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Using Altman's Model and Current Ratio to Assess the Financial Distress of Listed Companies in the Default board of Colombo Stock Exchange

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***Abstract*-Risk of financial failure is defined as the inability of a firm to pay its current liabilities. Financial failure may lead firms to bankrupt or go into liquidation. This study uses Edward Altman's financial distress prediction model and current ratio to assess financial situation of Companies listed in the default board of the Colombo Stock Exchange (CSE). The population of this study is composed of 8 selected listed Companies of Colombo Stock Exchange. The secondary data for assessment were obtained from the financial report of the particular Companies. This study found that there are financial distressed companies listed in the Colombo Stock Exchange. Study concluded that Edward Altman model and current ratio are useful tools for investor to predict financial failure of companies.**

***Index Terms*- Financial Analysis, Z Score, Current Ratio, CSE**

I. Introduction

Prediction of bankruptcy is one of the challenging tasks for every sort of organizations in different industries in the world. Many users of financial statements like banks, credit rating agencies, underwriters, auditors and regulators analyze company's financial position for their interest. For this purpose different approaches are used. During monetary and economic crisis selection of model for bankruptcy prediction is very important, For example when bank financially assists an organization bank predict risk of bankruptcy of that organization prior to financial help. Edward Altman in 1968 developed a well-known model for bankruptcy prediction called Altman Z score model. This model also called multiple discriminate analysis model (MDA). Altman study in 1968 presented that mostly bankruptcy occurs due to poor management, not due to economic recession, severe competition. Altman used 66 firms in his first study, half of which were bankrupted. He compared bankrupted organizations with non-bankrupted organizations. He selected five best ratios among a large number of ratios for bankruptcy forecasting. His study results showed 95% accuracy one year prior and 72% two year prior to failure. In 1983 Altman used model for private organizations showed 93% accuracy rate one year prior and 73% accuracy two years prior to failure. One can rely on both versions of Altman models of bankruptcy. After Altman many people used this model in various countries of the world (Altman, 1968).

Business failure leads to heavy losses whether financially and non-financially consequences. Thus, the importance to predict business failures accurately on a timely manner is useful to stakeholders including managers, the government, suppliers, customers and employees to take the necessary actions to avert a potential financial failure (Byrne & Barron, 1993) Business failure is defined as the inability of a firm to pay its obligations due to inadequate working capital. In other words, Business failure is the case in which a firm goes bankrupt as a consequence of not be able to fulfil its current liabilities. Firm that experiences financial failure cannot meet its obligations or has difficulty in fulfilling its obligations in time. This study is an attempt to analysis Using Altman's Model and current ratio to assess the financial status of companies listed in the default board of Colombo Stock Exchange(CSE).

II. Literature Review

In 1930, Bureau Business Research (BBR) published their study of simple ratio analysis based on failing industrial firms and they introduced the ratios which could be used by the companies to apply as the indicators of the weakness. This ratio analysis as a technique for predicting failures were used by few other researchers (eg: FitzPatrick: Smith & Winakor: Merwin: Jacendoff, as cited in Bellovary et al., 2007), and they introduce various ratios as the best indicators of company failure. Beaver (1966) uses univariate analysis as the statistical tool rather just limiting to a simple ratio analysis with the motive to provide an empirical verification of the usefulness of the accounting data. This study used ratios of Cash flow to total debt, Net income to total assets, Total debt to total assets, Working capital to total assets, Current ratio and No-credit interval and concludes that the all ratios do not predict equally well and the Cash Flow to Total Debt (CFTD) ratio has the excellent discriminatory power throughout the five year period while the predictive power of the liquid asset ratios is much weaker. He further concludes that the ratios do not predict the failed and non-failed firms with the same degree. However, the ratio analysis can be useful in the prediction of failure for at least five years before failure (Beaver, 1966). Beaver's univariate approach to analyze financial distress was seldom followed because; while one ratio would indicate failure another could indicate non-failure (Sharma, 2001).

