Using Altman’s Z-Score Model to Predict the Financial Hardship of Companies Listed In the Trading Services Sector of Malaysian Stock Exchange

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ABSTRACT

Background: The Stock Exchange of Malaysia has companies that are classified under PN17 (Practice Note 17) and are generally financially-troubled companies. The Malaysian Stock Exchange classified listed companies with financial difficulties under two categories; namely PN4 and PN17. Companies that fallen within the definition of PN17 will need to submit their proposal to the Approving Authority to restructure and revive their company in order to maintain the listing status in the Malaysian Stock Exchange. Objective: To use Edward Altman’s financial distress prediction model to predict the financial hardship of companies listed on trading services sector at the Stock Exchange of Malaysia. Results: The analysis in this paper was restricted to a sample of companies that matched the 28 companies which were selected from the sector of trading services in the Malaysian Stock Exchange. Altman model was used to test the hypotheses formulated in this study and determine the financial status of the companies studied. The threshold values of Altman Z-Score were applied to differentiate a Financial Failure and a Non Financial Failure Company. Conclusion: Firstly, Altman Z-Score 1968 model can be used to differentiate a failure Companies from a Non failure Companies listed in the Trading Services Sector under the Malaysian Stock Exchange. Secondly, some companies listed in the Non-Financial Failure Companies that are listed in the Malaysian Stock Exchange have financial difficulties. Thirdly, Edward Altman model is a useful tool for investors to predict financial failure of companies.

INTRODUCTION

Bank Negara Malaysia was established on January 26, 1959. It plays a key role in the financial sectors in the infrastructure development of Malaysia’s economy. Securities Commission in Malaysia was established in 1993 for promoting the development of Malaysian securities’ market in accordance to The Malaysian Securities Law 1993 (Sanaa, 2009). The Malaysian Stock Exchange holds a very strict view of breaches to the Malaysian Stock Exchange Rules and the Malaysian Stock Exchange Listing Requirements, as these breaches have the potential to undermine the investor's rights and protection. To undertake enforcement proceedings and actions so as to identify any contravention of the Malaysian Stock Exchange Rules and the Malaysian Stock Exchange Listing Requirements and initiate legal action where necessary, to put into effect the enforcement decisions and actions (Kim-Soon et al., 2013).

The use of financial analysis has increased in recent decades due to the increase in both industrial and commercial projects and the competitiveness among them, establishing standards and criteria of the sectors of such markets to monitor and assist in establishment of decision. Globalization is an era which is considered as a revolution of information. This has triggered the need to analyze and treat huge numbers of data (Mohammed, 1997). Advancement is another important factor that has led to the necessity of providing investors with the many needed financial criteria, such as technology, economics, management and accounting. All these represented an accelerating issue for the giant, limited, and multi-national companies to appear (Ali, 2008).
Altman and Beaver showed that a financial statement as sufficient information for a highly discriminate function of large businesses (Kim-Soon et al., 2013).

There is a dire need for prediction of business failures since the results of business failure lead to heavy losses both financially and non-financially. Thus, a model that could accurately predict business failure in time would be quite useful to managers, shareholders, government, suppliers, customers, employees amongst other stakeholders. Kim-Soon et al., (2013) reiterated that the prediction of business failure is an important and challenging issue that has served as the impetus for many academic studies over the past three decades. The widely applied methods to predict the risk of business failure were the classic statistical methods, data mining and machine learning techniques (Mohammed, 1997).

Financial failure may take the form of bankruptcy or insolvency. Insolvency refers to where a company is unable to meet its current obligations as and when they are due. This happens when the current liabilities exceed the current assets. Bankruptcy on the other hand refers to where the total liabilities exceeded the fair value of assets. Financial statements are normally used to gauge the performance of the company and its management (Mohammed et al., 2012), the financial statements commonly used is profit and loss statements, balance sheets and cash flow statements. From the financial statements, various ratios can be calculated to assess the current performance and future prospects of the concerned company (Ahn et al., 2000).

