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Do Z-Score and Current Ratio have Ability to Predict Bankruptcy?

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Abstract
Altman's Z-score Model (1968) is the Strongest Predictor of the bankruptcy and after its development many studies have been conducted to assess the financial viability of the corporate sector by using this model. This study used Z-Score model and Current Ratio to measure the Financial Failure of 22 selected Textile Industries of Pakistan. Results showed that Z-Score and current ratio are the good tools to assess the financial health of the textile companies listed in KSE. This study also revealed that financial distressed companies are also present in textile sector.
Keywords: Z-Score, Current ratio, Paired Sample T-Test, Financial Failure

Introduction

Now a days, Bankruptcy prediction plays vital role in assessing the financial viability of the firms. Prediction of bankruptcy is one of challenging tasks for every sort of organization in all over the world. The Bankruptcy refers to a company ceasing its operations following its inability to make a profit or to bring it enough revenue to cover its expenses. Argenti defined the concept of failure as "incapability of a firm to survive." (Argenti, 2003). Bibealt (1982) defines business failure from economic stand points as "a situation whereby the realized rate of return on investment capital is considerably and repeatedly lower than prevailing rates on similar investments."

Bankruptcy prediction has become a matter of great concern for every organization as well as for organization's stakeholders. Financial Statements users are interested in determining financial viability of companies for investment and other purposes. (Fawad, Iqtidar, Shakir, & Madad, 2014). Financial Viability is also checked by shareholder to know either firm has ability to pay off their expected rate of return. Firm's Creditors are interested to know the firm's debt paying ability. Firm's Performance assessment is also a matter of interest for other firms dealing with them.

The purpose of this paper to check the predicting ability of Z-Score and Current Ratio by implementing both on Textile Sector and is to analyze the financial situation of Textile Sector. Z-Score Model is developed by Altman in 1968 which predicts bankruptcy in advance with the help of five specific ratios under multiple discriminant analysis.

Pakistan textile sector is a key contributor to the economic growth in terms of Export and employment. Pakistan grips the distinction of being the world's 4thlargest producer of cotton as well as 3rd largest user in the world and 8th largest exporter of textile goods in Asia. Textile Sector is considered as the mainstay of the economy. It has usually, after agriculture, being the only Sector that has produced massive employment for both skilled and un-skilled labor. The textile business contributes to be second largest employment creating sector of Pakistan. For the Economic growth of Pakistan, Textile sector of the country played a dynamic part for a long time, the core objective of any country either it is a developed or a developing country should be to broaden the sector which contributes such a huge portion in export and GDP as well as the generation of tax revenue and provides employment to the manpower of the country.

Review of Literature

Firm's financial analysts and researchers are interested in bankruptcy prediction and also it is fascinating for them to predict in advance that the business will be able to meets its obligation or will dissolve. It is the matter of interest for the management as well as for the employees. Thus assessing the financial capability of the business

provides lots of information to the institutions and people in the environment. (Mizan & Hossain, 2014). William Beaver observed 29 financial Ratio's by taking sample of 79 Bankrupt versus Non Bankrupt Firms and the data was taken for periods before bankruptcy. Beaver Recognized Six financial ratio's that had efficient discriminating capability. He was the first who found that all the financial ratios do not predict bankruptcy similarly. Beaver found following ratios which have most discriminating power of prediction, 1) Net Income/total assets, 2) total Debt/total assets, 3) Net Working capital/Total Assets, 4) Current Assets/Current liabilities, 5) Net Income + Depreciation& Amortization/Total assets, 6) Cash, Short Term Investments, A/R/Operating Expense excluding depreciation and Amortization (Beaver W, 1966).

First Statistical Method used for analyzing Bankrupt and Non Bankrupt is linear Discriminant analysis. Beaver performed univariate analysis for different bankruptcy predictions which form the basis for multivariate attempts and also found that multiple indicators can distinguish b/w failed and non-failed for the period of five year before failure (Beaver W, 1966). Univariate Analysis only consider the individual ratio for predicting bankruptcy so unlikely to multivariate analysis which provide combine effect of set of Ratio's. It does not exhibit meaningful picture of firm's solvency position so it is impossible to make a complete assessment of potential bankruptcy of firms. Altman moved significantly forward since he developed a multiple discriminant analysis model called the Z-Score Model with Five Ratio's. This developed Model of Altman has discriminating ability of the probable bankruptcy for the manufacturing firms which are publically traded (Altman I.E, 1968). Multiple Discriminant Analysis is a technique used to classify an observation into one of several groups, prior grouping was dependent upon the individual characteristics of observations. Z-Score Model of Altman is,

Z-SCORE MODEL = 0.12X1+0.14X2+0.33X3+0.006X4+0.99X5

Where;
X1 = Net Working Capital/Total Assets
X2 = Retained Earnings/Total Assets
X3 = EBIT/Total Assets
X4 = Market value of Equity/Book value of Debt
X5 =Sales/Total Assets

Current Ratio represents that firms have not adequate resources to meets its short term obligations and it gives an assessment among current assets and current liabilities. Higher Current Ratio is much wanted by short term creditor because it's lessen their risk. In contrast, shareholder of the company like lesser current ratio more because they are interested in the growth of the business by financing more in the long term assets which is basic purpose behind the existence of every organization. Another important point is that typical values of the current ratio are not same to all business it differs industry to industry. So current ratio is also helpful in assessing the financial viability of firms.

Fawad Hussain has concluded that Z-score model is accurate for bankruptcy predictions in Pakistan, he examined 21 Textile companies (12 stable and 9 bankrupt) listed in KSE through Z-Score Model. In that Study bankruptcy predictions of Z-Score model is investigated for four years prior to bankruptcy and concluded that Z-score Model is good predictor for bankruptcy predictions (Fawad Hussain, Iqtidar Ali, 2014). Another Study Conducted on Sugar sector, companies listed on KSE by applying Z-Score and Current Ratio. Total population sampling technique was used in the study and so all thirty five sugar companies listed on stock exchange were taken for analysis purpose. The output of the research indicated that current ratio and Altman's Z-Score Model are trustworthy tool for measuring financial health of sugar sector listed companies of KSE (Ijaz & Hunjra, 2013) Other Study showed the Comparison of Z-Score and Current ratio for the assessment of financial health of Malaysian Listed Firms. The results revealed that both models are successful in determining the differences of bankrupt and non-bankrupt firms. (REF) (Alkhatib & Al Bzour, 2011) Examined the Jordanian listed companies which were liquidated in 1990-2006, by applying Altman model for predicting bankruptcy. 16 firms were bankrupt out of 32 firms. The study concluded that Altman's Model has ability to predict the bankruptcy and showed 75% precision rate for the 5th year, 94% for the 4th and 100% for the third year. It also concluded that prediction frequency of Z-Score is better than Kida's Model (Alkhatib & Al Bzour, 2011).

In another research, Z-Score were calculated for 5 years of publically traded companies and concluded that Z-Score can be used to predict the liquidity risk effectively (Tracy, Quasnitschka, & Moenck, 2013). Another study has been conducted on cement companies of India to test the financial performance and predicting bankruptcy before time so that corrective actions should be followed regarding financial decisions (Ramana, Azash, & K.Ramakrisnaiah, 2012). Bright Kpodohhas performed a test to analyze the internal liquidity, financial risk, growth and operating performance of firms through financial ratios. Positive Z-Score confirmed the financial health of companies correctly (Kpodoh, 2009).