Financial analyst uses financial ratios to evaluate corporate performance. These ratios include profitability, liquidity and solvency, as well as the efficiency of management in the design and implementation of funding policies and investment (Mohammed, 1997). Researchers began to focus their attention on analyzing financial conditions of companies as early as in the sixties. In the United States, the encouragement of the American Institute of Certified Public Accountants (AICPA), the Securities and Exchange (SEC), auditors' role in early warning of the incidence of corporate bankruptcy. 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, referred to each other but, did not limit themselves to timing for the deployment of these studies in accounting journals. In addition, these models consist of a set of financial ratios and at the same time as a measure of performance. It is regarded as one of the positives of this descent because it would reduce a lot of financial ratios in a single model. It is therefore called the analysis of differentiation. However, it is limited only to predict financial failure and not to study the financial situation of companies from various aspects. Researchers began giving attention to the area of analyzed financial companies, which failed in the sixties in the United States, but the Altman model is considered as the most common model among them (Mohammad, 1997).

Financial ratios are useful indicators of a firm's performance and financial situation. Most of the ratios can be calculated from the information provided by the financial statement, the importance of using financial ratios in financial analysis and its role and its importance in the performance of evaluation of companies and also in calculating the financial failure of companies through the practical application of a number of companies as well as use the graph to display the results, in order to avoid failure and face global financial crisis. The researchers found significant results, including convergence of results between the value of the financial performance of companies and the value of financial failure of companies, and the possibility of the use and presentation of results in the financial markets, to take advantage of them (Mahmood, 2009).

Financial ratios have been used for many years by investors, creditors, lenders, stockholders, auditors, employees and others who may incur substantial losses as a result of business failure. Researchers have used financial ratios to develop business failure prediction models and some have focused on specific industries such as manufacturing, retail trade, and wholesale trade (Jones, 1987). After reviewing the financial ratios that have been divided into five main ratios such as; Profitability Ratios, Liquidity Ratios, Activity Ratios, Leverage Ratios or Financial Leverage ratios and Capital Market Ratios, it can be mentioned that the liquidity ratios are the best and easy suited to undertake this study because it is used to evaluate the credit rating of the company and to identify the liquidity and capital of the critical current case. On the other hand, the rates of the financial liquidity ratios such as Current, Quick and Cash ratios are only specific numbers that can be measured or used as an indicator to predict or explore for the better or worse (Platt, 1990).

Liquidity ratios are used to assess the status of credit facility. They usually reflect the extent of their ability and meet their obligations in the short term that are optimized. Current ratio is a financial liquidity indicator that measures whether or not a firm has enough resources to pay its debts over the next 12 months, and it compares a firm's current assets to its current liabilities. Short-term creditors prefer a high current ratio since it reduces their risk. Shareholders may prefer a lower current ration so that more of the firm's assets are working to grow the business. Typical values for the current ratio vary from firm and industry. For example, firms in cyclical industries may maintain a higher current ratio in order to remain solvent during downturns, which are supposed to be Current Assets /Current Liabilities (Ali, 2008; Mahmood et al., 2009).

In the Sri Lankan context there were few studies have been done by researchers. In Sri Lanka (Samarakoon & Hasan, 2003) could be found in the area of predicting financial distress. They empirically tested the three versions of Altman's Z-Score model with the financially distressed companies in Sri Lanka. According to them US based Altman Z"- Score model has a remarkable degree of accuracy in predicting distress in the year prior to distress. Samarakoon & Hasan (2003) conclude that the Z-Score model is a suitable model in predicting financial distress in Sri Lanka. Further, according to the companies act no 07 of 2007, a company should be satisfied with the solvency test before making any distribution to the shareholders. In satisfying the solvency test it should consider the working capital requirements and the equity position of the company. Hence the importance of accounting data in predicting the financial distress is evident owing to the company law of Sri Lanka.

