0.01**	**-0.16**	**0.28**	**0.07**
Retained earnings	8057.98	9283.4	4928.78	2253.94	6131.03
Total assets	8826.98	18360.65	7220.23	3832.9	9560.19
X2=Retained Earnings/Total Assets	**0.91**	**0.54**	**0.65**	**0.59**	**0.67**
EBIT	1982.73	2451.51	2172.61	569.91	1794.19
Total assets	8826.98	18360.65	7220.23	3832.9	9560.19
X3=EBIT/Total Assets	**0.23**	**0.19**	**0.29**	**0.17**	**0.22**
Market Value of Equity	24292.4	33474.48	11998.55	4684.54	18612.49
Total liabilities	3720.16	3720.16	6405.02	3785.94	4407.82
X4=Market Value of Equity/ Total Liabilities	**6.54**	**8.47**	**2.36**	**1.34**	**4.68**
Net sales	19512.7	27641.24	13151.8	6927.13	16808.23
Total assets	8826.98	18360.65	7220.23	3832.9	9560.19
X5=Net Sales/ Total Assets	**2.2**	**1.91**	**1.82**	**1.99**	**1.98**
Z Score	**8.28**	**4.51**	**4.9**	**4.53**	**5.55**

The above table is the comparative analysis of the companies selected for the study. Average of the results of the four companies is computed. The value of X1 is negative for Tata Motors and M&M Ltd and they are very low when compared to the average. When X2 is considered, the result of Tata Motors and Ashok Leyland is lower than the overall average. On the other hand, Maruti Suzuki and Tata Motors performed above the average. In case of X3, the average percentage is 22%. It depicts that the companies are able to earn only upto 22% of its total assets. Market Value of Equity to total assets should be at least 200%. The overall average is above the standards. But the value of Ashok Leyland is below this idle number. The average of X5 is 1.98, which is almost attained by all the companies.

Table 6: Computation of Average Z Score

Year/Z Score	Maruti Suzuki	Tata Motors	M & M Ltd	Ashok Leyland	Average
2003	5.18	4.09	2.78	3.87	3.98
2004	7.72	6.13	5.14	5.48	6.12
2005	8.31	5.41	4.95	4.67	5.84
2006	11.74	6.69	7.27	5.92	7.91
2007	8.04	5.97	5.99	6.30	6.58
2008	7.72	4.29	5.68	5.38	5.77
2009	7.25	2.04	3.74	2.76	3.95
2010	9.90	2.71	4.17	3.46	5.06
2011	9.70	3.78	4.49	3.76	5.43
2012	7.27	3.98	4.76	3.65	4.92
Average	**8.28**	**4.51**	**4.90**	**4.53**	**5.55**

By analyzing the values of Z Score, Mahindra and Mahindra Limited and Ashok Leyland have not reached the average Z Score value throughout the study period. Tata Motors Z Score value stood above the average for the first two years and then it started declining. The average Z Score value of all the 10 years is high for Maruti Suzuki Ltd and its Z score value is above the average value of all the companies.

RESEARCH SHORTCOMINGS

The study is done for automobile companies and it cannot be generalized to all other sectors. The results are applicable only for the period chosen. Only a small sample is used for the study, therefore some risk is associated with the sample size. And Altman Z Score was formulated and tested during 1960s. The samples he used were American Companies. Even though it has been updated, the reliability of the model to the current situation and Indian Companies is not yet tested.

Conclusion

Assessing the financial health of a company periodically is very important. But in a developing country like India, such analysis is not given importance. It is not researched in depth in many emerging economies. This study has focused on measuring the financial health of automobile companies. And it revealed that even the top companies are not able to reach the overall average. Automobile sector is one which contributes considerably to the GDP of any economy. So, a study of this sector will provide insights of their performance to the external and internal users. The results show that all companies have underperformed after the Global Crisis and are trying to overcome the fall. But again due to economic slowdown, rise in fuel prices, government policies etc..., it has declined. According to our study the companies analyzed are in the safe zones, but the overall performance of the company has decreased. These inefficiencies have to addressed in time, or else the firms may move to grey zone.

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