An Application of Altman Z-Score and Beneish M-Score Model on Selected Textiles Companies

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Abstract:
Financial Statements vary from country to country as different accounting standard is applied in the financial statements. Although there could be different type of financial statements, its information value is basically same everywhere i.e. to provide its true and fair value on company’s financial position. But sometimes, this does not happen and the financial statements contains the falsified accounting statements. Therefore, it is necessary to identify this kind of fraud by making use of various fraud detection models. The objective of this study is to calculate the value of Altman Z-score and Beneish M score using ten-years financial data collected from the Annual Reports of three selected Indian textile companies. According to Altman Z score Model, Financial position of all three selected companies i.e. Arvind Ltd., Grasim Ltd. and Raymond Ltd is good. According to ten years average of the M score, all three selected companies i.e. Arvind Ltd., Grasim Ltd. and Raymond Ltd has not manipulated its financial statements for the selected periods of study. This analysis suggest that the Altman Z score Model and Beneish Model should be used together than stakeholders would be better protected.

Keywords: Financial Statements, Textile Companies, Altman Z-score, Beneish M-score.

1. INTRODUCTION

Financial Statements can be defined as a reporting activity of the company which provides information about the financial status and results of the company to its stakeholders. Financial Statements vary from country to country as different accounting standard is applied in the financial statements. Although there could be different type of financial statements, its message and information value are basically same everywhere i.e. to provide its true and fair value on company’s financial position. On the basis of information provided in the financial statements, the owners of companies, investors, creditors, government institutions make their decisions. So, it must be true and fair. But sometimes, this does not happen and financial statements contains the falsified accounting statements; where generally numbers are manipulated by overstating assets, spurious entries related to sales and profit, misappropriation in taxes, or understating liabilities, debts, expenses or losses. This kind of task is carried out for showing the data in a better way to attract the investors and other related parties. In addition to this, Deloitte (2008) has revealed that there is connection between the bankruptcy and fraud. when a company is at the verge of bankruptcy, managers are motivated to manipulate their financial statements for showing a better financial position of the company to their stakeholders. So, if the financial statement is manipulated, it leads to disagreement between a company’s financial performance and related non-financial measures of the company. Because of this, Stakeholders may lose their trust in the company.

Therefore, it is necessary to identify this kind of fraud by making use of various fraud detection models. Altman Z score Model, Beneish M score Model, Dechow Model, Benford’s Law are generally used for this purpose.

2. LITERATURE REVIEW

- John MacCarthy (2017) conducted case study of Enron Corporation for detecting corporate fraud and corporate failure by using Altman Z Score and Beneish M Score Model. For this purpose, Five-year financial information was collected from the US SEC Edgar database covering the period 1996 to 2000. The Author concluded that the financial statements for the five years studied were manipulated by management. Moreover, the researcher argued that, stakeholders would be better protected when these two models are used simultaneously than when only the Altman Z-score is used. This paper recommended that Altman Z-score and Beneish M-Model should be used together as an integral part of every audit.
- Normah Omar et al (2014) examined a case of Megan Media Holdings Berhad using Beneish Model and ratio Analysis for fraud detection. All the Beneish ratio as well as certain accounting ratio was calculated for the year 2005 and 2006 for this purpose. The results show that the company was involved in manipulation of financial statements.
- Rasa kanapickiene and ZivileGrundiene (2015) applied the ratio-based model for fraud detection on 40 sets of fraudulent financial statement and 125 sets of non-fraudulent financial statements. The logistic regression model of fraud detection in financial statements has been developed. It was found in this study that in most cases fraud is committed to show that the company keeps growing and to fulfil obligational conditions.
- Roli Pradhan(2014) estimated Z score of three banks form Indian banking sector in this paper. Secondary data were collected from annual reports of 2008 to 2010. Z score value of Oriental Bank of Commerce is the highest amongst the mentioned three banks. This paper emphasized on the usage of Backpropagation Neutral Network for the prediction of bankruptcy for public sector banks in India.
Tanti Irawati Muchlis and Kurniasari Dian Jayanti (2009) applied the Z score for risk analysis of Property sector companies. Author analyzed bankruptcy risk of property companies listed at Indonesian Stock Exchange (IDX) on period of 2004-2008 using Altman Z-score prediction model on their audited financial statements. The result of study of 19 listed property companies show that for 5 (five) consecutive years based on Altman Z-score, only 2 (two) companies, LPCK and JRPT are fit into healthy companies’ category. Only one company, BMSR is fit into bankrupt company category for 5 (five) consecutive years and one company, LPKR is fit into grey area.

