Project Dissertation Report on

STUDY OF FIRST 10 COMPANIES IDENTIFIED BY RBI FOR BANKRUPTCY PROCEEDINGS UNDER IBC, 2016

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CERTIFICATE

This is to certify that the Project Report titled *"**Study of first 10 companies identified by RBI for bankruptcy proceedings under IBC**, **2016",** is a bonafide work carried out by **Srishti Sharma** of MBA 2017-19 and submitted to Delhi School of Management, Delhi Technological University, Bawana Road, Delhi-42 in partial fulfilment of the requirement for the award of the Degree of Masters of Business Administration.

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DECLARATION

I **Srishti Sharma**, student of MBA 2017-19 of Delhi School of Management, Delhi Technological University, Bawana Road, Delhi-42 declare that project dissertation Report on *"***Study of first 10 companies identified by RBI for bankruptcy proceedings under IBC***, ***2016",*** submitted in partial fulfilment of Degree of Masters of Business Administration is the original work conducted by me.

The information and data given in the report is authentic to the best of my knowledge.

This Report is not being submitted to any other University for award of any other Degree, Diploma and Fellowship.

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EXECUTIVE SUMMARY

The study examined financial data and credit ratings of first 10 companies (Bhushan Steel, Alok Industries, Amtek Auto, Lanco Infratech Ltd, Monnet Ispat And Energy Ltd, Electrosteel Steels, Era Infra Engineering, Jaypee Infratech, ABG Shipyard and Jyoti Structures) identified by Reserve bank of India for bankruptcy proceedings in July, 2017 under insolvency and bankruptcy code, 2016 over 6 years (2011 to 2016). Probability of default is calculated for these companies using Altman Z score model and Merton model and used to predict the time of default. External and internal factors behind failure of each firm were also studied. The external factors responsible for the companies' failure were found out to be global economic slowdown, delayed approvals and land clearances in India, high raw material cost, changes in government policies and high borrowing costs. Internal factors included unrelated or no diversification, improper strategies, debt funded expansions and acquisitions leading to highly leveraged balance sheets. These factors made it difficult for firms to repay their debt and resulted in default. It was found that probability of default calculated using Altman Z score model gave better results for Indian companies as compared to Merton model. Prediction of default using Altman Z score proved to be true for 6 out of 10 companies. Few weaknesses in Merton model were also observed while predicting time of default. Changes in credit rating of companies given by credit rating agencies found out to be either delayed or frequent prior to default for 5 out of 10 companies. The study concluded that Altman Z score model can be used for predicting time of default of Indian companies.

Keywords: Probability of Default, Merton model, Altman Z score model, credit ratings

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1. INTRODUCTION

On June 13, 2017, Central Bank of India (Reserve Bank of India) has identified 12 companies constituting 25 percent of the gross Non- performing assets (NPAs) of the banking system for insolvency proceedings under the newly implemented law 'Insolvency and Bankruptcy Code', 2016 (IBC, 2016). The top 12 companies were given priority for insolvency resolution by National Company Law Tribunal (NCLT) as decided by the Internal Advisory Committee (IAC) of RBI. IAC selected all stressed accounts with total exposure amount more than ₹ 5000 crore out of which 60% or more is declared NPA (non-performing asset) by Indian banks till March 31, 2016 ("RBI identifies Accounts for Reference by Banks under the Insolvency and Bankruptcy Code (IBC)", 2017).

The companies which made their place in top 12, commonly referred as "Dirty Dozen" by media, included Bhushan Steel, Alok Industries, Amtek Auto, Lanco Infratech Ltd, Essar Steel Ltd, Bhushan Power & Steel, Monnet Ispat And Energy Ltd, Electrosteel Steels, Era Infra Engineering, Jaypee Infratech, ABG Shipyard and Jyoti Structures. After the consent of majority of lenders, banks took these companies to NCLT for bankruptcy proceedings. Bidding process is started for all the companies in first stage. Electrosteel Steels became the first company to get deal (bid) under IBC, 2016. Vedanta group acquired Electrosteel Steels in May, 2018. Tata steel acquired Bhushan Steel in May, 2018, making it Tata Steel BSL Ltd. Monnet Ispat and Energy Ltd. went to JSW Steel in August, 2018. Creditors committee decided to go for liquidation of Lanco Infratech in August, 2018. ABG Shipyard is on the verge of liquidation as of March, 2019 after committee of creditors has approved a liquidation plan. The resolution for other 7 companies is in progress.

IBC, 2016 is not the first attempt by creditors and banks to recover their money. Earlier also, they have adopted various strategies introduced by Reserve Bank of India (RBI) since 2011. But all those restructuring and recovering mechanisms failed in reviving firms. Here is a brief introduction about those schemes.

By issuing a circular dated 23rd August, 2001, RBI introduced a scheme called 'Corporate Debt Restructuring' (CDR), with an objective to evolve a transparent and

timely mechanism for corporate debt restructuring and minimize ill- effects of defaults; as a voluntary agreement so that Financial Institutions (FIs) and banks could realize the amount of debt from borrowers who were not able to repay the whole debt in full. For implementation-

- 75% (super majority) of votes in favor of CDR were required from creditors.
- Only Consortium/syndication of accounts and multiple banking accounts, where total outstanding exposure is of Rs.100 million and above were covered.

Any numbers of the creditors (even one) which had minimum of 20% share in either term finance or working capital or with the support of financial institutions or banks fulfilling the same criteria of having minimum 20% shares by concerned corporate could go for initiating CDR in a company. The final decision regarding restructuring must be taken within 90 days, or maximum 180 days with decent reason behind delay. In this scheme, banks have the option to decide upon new, longer moratorium periods with companies for interest and loan repayments ("Corporate Debt Restructuring (CDR)", 2011).

During 2012-2013, banks implemented CDR mechanism in ailing companies to revive them again and realize their money. But due to ineffective preparation by banks before adopting CDR, financials of companies did not show any signs of improvement.

On February 26, 2014, Central bank provided guidelines on CAP (corrective action plan) and JLF (Joint Lenders' Forum) for dealing with stressed assets. Banks were required to provide all the information on borrowers having loan of Rs.50 million and above to CRILC - 'Central Repository of Information on Large Credits', which is set up for the collection, storage and dissemination of data on loan to creditors. It was done so that an early corrective action would be taken by banks before an account becomes NPA.

For revival of infrastructure and core industry, RBI came up with another scheme called 'Flexible Structuring of Long Term Project Loans to Infrastructure and Core Industries', commonly known as the 5:25 scheme on July 15, 2014. This allowed

giving loans to infrastructure firms for longer periods, say 25 years with refinancing after every 5 years ("Flexible Structuring of Long Term Project Loans to Infrastructure and Core Industries", 2014).

In a circular dated June 8, 2015, RBI introduced another scheme- Strategic debt restructuring' (SDA) for lenders. To give more power in the form of ownership into the hands of suffering lenders, SDR enabled the lenders to convert their loans into equity. Before implementing SDR, consent of at least 75% of lenders by loan amount value and 60% by number of creditors was required and should be taken at JLF (joint lenders forum). After such conversion which must be completed within 90 days, creditors were required to become the majority shareholders by holding 51% shares collectively. SDR gave the power to lenders to change Management, appoint new professional who will look into the operations of defaulted company and sell the company to new owner to recover their loan money within 180 months. After 180 months, if none of the objective was achieved, account would again be treated as NPA in banks' account books ("Strategic Debt Restructuring Scheme", 2015).

In a year, RBI came up with another scheme on June 13, 2016, commonly known as 'S4A' or 'Scheme for Sustainable Structuring of Stressed Assets. The objective of this scheme was to enhance the creditors' financial ability to deal with stressed accounts. This allowed classification of company's outstanding debt into 2 parts. Part A, called 'sustainable debt', would be treated as the existing debt and have to be serviced as per the terms and conditions decided at the time of loan and must be more than 50% of total outstanding debt. No conversion of this part was allowed. Conversion of Part B, called 'unsustainable debt', was allowed into equity or more preferred option by lenders called 'Redeemable cumulative Optionally Convertible Preference Shares'. The scheme gave the flexibility to lenders that they want to change the current management of company or not by selling company to a new owner, unlike SDA. S4A could only be initiated when the total exposure of lenders (banks) was more than Rs.500 crore and the resolution plan submitted by them have to be reviewed by Overseeing Committee (OC) ("Scheme for Sustainable Structuring of Stressed Assets", 2016).

But even after sustained efforts, NPAs problem was not solved. So, on August 19, 2017, RBI introduced the revolutionary and the much awaited law for dealing with

NPAs, called the "Insolvency and bankruptcy code, 2016". This law is developed to provide a comprehensive and holistic time- bound one point solution to resolve stressed assets. Creditors have to decide a resolution plan within 180 days; otherwise liquidation order will be passed by the adjudicating authority. The time can be extended by 90 days in case of genuine reasons ("Resolution of Stressed Assets: Towards the Endgame", 2017). The process of insolvency in the case of default of minimum 1 lakh rupees can be initiated by any stakeholder, who is financially affected by default, be it operational or financial creditor or debtor. The application under IBC, 2016 can be filed with that branch of NCLT (National Company Law Tribunal; adjudicating authority) where registered office of defaulter is incorporated ("The Insolvency and Bankruptcy Code, 2016", 2016). After the introduction of IBC, 2016, Central bank has withdrawn all earlier schemes -S4A, CDR, JLF and SDR related to dealing with NPAs, making the IBC the important and only tool for NPAs on February 12, 2018 ("Resolution of Stressed Assets – Revised Framework", 2018).