**Literature Review:**

Bursa Malaysia has companies that are classified under PN17 (Practice Note 17) and these companies are generally financially-troubled companies. The Malaysian Stock Exchange classified listed companies with financial difficulties under two categories; namely PN4 and PN17. PN means Practice Note. Basically, PN17 stands for Practice Note 17/2005 and was issued by the Malaysian Stock Exchange and it relates to companies that are in financial distress. Companies that fall within the definition of PN17 will need to submit their proposal to the Approving Authority to restructure and revive their company in order to maintain the listing status in the Malaysian Stock Exchange. Mohammed et al., (2012) cited that “if it is scrutinized carefully, it seems that these companies are usually poorly managed or do not have good track records”. The reasons as to why investors continue to hold on to these PN17 companies include not keeping a proper track of the companies’ financial performance, investors are not aware that they are holding on to stocks of companies that have been classified under PN17. In some cases, the investors do not even notice that these companies have been delisted (Kok, 2010).

Financial analysis has many purposes and one of them is studying the financial failure; specifically, in the insurance field, where projects need bank loans to limit and avoid bankruptcy risks (Edward, 1968). Furthermore, the purposes of the financial analysis are to predict the processes that produce the financial failure, to activate many reasons and factors over long periods of time up to the case of the inability to pay obligations and access to new commitments, loss of financial balance and operating cash. The result is that the company is experiencing financial hardship and the inability to pay their existing obligations in a timely manner and that is why they suffer from such problems (Hayali, 2004). There are cases where classical inspection is not able to detect issues and deviations in financial management reporting. However, through the use of financial analysis methods, such deviations can be tracked in greater details. Financial analysis is also used in evaluation works for obtaining concise and realistic financial and accounting reporting (Ahn et al., 2000). The prediction models of financial failure were studied for over 70 years. Primarily, these researches consisted of statistical models prepared through empirical analysis and attempted to explain the results through mathematical models. Jones (1987), however, stated that the lack of a foundation theory does not necessarily seriously impede research on financial failure prediction. Scott (1981) stated that he found a significant amount of overlap between the empirical predictions and the theoretical models and suggested that failure prediction is both theoretically feasible and empirically explainable (Ahn, 2000).

The researchers’ attention began to focus on analyzing the financial conditions of companies in the sixties in the United States with the encouragement of the American Institute of Certified Public Accountants, and the Securities and Exchange auditor's role in early warning of the incidence of corporate bankruptcy (Mohammed, 2012). Beaver was the first researcher to complete a study in this area in 1966. He built a model which is known as complex financial ratios. Later, researchers from Britain, Canada, and the United States have done similar studies in this field, where Altman is considered the most common model among them (Mohammed, 1997). Financial ratios serve as financial analyst in the evaluation of corporate performance in the areas of profitability, liquidity and solvency, as well as the efficiency of management in the design and implementation of funding policies and investments (Byrne and Barron, 1993).

As of 9th August 2010, there are still thirty four companies listed on the Malaysian Stock Exchange that are classified under PN17 (Practice Note 17) List. These companies have entered into the PN 17 list in accordance with the existing standards, (www.klse.com, accessed on 11th August, 2010). The Star, a local newspaper highlighted among others the negative views expressed on PN17 Companies, especially by the auditors on the payment-failure of loans and the main benefits, companies shareholders’ funds are less than 25% of their total.
paid-up capital. Also, there are Companies that were classified under the PN 17 list as early as the year 2005 that failed to resolve their financial problems. Among such companies are also those that were warned for the lack of disclosure of data or to reconsider their regularization plans. Companies that continued were unable to regularize which, also led to their delisting from the listing under the Malaysian Stock Exchange (Mohammed et al., 2012). On the other hand, investors are very concerned about whether to cut losses or to hope in the healing of these shares for stocks they owned that were classified as under the companies PN17 category. Some investors are also unaware that they are those holding shares in companies that have been classified under PN17. In some cases, investors do not know about written off notices of these companies (Kok, 2010). Despite the recent strong stock market rally and performance, some investors may still doubt the financial health of some listed companies, whereby many questions, worries and comments on the future of PN17 have arisen. However, a real and full attention has not yet been given for these companies. Analytical studies and scientific researches are almost still lacking on PN17 Malaysian Companies listed in the Malaysian Stock Exchange (Kim-Soon et al., 2013).

