Using Altman's Z-Score Model to Predict the Financial Hardship of Firms Listed In the Trading Services Sector of Bursa Malaysia

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Abstract— This study uses Edward Altman’s financial distress prediction model to predict the financial hardship of firms listed in the trading services sector at the Stock Exchange of Malaysia. The population of this study is composed of 28 selected firms listed under a trading services sector of the Malaysian Stock Exchange. The secondary data for assessment were obtained from the financial report of these Companies. This research work has found that there are financial distressed companies listed on the main board and are not classified as PN17 company. This study concluded that Edward Altman model is a useful tool for investors to predict financial failure of firms.

Keywords: — Bursa; Statistical Models; Troubled Firms; Markets and Finance.

I. 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 (15). 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 SE Listing Requirements and initiate legal action where necessary, to put into effect the enforcement decisions and actions. (9)

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 establishing the decision. Globalization is an era, which is considered as a revolution of information, which has triggered the need to analyze and treat huge numbers of data (13). 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 (3). Altman and Beaver showed a financial statement, to be sufficient information for a highly discriminate function for large businesses stated by (9).

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. (9) 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 (13).

Financial failure may take the form of bankruptcy or insolvency. Insolvency refers to where a firm 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 exceed the fair value of assets. Financial statements are
II. Literature Review

Bursa Malaysia has firms 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. 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. (11) It is cited that many investors wonder why some companies have turned into PN17. 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 (10).

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 (6). 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 indicators, and that is why they suffer from such problems (7). 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 (1). The prediction models of financial failure were studied for over 70 years. Primarily the research consisted of statistical models prepared through empirical analysis and attempted to explain the results through mathematical models. (8), however, stated that the lack of a foundation theory does not necessarily seriously impede research on financial failure prediction. (16), 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 (2).

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. (12) 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 (13). 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 (4).

However, 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 and 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 (10). 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, (12). 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 own that were classified as under the companies PN17 category. Furthermore, 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 (10). Moreover, 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 researchers are almost still lacking on PN17 Malaysian Companies listed in the Malaysian Stock Exchange. (9)

III. Methodology

This study is just an attempt of using Altman's model to predict the financial hardship of firms 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 (14). Using Non-random sampling where the samples are gathered in 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 Firms and still active under PN17 list. The 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. The data for years 2005 to 2009 were collected for analysis.

a. Measurement

This section will be discussed the specific measurement item which is Altman Model 1968.

There is one main type of measures for this study, 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 (6).

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

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

Adds market dimension that can show up security price fluctuation as a possible red flag

\[ X_5 = \frac{\text{Sales}}{\text{Total assets}} \]

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

\[ Z = \text{Overall Index} \]
Table I: Threshold differentiating a Financial Failure and Non-Financial Failure Company using 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. (11) The threshold of Altman model was used to determine the financial hardship of the firms studied.

b. Hypotheses
The hypotheses formulated for this empirical verification are as below:

H1: There is a significant difference in the financial situation between PN17 companies and Non-PN17 companies.
H2: There is financial distress companies that are listed in the Trading Services sector list of companies listed in the Malaysian Stock Exchange.

IV. Findings and Discussion
The analysis here was restricted to a sample of companies that matched the 28 firms 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 (5) and (6).

a. Test of Hypotheses
Independent T-test was used to test hypothesis H1: There is a 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 II: Results of T-Test (Independent samples Test) to compare between PN17 and Non-PN17

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Variable</th>
<th>PN17</th>
<th>Non-PN17</th>
<th>T</th>
<th>Sig. 2-tailed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>T Mean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Altman</td>
<td>12</td>
<td>1.142</td>
<td>1.82</td>
<td>.99</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Altman</td>
<td>11</td>
<td>1.085</td>
<td>1.85</td>
<td>11.3</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 at p<0.001 for both the PN17 and the Non-PN17 companies, respectively. It implies that there is a significant difference in the financial performance between PN17 and Non-PN17 companies at p<0.001. The comparison for year 2 also indicated a significant difference at p<0.001 in the financial performance between PN17 and Non-PN17 companies. Thus, Hypothesis 1 is supported.

Altman Z-score was used to determine Hypothesis H2: There are financial distress companies that are 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 III: Financial status of Non-PN17 Companies based on Altman Z-score

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Non-PN17</th>
<th>Non-PN17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altman Z-Score</td>
<td>4 10</td>
<td>3 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 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 as well. 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.

V. Concluding Remarks

This study leads to several conclusions. Firstly, there is a difference in determining the financial situation between failure Companies and Non failure Companies listed in the Trading Services Sector under the Malaysian Stock Exchange using Altman Z-Score 1968 model. Secondly, some companies listed in the Non-Financial Failure Firms 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. 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 (8) and (16) and also (11).

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 (9).

References