A STUDY ON PREDICTION OF DEFAULT PROBABILITY OF AUTOMOBILE DEALERSHIP COMPANIES USING ALTMAN Z SCORE MODEL

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Abstract

Over the past few years, the auto dealership company's profitability is eroded due to increasing operating cost and financial expenses. This decline in profitability is due to a higher level of stocking and working capital requirements. On account of above factors, the companies facing severe liquidity problems and leads to bankruptcy. Predicting bankruptcy is important for investor and other stakeholders to take appropriate decision on making investments. Identification of probability of default may avoid various problems shortly & may shelter the company from Bankruptcy situation. If the financial distress was predicted ahead of time, stakeholders of the companies can secure their company and could take necessary action to mitigate the risk and perhaps avoid bankruptcy itself. The financial health of the firm shall be established with detailed ratios analysis and using other Financial analytical tool. The analysis establishes the financial performance of a firm by evaluating its operational and financial status. For this specific study, we are trying to analyze the probability of bankruptcy of automobile dealer companies using Altman's Z-Score Model and their score. This study aims to evaluate the financial distress of the automobile dealership companies in India.
Keywords: *Bankruptcy, Altman's Z-Score model, EM-Score Model, Automobile dealership, Stakeholders, Financial distress.*

Introduction

All stakeholders are expecting the company to perform beyond expectations and deliver results in all aspects of the business. The stakeholders also expect that, the management to work hard to manage and minimise the risk of business failure/bankruptcy. Therefore, it is essential to forecast bankruptcy/business distress and

take necessary corrective steps to reduce its impact. The objective of any company is to maximise the shareholder wealth.

In recent times, we have been witnessing automobile dealership is being on fast track and introducing their new products regarding new models, new variants, and new features besides differentiating their services offerings too. It makes industry to grow in much faster phase and leads to faster expansion. On account expansion and competition, these companies may not deliver the expected results and closed down in shorter term. Now it is the right time to predict business bankruptcy/failure of these companies can be very useful for them to initiate necessary action for better financial planning, operational efficiency, and overall corporate policies. Every organization has an element of risk of business failure; auto and auto ancillary companies are no exception. Business failure as an indication of resource mismanagement and inefficiency of management. Distress as 'the inability of a firm to pay its financial obligations as they mature'.

This research paper defines business failure as three successive years of any or a combination of the following:

- Erosion of Net worth
- Increase in working capital Gap
- Increase in Borrowing cost

Literature Review

Prihadi (2011:332) bankruptcy, a condition where the company no longer able to repay their obligations. This condition usually does not just show up on the company. Preliminary indications from the company that usually can be recognized early that the financial statements are carefully analyzed in a particular way. Financial ratios can be used as an indication of the bankruptcy of the company.

Jumingan (2011:118) the ratio in financial statement analysis is a number that shows the relationship between an element with the other elements of the financial statements. Concluded that the financial ratios financial ratio is a number that shows the relevant and significant relationship between some elements with other elements of the financial statements.

Narayan, et al. "Zeta Analysis" reviewed international failure studies across 22 countries, including some developing countries, and concluded that multivariate approaches such as MDA, logistic regression, and probit models based on financial ratios are better indicators of failure. These models can perform well over several time periods and across different countries. From amongst these models, MDA was found to be more superior and more acceptable.

In general, after the financial crisis in (2008) the need for developing bankruptcy prediction models became more vital than ever. Researchers have examined many of the models to identify their ability to predict corporate failure. Examples of studies

include: Beaver (1966), Altman (1968), Deakin (1972), Kida (1980), Ohlson (1980), Taffler (1983) and Shirata (1998). Also, the accuracy of these models is questionable. Therefore, advanced economies, such as those of the US, the UK, Canada, Malaysia, and China, have been used as case studies (Mohammed et al., 2012).

Bankruptcy prediction models can be divided into several categories. These categories are statistical, artificially intelligent expert systems (AIES), and theoretical models. The statistical models focus on the symptoms of failure based on the company's accounts in a multivariate (several symptoms considered together) or univariate (each symptom considered separately) nature following the classic model procedures. The AIES model focuses on symptoms of failure using company accounts in a multivariate nature using technological advancements as the basis. The theoretical models focus on qualitative reasons for failure using information that could settle a theoretical argument rather than the company's financial data (Aziz, 19, 2006).

Objectives of Study

The objectives of this study are twofold, viz:
1. To assess the probability of default prediction.
2. To evaluate the strength of the Z score model as applied to specific mid-size Automobile dealerships.

Research Methodology

The financial position of the select automobile dealership companies was studied based on the secondary data collected from audited financial status for two financial years 2015 & 2016.The concept of Altman Z-score was applied to understand the performance of the select companies in the automobile industry which is the key driver of Indian economy. The following parameters were used to identify the sample for the study.
1. Companies who are into automobile dealership business.
2. Those who have the track record of two years.