Methodology:

This study is an attempt to use Altman’s model to predict the financial hardship of companies listed under the list of the trading services sector in Bursa Malaysia. The data of this research work were collected from the listed companies’ financial reports available at the library and the knowledge center of the Malaysian Stock Exchange. This study has used two categories of sampling methods namely; random and non-random of probability sample (censor method) as stated by (Mohammad et al., 1999). Using non-random sampling provide a process that gives all the individuals in the population equal chances of being selected. Fourteen failure companies from the sector of Trading Services were studied in this research. There were 14 companies classified as PN17 Companies and still active under PN17 list. Data for the years 2003 to 2009 were collected for analysis. Fourteen non-failure companies were selected by using the random sample method from the sector of Trading Services in the Malaysian Stock Exchange to give each company an opportunity to appear in this study, selected on a stratified random basis, based on the number of the failure companies.

Measurement:

This section will be discussed the specific measurement items of Altman Model 1968. There is one main type of measure in this study – the Altman’s z-score model 1968 used to measure the probability of insolvency (inability to pay debts as they become due).

**Altman’s Z-Score Model (1968):**

Altman’s model consists of five independent variables, each variable represents financial ratios and the rates recognized by the dependent variable (Z) which was developed to complement the model developed in 1968. The Altman’s Z-Score Method was developed by Altman in 1968. It is a multivariate formula to measure the financial health of a company on whether it will enter into bankruptcy in the forthcoming two years. This model uses five financial analysis ratios: earnings before interest and tax (debit) / total assets ratio, sales/total assets ratio, market value of equity / market value of total liabilities, working capital/total asset ratio and retained earnings/total assets (Edward, 1968).

The original Altman’s z-score model formula is as follows:

\[ Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.010X_5 \]

\[ X_1 = \frac{\text{Working Capital}}{\text{Total Assets}} \]

Measures liquid assets in relation to the size of the company

\[ X_2 = \frac{\text{Retained Earnings}}{\text{Total Assets}} \]

Measures profitability that reflects the company’s age and earning power

\[ X_3 = \frac{\text{Earnings before interest tax}}{\text{Total Assets}} \]

Measures operating efficiency apart from tax and leveraging factors, it recognizes operating earnings as being important to long-term viability

\[ X_4 = \frac{\text{Market value equity}}{\text{Book value of total debt}} \]

Adds market dimension that can show up security price fluctuation as a possible red flag.
\[ X_5 = \frac{Sales}{Total\ assets} \]

For sales turnover (It measures revenue generating ability of a company’s assets)

\[ Z = Overall\ Index \]

Table 1 tabulated the threshold that differentiates a financial failure from a non-financial company using the Altman Z score.

<table>
<thead>
<tr>
<th>Financial Performance</th>
<th>Altman Z Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure Company</td>
<td>&lt; 1.81</td>
</tr>
<tr>
<td>Non failure Company</td>
<td>&gt; 2.99</td>
</tr>
</tbody>
</table>

The analysis here is restricted to a sample of failed and non-failed companies selected from the Malaysian Stock Exchange. Altman 1968 model was used to test the hypothesis formulated. The threshold of Altman model was used to determine the financial hardship of the companies studied.

Hypotheses:

The hypotheses for this empirical verification are as below:

H1: There is no significant difference in the financial situation between PN17 companies and Non-PN17 companies.

H2: There is financial distress company listed on the Trading Services sector list of companies listed in the Malaysian Stock Exchange.

Findings and Discussion:

The analysis here was restricted to a sample of companies that matched the 28 companies which were selected from the sector of trading services in the Malaysian Stock Exchange. The Altman [1968] model was used to test the purpose of the study formulated in this research or was used to determine the financial status of the companies studied. Thresholds for financial failure were used to differentiate a Financial Failure and a Non-Financial Failure Company using Altman Z-Score. The set of thresholds used to measure the financial performance were in accordance to Courtis (1978) and (Edward, 1968).