3. RESEARCH METHODOLOGY

This paper adopted descriptive and quantitative research methodology. This research has used secondary data from the annual reports of three selected Indian textile companies for the period of the years 2009 to 2018. For this study, three company namely Arvind ltd, Raymond ltd and Grasim ltd are selected. The Objective of this study is to determine the value of Altman Z scores Model for checking the financial health of selected companies and Beneish M Score Model to determine whether selected companies has manipulated its financial statements or not. The analytical tools used for this study are Altman Z-score Model and Beneish M-model.

**ALTMAN Z SCORE MODEL**

Altman Z-score Model is a Multiple Discriminant Analysis (MDA) which is mainly used to distinguish between surviving and failing companies based on the information gathered from published annual financial statements. The Model is given below:

\[ Z \text{ Score} = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5 \]

Where:

\[ X_1 = \frac{\text{Net Working Capital}}{\text{Total Assets}} \]
\[ X_2 = \frac{\text{Retained Earnings}}{\text{Total Assets}} \]
\[ X_3 = \frac{\text{EBIT}}{\text{Total Assets}} \]
\[ X_4 = \frac{\text{Market value of Equity}}{\text{Book Value of Total liabilities}} \]
\[ X_5 = \frac{\text{Sales}}{\text{Total Assets}} \]

<table>
<thead>
<tr>
<th>Result of Z Score</th>
<th>Interpretation of Result</th>
</tr>
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<tbody>
<tr>
<td>more than 2.67</td>
<td>Non distress zone means the company is safe from the bankruptcy that means the company does not experience any problems with its financial condition.</td>
</tr>
<tr>
<td>between 1.80 to 2.67</td>
<td>Grey zone means the company has to improve its management and financial structure. otherwise, the company may be in danger of the bankruptcy within one or two years.</td>
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<tr>
<td>less than 1.80</td>
<td>Distress zone means the company is facing a serious threat of the bankruptcy.</td>
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**BENEISH M-SCORE MODEL**

Professor Messod Beneish developed Beneish M-score Model in 1999 as a complementary forensic tool to Altman Z-score Model with the aim of protecting stakeholders in their analysis. Beneish model is used to discriminate between companies that may have manipulated their financial statements and companies that are not manipulating their financial statement. This study uses Eight variable model of Beneish which is given below:

\[ M \text{ - Score} = -4.84 + 0.920*\text{DSRI} + 0.528*\text{GMI} + 0.404*\text{AQI} + 0.892*\text{SGI} + 0.115*\text{DEPI} - 0.172*\text{SGAI} + 4.679*\text{TATA} - 0.327*\text{LEVI} \]

The M-score obtained that is greater than negative 2.22 is an indication that the company’s financial statements may have been manipulated. The eight variables used to develop the Beneish M-score model are:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Formula</th>
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<tbody>
<tr>
<td>1. DSRI (Day’s Sales Receivable Index)</td>
<td>[ \text{Accounts Receivables (t)} / \text{Sales(t)} ]</td>
</tr>
<tr>
<td>2. GMI (Gross Margin Index)</td>
<td>[ \text{Sales(t−1)} - \text{Cost of goods sold (t−1)} / \text{Sales(t−1)} ]</td>
</tr>
<tr>
<td>3. AQI (Assets Quality Index)</td>
<td>[ [1−\text{Current assets (t)}+PP&amp;E] / \text{Total Assets(t)} ]</td>
</tr>
<tr>
<td>4. SGI (Sales Growth Index)</td>
<td>[ \text{Sales (t)} / \text{Sales (t−1)} ]</td>
</tr>
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</table>