Another studies have been done to Predict the corporate financial distress in Sri Lanka (Nanayakkara & Azeez , 2012) their main purpose of this study was to develop a better financial distress prediction model for Sri Lankan companies using the Z-score model. Multivariate Discriminate Analysis (MDA) was used as the analytical technique and simultaneous estimation method has used to enter the variables in the analysis. Their study has examined four accounting ratios for 134 distressed and non-distressed companies from 2002 to 2011. Their study has found that the derived model which consists of four accounting ratios is capable of predicting financial distress of quoted public companies in Sri Lanka with 76.9% accurate one year prior to distress. Further, the model has the financial distress predicting ability of 74.6% and 67.2% two years and three years prior to distress respectively. This model can be used to assist investors, creditors, managers, auditors and regulatory bodies in Sri Lanka to predict the financial distress.

III. METHODOLOGY

3.1 Data sources& Sample Selection

This study attempts to use Altman's model and current ratio to assess the financial status of companies listed in the default board of Colombo Stock Exchange(CSE). The data of this research were collected from the listed companies' financial reports available at Colombo Stock Exchange. The financial data of these companies is based on their last two published annual reports.

The Criteria for transfer to the Default Board of Colombo Stock Exchange (CSE)

The Listed Company should be transferred to the Default Board under a heading of Non Performing Companiesupon the triggering any of the following criteria:

1. Incurring net losses for three consecutive years (in the case of Group Companies, net losses attributable to the shareholders of the parent Company) andnet assets of the listed company is less than the quarter (25%) of its stated capital (in the case of Group Companies, net assets attributable to the shareholders of the parent Company).

2. The Net Assets of the company is negative (in the case of Group Companies, negative net assets attributable to the shareholders of the parent Company).

3. The Listed Companies which have ceased operations or negligible operations (in the case of group Companies, this should be considered from group's perspective).

4. The auditor of the company in his report casts a substantial doubt on the Listed Company's or Group's ability to continue as a going concern. (The modification of the audit report on the ability to continue as a going concern) andthe net assets of the company is less than the quarter (25%) of the Stated Capital (in the case of Group Companies, net assets attributable to the shareholders of the parent Company).

5. The auditor issues an adverse or a disclaimer of opinion on the latest financial statements of the listed company.

6. The Colombo Stock Exchange with the consultation of Securities and Exchange Commission of Sri Lanka may exonerate a listed company which trigger above criteria due to economic reasons which affect a particular industry.

By observing the criteria there is a chance to become a failure companies in near future. That's why I have selected those companies which are transferred to default board of CSE as my sample.

3.2 Model explanation

To find the financial failure of listed companies a prominent model developed by Altman in (Z score model) is used. Model contains 5 ratios given below.

Z =.012X1+ .014Xz +.033X3 +.006X4 +.999X5

In this model variables X1, X2, X3, X4 and X5 can be described as:

X1 = X1 can be calculated by subtracting current liabilities from current assets. It is the relationship between liquid assets and total assets of balance sheet.

X2 = for calculation of X2 we divide retained earnings or losses on total assets. Retain earnings are the company earnings or losses throughout its existence time period.

X3= X3 indicates operating profit before interests and taxes (EBIT) to total assets. EBIT is the real profit of the organization.

X4= It the result of Market value of equity to book values of liabilities. Market value of equity comes from multiplication of outstanding shares by market price of share.

X5= It shows the degree of total assets used for documented sales i.e. sales divide by total assets.

3.3 Measurement

Altman's Z-Score Model (1968) is based on five independent variables, each of them represent financial ratios and the rates recognized by the dependent variable (Z). Current ratio is the most basic liquidity test. It shows the company's ability, if current ratio is greater than or equal to one, this indicates that current assets should be able to meet near-term obligations and a current ratio less than one may mean that the firm has liquidity issues (Cowen & Hoffer, 1982; Courtis, 1978).