Table 1.1: The loan amounts of the top 12 companies according to total debt on their balance sheets and the sector of activity-

Company	Sector	Default Amount (in INR Crore)
Bhushan Steel	Steel	44,478
Alok Industries	Textiles - Weaving	22,075
Amtek Auto	Auto ancillary, forging	14,074
Lanco Infratech Ltd	Infrastructure	44,364
Essar Steel Ltd	Steel	37,284
Bhushan Power & Steel	Power and Steel	37,248
Monnet Ispat & Energy Ltd	Steel, mining and power	12,115
Electrosteel Steels	Metals & Mining	10,273
Era Infra Engineering	Infrastructure	10,065
Jaypee Infratech	Construction & Contracting	9,635
ABG Shipyard	Private Shipbuilding	6,953
Jyoti Structures	Power – Transmission	5,165

Source: www.financialexpress.com

Out of 12 NPA companies, only 2 companies- ABG Shipyard and Jyoti Structures had agreed to loan default and did not oppose insolvency petition and bankruptcy proceedings initiated by the banks against them.

1.1. Overview of the firms identified by Central Bank under IBC, 2016

A B G Shipyard Ltd. - ABG Shipyard, incorporated in 1985, was the largest privately owned shipbuilding yard in India with two shipbuilding facilities at Surat and Dahej, Gujarat ("Annual Report Of ABG Shipyard, 2015-16", 2016).

After facing liquidity issues and financial crises, during the financial year 2013-2014, company decided to adopt CDR for 2 years after the approval from Consortium of 22 lenders in August, 2013; and on 23 December, 2015, CDR lenders invoked Strategic Debt Restructuring (SDR) provisions in the company after CDR failed to revive company ("ABG Shipyard Director Report - Business Standard News", 2016).

In August, 2017, insolvency proceedings against the company, initiated by ICICI Bank (with major stake) under the Insolvency and Bankruptcy Code (IBC), 2016 were admitted to the Ahmedabad bench of National Company Law Tribunal ("NCLT admits ICICI Bank's insolvency petition against ABG Shipyard", 2017).

Monnet Ispat and Energy- Incorporated on February 1, 1990 in Kolkata, West Bengal, Monnet Ispat Ltd. (MIL) shifted the registered office to Delhi in 1993. Started from manufacturing Sponge Iron in Raipur, Chhattisgarh, it was engaged in the mining of coal, power generation and manufacturing of steel and Ferro alloys ("About | Monnet Ispat & Energy (AIONJSW) Company - Business Standard News", n.d.). The company had two iron and steel manufacturing facilities in Chhattisgarh, one at Raipur and another at Raigarh. Monnet Ispat merged with Monnet Power Ltd in 2004 and changed its name from Monnet Ispat Ltd. to Monnet Ispat & Energy Ltd. in 2006 ("Company History - Monnet Ispat", n.d.).

In August 2015, lenders invoked the Strategic Debt Restructuring (SDR) scheme after company defaulted on loan repayments (Sharma, 2018). The account was declared as NPA on June 30, 2015 by SBI. NCLT approved the bankruptcy proceeding initiated by SBI against the company in July, 2017.

Jaypee Infra- Incorporated under the Companies Act on April 5, 2007, Jaypee Infra was a subsidiary of conglomerate Jaypee Group, with registered office at Noida, Uttar Pradesh. Engaged in the real estate development, the Company was famous for Yamuna Expressway Project which was an integrated project. It was developed on build, own, operate and transfer basis and company had rights to develop the land along the route ("Company Profile for Jaypee Infratech Ltd (JYPE.BO)", n.d.).

To reduce its debt, company sold a 300-acre plot along the Yamuna Expressway in May 2013 to the national capital region-based real-estate developer Gaursons India Ltd. On May 28, 2016, company admitted that it had defaulted on interest payments to Indian banks for the first time (Chatterjee, 2016). On August 9, 2017, NCLT (Allahabad Bench) had admitted insolvency petition filed by IDBI bank, but the Supreme Court intervened in the order after home buyers filed petitions against the move. Now, Supreme Court has sent fresh case to NCLT again.

Alok Industries Ltd. - In the list dominated by steelmakers, power and infrastructure companies of twelve large stressed accounts identified by the Reserve Bank of India for insolvency proceedings in June 2017; Alok Industries is the only textile company in it.

Alok Textiles Industries Limited, incorporated on March 12, 1986 as a private limited company, became public in 1993 and changed its name to Alok Textile Private Ltd. Mumbai-based textile manufacturing company was a fully integrated textile company, engaged in manufacturing of textile, including mending and packing activities; leather and other apparel products with a presence in the cotton and polyester segments ("Company History - Alok Industries", n.d.).

On the petition filed by HSBC, the Bombay High Court had put stay on lenders plan to revive the company through a strategic debt restructuring (SDR) scheme in August, 2016 ("With Rs 19,920.6 Cr Debt, Alok Industries Wants Banks to Lend More", 2016). Joint Lenders Forum was formed in April, 2014; and on 31 March 2015, the account was classified as NPA by lead bank (SBI) on account of default in interest payments ("Chapter 6: Non-performing Assets", 2017). The NCLT admitted insolvency proceedings against the company in July, 2017, filed by State Bank of India (lead bank) with other lenders including Punjab National Bank, Bank of Baroda, IDBI Bank etc.

Jyoti Structures Ltd.- Jyoti Structurers Limited was incorporated on May 27, 1974, changed its name to Jyoti Structures Private Limited and became public on October 21, 1974, finally taking the name Jyoti Structures Limited ("Jyoti Structures Limited", 2014). Being an EPC contracting Company, its operational areas included - Transmission Lines; Substation and Distribution. It was engaged in the power transmission and distribution networks having customers all across the globe.

The company's debt was first restructured in September 2014 under CDR by SBI after the default ("Insolvency Professionals Agency- Weekly Bulletin", 2017,) and again under the strategic debt restructuring (SDR) norms in August, 2015 but lenders failed to find any suitable buyer. The insolvency petition against the company was filed by company's lead banker, SBI, which was approved by the NCLT, Mumbai in July, 2017 under IBC. This makes the debt ridden company the first among the 12 companies to face the bankruptcy proceedings (Pandey, 2017).

Amtek Auto Ltd. - Once at the peak of success and profit making, Amtek had defaulted on loan repayments in September, 2015. No one had anticipated this failure, not even credit rating agencies. Amtek was one of the largest integrated component manufacturers in India as well in world along with Motherson Sumi Systems Ltd and Bharat Forge Ltd, with a strong global client base. The Amtek group had expanded its business segments across Forging, Iron and Aluminium Casting, Machining and Sub-Assemblies.

The insolvency petition was filed by Corporation bank along with a consortium of banks against the debt-ridden auto component maker Amtek under section 7 of the Insolvency and bankruptcy Code, 2016 in the National Company Law Tribunal (NCLT), Chandigarh in July, 2017 ("Amtek Auto says insolvency proceedings accepted by NCLT", 2017).

Lanco Infratech Ltd. - Lanco Infratech Limited, headquartered in Gurgaon became public in November 2006 after initially incorporated on March 26, 1993 in Secunderabad, Telengana. With diverse portfolio of business segments including Engineering, Procurement and Construction (EPC), Power, Solar, Property, energy and Infrastructure, it reached new heights of business and listed among the 'fastest growing companies' in the world in 2010. It became famous for setting up India's first independent power project at Kondapalli in Andhra Pradesh (Bhaskar, 2015).

Lanco had been delaying its debt repayments since financial year 2012-13 (Lele, 2017). Lanco's loans were restructured in December 2013 by adopting CDR mechanism. IDBI, the lead bank had filed the insolvency petition against debt-laden construction company's loan defaults which was accepted under the Insolvency and Bankruptcy Code by Hyderabad bench of NCLT in August, 2017 (Worstall, 2017).

Bhushan Steel Ltd. - Incorporated in 1983, Bhushan Steel was among the largest manufacturer of auto-grade steel in India. Company made news for every wrong reason. According to media reports, company bribed the syndicate bank chairman to get loan extension without proper collateral and defaulted on its loan repayments of around Rs.100 crore to Syndicate Bank. On August 1 2014, the Centre Bureau of Investigation (CBI) started inquiry in the case by acting on information received from bank insider. When Bhushan Steel was on the brink of default in March 2014, SBI and a consortium of lenders sanctioned fresh loans but defaults continued into 2017 (Sethi, 2017).

Insolvency proceedings were initiated against the company on 26 July 2017 on application filed by SBI, the leading bank along with consortium of lenders under the IBC, 2016. The company is bought by Tata Steel and now renamed as Tata steel BSL ltd on November 27, 2018 ("Bhushan Steel-Wikipedia Republished", n.d.).

Electrosteel Steels- Incorporated on December 20, 2006 as public limited company, Electrosteel Integrated Ltd changed the name to Electrosteel Steels Ltd in May 2010 for better market reputation ("Electrosteel Steels Company History - Business Standard", n.d.). Being a subsidiary company of Electrosteel Castings Ltd, Kolkata- based Electrosteel Steels was engaged in the manufacturing of Ductile Iron water Pipes (leading manufacturer), wire rods & cast iron products with subsidiaries in 11 countries.

After the failed corporate debt restructuring which was adopted by company in December 2013, lenders invoked the strategic debt restructuring (SDR) mechanism in company in 2015. It defaulted on interest payments in August, 2015 (Dasgupta, 2017). Consortium leader State Bank of India had initiated the corporate insolvency resolution process in NCLT, Kolkata, in June, 2017 under the Insolvency and Bankruptcy Code (IBC), 2016 ("Rs 10,000-cr bad debt: SBI moves NCLT against Electrosteel", 2017).

<u>Era Infra Engg. Ltd</u>**.** **-** Delhi-based infrastructure firm, Era Infra became public within 2 years in 1992 after incorporation in 1990. The business segments included construction of Residential Buildings, industrial Complexes, and Development of Projects etc. ("Era Infra Engineering", n.d.).

A consortium of 20 lenders had provided Corporate Debt Resolution (CDR) mechanism to revive ailing company in January, 2014 (Saha and Lele, 2014). On failure of CDR and inability of firm to repay debt, on June 22, 2015, Union Bank classified its account as non-performing asset (NPA) and other lenders followed the suit. In June, 2017, Union Bank, a leading bank filed an insolvency petition along with 21 other lenders against the debt-ridden infrastructure company under Section 7 of the Insolvency and Bankruptcy Code (IBC) in the NCLT ("NCLT reserves order in Union Bank's insolvency plea against Era Infra", 2018).

Table 1.2: Table showing date of implementation of Corporate Debt Restructuring (CDR) and Strategic Debt Restructuring (SDR) in NPA companies-

Company	CDR Implementation	SDR Implementation
Bhushan Steel	-	-
Alok Industries	-	-
Amtek Auto	-	-
Lanco Infratech Ltd	December, 2013	-
Monnet Ispat & Energy Ltd	-	August, 2015
Electrosteel Steels	December 2013	2015
Era Infra Engineering	January, 2014	-
Jaypee Infratech	-	-
ABG Shipyard	August, 2013	December, 2015
Jyoti Structures	September, 2014	August, 2015

Many researchers have looked into the issue of NPA from the perspective of banks. This paper is an attempt to look into the matter from the 10 companies' point of view- Why they failed, what factors were responsible for their bankruptcy and the how their financial performance deteriorated during the years. This paper also tries to identify the

red flags that indicated their default by calculating the probabilities of default and compare its transition with the revision in credit ratings given to companies' loans by Credit rating agencies (CRAs).

1.2 Objectives-

1. To analyze the financials of company and identify factors behind their failure.
2. To calculate the Probabilities of default of companies using Altman Z score and Merton model
3. To examine the role of rating agencies in 10 NPAs
4. To compare the time of default predicted by Merton model and Altman Z score model with the actual default of companies

2. LITERATURE REVIEW

Many researchers have done an extensive study on the credit risk and the problem of rising non- performing assets (NPAs) in Indian banking system. A brief summary of the available literature is given below.

Kumar et al. (2018), stated that three major reasons behind increasing menace of NPA's in India are ineffective recovery system, ineffective management and poor strategy of companies (industrial sickness) and change in government policies. Singh (2013), described the ill-effects of NPAs on banks which include lower profitability, blocking of money (low liquidity), wastage of time of bank management and loss of brand and market value (credit loss) of banks.

The cases of default are observed to be higher after 2012. This fact is proved in many studies. Kumar (2018), stated that NPAs have increased after 2005 which is due to an increase in interest cost which might have resulted in reduction in repaying capacity of borrowers and providing loans by banks on low asset quality during 2009 to 2012, known as "period of high credit growth", which became non- performing loans in later year. Pandey and Patnaik (2016), showed that Indian economy expanded during the period of 2009 (Q3) - 2011 (Q2), followed by a period of recession from 2011 (Q2) to 2012 (Q4.) to revive the economy, expansion phase was accompanied by lending more and more by banks to companies.

Sengupta and Vardhan (2017), described that after the global financial crisis of 2008, Indian government encouraged banks to lend more to companies, especially to infrastructure sector to revive economy, increasing the financial leverage of companies between 2010 and 2012. The problem worsened when recession started in Indian economy by 2011 due to global slowdown and lower demand of Indian products in global markets. The GDP growth rate slowed down to 6% .The problem exaggerated when the corruption scandals in coal and telecommunication sector became public. Shortage of funds, delays in project approvals and clearances and high interest expenses, affected every sector. But the worst hits were steel, power, textiles, infrastructure and metals sector. This pushed many companies towards bankruptcy, giving rise to the wave of NPAs that had shaken the entire Indian economy.

It is a common belief that banks lose more in priority sector rather than non- priority sector but Banerjee and Mitra (2018), showed that while both sectors are responsible for rising NPAs in India, the bigger contributor is non- priority (corporate) sector during 2013-2016. Dubey and Binilkumar (2016), showed that the cases of Willful Defaulters (WD) have increased for all banks in recent years which could be due to the strengthening of legal system and availability of better options for creditors, or the rising awareness among banks about the problem.

Geetha and Jayashree (2016), compared the recovery rates of NPAs by different methods adopted by banks including 'Asset Reconstruction Company' (ARC), 'SARFAESI Act', 'Corporate Debt Restructuring' (CDR), 'Debt Recovery Tribunals' (Lok Adalat), 'Strategic Debt Restructuring' (SDR) and 'Credit Information Bureau of India Limited' (CIBIL). They also showed that NPA menace has affected both public and private sector banks, but worst hit are the public sector banks.

Manjule (2013), suggested preventive measures to combat the issue of NPAs in banks viz. proper evaluation of credit worthiness of borrower, timely follow-up, review and audit of the company before and after giving loans and financing viable projects etc. Singh (2017), advised for setting up an independent audit committee under Start up India initiative which will keep a check at application stage and disbursement stage on companies and banks that all requirements are fulfilled or not before giving loans.

Various factors affect the profitability of companies, which in turn affect the probability of default of the companies. According to Oubdi and Touimer (2017), the companies with a high market value (high market capitalization) have a low default risk. The market value of firms is negatively correlated with the PD (probability of default). As the business sector to which a firm belongs also determines the risk of company, it is better to categorize all the firms according to industry and then decide the credit worthiness. Psillaki et al. (2010), suggested that the information about firm's performance can be used to evaluate the credit risk and predict the business success in long run; where firm size, capital turnover ratio, profitability and liquid assets (high working capital to asset ratio) have a direct relation with the chances of business failure along with non-financial indicator like managerial effectiveness.

There are various internal factors in a bank that can affect its profitability and the problem of NPAs. Spuchľáková et al. (2015), suggested that both external and internal factors affects credit risk of banks; where external factors include the economic conditions, inflation, currency movements and interest rates, trade barriers and Government policies of a country and internal factors include loopholes in bank policies, poor administration and evaluation of companies' financial position, lack of loan review systems and post loan sanction surveillance, etc. Bawa et al. (2019), suggested that diversification by banks i.e. focusing more on different banking services, low business per employee, higher increase in total assets and return on assets increase the occurrence of NPAs in banks

Market regulators are implementing various reforms in the market to make it more transparent. Whenever credit rating agencies failed in predicting the default of companies, the need of reforms for credit rating agencies arises. Many researchers have tried to devise the best model for credit rating agencies. Boylan (2012), suggested that unconscious biases in giving credit ratings to companies cannot be eliminated completely due to presence of structural elements that can affect credit ratings, for e.g. agencies need to work closely with issuers that can affect credit ratings and subjectivity bias that will always arises while rating financial instruments, but the reforms like replacing the issuer-pay model with user- pay model, changing rating agencies' organizational structure, putting restrictions on the hiring of credit rating agencies' workers by issuers, internal risk management etc. can help in reducing such biases.

Sangiorgi and Spatt (2017), pointed out that credit rating agencies (CRA) share a similarity with auditors of a company in terms of industrial organization as only few big players dominate the market. But the contrast lies in the assessment of different objects, where CRA evaluates the potential risks to profitability of company which can affect its ability to fulfill obligation, auditor on the other hand, evaluates current performance of the firm. Auditors confirm that the given financial information is correct and according to accounting standards whereas investors build opinions based on the ratings given by CRAs, hence CRAs act as opinion makers. The study also pointed out the problems in issuer paying model as well as investor paying model and suggested an alternative model.

Credit risk assessment is the most studied field in banking industry as researchers are trying to develop a model that can predict bankruptcy of companies accurately and timely. A variety of statistical models and analytical techniques have been developed for risk evaluation till now. Prasad (2018), suggested that the probability of financial distress (distance to default) of firms, estimated using Merton's default model is significantly positively related to exchange rate movements. According to Mishra (2008), Merton's default model can be used to predict default for Indian firms but it becomes severely unpredictable or gives inaccurate results for low volatility and low leverage firms. Li (2016), stated that the chances of default by a firm is not independent of other companies' default and then developed a structural model by identifying correlations between default events and gave explicit formulas to find the probability of multiple defaults and default correlations.

Castagnolo and Ferro (2014), compared 4 models of credit risk: 'Ohlson's O-score', 'Altman Z-score', 'Campbell', and 'Merton distance to default model' (MDDM), and found out that Ohlson's O-score's is a better model to predict default as compared to other three and use of only MDDM do not give correct results, whereas prediction can be enhanced by combining both models. Singh (2018), developed a model to predict if a firm is heading towards bankruptcy or not using five financial ratios- 'Current Ratio', 'Return on capital Employed' (ROCE), 'Operating Cash Flow to Sales', 'Debt/Equity Ratio' and 'Interest Coverage Ratio' as predictor variables arranged in descending order of their influence on bankruptcy. Bandyopadhyay (2006), developed a modified Z score model and applied on Indian firms with 90% accuracy rate. After using the logistic approach analysis, he found out that PD (Probability of default) is a decreasing function of total sales relative to total assets, working capital to assets, cash profit over total assets, solidity, firm age solvency ratio and ISO certification. He also proved the importance of using both financial and non-financial factors in the accurate prediction of PD instead of using only accounting ratios.

3. RESEARCH METHODOLOGY

3.1 Collection of data-

Ten companies were selected from the list of top twelve companies which were identified by Reserve bank of India in June, 2017 for bankruptcy proceedings. The names of ten companies which were examined in detail were Bhushan Steel, Alok Industries, Amtek Auto, Lanco Infratech Ltd, Monnet Ispat And Energy Ltd, Electrosteel Steels, Era Infra Engineering, Jaypee Infratech, ABG Shipyard and Jyoti Structures. Two companies- Essar Steel and Bhushan Steel and Power were not selected for research as the share prices of both firms were not available.

Financial data (Balance sheet, Income statement and cash flow) and credit ratings of these companies were collected from the financial database Prowess. Share prices are sourced from the website Moneycontrol. All the collected data was for the period from duration of March, 2011- March, 2016.

3.2 Calculation of financial ratios-

4 ratios are calculated viz. Debt-equity ratio, Interest coverage ratio, Total income to total assets and Total outside liabilities to tangible net worth to determine the solvency and liquidity condition of firms. To determine the obligations of companies, total outside liabilities is calculated. Net working capital is calculated to determine the liquidity of firm.

The calculations are done using following formulae-

- **Debt to equity ratio** = Total liabilities (value of debt)/ total shareholders' fund
  It is used as a measure of leverage, that how much of company's operation is debt funded relative to equity. It is an important ratio in credit risk evaluation. High value shows that company's growth is highly debt funded which increases the risk of default.

- **Interest coverage ratio**= Profit before interest and tax (EBIT or PBIT) / interest payments(expenses) to be made in a year

  This ratio shows the ease with which company can pay off its obligations-interest expenses accrued in a year. The lower value of ratio shows that company's interest expenses are high and it is debt-ridden.

- **Total income to total assets**= Earnings before interest and tax/total assets

  This is a profitability ratio that shows the efficiency with which management of a company can utilize its investments in assets and convert it into profits.

- **Total outside liabilities to tangible net worth**= total liabilities of the company/ total net worth of the business

  This ratio gives an accurate percentage by which a company is financing its operations by debt.

- **Net working capital** = Total CA (current assets) - total CL (current liabilities)

  This is an indicator that company has enough liquidity to fulfill its short term obligations and operational expenses.

3.3 Calculation of Probability of default (PD) -

Probability of Default is calculated using 2 famous models of credit risk- Merton model and Altman Z score model.

3.3.1 Altman Z score Model-

Altman (1968), devised a multivariate discriminant model by including five accounting ratios- Working capital/total assets, EBIT/ total assets, Market value of equity/total debt, Retained earnings/ total assets and Sales/Total assets, as proxies of liquidity, leverage, solvency, profitability and the level of activity to predict a firm's probable bankruptcy within two years.

- **Z score = 0.12 * (Working capital/total assets) + 0.14 * (Retained earnings/ total assets) + 0.33 * (EBIT/ total assets)+ 0.006 * (Market value of equity/total debt) + 0.999 * (Sales/Total assets)**

Where:

Market value of equity = Number of outstanding shares (both preference and common) * share price

EBIT= earnings before Interest and tax

Working capital= Current assets- Current liabilities

Sales= Net sales after excise duty is paid

Total debt= short term borrowings + long term borrowings = book value of debt

Ratio of 'working capital to total assets' is a liquidity ratio. The ratio will decrease with decrease in operating profits of a firm due to shrinking of current assets with respect to total assets. 'Retained earnings to total assets' ratio is an indicator of leverage that shows how much of firms' assets are made using borrowed money i.e. debt funded. Probability of bankruptcy will increase with decrease in the ratio. As firm becomes older, cumulative profits (retained earnings) will increase leading to lower chances of bankruptcy. 'Earnings before Interest and tax to total assets' ratio is an indicator of true productivity or profitability of a firm. 'Market value of equity (market capitalization) to total debt (book value of debt) ratio is a measure of solvency of a firm. 'Sales to total assets' is an activity ratio that shows the managerial ability in the competitive market that how much assets are being utilized to generate sales (Altman, 1968).

Results of the Z score can be interpreted as-

Z score below 1.8 = company is heading or going towards bankruptcy; very high risk of default within 2 years

Z score above 3 = company is not heading towards bankruptcy or there is very low risk of default

Z score between 1.8 and 3 = Gray area, company is in trouble / Red flag

3.3.2   Merton Structural Model-

Merton (1974), devised a model for predicting the probability of a default by using three variables – value of equity, value of debt (liability) and volatility of equity prices (s_A). At maturity (time t), if the asset value is greater than liabilities' value, company can make full repayment of principal to creditors. But, if debt value is greater than asset value at time t, default will occur.

Assumptions made by model-

- Company is not paying out dividend
- Options are European in nature as they can be exercised only at maturity
- Market is efficient
- Volatility of stock is constant
- Risk free rate is constant

The equation of Merton Model is

$$E = V_{A,t}\, N(d_1) - X_t e^{-rt} N(d_2)$$

Where,

$d_1 = [\ \ln (V_{A,t}/ X_t) + (r + 0.5\, s^2_A)\ T\ ]/ (s_A *t^{0.5})$

$d_2 = d_1 - (s_A *t^{0.5})$

E = theoretical value of company's stock (equity)

$V_{A,t}$ = firm's assets value at time t

X_t = book value of debt

r = risk- free interest rate

s_A =volatility (standard deviation) in stock prices

t = maturity time

N = Standard normal distribution

e = exponential term

The probability of bankruptcy can be calculated as-

$$DD = [\log V_{A,t} + (\mu_A - 0.5\, s^2_A)\, T - \log(X_t)] / (s_A *t^{0.5})$$

Where,

DD = distance to default

μ_A = expected return on assets (drift parameter)

$$PD = 1 - N\ (DD)$$

PD = Probability of Default (bankruptcy) = risk associated with the value of asset falling below the value of debt (liability) threshold at the maturity or time of expiration.

Interpretation of result obtained by Merton Model-

If the Probability of default (PD) is greater than 2%, there are high chances of firm's bankruptcy

3.4 <u>Analysis of Credit ratings given by credit rating agencies</u>

Credit ratings given by credit rating agencies like CARE, BRICKWORK and CRISIL on long term loans and debentures issued by companies were noted from the financial database Prowess for the period of 2011-2016.

4. RESULT AND DISCUSSION

4.1 To analyze the financials of company and identify factors behind their failure

The financial statements of all 10 companies- Bhushan Steel, Alok Industries, Amtek Auto, Lanco Infratech Ltd, Monnet Ispat And Energy Ltd, Electrosteel Steels, Era Infra Engineering, Jaypee Infratech, ABG Shipyard and Jyoti Structures for the period 2011-2016 were analyzed and net working capital and total outside liabilities were noted in the tables. Ratios like Interest coverage ratio, Debt to equity ratio, Total income to total assets and Total outside liabilities to tangible net worth were calculated and noted in the tables for 6 years. The reasons behind companies' failures were also studied

4.1.1   Bhushan Steel Ltd-

Adverse external factors were the main culprit behind failure of Bhushan steel, once the biggest manufacturer of auto-grade steel in India. Steel prices fell globally after 2011due to availability of low priced steel from China, Russia and Japan etc. ("ECB Economic Bulletin", 2017). Sales in both India and abroad was reduced due to import of low priced steel in large quantities in India and subdued demand in global market.

Debt financed expansion worsened the situation by increasing the burden of interest expenses. To add production capacity, steelmaker had taken huge debt for all the 3 phases of Odisha plant's expansion programme without repaying the previous ones. Real problems started appearing during 2010-11, when its debt repayment obligation started exceeding the operating cash flows. With more loans became due, situation worsened in 2013-14. From table 4.1, it can be observed that debt-equity ratio and total outside liabilities-tangible net worth ratio doubled in a year, in 2016 compared to 2015.

Table 4.1: Table showing financial ratios and working capital of Bhushan Steel Ltd.

	2011	2012	2013	2014	2015	2016
Interest coverage ratio	4.08	2.16	1.94	1.06	0.50	0.23
Debt to equity ratio	2.65	2.71	2.97	3.48	4.89	8.96
Total outside liabilities / tangible net worth	4.06	3.31	3.62	4.42	5.54	10.32
Total outside liabilities (mn)	236,560.3	295,873.8	375,760.4	480,897.8	517,203.2	687,045.3
Net working capital (mn)	-268.8	-209.98	-385.4	-514.2	-472.5	-536.4
Total income / total assets	0.08	0.09	0.07	0.04	0.02	0.01

4.1.2   <u>Alok Industries Ltd.</u>

Debt fuelled expansion leading to over- production in anticipation of global demand was the key reason behind company's failure. Company used borrowed money to expand spinning, weaving, processing & garmenting units. Excess capacity due to large capex led to over production and high inventory resulted in lower utilization of assets and declining asset turnover ratio. This failed to generate commensurate revenues for the company. Interest costs due to large accumulation of debt became a huge burden and the second largest expense for Alok Industries after raw materials (Sarkar, 2018). This is evident from the table 4.2; total income -total assets ratio is observed to be declining after 2013, debt-equity ratio tripled in a year, in 2016, compared with 2015.

Diversification into unrelated areas like real estate further deteriorated the financial performance. Slowdown in international textile markets, lower global demand, high competition and fluctuations in foreign exchange eventually pushed the company into bankruptcy (Lele, 2017).

Table 4.2: Table showing financial ratios and working capital of Alok Industries Ltd

	2011	2012	2013	2014	2015	2016
Interest coverage ratio	1.562	1.401	1.499	1.163	-	-
Debt to equity ratio	3.180	3.499	3.151	2.869	3.256	9.246
Total outside liabilities / tangible net worth	4.684	5.385	5.181	5.251	5.537	16.037
Total outside liabilities (mn)	143,089.4	194,775.4	262,233.4	283,661.2	355,520.8	479,859.9
Net working capital (mn)	-2,081.7	6,645.6	31,674.9	52,946.1	9,500.3	-69,387.4
Total income / total assets	0.510	0.581	0.812	0.772	0.370	0.231

4.1.3 Amtek Auto

Amtek auto was a big name in auto components' manufacturers in India. Its unexpected default on loan repayments in 2015 had shaken the banks which were already in poor condition. But, by careful observation of financials of company, it can be noted that the company was in trouble since 2012 in terms of liabilities. Revenue was increasing till 2014 but higher debt and interest expenses offset this increase. The real problem began after 2014 when

revenue decreased due to slowdown in demand of auto components globally and company reported losses. Interest coverage ratio reduced to 0.548 in a year, in 2015, compared to 2.088 in 2014, as observed from the table 4.3.

In a race to become the largest company in terms of operations and improve operational margins, Amtek adopted inorganic growth strategy and acquired different firms globally. 22 acquisitions were made by Amtek Group between 2005 and 2014 and three acquisitions by company itself in 2015 resulted in increase in overall debt in the same duration. Balance sheet became highly leveraged and increase in interest expenses was more than 100% (Thukral et al, 2017).

Table 4.3: Table showing financial ratios and working capital of Amtek Auto

	2011	2012	2013	2014	2015	2016
Interest coverage ratio	3.221	3.213	2.369	2.088	0.548	-
Debt to equity	0.766	0.914	1.408	1.515	1.833	2.157
Total outside liabilities / tangible net worth	0.885	1.407	1.752	2.089	2.708	3.326
Total outside liabilities (mn)	37,748.9	61,662	84,068.1	107,252.4	137,799.2	148,123.9
Net working capital (mn)	18,809.5	1,165.2	5,205.6	-6,546.3	-15,341.4	-24,484.2
Total income / total assets	0.262	0.279	0.304	0.307	0.259	0.092

4.1.4 Lanco Infratech Ltd

Lanco is the textbook example to show how changes in government regulations can affect companies badly if the company's major revenue sector is affected by those changes. Change in merchant power policy in 2011 hit company's revenue badly. Average merchant power tariffs were reduced by ₹ 7.78 per unit in only 3 years. Once as high as ₹ 10.78 per unit in April 2009, rates were cut down to ₹ 3 per unit in January 2012 due to government rules. No diversification in product category made this change worse for Lanco as close to 95% of its revenues were coming from its energy linked (gas- and coal-based power) projects and the engineering, procurement, and construction (EPC) segment. Due to poor condition of State electricity boards (SEBs), they did not paid dues, leading to increased trade receivables and shortage of liquidity in company.

Slowing economic growth in 2011, infrastructure problems such as unavailability of roads and ports, high borrowing costs, delays in securing environmental clearances & completing land acquisition (Govt. regulations) further exaggerated the company's problems. Fuel (coal and gas) shortages in India forced Power generation companies to import raw materials as Coal India was not able to meet the demand giving rise to high input costs. Unable to pass this cost to consumers, Lanco started making losses.

Internal factors were also responsible for company's failure. Due to poor due diligence before acquisition, Lanco acquired Griffin Coal which was already bankrupt. To acquire projects, it went for aggressive bidding by offering power at very low rates. Investing in overseas mines also proved to be a bad idea (Bhaskar, 2015).

Table 4.4: Table showing financial ratios and working capital of Lanco Infratech

	2011	2012	2013	2014	2015	2016
Interest coverage ratio	2.256	1.218	1.034	-	0.065	0.413
Debt to equity	1.104	1.174	1.331	2.158	3.381	5.312
Total outside liabilities / tangible net worth	2.797	3.690	3.848	5.025	7.797	10.570
Total outside liabilities (mn)	95,842.8	132,311.9	139,490.5	134,099.9	158,065.9	162,217.7
Net working capital (mn)	-11,041.6	-13,546.4	-10,638.3	-7,217.7	-19,130.5	-22,772
Total income / total assets	0.488	0.502	0.244	0.120	0.085	0.149

4.1.5   Monnet Ispat and Energy

Monnet shows how debt funded expansion can lead to failure of firm in long term if firm has no proper strategy of loan repayment. When the loans were cheap, company took the help of borrowed money and expanded aggressively. The problem surfaced when steel sector went into depression leading to fall in steel prices and lower earnings. Huge imports from china reduced the sales further. Due to high debt, the firm faced huge burden of interest cost. The default was made sure by Supreme Court ruling in 2014 that de-allocated coal mine licenses of Monnet as court removed all mine allocations since 1993. Due to this, firm couldn't earn enough to pay the interest. (Nambiar & Ali, 2015).

Power project in Angul, Odisha got delayed and cost over-run of the project due to bureaucratic challenges like late approvals and delayed land acquisition. Ramping up plant capacity became costly and high depreciation costs pushed company towards making losses.

Table 4.5: Table showing financial ratios and working capital of Monnet Ispat & Energy Ltd

	2011	2012	2013	2014	2015	2016
Interest coverage ratio	12.801	5.320	3.833	1.406	-	-
Debt to equity ratio	1.278	1.736	2.339	2.636	4.428	13.321
Total outside liabilities / tangible net worth	1.871	2.359	3.253	3.412	6.531	19.072
Total outside liabilities (mn)	39,114.1	55,687.0	83,912.1	90,921.3	120,348.7	112,915.4
Net working capital (mn)	3,532.6	4,871.9	-5,612.0	-4,920.4	-20,631.5	-20,586.6
Total income / total assets	0.395	0.351	0.275	0.259	0.315	0.188

4.1.6 A B G Shipyard Ltd.

The failure of ABG Shipyard could be completely attributed to global slowdown in shipping industry. Global shipping industry is cyclical in nature. Shipping firms had been struggling globally to save their revenues as downturn in global trade adversely impacted the profitability of shipbuilding companies after 2011.

Many other shipyards in the world were going through same fate as ABG shipyard at that time. The largest shipyards of South Korea, known as 'Big Three' – "Hyundai Heavy Industries", "Daewoo Shipbuilding & Marine Engineering" and "Samsung Heavy Industries", all were making losses and seeking for their government aid. (Asthana, 2016)

Moreover, the delays in receiving payments (rising trade receivables) from clients led to tight liquidity issue in the firm. ("Ind-Ra Downgrades ABG Shipyard`s NCD Programme to `IND D`", 2013). Because of liquidity issues, firm was not able to complete its orders and defaulted on loans.

Table 4.6: Table showing financial ratios and working capital of ABG Shipyard

	2011	2012	2013	2014	2015	2016
Interest coverage ratio	1.829	1.635	1.275	0.889	-	-
Debt to equity ratio	1.927	2.447	2.606	4.052	14.422	-
Total outside liabilities / tangible net worth	6.008	6.439	7.660	9.644	28.505	-
Total outside liabilities (mn)	74,344.7	91,330	116,924.9	128,019.2	144,244.8	189,932.4
Net working capital (mn)	-6,272.6	-5,408.6	-13,123.7	4,118.8	5,773.8	-23,296.4
Total income / total assets	0.340	0.296	0.220	0.145	0.032	0.003

4.1.7 Jaypee Infra

Too much leveraging on assets and too much investment in different projects led to failure of Jaypee infra and Jaypee group as whole. This case also proves that projects which look profitable at one time can turn into bad ones in long run. Jaypee group got the rights of Formula One for 5 years as Circuit

owners in 2011. The source of revenue was tickets. But in India, there were not many people who wanted to buy such costly tickets. As a result, operating cost was much more than the revenue earned by selling tickets leading to losses (Raj, 2015). But the major project that led to breakdown of firm was failed Yamuna Expressway project. Firm could not achieve what it had expected from this project. Due to piling losses from such projects, company could not complete the construction of apartments, affecting around 32,000 homebuyers.

Other reasons could be attributed to delays in environmental clearances and project approvals, lower GDP and slowdown in infrastructure sector in 2012-13, fund shortage, high interest costs and ban on use of ground water for construction activities by NGT (National Green Tribunal).

Table 4.7: Table showing financial ratios and working capital of Jaypee Infra

	2011	2012	2013	2014	2015	2016
Interest coverage ratio	236.973	48.093	2.523	1.474	1.394	0.767
Debt to equity ratio	1.329	1.231	1.311	1.393	1.403	1.559
Total outside liabilities / tangible net worth	1.869	1.809	-	-	-	-
Total outside liabilities (mn)	89,020.7	104,489.4	126,547.5	134,545.2	151,350.8	131,530.4
Net working capital (mn)	31,099.9	20,272.9	25,280.3	34,204.0	25,096.0	37701.8
Total income / total assets	0.234	0.205	0.182	0.168	0.163	0.148

4.1.8 Electrosteel Steels

Adverse external factors had taken their toll on successful Electrosteel steels ltd. Company used Chinese technology for its ambitious Bokaro project in

Jharkhand, which was unique in its own style as Indian firms were dependent on Russian and German technology till that time. What was going to be its unique selling proposition of the project became the reason for its failure. Chinese visa policy changed in 2009. Adding to this, there were conflicts between local villagers and Chinese people due to cultural differences, leading to protests from local villagers that delayed the project, leading to cost overruns. Approval for funds from banks also got delayed which led to fund shortage resulting in halt of expansion, which further increased interest and overhead costs (Mishra & Dutt, 2013).

Cancellation of coal block allocations of Electrosteel Castings by Supreme Court in 2014 led to shortage of raw material for running steel plant of Electrosteel Steels (Dutt, 2015). Crash in steel prices due to import of cheap steel from china had made the condition worse for company to revive.

Table 4.8: Table showing financial ratios and working capital of Electrosteel Steel

	2011	2012	2013	2014	2015	2016
Interest coverage ratio	0.860	-	-	-	0.374	0.663
Debt to equity ratio	1.990	3.205	4.078	5.600	9.492	12.62
Total outside liabilities / tangible net worth	2.586	4.006	5.412	6.670	12.609	17.540
Total outside liabilities (mn)	53,417.5	76,645.4	96,559.8	99,675.6	136,574.3	156,630.8
Net working capital (mn)	-10,576.4	-11,815.2	-20,118.5	-8,774.4	-17,237.3	-31,899.1
Total income / total assets	0.002	0.009	0.019	0.054	0.166	0.238

4.1.9   Era Infra Engg. Ltd.

Era Infrastructure failed mainly due to non -realization of trade receivables that led to fund shortages for other projects and interest payments. National Highways Authority of India had not provided funds for the work completed. Delays in build operate transfer (BOT) road projects approvals and clearances from NGT led to cost overruns. The infrastructure sector also faced downturn due to slower economic growth. The roads built saw less traffic than expected, hence were unable to realize profits.

It was also found out in Special Investigative Audit (SIA) report of Union Bank of India that Delhi-based infrastructure firm defied almost every borrowing norm— from fudging financial numbers, using a wrong accounting method to false billing (Rai, 2018).

Table 4.9: Table showing financial ratios and working capital of Era Infra Engg. Ltd.

	2011	2012	2013	2014	2015	2016
Interest coverage ratio	2.262	1.686	1.458	0.019	-	-
Debt to equity ratio	1.714	2.068	2.362	4.278	7.987	-
Total outside liabilities / tangible net worth	3.155	3.635	4.135	6.570	12.10	-
Total outside liabilities (mn)	54821.6	65136.3	80719.3	95690.8	102539	124491.6
Net working capital (mn)	7,409.3	8,340.2	11,129.2	25,219.9	27,075.8	13,192.4
Total income / total assets	0.743	0.719	0.662	0.310	0.188	0.135

4.1.10 Jyoti Structures Ltd.

Jyoti structures failure could be attributed to external factors. Unavailability of raw material required for manufacturing power transmission lines and towers was the biggest factor behind firm's failure. Company faced high difficulty while procuring raw material. This resulted in lower capacity utilization of plants and late delivery (Jog, 2016).

In addition to lack of raw material, delayed approvals and environmental clearances increased company's liquidity problems and led to stalled projects.

Table 4.10: Table showing financial ratios and working capital of Jyoti Structures Ltd.

	2011	2012	2013	2014	2015	2016
Interest coverage ratio	2.644	1.929	1.582	1.244	0.269	0.093
Debt to equity	0.793	1.178	1.389	1.672	4.437	50.460
Total outside liabilities / tangible net worth	2.184	3.313	3.845	5.861	9.578	112.099
Total outside liabilities (mn)	13037.5	21883.1	27243.4	43383.4	56414.5	98994.5
Net working capital (mn)	5173.5	4465.9	3702.5	3369.4	9826.9	-3070.2
Total income / total assets	1.481	1.246	1.081	0.975	0.615	0.465

4.2 Probabilities of default (PD) of companies using Altman Z score and Merton model

The default probabilities of 10 companies identified by RBI for insolvency proceedings in July, 2017 were calculated using Merton model and Altman Z score model. Default probability above 2% is considered very risky and there are high chances that the firm is about to default on its obligations in a year or two. Altman Z score above 3 is considered safe and below 1.8, it is assumed that company is heading towards bankruptcy. Between 1.8 and 3, it is a trouble zone. If external environment remains same, firm could default in 2 years or if it becomes adverse, company will default in a year.

From table 4.11, it can be observed that Z score of all the companies except Jyoti Structures is below 3. It means every firm was struggling to remain in business during 2011. In 2012, the Z score of 8 companies is below 1.8, only Jyoti Structures and Era Infra have scores above 2. This shows that all the 8 companies were heading towards bankruptcy since 2012.

Probability of default is also calculated using Merton model to find out if a firm is going to default in a year or not. Merton model has given higher probability of default to only 4 companies -Lanco, Jaypee, Electrosteel and ABG shipyards in 2012 in comparison to Altman Z score which showed high PD values of 8 companies.

Merton model has correctly estimated the time of default for Bhushan steel. The default probability has increased continuously for 3 years and became 100% in 2013 and Bhushan steel was actually on the verge of default in March, 2014 when SBI put funds into it to save it from bankruptcy and restructured funds. This resulted in reduction in default probability calculated using Merton model as the total debt of firm has been changed. Z score of firm is deteriorated continuously for the firm as the firm was not able to revive even after infusion of funds and made losses leading to default in 2014.

Both models showed high chances of bankruptcy of Alok industries in 2012-2013 i.e. 11-13%. But it improved in next 2 years due to company's efforts to revive itself. But the firm defaulted in 2015. This shows that the default can be predicted using Altman Z score model. On the contrary, Merton model does not give correct results and has given very low probability of default preceding the default even before a year.

Table 4.11: Table showing calculated values of Probability of Default (PD) of companies using Altman Z score and Merton model

Company/Year	Model	2011	2012	2013	2014	2015
Bhushan Steel	Z Score	0.75	0.86	0.81	0.57	0.53
	PD (Z)	22.61%	19.42%	20.97%	28.34%	29.68%
	MERTON	40.34%	20.83%	100%	0.15%	0.25%
Alok Industries	Z Score	1.19	1.26	1.80	1.76	0.33
	PD (Z)	11.70%	10.32%	3.57%	3.96%	37.2%
	MERTON	13.34%	0.72%	0.02%	0.79%	0.28%
Amtek Auto	Z Score	2.10	1.67	1.29	1.38	1.01
	PD (Z)	1.78%	4.78%	9.79%	8.42%	15.61%
	MERTON	0.22%	0.20%	0.38%	8.08%	1.68%
Lanco Infratech Ltd	Z Score	2.37	1.63	0.99	0.45	0.28
	PD (Z)	0.89%	5.11%	16.07%	32.72%	39.06%
	MERTON	0%	8.13%	2.40%	2.13%	4.82%
Monnet Ispat And Energy Ltd	Z SCORE	2.08	1.62	0.93	0.75	0.32
	PD (Z)	1.89%	5.31%	17.73%	22.74%	37.34%
	MERTON	0%	0.05%	0.01%	5.39%	7.37%
Electrosteel Steels	Z Score	0.15	-0.02	-0.17	-0.06	-0.07
	PD (Z)	44.22%	50.96%	56.87%	52.56%	52.95%
	MERTON	0%	8.12%	3.22%	5.73%	2.47%
Era Infra Engineering	Z Score	2.41	2.05	1.80	0.81	0.65
	PD (Z)	0.81	2.00	3.60	20.81	25.74
	MERTON	27.21%	0%	1.96%	10.77%	21.72%
Jaypee Infratech	Z Score	1.99	1.66	1.36	1.06	1.15
	PD (Z)	2.35%	4.85%	8.64%	14.39%	12.54%
	MERTON	0.06%	2.50%	0.57%	2.70%	2.41%
ABG Shipyard	Z Score	1.25	1.07	0.85	0.81	0.31
	PD (Z)	10.63%	14.17%	19.90%	20.9%	38.00%
	MERTON	10.70%	5.27%	0.01%	0.14%	0.18%
Jyoti Structures	Z Score	3.61	2.39	2.12	1.61	1.20
	PD (Z)	0.02%	0.83%	1.70%	5.33%	11.44%
	MERTON	44.1%	25.59%	9.88%	17.01%	17.91%

Default years of Lanco, Monnet and Electrosteel confirmed the results (PD) shown by both models. For all the three companies, PD is higher than 2% and has increased continuously till the time of default. ABG shipyard restructured its debt using CDR mechanism in 2013 leading to low probability of default given by Merton model in 2013 but this has no effect on Altman Z score which gave high probability of default. This shows that any change in debt on balance sheet can increase/decrease default probability to a higher extent in Merton model as compared to Altman Z score model.

The probability of default using Merton model has decreased for Jaypee in 2013. This could be due to the fact that it had sold some part of Yamuna expressway to clear some debt. But Altman Z score did not decrease much because selling expressway had reduced total assets also, a factor that is taken into account by Altman Z score but not by Merton model.

Amtek auto had defaulted in September, 2015. Both models confirm the result by giving PD of 8% in 2014. Jyoti structures had defaulted in September, 2014 but PD using Merton model was high since 2011 whereas it became high in March, 2014 in Altman Z score model. Hence, for this company, Altman gave better results compared to Merton model.

It is also observed that default probability of Era Infra using both models is around 2-3% till 2013 and the firm defaulted in October, 2013. But the PD has shoot up in 2014 as compared to 2013, from 1.96% to 10% (Merton model) and 3.6% to 20% (Altman Z score model) respectively. This could be due to the reason that deliberate changes while reporting financial statements was done till 2013 to hide poor financial conditions of firm. This fact was also proved in the report by Union Bank that showed company had fudged some financial numbers and overstated bills.

It can also be observed that default probabilities calculated using Merton model do not increase consistently for all the companies. This might be due to the fact that most of the companies restructured their debt into equity during 2013-2014 which changed value of total debt on their balance sheets leading to lower probability of default according to Merton model. Also, Merton model assumes market is efficient and change in asset value can be seen in the share prices. But that is not true for any market. Moreover it considers deviation in the share prices of company and market capitalization in addition to total

debt of the company. Fluctuations in share prices could also be affected by other market forces apart from company's financial performance. It is observed that Merton model either overstates or understates the default probability in extreme cases, for e.g. 100% and 0% even when Altman Z score was showing 20.97% and 1.89% respectively. Due to these reasons, it can be inferred that Merton model need to be modified before being applied to calculate default probabilities of Indian companies.

After analyzing the data of 10 companies and comparing the default probabilities given by both models, Merton model and Altman Z score model, it can be inferred that Altman Z score has given very consistent results as compared to Merton model. Moreover, any change in debt of a company affects the results of Merton Model in major extent than Altman Z score model. Hence, it can be inferred that Altman Z score is a good model to be used for predicting default of Indian companies.

4.3 Analysis of role of Credit Rating agencies in 10 NPAs

The credit ratings given by rating agencies on long term loans or debentures was observed for the companies and transition in credit ratings was noted for 1 year period prior to default.

A B G Shipyard Ltd. -CARE had given 'CARE A' rating to long term loans of company on March 15, 2011. After 2 years, rating was downgraded to CARE BBB- on 03 Jan, 2013. On 28 Jun, 2013, CARE BB was given and after 1 month on 19 Jul, 2013, CARE suspended the rating with CARE BB (Inadequate Safety). Company defaulted in August, 2013 and on 03 Oct, 2013, IND-RA downgraded BB-(ind) to default- D (ind) rating for Fixed rate unsecured NCD (non-convertible debentures as the company was not able to complete the redemption even after due date ("Ind-Ra Downgrades ABG Shipyard`s NCD Programme to `IND D`", 2013). This clearly shows that rating agencies had frequently changed credit ratings in only 8 months' time prior to default.

Table 4.12: Table showing credit ratings and time of default

Company/ Year	Rating Agency	Before 1 Year	Before 6 months	Before 1-2 months	Default year	Rating after default
Bhushan Steel	CARE	CARE A	CARE BB	CARE BB	August, 2014[1]	CARE D
	BRICK WORK	BWR C	BWR C	BWR C		BWR C
Alok Industries	CARE	CARE BBB	CARE BBB-	CARE BBB-	31 March, 2015[2]	CARE BBB- / Suspended
Amtek Auto	CARE	CARE AA	CARE AA	CARE AA-/ Suspended	21 SEP,2015[3]	Suspended
	BRICK WORK	BWR AA	BWR AA	BWR C		BWR D
Lanco Infratech Ltd	CARE	CARE A-	CARE BBB-	CARE BB	October 23, 2012[4]	Withdrawn
	CRISIL	BBB+	BBB-	BB		D
Monnet Ispat And Energy Ltd	CARE	CARE A+	CARE A-	CARE BBB-	April, 2015[5]	CARE D
	BRICK WORK	BWR AA-	BWR BBB	BWR BBB		BWR D
Electrosteel Steels	CARE	CARE B	CARE B	CARE D	July- August 2015[6]	CARE D
Jyoti Structures	CARE	CARE BBB	CARE BBB	CARE BB	September, 2014[7]	Suspended
Era Infra Engineering	CARE	CARE BBB	CARE BB+	CARE D	October , 2013[8]	CARE D
Jaypee Infratech	CARE	CARE BB	CARE D	CARE D	May, 2016[9]	CARE D
ABG Shipyard	CARE	CARE BBB+	CARE BBB-	CARE BB/ Suspended	Aug-Sep, 2013[10]	Suspended
	IND-RA	BBB(ind)	BBB(ind)	BB-(ind)		Default/ withdrawn

Source: 1. Sethi, 2017; 2."Chapter 6: Non-performing Assets", 2017; 3. Thukral et al, 2017; 4. Srivastva, 2012; 5. Sharma, 2018; 6.Dasgupta, 2017; 7. Insolvency Professionals Agency, A Weekly Bulletin. (2017); 8.Press Release of Axis Trustee, December, 2013; 9.Chatterjee, 2016; 10."ABG Shipyard Director Report - Business Standard News", 2016.

Monnet Ispat and Energy: Company has defaulted on loan in April, 2015. On reviewing the ratings, it is observed that CARE had given the CARE A+ on 06 Jan, 2014 on long term loans. It downgraded the rating to CARE A- on 13 Oct, 2014 and further to CARE B+ that shows Moderate Safety on 21 April, 2015, when firm had already defaulted on repayments. On 9 July, 2015, rating was downgraded to CARE D which is given to firm in default. Another rating agency BRICKWORK followed the same suit.

Monnet Ispat and Energy shows that change in rating was delayed by rating agencies even on clear signs made visible by poor financials of firm leading to losses to investors.

Jaypee Infratech: On 10 June, 2015 CARE had given CARE BB (Inadequate Safety) rating to company and within 3 months downgraded rating to CARE D (Default) on 25 Sep, 2015. In 2016, company accepted that it had defaulted on interest payments. On 31 Jan, 2019, CARE D rating has been reaffirmed by CARE. The rating agencies showed pro-activeness in changing the ratings in the case.

Alok Industries Ltd.: On 7 April, 2014 CARE had given CARE BBB rating on term loans to company. On 1 Oct, 2014, CARE had downgraded the rating to CARE BBB- (Moderate Safety) on term loans and on 27 May, 2015 suspended the ratings. But SBI classified company's account as NPA in March, 2015 due to default on interest payment (June, 2015). This case shows that instead of giving default rating to company, rating agency CARE had suspended the rating.

Jyoti Structures Ltd.: CARE had given CARE BB on 8 August, 2014 on long term loans. The company defaulted on loan repayment in September, 2014 and confirmed its indebtness. Hence, SBI restructured the loan on 29 September, 2014. Before few days of the default, CARE downgraded the rating to CARE C and suspended the rating after firm's liquidity profile deterioration and financial stress.

Amtek Auto Ltd.: On 20 Apr, 2015 CARE had given CARE AA on long term loans to Amtek. Non-convertible secured debentures/bonds/notes/bills were rated by BRICKWORK as BWR AA on 21 April, 2015. Both ratings showed High Safety. In May, rating downgraded to CARE AA- and BWR AA. On 07 Aug, 2015 CARE suspended the CARE AA- rating whereas on 27 Aug, BRICKWORK downgraded the

rating to BWR C (Substantial Risk). After the firm had defaulted on loan repayments in September, 2015, BRICKWORK downgraded the rating to BWR D (Default).

Amtek Auto is a clear case of negligence shown by rating agencies. Rating agencies were not able to identify default risk even before 2 months of actual default. Due to poor performance in this case, SEBI had set penalties on rating agencies.

Lanco Infratech Ltd.: On 24 Aug, 2011, CRISIL gave CRISIL BBB+ (Moderate safety) rating to company on term loans. Following the suit, CARE had given CARE BBB+ on unsecured debentures of company in January, 2012. Both rating agencies revised their ratings to CRISIL BBB- and CARE BBB- in February and March, 2012 respectively. In August, rating downgraded to CRISIL BB and CARE BB. Within 2 months, on 23 October, CRISIL downgraded rating to CRISIL D (Default), on the day company failed to make interest payments. On 30 Oct, 2012 CARE had withdrawn its ratings whereas CRISIL reaffirmed its rating as D (Default). In the case of Lanco, it is observed that both CARE and CRISIL rating agencies had frequently downgraded the rating in an 8 months' timeframe

Bhushan Steel Ltd.: On 13 Jan, 2014, CARE had downgraded the rating to CARE A on long term loans. 05 Mar, 2014, rating downgraded to CARE BB. In August, rating (CARE BB) was put under watch when the firm had already defaulted on loan. In October, 2015, rating was finally downgrade to CARE D whereas, BRICKWORK, had downgraded rating to BWR C on Fixed rate secured non-convertible debentures in February, 2015, which showed substantial risk.