Test of Hypotheses:

Independent non-parametric independent samples test (Mann-Whitney U Test) was used to test hypothesis

H1: There is no significant difference in the financial situation between PN17 companies and Non-PN17 companies. Comparing between the two groups of companies, the result is tabulated in Table 2.

<table>
<thead>
<tr>
<th>Year*</th>
<th>Variable</th>
<th>PN17</th>
<th>Non-PN17</th>
<th>Sig. level is 0.05</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Altman</td>
<td>12</td>
<td>13</td>
<td>.265</td>
<td>Reject H1</td>
</tr>
<tr>
<td>2</td>
<td>Altman</td>
<td>11</td>
<td>14</td>
<td>.056</td>
<td>Reject H1</td>
</tr>
</tbody>
</table>

Note: * Year 1 for PN17 company is the result of computation of the financial variable prior to the company classified as PN17 and year 2 is the year after it was classified as PN17; Year 1 for Non-PN17 is 2008 and year 2 is 2009.

From Table 2, it is observed that the comparison for year 1, Altman Z-score indicated significant difference between the PN17 and the Non-PN17 companies at p<0.05. It implies that there is a significant difference in the financial performance between PN17 and Non-PN17 companies at p<0.05. The comparison for year 2 also indicated a significant difference at p<0.05 in the financial performance between PN17 and Non-PN17 companies. Hence, Hypothesis H1: The financial performance for PN17 and Non-PN17 is the same is rejected.

Altman Z-score was used to determine Hypothesis H2: There is financial distress company listed in the Non-PN17 list of companies listed under the Trading Services sector list of companies in the Malaysian Stock Exchange. This is done by separating the financial failure and non-financial failure threshold value (refer to Table 1) of the respective ratios and the result is tabulated in Table 3.
Table 3: Financial status of Non-PN17 Companies based on Altman Z-score.

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Non-PN17 Failure</th>
<th>Non-PN17 Non-Failure</th>
<th>Year 1</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altman Z-Score</td>
<td>4</td>
<td>10</td>
<td>3</td>
<td>11</td>
</tr>
</tbody>
</table>

Note: *Year 1 for Non-PN17 is 2008 and year 2 is 2009.

It is observed from Table 3 that, there is Non-PN17 Company that is financial failure. In Year 1, Altman Z-score indicates that there are 4 financial failure companies and 10 non-financial failure companies for the Non-PN17 companies. The test on the Non-PN17 companies for Year 2 in Table 3. It shows that there are Non-PN17 companies which are financial failures. Altman Z-score indicates that there are 3 financial failure companies and 11 non-financial failure companies for the Non-PN17 companies. As observed, a few of Non-PN17 selected-randomly companies had financial difficulties and likely to join PN17 list whereas; most other companies had a stable financial performance and avoided the risk of being financial failure companies where, as demonstrated in the table in year 3, most of the companies have submitted their reports with no missing data as compared to PN17 Companies in that sector. Hence, Hypothesis H2 is supported. Thus, homogeneity and convergence are achieved in the results for all companies, indicating that the application is a significantly successful method. What has become clear as a result of this research is that the value of Altman's 1968 model appears to be generalised far beyond their initial intended uses and are thus powerful tools for future research.

Concluding Remarks:

This study leads to several conclusions. Firstly, the use of Altman Z-Score 1968 model is able to significantly differentiate the financial situation between failure Companies and Non-failure Companies listed in the Trading Services Sector under the Malaysian Stock Exchange. Secondly, some companies listed in the Non-Financial Failure Companies that are listed in the Malaysian Stock Exchange have financial difficulties. Thirdly, the results of this study demonstrate that the use of Altman model as the predictor of financial failure of a company is a successful tool. It cleared doubts about the credibility of this model and the acceptability of using this tool as a means of assessing potential financial failure of companies. This is in line with studies done by Jones (1987), Scott (1981) and Mohammed et al., (2012). This study found that there are financial distressed companies listed on the main board and are not classified as PN17 company. Study concluded that Edward Altman model is a useful tool for investors to predict financial failure of companies in the line with Kim-Soon et al., (2013).

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REFERENCES