Basic Z Score Model

Bankruptcy is a serious problem and costly. Therefore, it is important to anticipate the emergence of financial problems that could lead to bankruptcy. The prediction model of companies that experienced financial difficulties and possible bankruptcy becomes important. Business bankruptcy prediction model will guide the parties involved about whether the company's financial performance will experience financial difficulties or are not in the future using five financial ratios. Management may make improvements needed as early as possible to avoid bankruptcy when it has developed a system that can provide early warning.

The Z-score model was constructed by Edward I. Altman; the model was first created in the year 1968 by using a linear combination of four or five ratios, weighted by coefficients.

The coefficients were estimated by identifying a set of firms that had declared bankruptcy and then collecting a matched sample of firms, which had survived, with matching by industry and approximate size (assets). Altman applied the statistical method of discriminant analysis to a dataset of publicly held manufacturers.

The estimation was originally based on data from publicly held manufacturers, but has since been re-estimated based on other datasets for private manufacturing, non-manufacturing and service companies. The original data sample consisted of 66 firms, half of which had filed for bankruptcy.

All businesses in the database were manufacturers, and small firms with an asset of < $1 million were eliminated. The original Z-score formula was as follows:

The original Z-score formula, which will be the model in our study, was as follows:

Model 1: $z = 0.012x_1 + 0.014x_2 + 0.033x_3 + 0.006x_4 + 0.999x_5$

 Whereas;

- x_1 = Working Capital / Total Assets. It measures working capital with total assets about the size of company.
- x_2 = Retained Earnings / Total Assets. It measures Net worth that reflects the company's earning power.
- x_3 = Earnings Before Interest and Taxes / Total Assets. It measures operating profit apart from tax and leveraging factors. It recognizes as operating earnings as being important to long-term viability.
- x_4 = Book Value of Equity / Total Liabilities.
- x_5 = Sales / Total Assets. The standard measure of total asset turnover

Table 1: The Interpretation of Z-Score Model

S. No.	Z Score	Status
1	Greater than 2.99	Safe
2	Between 1.81 to 2.99	Grey
3	Less than 1.81	Distress

Data Collection & Research Sample

The study depends on the secondary source & annual reports (financial statements) were collected from the various automobile dealerships across India. The period of data collected for this purpose is the financial year 2015 and 2016. This study covers the sample size of nineteen companies, which is operating in various parts of the country and mainly on selling, and servicing of automobiles. The companies were selected based on the Turnover and balance sheet size of last financial year. The collected data were analyzed by using Excel. Below shown are the companies which were selected for the study.

Table 2: Key Ratios & Z score for the Financial Year 2014-15

S. No.	Company Name	(X1)	(X2)	(X3)	(X4)	(X5)	Z score (2014-15)	Risk (2014-15)
1	Varanasi Auto link	0.82	-0.01	0.09	0.01	3.37	3.38	Safe Zone
2	Vimal Cars	0.36	0.01	-0.06	0.19	1.69	1.69	Distress Zone
3	Vibrant Motors	0.92	-0.01	0.07	0.06	3.38	3.39	Safe Zone
4	Karan Ashok Vehicles	0.81	-0.01	0.10	0.10	3.82	3.83	Safe Zone
5	Auto logic Motors	0.61	0.00	0.04	0.16	1.23	1.23	Distress Zone
6	Aradhana Enterprises	0.63	0.00	0.02	0.20	4.54	4.54	Safe Zone
7	NCR Motors India	0.87	0.02	0.08	0.04	2.17	2.18	Grey Zone
8	Basudev Motors	0.46	-0.02	0.00	0.07	0.34	0.35	Distress Zone
9	Dee Cars	0.75	0.02	0.13	0.05	3.72	3.73	Safe Zone
10	Krishna Motors	0.57	0.00	0.12	0.19	2.27	2.28	Grey Zone
11	Kamdar Carz	0.79	-0.21	-0.07	0.00	2.29	2.29	Grey Zone
12	Vidhatri Motors	0.70	-0.02	0.06	0.10	3.31	3.31	Safe Zone
13	Vish Automotives	0.54	-0.08	-0.02	0.02	2.80	2.80	Grey Zone
14	Aphrodite	0.57	0.01	0.08	0.23	2.96	2.96	Grey Zone
15	HGP Cars	0.88	0.03	0.05	0.08	2.47	2.49	Grey Zone
16	Madan Motors Auto wheels	0.85	0.00	0.01	0.10	0.21	0.22	Distress Zone
17	TR Auto wheels	0.88	-0.03	0.10	0.30	3.41	3.42	Safe Zone
18	Nagshanti Auto cars	0.82	0.03	0.06	0.14	3.49	3.50	Safe Zone
19	Sky Wheels	0.81	0.01	-0.01	0.22	1.91	1.92	Grey Zone

Source: Financial statements of all nineteen companies are taken from Register of companies' web site (2015).

Table 3: Key Ratios & Z score for the Financial Year 2015-16

S. No.	Company Name	(X1)	(X2)	(X3)	(X4)	(X5)	Z Score (2015-16)	Risk (2015-16)
1	Varanasi Auto link	0.85	0.00	0.13	0.02	3.24	3.25	Safe Zone
2	Vimal Cars	0.42	0.01	-0.06	0.16	1.68	1.69	Distress Zone
3	Vibrant Motors	0.95	0.02	0.08	0.09	2.91	2.92	Grey Zone
4	Karan Ashok Vehicles	0.82	0.02	0.09	0.10	3.07	3.08	Safe Zone
5	Auto logic Motors	0.65	0.00	0.07	0.12	2.13	2.14	Grey Zone
6	Aradhana Enterprises	0.55	0.04	0.09	0.19	5.58	5.59	Safe Zone
7	NCR Motors India	0.71	0.04	0.11	0.06	2.60	2.61	Grey Zone

8	Basudev Motors	0.48	-0.07	0.02	0.02	2.68	2.69	Grey Zone
9	Dee Cars	0.79	0.03	0.11	0.05	2.71	2.72	Grey Zone
10	Krishna Motors	0.63	-0.02	0.06	0.17	1.65	1.66	Distress Zone
11	Kamdar Carz	0.80	-0.44	-0.07	-0.18	2.04	2.04	Grey Zone
12	Vidhatri Motors	0.67	0.00	0.11	0.13	3.85	3.86	Safe Zone
13	Vish Automotives	0.59	-0.19	-0.01	0.01	2.95	2.95	Grey Zone
14	Aphrodite	0.57	0.02	0.09	0.27	2.02	2.03	Grey Zone
15	HGP Cars	0.87	0.03	0.09	0.13	3.54	3.55	Safe Zone
16	Madan Motors Auto wheels	0.87	0.01	0.10	0.09	3.92	3.93	Safe Zone
17	TR Auto wheels	0.88	-0.02	0.09	0.24	2.69	2.70	Grey Zone
18	Nagshanti Auto cars	0.70	0.05	0.10	0.18	4.24	4.25	Safe Zone
19	Sky Wheels	0.81	0.02	0.08	0.23	1.67	1.68	Distress Zone

Source: Financial statements of all nineteen companies are taken from Register of companies' web site (2016).

Figure 1: Z score Analysis
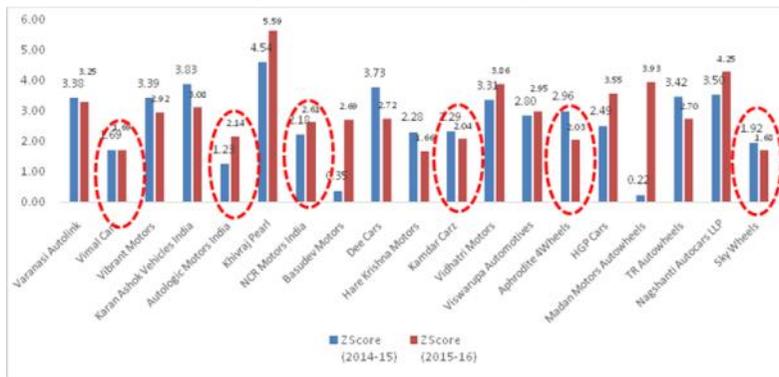
Analysis

- The Financials of nineteen dealership companies were analyzed and quantified the probability of default for last two financial years 2015 and 2016 to understand the trend.
- The sales to Total Asset and Book value to equity is key ratios, which will determine the liquidity and sustainability of Company in near term.
- The companies who have low Z score and under grey or distress category, have a huge investment in Fixed and current asset and sales volume were not proportional to the total asset.
- The companies who were under distress also have a low ratio of Equity to the Total asset. This means these companies were not able to raise additional capital due to poor performance.

Conclusion

- The Automobile dealership is undergoing several changes due to Government regulation, fierce competition, increased customer awareness, etc. On account of above factors, the profit per unit sold has come down and the viability of dealership companies is under thread. Hence, it shows continuous monitoring of financial status is inevitable to sustain the business.

- Since the dealership profitability is influenced by various factors, the five ratios of Altman Z score alone will not be able to give an accurate prediction of bankruptcy. Hence we recommend including other parameters like liquidity, working capital availability, payment behaviour and interesting expenses to arrive final score.

- To develop suitable strategies for coping with this risk, manufacturers and their network need to evaluate this risk in quantitatively. Otherwise, it is very difficult to manage the current level of network. Moreover they will fall back into a reactive role.

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