Table 1.0 shows threshold value differentiating a financial failure and non-financial failure Company using Altman Z-score and Current Ratio

If value of Z scores exceeds 2.99 the firms are to be considered in the safe zone, and there is low risk to default. And firms having Z scores between1.81 and 2.99 are deemed to be in the intermediate or gray zone and having high risk of default. While Firms with Z scores value below 1.81 signifies as filled firms or firms in distressed zone.

Table 1.0 Threshold of Current Liquidity Ratio and Altman Z score Financial Situation

Financial Situation	Altman Z Score Value	Current Ratio Value
Failure Company	<1.81	<1.1
Gray Zone	1.81 – 2.99	1.1 -1.99
Non-failure of Company	>2.99	=/>2

For analysis related data is extracted from financial statements and ratios of model like X1, X2 ….. X5 and Z scores are calculated through MS Excel Upon computing all the Altman Z Score value and current ratio value of the eight companies, the financial situation of the company is interpreted whether a failure or non-failure basing on the above threshold value to test hypothesis. These ratios are recoded into either 1 or 2 or 3 where 1 means a failure and 2 means a non-failure 3 means firms under gray zone for all the companies. These are detailed at the Appendix. Paired t-test using SPSS statistical package was used to perform to test hypothesis H1.

3.4 Hypotheses

The hypotheses formulated for this empirical verification are as below:

H1: There is a significant difference between the use of current liquidity ratio, and also Altman's Z score to determine the financial situation.

H2: There is financial distress companies that are listed in the Colombo Stock Exchange.

IV. Finding and Discussion

4.1 Test of Hypotheses

Paired T-Test was used to test whether there is a significant difference between the use of Altman's model 1968, and current liquidity ratio in determining the financial situation of company. The results of the tests are tabulated in Table 2.0.

Table 2.0: The results of using the Paired T-Test to compare between the Current Liquidity Ratio and Altman Z-score in determining the financial situation of the Company.

	Variable	N	Mean	T	Significant level (P) 95% CI
Pair 1	Z_score - CR_value	8	-12.766	-1.704	.13224

Based on Table 2.0, it is found that Altman Z-score and current ratio indicated there is no significant difference as an indicator of financial failure and non-financial failure of the companies at level of p>0.05. So H1 rejected.

Altman Z score and current ratio were used to determine if there is financial distress in companies that are listed in the Colombo Stock Exchange. This is done by separating the financial failure and non-financial failure threshold value. The counts of financial and non-financial companies is of the respective ratios are tabulated in Table 3.0.

Measurements	Number of Companies			
	Last Year		Previous Year	
	Failure	Non Failure	Failure	Non Failure
Altman Z Score	6	1	6	1
Current Ratio	4	2	3	3

It is observed from Table 3.0 that there are Companies that are financial failures. Based on last financial statement, Altman Z-Score indicated that there are 6 financial failure companies and 1 non-financial failure companies remaining 1 intermediate or gray zone and having high risk of default, and the current ratio analysis indicates that there are 4 financial failure companies and 2 non-financial failure companies another 2 in the gray zone of the 8 companies studied.

As for previous year in Table 3.0, it shows that there are financial failure companies too. Altman Z-score indicated that there are 6 financial failure companies and 1 non-financial failure companies remaining 1 intermediate or gray zone and having high risk of default and as for the current ratio measurement, there are 3 financial failure companies and 3 non-financial failure companies remaining 2 under the gray zone. This supported the hypothesis that there is financial distress companies listed in the Colombo Stock Exchange. So H2 Accepted.

V. Conclusion

The analysis here was restricted to a sample of companies that matched the 8 firms which were selected from Default board of Colombo 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 and Current Ratio. The study made use of the statistical model (Altman) and Current Ratio, which selected as well as calculated its own scale. Thus, homogeneity and convergence achieved in the results for all companies, indicated that the application is a significantly successful method, what has become clear as a result of this research is the value of Altman's 1968 model and the value of Current ratio. This study found that there are financial distressed companies listed on the default board of Colombo Stock Exchange. Study concluded that Edward Altman model and current ratio are useful tools for investor to predict financial failure of companies. The researcher recommend for the future researchers in this context to study more companies as a sample to determine the accuracy of the Altman model and current ratio to predict the financial failure in the Sri Lankan context.

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APPENDIX

Data of Selected Companies from default board of Colombo Stock Exchange used in this Study Altman Z Score and Current Ratio Computed for the respective Years

SYMBOL	NAME	SECTOR	ESTABLISHED DATE	QUOTED DATE	PAID UP CAPITAL	ALTMAN'S Z SCORE		CURRENT RATIO	
						LAST YEAR	PREVIOUS YEAR	LAST YEAR	PREVIOUS YEAR
CIFL.N0000	CENTRAL INVESTMENTS & FINANCE PLC	Banks Finance & Insurance	1966	8/18/2011	58,398,712.00	-98.4399	0.42678	0.066781	9.049831
HUEJ.N0000	HUEJAY INTERNATIONAL INVESTMENTS PLC	Land & Property	1981	1/1/1984	96,120,000.00	-1.96732	-1.69453	0.582583	0.59011
LCEM.N0000	LANKA CEMENT PLC	Manufacturing	1981	1/1/1982	1,405,437,056.00	-1.55457	-2.48094	0.781655	1.016885
OGL.N0000	ORIENT GARMENTS PLC	Manufacturing	1982	6/29/2011	538,183,232.00	1.447692	1.712404	0.820165	3.503456
PCH.N0000	PC HOUSE PLC	Information Technology	2000	8/26/2010	68,680,000.00	0.933241	1.82088	1.297428	1.526689
PCP.N0000	PC PHARMA PLC	Chemical & Pharmaceuticals	2008	1/18/2012	60,600,012.00	2.567126	1.743924	1.271522	1.650326
PMB.N0000	PEOPLE`S MERCHANT FINANCE PLC	Banks Finance & Insurance	1983	7/11/1994	1,350,000,000.00	0.934793	0.898917	33.64398	46.89977
SING.N0000	STANDARD CAPITAL PLC	Chemical & Pharmaceuticals	1982	1/1/1983	453,239,744.00	52.02112	24.83559	9.615768	75.14863

Classification of the 8companies according to code where 1 = failure and 2 = non-failure & 3 = gray zone for the two years basing on threshold values

SYMBOL	NAME	SECTOR	ESTABLISHED DATE	QUOTED DATE	PAID UP CAPITAL	ALTMAN'S Z SCORE		CURRENT RATIO	
						LAST YEAR	PREVIOUS YEAR	LAST YEAR	PREVIOUS YEAR
CIFL.N0000	CENTRAL INVESTMENTS & FINANCE PLC	Banks Finance & Insurance	1966	8/18/2011	58,398,712.00	1	1	1	2
HUEJ.N0000	HUEJAY INTERNATIONAL INVESTMENTS PLC	Land & Property	1981	1/1/1984	96,120,000.00	1	1	1	1
LCEM.N0000	LANKA CEMENT PLC	Manufacturing	1981	1/1/1982	1,405,437,056.00	1	1	1	1
OGL.N0000	ORIENT GARMENTS PLC	Manufacturing	1982	6/29/2011	538,183,232.00	1	1	1	1
PCH.N0000	PC HOUSE PLC	Information Technology	2000	8/26/2010	68,680,000.00	1	3	3	3
PCP.N0000	PC PHARMA PLC	Chemical & Pharmaceuticals	2008	1/18/2012	60,600,012.00	3	1	3	3
PMB.N0000	PEOPLE`S MERCHANT FINANCE PLC	Banks Finance & Insurance	1983	7/11/1994	1,350,000,000.00	1	1	2	2
SING.N0000	STANDARD CAPITAL PLC	Chemical & Pharmaceuticals	1982	1/1/1983	453,239,744.00	2	2	2	2