Table 1. Interpretation of the Z score

Table 2. Beneish Model’s Variable
5. DEPI: Depreciation Index

\[
\text{Depreciation Index} = \frac{\text{Depreciation} (t-1) + \text{PP} + E(t-1)}{\text{Depreciation} (t)}
\]

6. SGAI: Sales, General and Administrative Expenses Index

\[
\text{Sales, General and Administration expense Index} = \frac{\text{Sales} (t)}{\text{Sales} (t-1)} + \frac{\text{Sales, General and Administration expense} (t)}{\text{Sales} (t-1)}
\]

7. LVGI: Leverage Index

\[
\text{Leverage Index} = \frac{[\text{Long term debt} (t)+\text{Current liabilities}(t)]}{\text{Total assets}(t)}
\]

\[
= \frac{[\text{Long term debt} (t-1)+\text{Current liabilities} (t-1)]}{\text{Total assets} (t-1)}
\]

8. TATAI: Total Accruals to Total Assets Index

\[
\text{Total Accruals to Total Assets Index} = \frac{\Delta \text{Current assets}(t) - \Delta \text{Cash} (t) - \Delta \text{Current liabilities}(t) - \Delta \text{Current maturity of LTD}(t) - \Delta \text{Income tax payable}(t) - \text{Depreciation and amortization} (t)}{\text{Total assets} (t)}
\]

4. DATA ANALYSIS AND INTERPRETATION:

For the data analysis, Altman Z score is applied to check the financial status of the selected companies and Beneish M score is applied to check whether the financial statements of the selected companies are manipulated or not.

### Table 3. Z score of selected companies

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</thead>
<tbody>
<tr>
<td>Arvind</td>
<td>1.7312</td>
<td>2.0061</td>
<td>2.0407</td>
<td>2.2260</td>
<td>1.9677</td>
<td>2.5192</td>
<td>2.7882</td>
<td>2.7856</td>
<td>2.9702</td>
<td>3.2505</td>
<td>2.4285</td>
</tr>
<tr>
<td>Raymond</td>
<td>1.3137</td>
<td>2.1782</td>
<td>1.7866</td>
<td>2.2107</td>
<td>1.7004</td>
<td>2.1278</td>
<td>2.5783</td>
<td>2.3310</td>
<td>2.2813</td>
<td>2.5036</td>
<td>2.1012</td>
</tr>
</tbody>
</table>

The above table-3 shows the calculated value of Altman Z score for the selected textile companies.

### Chart 1. Z score of selected textile companies

The graphical presentation of calculated value of Altman Z score is shown in above chart 1. According to the above table-3 and chart-1, The value of the Z score is 1.7312 for the year 2009 in the case of Arvind ltd., which shows that Arvind ltd. is in distress zone in the year 2009. The value of the Z score is between 1.80 to 2.67 from the years 2010 to 2014, which shows that Arvind ltd. is in Grey zone for these time periods. The value of the Z score is above 2.67 for the remaining years of study. It indicates that Arvind ltd. is in Non distress zone for the remaining years of study. The Average value of the Z score is 2.4285, which is also between the 1.80 to 2.67, which is also indicates that Arvind ltd. is in Grey zone for the selected periods of study. As per the above table-3 and chart-1, The value of the Z score is greater than 2.67 for the entire selected periods of study, which indicates that Grasim ltd. is in Non-distress zone for the selected years of study. Not only this, the average value of the Z score is also greater than 2.67, which is also shows that Grasim ltd. is in Non-distress zone for the selected periods of study. According to the above table-3 and chart-1, The value of the Z score is 1.3137, 1.7866, 1.7004 for the years 2009, 2011, and 2013 respectively, which indicates that Raymond ltd. is in distress zone for these years. The value of the Z score is between the 1.80 to 2.67 for the remaining years of study, which shows that Raymond ltd. is in Grey zone for the remaining years of study.
The Average value of the Z score is also between 1.80 to 2.67 indicates that Raymond Ltd. is in Grey zone for the selected periods of study.