A Study was conducted on the corporate bankruptcy by applying Altman's Model in Nigeria. Descriptive Research Study was done by taking audited financial statements of banks as sample over a period of 2006-2012. Financial ratios were used and finding suggested that probability of going bankrupt for some banks

were high because Z-Value was lower than 1.81. Additionally study concluded that model has Capability to successfully predict the failure in Nigerian Banks (A. Ezejiofor, U.C.Nzewi, & V.C.Okoye, 2014). On the basis of given literature, it can be concluded that Z-Score and Current ratio can predict the bankruptcy prior to the failure. Institutions, Business Analyst, Students, Researchers and Shareholders can use these model to forecast and evaluate the financial viability of firms.

Objective of the Study

The objective of this study is to implement the Z-score and Current ratio on textile industry of Pakistan and the most important is to check that which one is the most accurate predictor of bankruptcy between Z-Score Model and Current ratio. With this, Financial Viability of the Textile sector will be analyze in this study.

Hypothesis

H1: There is significant difference in Using Z-Score and Current Ratio to assess financial healthiness of the Company

H2: There is financially distressed company between textile sector listed at Karachi stock exchange.

Methodology

Textile sector has been taken for this study to assess the financial failure by using the Z-Score and Current Ratio. Moreover, this Study tested significant relation among Z-Score and Current Ratio with the help of Paired Sample T-Test in SPSS. First hypothesis is tested through the Paired Sample T-test and Second Hypothesis is tested by calculating the Z-Score Values and Current Ratio of the Firms.

Z-SCORE MODEL = 0.12X1+0.14X2+0.33X3+0.006X4+0.99X5

Where;

X1 = Net Working Capital/Total Assets

X2 = Retained Earnings/Total Assets

X3 = EBIT/Total Assets

X4 = Market value of Equity/Book value of Debt

X5 =Sales/Total Assets

Current Ratio = Current Assets/Current Liabilities

Table: 1 Cut Off Scores

Model	Bankrupt	Non Bankrupt	Gray Area
Z-Score	<1.81	>2.99	1.81<Value<2.99
Current Ratio	<1.1	>1.1	None

In Table 1, Cut off Scores of Current Ratio and Z-Score has been described. If the Z-Value will be lower than 1.81 then the firm will be considered financially distressed or failed. If the Z-Value lies between 1.81 and 2.99 than the firm will be considered in grey area. The firms needs to take serious steps to make itself financially strong. And if the Z-value will be greater than 2.99 than firm will be considered as a financially strong or non-failed. Current ratio also has cut off score to assess the financial health of the company. Firm will be taken as a financially failed if current ratio is fewer than 1.1 and vice versa. So according to these Cut off Scores, we will test the second hypothesis of the study.

Sample

In this Study 22 Textile Firms were selected according to their Paid up Capital. Companies were selected by their max and min paid up capital. Selected sample details as per discussed criteria are given below;

Table: 2

Paid Up Capital (Millions)	No. of Companies
More Than 3000	2
More Than 2000	2
More Than 1000	2
More Than 500	9
Less Than 500	7
Total	**22**

Table: 2 shows the hierarchy of the selected firms according to the paid up capital. Out of 22 Companies, 2 companies have paid up capital greater than 3000m, 2 companies have greater than 2000m, and 2

companies have paid up capital greater than 1000m. There are 9 companies having paid up capital greater than 500m and 7 companies had paid up capital less than 500m.

Test of Hypothesis

Table:3 Comparison of Z-Score and Current Ratio Using Paired T-test in SPSS for 2008

	Paired Differences					T	Df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Z-Score – CurrentRatio	.1697636	2.3005613	.4904813	-.8502481	1.1897754	.346	21	.733

Table:4 Comparison of Z-Score and Current Ratio Using Paired T-test in SPSS for 2009

	Paired Differences					t	Df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Z-Score – Current Ratio	-1.9976818E-1	.8994612	.1917658	-.5985669	.1990306	-1.042	21	.309

Table: 5 Comparison of Z-Score and Current Ratio Using Paired T-test in SPSS for 2010

	Paired Differences					T	Df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Z-Score – Current Ratio	.0734227	.7681356	.1637671	-.2671495	.4139950	.448	21	.659

Table:6 Comparison of Z-Score and Current Ratio Using Paired T-test in SPSS for 2011

	Paired Differences					t	Df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Z-Score – Current –Ratio	.0967727	1.2022249	.2563152	-.4362639	.6298094	.378	21	.710

Table:7 Comparison of Z-Score and Current Ratio Using Paired T-test in SPSS for 2012

	Paired Differences					T	Df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1 Z-Score – Current Ratio	-3.8913636E-2	1.0824515	.2307794	-.5188457	.4410185	-.169	21	.868

Paired sample T-Test describes that if the t ≥ 2.37 than null hypothesis will be rejected. If P < 0.05 that is actually level of significance with the 95% CI which means there is significant difference between two paired variables. But if the t≤2.37 and p>0.05 than null hypothesis will be accepted.

Based on the Output of Paired Sample T-Test, results show that there is no significant difference between the Z-Score and Current Ratio to assess the financial failure of the textile Sector in KSE. It is insignificant. Paired sample t-test was applied on 22 companies in different 5 years. There are Summary of the Results given below to discuss more briefly

Table: 8

Summary of Paired Sample T-Test			
Year	**t Value**	**P Value**	**Result**
2008	0.346	0.733	Not significant
2009	-1.042	0.309	Not significant
2010	0.448	0.659	Not significant
2011	0.378	0.71	Not significant
2012	-0.169	0.868	Not significant

Table 8 shows that in all five years, t value is less than 2.37 and p value is greater than 0.05 so it is concluded that there is no significant difference between Z-Score and Current ratio to assess the financial health of the textile sector of KSE. Based on the results, this study demonstrates that Z-Score and Current ratio are useful techniques to assess financial failure of the textile sector listed in KSE.

Table: 9 Financially Failed and Non Failed Companies according to Z-Score and Current Ratio

		Z-Score		Current Ratio	
Year	**Total**	**Non Failed**	**Failed**	**Non Failed**	**Failed**
2008	22	4	18	6	16
2009	22	2	20	4	18
2010	22	6	16	4	18
2011	22	8	14	6	16
2012	22	9	13	7	15

In this Table, it is observed that there are 18 financially failed companies according to the Z-Score out of 22 Companies in 2008 and Current Ratio is also showing the 16 failed firms in 2008. In 2009, Z-Score analysis indicates that there are 20 Financial Failed Firms and Current Ratio analysis indicates 18 Failed out of 22 Companies. As for as 2010 is concerned, Z-Score Showing 6 Non Failed Companies and 16 Failed Companies and according to the Current Ratio, There are 18 Financial failed firms from 22 Companies Studied. 2011 and 2012 is looking better comparatively better from the past years. In 2011, Z-Score Indicates that there are 14 Financial Failed Firms and current ratio analysis described that there are 16 failed and 6 non-failed firms. In the Last 2012, Z-Score Representing the 13 failed firms and current ratio showing 15 firms that are financially distressed. So these results support the hypothesis that there are financially distressed companies in the Textile Sector of Pakistan listed in Karachi Stock Exchange.

Discussion

This study was restricted to the 22 companies that were taken to assess the financial failure. Z-Score and Current ratio were used to calculate the financial failure or non-failure according to the cut off scores. In this study, Bankruptcy Ratio were high in the 2008, 2009 but in 2011 and 2012, companies were financially healthy. The Textile Sector of Pakistan suffered more in 2008 as compare to the 2012. Moreover, This Study needs more to concentrate with other models for accuracy and to predict bankruptcy with higher degree of capability.

Conclusion

The finding of the Study suggest that Z-Score and Current Ratio are good predictor of the financial failure of the Companies. It is concluded that there are financially distressed companies among textile sector of Pakistan listed in Karachi stock Exchange. Z-Score and Current ratio are beneficial techniques for investors to predict the financial health of the Companies. Both models are reliable tools to predict the bankruptcy. This study also revealed that there is no significant difference in using Z-Score and Current ratio to evaluate financial failure of the Companies. There is also significant positive correlation between Altman Z-Score and Current Ratio in all given years on which Paired sample T-test was applied. This Positive Correlation furthermore Supports to the aim of this study and increased the integrity of this study.

Recommendations

This study can be expended by using more models to assess the financial failure of the firms. Liquidity Ratio can also be taken to conduct the study for the higher accuracy. Textile Sector is the Biggest Sector of Pakistan in term of contribution to the economy, so further Studies should be conducted with large Sample to take more appropriate results. This study also suggests that develop new models in order to predict the financial distress with more accuracy in Karachi Stock Exchange.

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APPENDIX

Z-Score & Current Ratio of Selected Firms

		Year 2008		Year 2009		Year 2010		Year 2011		Year 2012	
S/No	Symbol	Z-Score	Current Ratio	Z-Score	Current Ratio	Z-Score	Current Ratio	Z-Score	Current Ratio	Z-Score	Current Ratio
1	ADML	2.1136	1.04	1.7166	0.82	1.5559	0.89	1.5491	1.01	1.9562	1.16
2	ANL	0.611	1.8	0.8057	0.64	0.7203	0.64	0.4605	1.33	-0.2889	0.8
3	CHBL	0.4858	0.85	0.7846	0.92	0.019	0.67	-0.7109	0.45	-0.7738	0.38
4	CML	0.9576	1	0.6044	0.76	1.0788	0.72	1.3243	0.81	1.0563	0.94
5	DLL	18.313	8.23	6.0326	8.41	9.2637	10.55	6.8337	9.91	9.3278	11.81
6	DFSM	0.6645	1.13	0.0359	0.7	0.916	0.74	0.7652	0.73	0.6259	2.03
7	HIRAT	0.737	0.98	1.1027	0.85	1.5607	0.92	1.8969	0.95	1.5445	0.94
8	JKSM	0.8121	0.57	1.0491	0.88	1.8335	1.04	3.0398	1.28	2.4898	1.43
9	KML	0.7406	0.79	0.3675	0.56	-0.1864	0.44	-0.5711	0.38	1.9333	1.05
10	KOSM	1.4531	0.79	1.2631	1.02	2.2123	0.96	2.2123	1	2.4355	0.93
11	KTML	1.1169	1.74	0.6050	0.76	0.8653	0.8	1.0282	0.67	0.9546	0.63
12	MSOT	1.868	1.32	2.4682	1.25	2.4034	1.22	2.4603	1.12	2.4479	1.34
13	NCL	0.8838	0.81	0.6729	0.77	1.6388	0.86	2.2465	1.12	1.8172	1.28
14	NML	2.2694	2.31	1.5531	0.86	1.8397	1.11	2.0875	1.2	1.8794	1.31
15	ZPL	0.2769	0.62	0.6682	0.65	0.7289	0.63	1.8137	0.61	0.9651	0.59
16	ANNL	-0.7549	0.39	-0.9316	0.44	-0.9567	0.44	-0.958	0.44	-0.9957	0.44
17	COST	-0.1652	0.87	-0.6711	1.12	-0.6262	0.14	-0.8196	0.08	-0.9152	0.07
18	DATM	-0.8644	0.68	-0.8484	0.11	-0.8787	0.1	-0.9134	0.09	-0.0654	0.25
19	GOEM	0.186	0.83	0.8524	1.12	1.819	1.24	2.4104	0.9	2.3422	1.02
20	HAJT	0.1039	0.26	0.6030	0.64	1.1312	0.66	0.9905	0.44	0.9918	0.44
21	HATM	-0.1169	0.26	1.5405	0.32	0.1882	0.29	0.2328	0.2	-0.7869	0.17
22	KHSM	-0.227	0.46	-0.1793	0.89	-0.1414	0.31	-0.2197	0.31	-0.7077	0.08

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