Rescuing Business; Analysis of Bankruptcy in textile Sector of PakistanUsing LogitModel FromYear 2005-2010

Mr. Ahmed Muneeb Mehta[1]

Abstract

This study estimated a logit discriminant model for analyzing bankruptcy in textile sector of Pakistan.The model achieved a 92-percent accuracy rate in classifying the in-sample firms into bankrupt and non-bankrupt groups. A group of 37 bankrupt companies and 53 non bankrupt companies has been taken for analysis using logit model. 14 ratioshave been used to analyze data. The model suggests that firms with low earnings before interests and taxes and high total liabilities are more likely to be bankruptcy candidates. These ratios have been categories in to five groups which are Profitability,Liquidity, Leverage, Turnover Ratios and shareholder group. To reduce bankruptcy risk, textile sector should adopt a prudent growth strategy accompanied by less debt financing and tighter cost control

Keywords: Bankruptcy, Cash Flows, Profitability, Textile, Logit Model

Introduction

Bankruptcy is one of the important issues in any country. Bankruptcy has many definitions that vary according to country and their legislative environment. According to (Bernhardsen, 2001) bankruptcy is the legal condition in which company or individual is no longer able to pay its debt or full fill the economic obligation.

Bankruptcy is the international issue which occurs worldwide. It is present in both developed and developing countries. How over its presence in developing countries is in greater extent .Few causes vary country to country because of difference in legal systems, accounting standards, social & political environments.

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[1] Lecturer, Hailey College of Banking and Finance, University of the Punjab.

Factors that contribute in bankruptcy can be categories in to (i)Macro factors (ii) Micro FactorsMacro factors are the factors that are outside of the firm and firm do not have any control over them eg in Pakistan power generation problem , Inflation, Rate of Interest , Terrorism etc. these are the economic factors and are same for each company.

Micro factors are those that happen with in firm. These factors are controllable by the firm's management. Internal factor are depended n the management decisions these factor vary from one organization to another organization. It includes capital structure, production efficiency, sales expenses etc.

This study aims to analyze the bankruptcy but taking ratios.Financial ratios are the indicator of the management performance.Although analyzing bankruptcy in the complete picture that represents both external and internal environment.

Bankruptcy analyzing has the significant value in the field of finance, these reports are used at for many purposes like for law or regulation authorities , managers and academic.The purpose behind these is the well being of the firm and the stake holder associated with it.

If we look at previous studie Ohlson, (1980) was the among first authors who have used logit model, he used size,financial structure, activity and liquidity to predict bankruptcy.

It will be worth to find whysome of these firms fall in to bankruptcy and what were the factor that these firms did not management to call for merger or timely liquidation and what are the Pakistani banking sector response while restructuring these debts.

Problem Statement

As detailed in APTMA web site, In Pakistan Textile Sector contributes 8.5% of GDP .This sector exported54% of the total exports in 2008-09.More than 38% of total labour force is attached to this industry. Market capitalization is 5% of total market capitalization. We can see that it is a huge sector in all aspects.According to the publications of State Bank of Pakistan 147 companies were repotted bankrupt in 2010 out of which 85 were related to the textile sector.

Few studies in nonfinancial sector of Pakistan has been done regarding bankruptcy but studies specifically for textile sector has not been observed. As stated above textile sector is very important sector of Pakistan so it is very important to find what the reasons behind those failures are and what the solutions to the problem are?.

The reasons behind this situation are of many types. But as defined by many studies, the main reason is behind is liquidation or the cash flows. Bankruptcy is the condition of the firm in which it have no sufficient funds to pay its daily out flows.This article will enhance the knowledge regarding bankruptcy.

Objective of the Study

- To analyze the causes of bankruptcy in Textile sector of Pakistan
- To formulate a model which have good predictive measure for bankruptcy.

Limitations

Limitations of the study are that a firm cannot be operated in solo environment, as a part of society. The effect of Social Political or macroeconomic issues put a big difference on the manger decisions.

Due to shortage of data and information all the external environment effects are not taken in the analysis. It necessary to incorporate different types of information that describe the actual condition of a firm like production cycle type of machinery market competition.etc.

Due to window dressing of the financial statements by the firms it is possible that truly picture of the firm condition may not be present.

In this study market variables can also be incorporated like market value of assets of the firm, size of competitor companies and demand for final product.

Literature Review

In the article by (Ohlson, 1980) significance of four major factors have been identified (i) Size of company (ii) Financial Structure (iii) Activity or performance of the firm (iv) Current Liquidity. He further stated that the disadvantage of logit model is that it don't utilize market transactions data of a company.

As argued by (Shumway, 2001)logit model contains the deficiency of independence between the observations that are the characteristics of panel data, because logit model take one value for one variable and bankruptcy is the outcome of many previous activities.

In e-book written by (Stewarts Jones, 2012)logit and probit models assumes that with the given set of data with different attributes there exists the probability that firm will default or not. According to (Bernhardsen, 2001) there are certain difficulties that may arias if we merge both the theories that prevail in country and empirical fields, it is not only necessary to describe weather a firm falls in the bankrupt category, but also the reason behind the bankruptcy are also need to be explain.

" If the establishment and abolishment of the firm can be viewed as a reversible investment decision, or the decision cannot be postponed, at any point in time continuance is optimal if the present value of operations is in excess of the liquidation value of the firm. This result is referred to as the standard net present value rule (NPV). If non of the above conditions hold, NPV need not hold and the decision of continuance is better analyzed in a dynamic framework." (Bernhardsen, 2001)

"An explosion in their financing costs along with removal of textile quota from 2005 onwards and later on acute energy crisis hampered their profitability and ability to repay their debt. This in turn contributed to non-performing loans which is now is likely to pose a big challenge for financial sector and push economy into another crisis". (Hussain, 2011)

According to (Barbo Back, 1996) liquidity ratios explain the most important factor in bankruptcy prediction, there are two reasons first the liquidity itself is the major cause of bankruptcy and second, the other variables taken in the study were mostly describing the liquidity.

" when either the firm's operating cash flow is insufficient to meet current obligations that is, the inability to service its debts or when the firm's net worth is negative – that is, the value of the assets is less than the value of its liabilities" (Kris Joseph Knox, 2009).

Ratios used to predict or analyse bankruptcy by (Shumway, 2001) are TA, RE/TA, EBIT/TA, ME/TL(market Equity to Total Liability), S/TA (Sales to Total Assets), NI/TA(Net i*ncome to total Assets),TL/TA, CA/CL.* (Ohlson, 1980) has usedTL/TA , WC/TA, CL/CA, NI/TA, FU/TL (Funds provided by operations by Total Liability) & SIZE (log (Total assets/GNP Price Level Index).Barbo Back, (1996) has used(Cash/Current Liabilities, Cash Flow/Current Liabilities, Cash Flow/Total Assets Cash Flow/Total Debt, Cash/Net Sales, Cash/Total Assets, Current Assets/Current Liabilities, Current Assets/Net Sales, Current Assets/Total Assets, Current Liabilities/Equity, Equity/Fixed Assets, Equity/Net Sales, Inventory/Net Sales, Long Term Debt/Equity, MV of Equity/Book Value of Debt, Total Debt/Equity, Net Income/Total Assets, Net Quick Assets/Inventory, Net Sales/Total Assets, Operating Income/Total Assets, EBIT/Total Interest Payments ,Quick Assets/Current Liabilities, Quick Assets/Net Sales, Quick Assets/Total Assets, Rate of Return to Common Stock ,Retained Earnings/Total Assets, Return on Stock, Total Debt/Total Assets, Working Capital/Net sales, Working Capital/Equity, Working Capital/Total Assets) his analysis of bankruptcy.

Theoretical Frame Work

According to (Bernhardsen, 2001) decision of establishing a firm in an important investment decisionand the high activity of the firm indicates that there is inflow of liquid assets of cash equivalent. It is necessary to indicate that if the economic condition of the country are not satisfactory than stabling of new entity is the risk.

This may result in loosing the opportunity of another investment. "if the entry or exit of the market are sufficiently costly and the variance of outcomes sufficiently high the firm may choose to operate even at negative contribution margin" (Bernhardsen, 2001) .

Many author have used logit model to predict bankruptcy (Ohlson, 1980) are the author who have used logit model and there article have shown that the ratios which effect bankruptcy are cash flows ratios, activity ratios liquidity ratios profitability ratios and leverage ratios

Ratios are used very commonly in analyzing financial condition of a firm. These ratios are derived from financial statement of particular firm and are used to measure performance and results of decisions that a management is taking. These ratios can be divided into groups based on the activity which is being reflected. So it is very logical to say that these ratios have inbuilt properties that can show the causes and reasons behind bankruptcy.
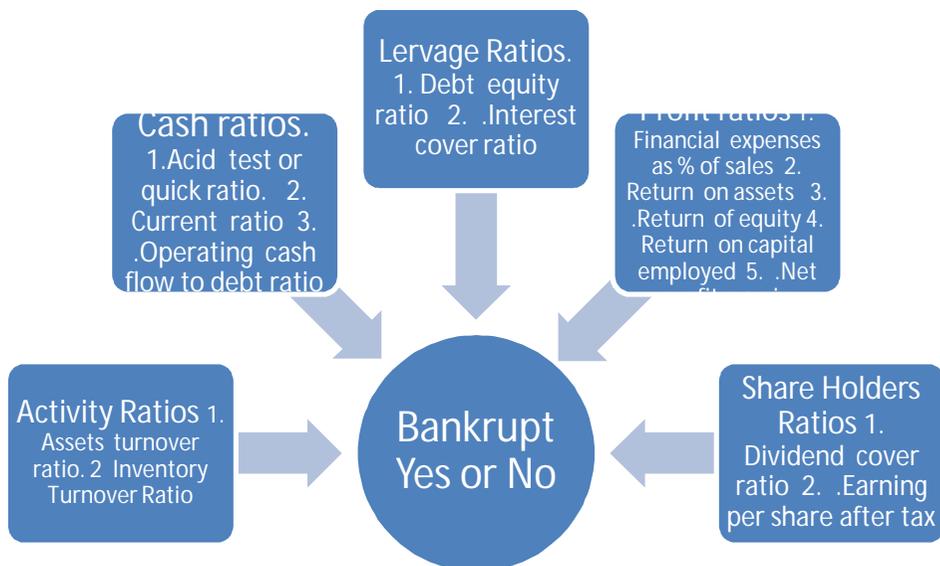
Research Design &Methodology

We have used logit model for the analyzing bankruptcy it is assumed that all the external factors are constant and have no significant effect on firm conditions. Data for 6 years (2005 to 2010) have been used. Bankruptcy is the outcome of company's previous performance, for this purpose we have used average of each ratio for the last six years so that the effects of previous years in account for.

With given set of attributes there exists a define-able probability that firm is going to bankrupt or not. The bankruptcy is the conditional situation that is connected to ratios. Further these ratios present the manger's decisions which are random. The event are the decision that cause change in ratios, it is necessary to mention that managers decision that are effected due to change in external environment is considered to be constant because our focus is to analyze on the biases of internal environment.

The dependent variable is the propensity to default or bankrupt and the independent variable are the corresponding ratios. As argued by (Shumway, 2001)Logit models lacks the characteristics of a panel data in which the trends are observed or we can say that bankruptcy is the outcome of many previous activities, which can only be done in analyzing time series data or penal data.To cater this. Variables are briefly define and explained as under:

(a)Asset Turnover Ratio: This ratio measures firm competence for using it assets to earn revenue. Firms having low price for it product will have high assets turn over and so on. Higher this ratio shows the company position is good. (b)Inventory Turnover: This ratio measures efficiency of sales. High Inventory levels are considered to be un health because they represent investment having low rate of return.(c)Current Ratio: Current Ratio shows company ability to pay it current liabilities in next 12 month period or in a financial year. Current ratio gives an idea of company's operating efficiency. (d)Cash Flow to Debt Ratio: This ratio shows company ability to pay its debt with the annual cash flows. A high ratio shows that company is in better position to pay its debts. (e)Quick Ratio: This ratios shows company short term ability to full fill its short term obligations.

High quick ratio shows the better company position. (f)Debt/Equity Ratio: This show the proportion of both equity and which the company is using to finance its assets (g)'Interest Coverage Ratio: This ratio shows company ability to pay it financial expenses. Whether a company is generating enough resources to pay is financial expenses or not. (h)Return on Assets interpretation: It shows company assets profitability over a period of time it is a profitability ratio which shows the revenue generating efficiency of a assets or the management.(i) Return on Equity interpretation: This ratio shows company profitability with reference to share holder's equity ie how much profit is earn with the investment of ordinary share holders.

(j)Return on Capital Employed: This ratio shows the profitability of capital invested in a company. If rates are higher then the borrowing then company is in good position. (k)Profit Margin: This is simple profit ratio which show how much profit is earn from sales. (l)Dividend Coverage Ratio: This ratio that shows company's ability to pay its dividend. (m)Earnings Per Share: This ratio show that how much profit is earn on each share invested by share holders

Research Results

Table1:Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	75.699	14	.000
	Block	75.699	14	.000
	Model	75.699	14	.000

Omnibus Tests of Model Coefficients shows how good this model performs. Chi-square is same and significant this shows that there is no exclusion or inclusion of variable in the model.

Table 2: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	45.141[a]	.573	.771

Nagelkerke R Square is .771 which shows the variability of the dependent variable. As our dependent variable is binary (ie the chances of being bankrupt) and there are 13 independent variable in the model shows 77.1 % of the variation in independent variable.

Table 3:Hosmer and Lemeshow Test

Step	Chi-square	Df	Sig.
1	43.610	8	.000

Hosmer and Lemeshow Test sig value is .000   which shows that there is significant misspecification in the model prediction capacity.

Table 4:Contingency Table for Hosmer and Lemeshow Test

	BKRUP = .00		BKRUP = 1.00		
	Observed	**Expected**	**Observed**	**Expected**	**Total**
1	9	9.000	0	.000	9
2	9	8.851	0	.149	9
3	8	7.868	1	1.132	9
4	7	5.877	2	3.123	9
5	2	3.036	7	5.964	9
6	1	1.581	8	7.419	9
7	0	.593	9	8.407	9
8	0	.171	9	8.829	9
9	1	.023	8	8.977	9
10	0	.000	8	8.000	8

Contingency Table for Hosmer and Lemeshow Test shows that there is no difference in the observed value and predicted value so this also show that model predictive capacity is good. Less deviation in the predicted and observed value show that prediction capacity of the model will give more reliable results.

Table 5:Classification Table[a]

Observed			Predicted		
			BKRUP		
			.00	1.00	Percentage Correct
Step 1	BKRUP	.00	33	4	89.2
		1.00	3	49	94.2
		Overall Percentage			92.1

a. The cut value is .500

Classification table shows that out of 37bankrupt 33 were considered bankrupt as per model specification so the model result accuracy is 89.2% and similar to none-bankrupt companies model accuracy is 94.2 %. Over all model prediction accuracy is 92.1 %.

Table 6:Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1a	ACTRX1	3.358	1.545	4.721	1	.030	28.720
CSHRX4		-56.481	22.227	6.458	1	.011	.000
PRFRX1		.635	.252	6.355	1	.012	1.887
Constant		-3.324	1.668	3.973	1	.046	.036

Exp(B) is also known as odd ratio it is the predicted change in odds for one unit change in independent variable. As we can see that Exp(B) is less than 1for two variables which show that by increase in these ratios the chances of the bankruptcy will decrease. And similarly chances for bankruptcy will increase by increase in the ratios where Exp (B) is greater then one

Wald test shows significance of the parameter to the model

Out of 14 variable only 3 has shown significance ieACTRX1 Sig =.030 , CSHRX4=.011 and PRFRX1=.012

Model Equation

Y=-3.324-56.481CSHRX4+3.358 ACTRX1+.635PRFRX1

Operating Cash Flow to Debt ratio has a large impact on the bankruptcy, one unit increase in Operating Cash flow to Debt ratio (CSHRX4) will bring 56.481 time reduction in chances of being bankrupt. Significance of this ratio in the model is 0.011. This ratio indicates the company ability to pay its debt with its yearly cash flows.

Assets Turn Over ratio(ACTRX1) effects 3.358 times on predicting or determining company bankruptcy conditions. Assets Turnover measures the firms efficiency to use its assets for generating revenue.

Financial Expenses over Sales ratio hassignificance valueequals 0.012, this ratio indicates the firms capability to pay its financial expenses from its revenues.

Conclusions

Conclusions of the study are as under:

- Operating Cash Flow to Debt ratio has a significant impact on the bankruptcy. This ratio indicates the company ability to pay its debt with its yearly cash flows.
- Assets Turn Over ratio which measures the firms efficiency to use its assets for generating revenue, effects 3.358 times on predicting or determining company bankruptcy conditions.
- Financial Expenses over Sales ratio has significance value equals 0.012, this ratio indicates the firms capability to pay its financial expenses from its revenues.
- Over all bankruptcy is the outcome of business cash flow, activity and profitability determinants.

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