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<tbody>
<tr>
<td>2.Grasim</td>
<td>2.7567</td>
<td>5.4638</td>
<td>2.3996</td>
<td>2.1220</td>
<td>2.6326</td>
<td>2.1253</td>
<td>2.2492</td>
<td>2.7572</td>
<td>2.0001</td>
<td>1.4048</td>
<td>-2.5911</td>
</tr>
</tbody>
</table>

The above table-4 shows the calculated value of Beneish M score for the selected textile companies.

According to the above table-4 and chart-2, M-score value is greater than negative 2.22 in the year 2009 and 2014 in the case of Arvind Ltd., which indicates that there may be chances of manipulation in the financial statements of the year 2009 and 2014. Here, the Assets Quality Index is the highest contributing factor for the greater value of the M score. The M-score value is smaller than negative 2.22 for the entire selected periods of study except for the year 2009 and 2014 indicates that the Arvind Ltd. has not manipulated the financial statements of these years. The average value of the M-score is negative 2.8229, which is also smaller than negative 2.22 indicates that Arvind Ltd. has not manipulated its financial statements for the selected periods of study. According to the above table-4 and chart-2, the M-score value is negative 2.1220, 2.1253, 2.0001 and 1.4048 for the years 2012, 2014, 2017, and 2018 respectively in the case of Grasim Ltd., which indicates that there may be chances of manipulation in the financial statements of these years. The Depreciation Index is the highest contributing factor for the greater value of the M score in the financial statements of the year 2017 and 2018. The M-score value is smaller than negative 2.22 for the remaining years of study, which shows that the Grasim Ltd. has not manipulated the financial statements of these years. The average value of the M-score is negative 2.5911, which is smaller than negative 2.22 indicates that Grasim Ltd. has not manipulated its financial statements for the selected periods of study. As per the above table-4 and chart-2, the value of M score is smaller than negative 2.22 for all the selected years of study except for the year 2014 in the case of Raymond Ltd., which shows that Raymond Ltd. has not manipulated the financial statements of these years. The M-score value is greater than negative 2.22 in the year 2014 meaning thereby there may be chances of manipulation in the financial statements of the year 2014. The Day’s Sales Receivables Index is the highest contributing factor for the greater value of the M score in the year 2014. The average value of the M-score is negative 3.0510, which is also smaller than negative 2.22 indicates that Raymond Ltd. has not manipulated its financial statements for the selected periods of study.

5. FINDINGS AND CONCLUSION:

The result of study of three selected companies shows that for ten consecutive years based on Altman Z score, Grasim Ltd. is fit into Non distress zone while Arvind Ltd. and Raymond Ltd. are fit into grey zone. From the analysis of value of Altman Z score Model, it is found that Financial position of all three selected company i.e. Arvind Ltd., Grasim Ltd. and Raymond Ltd. is good. According to the ten years average of the M score, all three selected company i.e. Arvind Ltd., Grasim Ltd. and Raymond Ltd. has not manipulated its financial statements for the selected periods of study.

The Altman Z score Model and Beneish M score Model can be utilized by the stakeholders in prediction of the bankruptcy and earnings manipulations. Thus, it saves investors from incurring the substantive losses from their investments. This analysis suggest that the Altman Z score Model and Beneish Model should be used together for the better protection of the stakeholders.
6. REFERENCES:


