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"THE PREDICTION OF BANKRUPTCY IN THE POWER AND STEEL SECTORS IN INDIA"

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Abstract

Titled "THE PREDICTION OF BANKRUPTCY IN THE POWER AND STEEL SECTORS IN INDIA" this study aims to understand the probability of bankruptcy in an Indian organization in the Power and Steel sectors.
We have studied the ability of mathematical formulas namely Altman's Z-Score and Ohlson's O-Score to predict bankruptcy within a period of two years from the date of which the formula is tested. With this we use historical data to predict current scenarios and offer investors and loan officers a method to predict the possibility of default for any corporate.We have also provided suggestions to tailor the formula to the Indian market.
This study is in part illuminative and in part experimental in order to prove the formulas.We have tested this formula in two highly leveraged industries.
Keywords: Non-Performing Assets, Ohlson O-Score, Bankruptcy, Distressed Assets.

Introduction

Conditions that have created requirement of study:

The Bankruptcy code of India was passed on 28th May 2016. The law was proposed to deal with the issue plaguing the Indian Banking system. An abundance of Non-

Performing Assets. This issue is more prevalent in public sector banks where the government has a stake. This directly has an impact on the government due to this issue. There was a study performed on the largest lender of the State Bank of India and there was a comparison made between its Non- Performing Assets and its Net Profit year on year and there was said to be a positive correlation which would indicate two things to a person reading the financials.Bankers have made a habit of lending in a very risky manner in order to increase profitability and have not made provisions adequately as per banking regulations so as to not weigh down the balance sheets.
This issue of Non-Performing Assets is faced mainly by private sector

The Purpose of the Research: TheBankruptcy Code is a necessary phenomenon that has been formulated by the Finance Ministry in India so that the banking sector could recover from the problem of long due non-performing assets that have not been serviced by the organization for a period of time providing a direct loss to the bank's assets and in turn capital. We believe that while bankruptcy from a legal point is a very good reform to turn India into a "creditor in control" lending market highly leveraged organizations should have a pre-hand focus on restructuring of loans and division of assets or efficient operations for adequate cash flows. We have taken the example of share valuation for unlisted organizations under Ind AS 102 which states that a company should value its shares using an adequate valuation model e.g Black Scholes Theory. We would suggest that organizations be required to value their debts using a prediction formula e.g Altman's or Ohlson's. This will be more informative to minority shareholders who lose out all rights once a company will go bankrupt and would force companies to make a provision for them and act in their benefit.

Benefits:
Will benefit distressed asset companies to position their investment with a better knowledge regarding the probability of default as distressed asset companies tend to purchase the debt of an organization as well as the equity.Will benefit shareholders who will lose the complete value of their shares once the company goes into liquidation as the shareholders lose the right of voting for the purpose of decision making in the company(As per the clarification order to Section 30 and 31).This will provide banks with an accurate model to value the possibility of their loans becoming non-performing so that they can restructure the assets early or they can attach possibly distressed loans to assets providing them with an easier solution rather than bankruptcy court.

Actions taken by RBI:
The RBI will now instruct banks regarding which 12 companies or NPA accounts are to be referred to initiate the insolvency and bankruptcy proceedings. Once the banks receive the names of the companies shortlisted by the regulator, the lead bank in the

respective joint lender forums (JLFs) will admit the case to the National Companies Law Tribunal (NCLT).As the case of default has already been established through the RBI's selection, the NCLT will admit the cases. Moreover, the regulator has also requested the tribunal to accord priority to these cases, when they get admitted. When a case is admitted to the NCLT under insolvency proceedings, an interim insolvency resolution professional is appointed to the case. The case is also placed under a moratorium, whereby no other legal proceedings can be initiated against the company involved.
As on date bids had been provided for Essar Steel one of the 12 and the bankruptcy process has been performed in over 468 companies of which 26 have gone into liquidation.

Creditor Results:
In the first case for automotive wheel manufacturer Synergies Dooray Automotive Ltd. The creditors of the company only ended up receiving 50 crores from a debt of 972 crores.
This was accepted by the 3 creditors in the resolution plan which caused the company to merge with its related party concern. This recoverability of 6% in a case which is not covered by media as the debt is not very high has stunned people who have been following the proceedings carefully.

Review of Relevant Literature:

1. Lawrence Judy Ramage, The Use ofOhlson's O-Score for Bankruptcy prediction in Thailand (2015)

Prediction of Bankruptcy in advance can help take action and reduce the risks to its minimum. There were various researchers who conducted research in this area of predicting bankruptcy like Fitzpatrick, Altman etc. James Ohlson (1980) was the first to do it on logit analysis which made the formula much more dynamic.
There is an analysis drawn on the fact that a study conducted in countries like the United States and Europe will not have relevance to a country like Thailand. It examines the ability of Ohlson's to actually predict bankruptcy in Thailand. It was also done to see if there was a significant variance between the score measured on a bankrupt and non-bankrupt entity. It was found out that there is a significant change in the score for one, two and three years prior to insolvency.

2.Kumar, R. G., & Kumar, K. A Comparision of Bankruptcy Models. *International Journal of Marketing*.(2012)

The researcher tries to do a comparative analysis of the Bankruptcy models of Altman's, Ohlson's and Zmijewski's model at "Texmo Industries, Coimbatore" over a period of five years.As per the Altman's score, over the span of these 5 years, the probability has reduced. Recession caused an increase in the rate but however was managed well in the upcoming years.As per the Ohlson's there was no bankruptcy in the first 3 years, after which there was a slight probability which then increased to around 22% in the last year. As per Zmijewski's Model, the score was negative in all the years showing that the company has not failed. On analyzing all the cases with the actuals, it was found that Ohlson's gave the best results as there is a high positive correlation between Ohlson's model and the traditional approach. Also since Ohlson's uses 9 factors to predict bankruptcy which Altman and Zmijewski use only 4 and 3 respectively, giving a better picture of the scenario. Studies show that none of these ratios show a satisfactory level of prediction but however, Ohlson's is the most accurate.

3. Karamzadeh, M. S. (2013). Application and Comparison of Altman and Ohlson Models to Predict Bankruptcy of Companies . *Research Journal of Applied Sciences, Engineering and Technology*.

The researchertries to study the level of prediction of these ratios on the Iranian listed companies. The Tehran law states that if a company loses at least half of its assets, it is mandatory for its BOD to make an informed decision about the future of the firm. This is extremely important to ensure that a true image of the going concern of the firm is being depicted. The study was conducted on a total of 90 companies over a period of 4 years from 2007-10. Of the total 90 companies, there were 2 groups. One consisting of listed companies of the Iran stock exchange as per Article 141 of their Code whose retained losses are more than twice the capital invested. The other group consists of stratified random samples that were selected. The results of the study show that the accuracy for all the years is more accurate in case of Altman's than Ohlson's for the Iranian Companies.

4. Ohlson, James . *Financial Ratios and the Probabalistic Prediction of Bankruptcy.(1980)*

In the above paper the researcher has fromulated the Ohlson O Score, an original formula that was put forward to predict bankruptcy in a more effiecient method than previous formulas using the financial position of the company and the Gross National Product Price Index to value the inflation in the market. It also uses factors to measure the trends in the net income of the organisation. Ohlson has taken a sample of 2000 companies to prove his formula and got a 90% success rate.

RESEARCH DESIGN

Statement of the Problem:

The problem of Non-Performing Assets has become an issue in India and has affected the profitability and liquidity of much of the banking sector as well as making India an unfavorable place for investment in the form of debt. For the ease of recovery of creditors the finance ministry has introduced the Insolvency and Bankruptcy Code in 2016. This study aims at analyzing the ability to predict bankruptcy in organizations using ratios and mathematical formulas.

Objectives of the Study:

Whether the American formulas for the prediction of bankruptcy namely Edward Altman's Z-Score and James Ohlson's O-Score prove to be accurate in the steel and power sectors in India considering the differences between the market indicators in both countries as well as the propensity of banks to lend to business houses in India and the difference in the ownership make-up and capital structure of organisations in India as compared to developed countries.

LIMITATIONS OF THE STUDY

The study is based largely on samples and cannot be considered as absolutely conclusive.

The technical research is limited to only 10 publicly listed companies in two highly leveraged sectors.

The original limitations in the accuracy of the formulas as stated by Altman and Ohlson respectively.

The inability to get a direct correlation from the numerical and financial data provided by the formulas as compared to the psychological and legal procedure of filing by creditors.

We limit the proof to default of debt repayment as opposed to filing of bankruptcy.

For the purpose of collecting data for the research formulated for the purpose of calculating the two formulas we have collected the data from 20 signed financial statements over the period of 2 years for numerical analysis as well as the quarterly reports for the period ending 31st December 2017 in order to confirm the hypothesis.

RESEARCH METHODOLOGY AND SOURCES OF DATA:

Financial data for the companies was collected from the annual reports and signed financials by the auditors that have been provided on their respective websites.

We use the financials of the companies as per year ending 31st March 2016 and 31st March 2015 to compute the scores and then test this hypothesis using the latest financial statements and check whether any filing has been made against the company in the NCLT on behalf of creditors.
We have also taken a look into the IBBI listing of companies that have started the insolvency proceedings. The confirmation of the hypothesis will be if the companies that are considered to be if the probability of default criteria is confirmed through the formulas as well as the NCLT filings in the current year.

The Data Analysis

Prediction of Bankruptcy through Mathematical Formulas:

In the present experiment we have performed the Altman and Ohlson mathematical and accounting formulas on ten organizations.
We have chosen two sectors in the Indian Market namely power and steel.
These 10 publicly listed companies are:

Tata Power
Adani Power
Torrent Power
JSW Energy
Reliance Power
Tata Steel
Jindal Steel Works
VISA Steel
Uttam Galva Steel
Steel Authority of India Ltd.

The Ohlson formula

$$T = -1.32 - 0.407\log(TA_t/GNP) + 6.03\frac{TL_t}{TA_t} - 1.43\frac{WC_t}{TA_t} + 0.0757\frac{CL_t}{CA_t}$$

$$- 1.72X - 2.37\frac{NI_t}{TA_t} - 1.83\frac{FFO_t}{TL_t} + 0.285Y - 0.521\frac{NI_t - NI_{t-1}}{|NI_t| + |NI_{t-1}|}$$

Source: (Ohlson, 1980)

The results of the Ohlson's formula can be interpreted in the following way.
If the $(e^{oscore})/(1+e^{oscore})=0.5$ or greater.
The organization will be expected to go bankrupt within a period of 2 years.

The Altman's formula reads:

$$\text{Z-Score} = 1.2\,A + 1.4\,B + 3.3\,C + 0.6\,D + 1.0\,E$$

Where:
A = Working Capital / Total
B = Retained Earnings / Total Assets
C = Earnings before Interests and Taxes / Total Assets
D = Market Value of Equity / Book Value of Total Liabilities
E = Sales / Total Assets

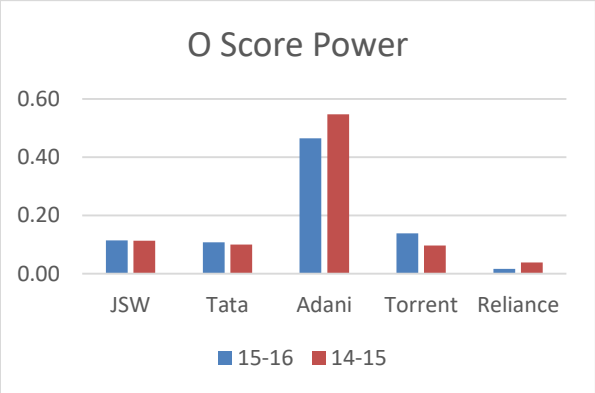
*Source: (Altman, 1968)

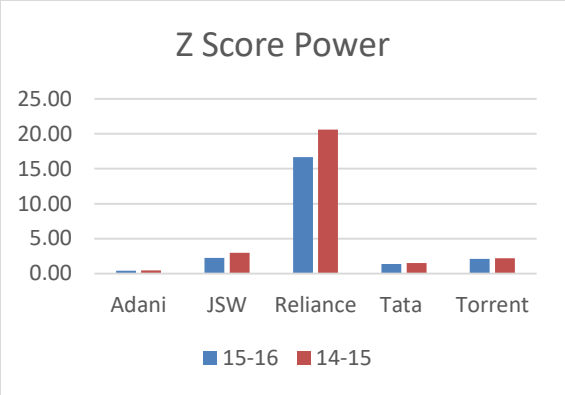
The Altman's formulas results can be read in the following way.
If the score is greater than 2.99 it is safe.
If the score is >1.81 but< 2.99 it is called gray zone.
If the score is less than 1.81 it is called the distress zone.

We have tested the formulas on the annual reports of the companies for the year ending 31st March 2016 and 31st March 2015.
We have gained the following results.

Power Sector:

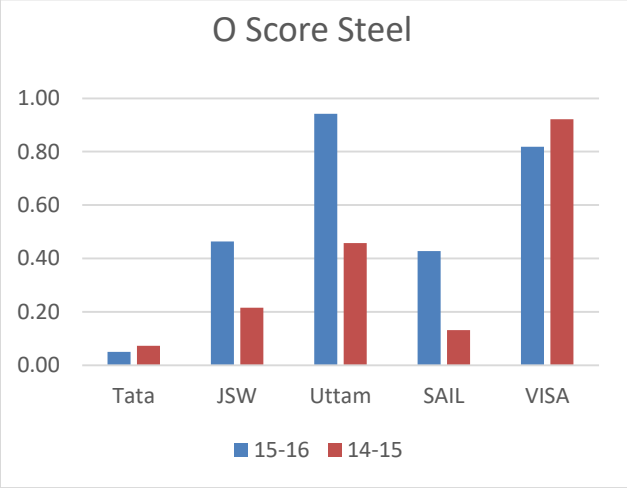
	Ohlson O-score			Altman Z-score		
Particulars	15-16	14-15	YoY change	15-16	14-15	YoY change
JSW	0.11	0.11	1%	0.41	0.46	-11%
Tata	0.11	0.10	7%	2.23	2.96	-33%
Adani	0.47	0.55	-15%	16.68	20.60	-24%
Torrent	0.14	0.10	43%	1.35	1.51	-11%
Reliance	0.02	0.04	-59%	2.12	2.19	-3%

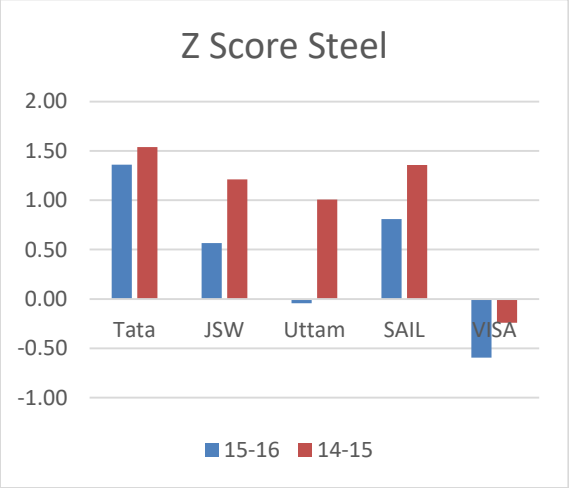




Steel Sector:

Particulars	Ohlson O-score 15-16	14-15	YoY change	Altman Z-score 15-16	14-15	YoY change
Tata	0.05	0.07	-48%	1.36	1.54	-13%
JSW	0.46	0.22	54%	0.57	1.21	-114%
Uttam	0.94	0.46	52%	-0.04	1.01	2416%
SAIL	0.43	0.13	69%	0.81	1.36	-68%
VISA	0.82	0.92	-13%	-0.59	-0.24	59%





Findings from the study:

In the final analysis we have noted down the following:

Accuracy of the formulas:

Ohlson O-score:

In the Ohlson's formula we have noted that two organizations have been flagged as potential bankrupt organizations. These are Uttam Galva Steel and VISA Steel.
Both companies have had petitions filed against them in the NCLT.
As per Ohlson O Score for the year ending 31st March 2016 both these companies were to be bankrupt.
The statutory auditor must disclose in the report whether the company has defaulted in loan payments and we have seen the above in the same reports as per 16-17.
Of the other organizations, the limits of 0.5 we have tested that none of the following have defaulted in their payments. Therefore we are able to note with 100% accuracy the Ohlson's formula.

Altman Z score:

In the Altman formula we have noted that in the steel sector is all below in the distress zone while in the power sector we have one company in the safe zone, two in the gray zone and one in the distress zone. We have checked the balance sheets for the year ending 31st March 2017 and only found two companies who have filed for bankruptcy as compared to the seven that would have been expected. Hence we cannot trust the accuracy of the Altman Z Score in the Indian market and we believe that the test has been deemed a failure. We have also noted that as an organization varies from a profitable year to a non-profitable year there may be a large variance in the score and this would matter especially when the company was near to bankruptcy and this has affected the market value.

Specific Clarification:

Adani Power: Due to the case of Adani Power we have made a suggestion to improve the formula in the Indian market. As described in our annexures the Indian manufacturing companies in leveraged sectors are part of business houses and and generally have a high promoter's share. Hence we will suggest that the formula be modified to include the promoters share as a factor in order to predict bankruptcy with complete accuracy to know whether the company will receive funds from promoters as Adani had a score close to 0.5 and received funds of 1500 crore from promoters and has managed to stay afloat due to this after continuous losses and reversal of the reprieve from the Mundra Power Agreement. The important factor here will be a weighted propensity to receive funds from promoters. We must also understand that in the sample of 10 leveraged organizations we have noted that 7 have promoters' shareholding of over 50%.

Reliance Power: We have taken the formula on the standalone financials of the organization as bankruptcy is an entity concept. However the company can run its business through subsidiaries and hold most of the debt within them.

The issue that will be faced in this situation is if the subsidiary goes bankrupt the entire organizations investment will become worthless. This cannot be solved easily as the company will have to go through impairment analysis every year.

We will hence need to take a look into adding a component of the investment in subsidiary value using an expected return factor to test the value of the subsidiary over the next two years as well as an impairment analysis to factor in the fall in investment value. We will have to value the propensity to receive dividend from the subsidiary or value the Total Assets less impairment value of subsidiaries.

Assumptions and given:

We have taken GNP Price Index as (Nominal GNP/Real GNP)*100

We have taken the figures from the standalone balance sheets of 14-15 and 15-16

We have tested defaults through NCLT filings against companies for Insolvency proceedings as well as the annual report for auditor notification of default.

Conclusion:

We have concluded that the Ohlson formula for predicting bankruptcy should be used and is accurate while the Altman is not.

We have come up with suggestions regarding the improvements that can be made to the formula to improve its accuracy in India.

Indian corporates are generally closely held by promoters and we should inculcate a factor being the promoters' propensity to invest in the company.

However we have noted that there are organizations that have kept a large amount of their liabilities in their subsidiaries and hence do not have a high score, hence we note that there must be a component regarding the cash flow and impairment analysis from subsidiaries to understand the likelihood of bankruptcy accurately.

With the findings from the research and the comparison with the Ohlson scores and the defaults as per the auditor's report for the year ending 31st March 2017 and this has appropriately proved the hypothesis that the Ohlson formula is accurate in the Indian market. We believe that the modified formula can be used in order for bankers to restructure loans early and attach assets rather than allow non-performing assets to reach bankruptcy court and have a lower possibility of recovering the debt. We also find that the formula will be useful for distressed asset funds who often purchase debt of organizations along with equity for turnaround purposes.

We would finally suggest that companies be compelled to give a certificate signed by auditors regarding the valuation and serviceability of the debts signed by the auditors

using the Ohlson formula to inform shareholders and lenders of the state of affairs of the organization.

Bibliography:

1. Altman, E. (1968). *Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy".*

2. Ammendment. (2017). *Insolvency and Bankruptcy Ammendment Act 2017.*

Code, B. (2016). *Insolvency and Bankruptcy Code 2016.*

3.GERRITSEN, P. (2015). *ACCURACY RATE OF BANKRUPTCY PREDICTION IN DUTCH PROFESSIONAL FOOTBALL INDUSTRY.*

4.Holmberg, N. A. (2012). *Prediction of Financial Distress among Swedish Listed Companies.* Stockholm School of Economics.

5. Hyderabad, N. (n.d.). *Ca No.123/2017.*

6. IBBI. (2016). *Insolvency and Bankruptcy Code.*

7.ICSI. (2017). *IBC Case Law Compedium.*

8.Karamzadeh, M. S. (2013). Application and Comparison of Altman and Ohlson Models to Predict Bankruptcy of Companies . *Research Journal of Applied Sciences, Engineering and Technology*.

9.Kumar, R. G., & Kumar, K. (2012). A Comparision of Bankruptcy Models. *International Journal of Marketing*.

10.Lawrence, J. R. (2015). The Use Of Ohlson's O-Score for Bankruptcy prediction in Thailand. *The journal of applied business research.*

11. NCLT. (2017). *CA No.123/2017.*

12. Ohlson, J. (1980). *Financial Ratios and the Probabalistic Prediction of Bankruptcy.*

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