It can be easily observed that within 8 months, CARE had changed rating frequently. After default, rating was not changed accordingly. But, BRICKWORK had changed rating to show risk in loan repayments about 6 months before the default.

Electrosteel Steels: In June, 2013, CARE had given CARE D rating to firm on risk of default. After company tried to restructure the debt by adopting CDR in December, 2013, rating was upgraded to CARE B. On 7 July, 2014, CARE had reaffirmed the rating on long term loans to CARE BB (high risk). On 8 July, 2015, CARE D (default) rating was given around the time when firm defaulted on interest payments. It can be observed that rating agency (CARE) had downgraded the rating to default on time.

<u>Era Infra Engg. Ltd.</u>**:** In August, 2012, CARE had downgraded rating on long term loans of company to CARE BBB. In June, 2013, CARE downgraded rating further to CARE BB+. On 8 October, 2013, CARE had again downgraded the rating to CARE D (default). Company had defaulted on interest payments on 31 October, 2013. Rating agency had timely downgraded credit rating to show expected default of the company.

Hence, after analyzing the Credit rating given by rating agencies, it can be inferred that rating agencies has either frequently changed the credit ratings prior to default or delayed the change in the ratings. In case of Amtek and Monnet Ispat, credit rating was downgrade after default. In case of Bhushan steels, Lanco and ABG shipyards, frequent rating changes occurred within 6-8 months before default. It is also observed that instead of giving lower rating, i.e. C or D, credit rating agencies had withdrawn or suspended the ratings before the due date of interest or principle payments, leaving the creditors with no option but to suffer loss. These cases clearly show that rating agencies had not worked efficiently. It might be possible that few stakeholders' money could be protected from default as they might have taken some corrective action before default of companies, if credit rating agencies had given correct lower credit rating to companies' loans on time.

4.4. Comparison of time of default predicted by Merton model and Altman Z score model with the actual time of default of companies

The Probability of default calculated using Merton Model and Altman Z score model was used to predict the time of default of companies, which was then compared with the actual time of default.

From table 4.13, it can be observed that for 4 out of 10 companies, Altman Z score model correctly predicted the time of default. For 3 out of 10 companies, Merton model has correctly predicted the time of default. Both models have given same results for Lanco Infratech and Electrosteel. Both models have predicted time of default for Electrosteel as 2013 but firm actually defaulted in 2015. This is due to the fact that due to poor financials of company, lenders had invoked debt restructuring mechanism (CDR) in company, resulting in delayed default. Altman has also predicted the time of default of Jaypee to be 2015 but firm defaulted in 2016. This could be due to selling of assets by

Jaypee to reduce its debt obligations, extending the default time by a year. For all the other firms, it can be noted that both models has predicted time of default 1 year prior to actual default. This could be due to recovery mechanisms adopted by ailing firms to revive again. This might have extended the actual time of default. This can be regarded as the weakness of models that they do not take into account the current internal or external changes occurring in the environment of companies leading to inaccurate results. This could be overcame by credit rating agencies, hence credit ratings are supposed to be more reliable than probability of default given by models.

Table 4.13: Table showing predicted time of default and actual time of default

Company	Default predicted using Merton model	Default predicted using Altman Z score model	Actual default
Bhushan Steel	2012	2013	August, 2014
Alok Industries	2012	2013	March, 2015
Amtek Auto	2015	2014	September,2015
Lanco Infratech Ltd	2012	2012	October, 2012
Monnet Ispat And Energy Ltd	2015	2014	April, 2015
Electrosteel Steels	2013	2013	July- August 2015
Jyoti Structures	2012	2014	September, 2014
Era Infra Engineering	2015	2013	October , 2013
Jaypee Infratech	2013	2015	May, 2016
ABG Shipyard	2012	2013	Aug-Sep, 2013

According to general rule, if the default probability of any company is above 2%, there are high chances that company is heading towards bankruptcy and can default on interest and loan repayments in future. Hence, debentures or long term loans issued by companies should be given low rating by rating agencies.

On analyzing the data from table 4.12, it can be easily observed that all the firms got high rating by rating agencies in 2011, mostly 'A' (investment grade rating) that indicate very low chances of default. Even in 2012, when economic slowdown had occurred in many sectors and firms were experiencing difficulty in surviving, all the 10 companies were still rated either BBB or A, even when default probabilities were quite high. Default of Amtek and Monnet can be easily predicted in 2014 as the default probabilities of both companies were higher than 5%; 8% in Amtek and 5.39% in Monnet, but rating agencies had rated them as CARE AA and CARE A+ respectively.

The data also suggests that change in credit ratings was not uniform across the years whereas default probabilities had increased consistently. In case of Bhushan steels, in 2014, firm got CARE BB when the PD was 28% in 2014. In a year, when PD was increased by only 1%, becoming 29%, credit rating had been downgraded severely, becoming CARE D, i.e. from inadequate safety to Default within 1 year. The same pattern can be noted in Era Infra, whereas rating had been downgraded from CARE BB to CARE D in a year.

After analyzing data, it was observed that default probabilities calculated using Altman Z score and Merton model consistently increased for all the companies except Alok industries before their default whereas revision of credit ratings of Amtek, Monnet, Bhushan steels and Era infra was not done as required and expected from credit rating agencies.

Hence, it can be inferred that there is an inherent weakness in both the models that they do not incorporate external conditions in calculation of probability of default resulting in higher probabilities of default of companies, 1-2 years prior to actual default. In those years, it could be possible that external situations become favorable to firm and it does not default at all. This kind of scenario can only be taken into account by credit rating agencies which are more flexible and responsive to changes in external or internal environment that can affect company's revenues, as compared to default probability models which do not consider such possible future scenarios.

5. SUMMARY AND CONCLUSION

The aim of this research was to identify the factors behind the failure of first 10 companies identified by central bank under Insolvency and Bankruptcy code, 2016 for bankruptcy proceedings in July, 2017. This paper also tried to predict the time of default of these companies using Probability of Default calculated using Merton Model (1974) and Altman Z score model (1968). The financial data of the 10 companies was collected and analyzed and the common external and internal factors behind their failure were identified. The probabilities of default of the companies were calculated for the period of 2011 to 2015 using Altman Z score and Merton model. The transition in default probability of the companies on annual basis was then compared with the revision in credit ratings till the time of actual default of companies.

The slowdown in global economy in 2012-2014 led to subdued demand of products, affecting sectors like steel, shipping, auto-components and textiles in the whole world. Import of low cost steel in country further resulted in lower demand of steel products of home companies. In India, delays in approvals and environmental clearances led to stalled projects and cost overruns. Change in merchant power policy and cancellation of coal block allocation by Supreme Court resulting in shortage of raw material like coal had affected every business segment, especially power sector. High borrowing costs and increased trade receivables created fund shortages in companies, making it difficult for them to complete their ongoing projects. Internal factors like no or unrelated diversification by firms, relying completely on one segment for revenue, debt funded expansions and acquisitions without proper strategy pushed many companies' towards bankruptcy.

Default probabilities calculated using Altman Z score showed consistent and reliable results instead of Merton model. The performance of rating agencies in warning lenders and stakeholders about the default of companies was observed to be inadequate in cases like Amtek, Monnet Ispat, Bhushan Steel, Lanco and ABG Shipyard. The revisions in credit ratings were observed to be either delayed or frequent in these companies. Debentures and long-term loans of companies were given high credit rating initially and then ratings changed (downgraded) frequently in a year prior to default. Instead of giving

lower rating (Default rating) to companies in case of poor credit worthiness, credit rating agencies had either suspended or withdrawn ratings before the due date of interest payments or loan repayments.

This research suggests that neither default probability calculated using Altman Z score and Merton model nor credit ratings given by credit rating agencies is completely reliable to predict default (bankruptcy) of companies. Hence, it is better to compare default probability given by Merton model, Altman Z score and credit rating to get more accurate picture of company's ability to fulfill its future obligations.

This paper opens the area for further research to find out the factors that affect the applicability and suitability of Altman Z score and Merton model for the prediction of default of Indian companies. A hybrid model can be devised for each sector (industry) by combining both models in which weightage to each model will vary according to their suitability for a sector.

5.1 Limitations of the study-

1. The study used the original models proposed by Altman and Merton in 1968 and 1974 respectively to calculate probability of default. Results might change and improve by using modified versions of these models.
2. The suitability of Merton model and Altman Z Score model was analyzed for only 10 companies. Analysis of more companies can improve predictions.
3. Only 2 models were used to calculate probability of default. Other advanced models can be used to improvise the results.

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7. ANNEXURE 1

Table 1: Table showing credit ratings of ABG Shipyard Ltd.

Date	Instrument	Rating	Action	Meaning
14 June, 2011	Long term Loans	CARE A	Reaffirmed	Adequate Safety
31 October, 2011	Long term Loans	CARE A	Reaffirmed	Adequate Safety
31 March, 2012	Long term Loans	CARE BBB+	Downgraded	Moderate Safety
3 January, 2013	Long term Loans	CARE BBB-	Downgraded	Moderate Safety
28 June, 2012	Long term Loans	CARE BB	Downgraded	Inadequate Safety
19 July, 2013	Long term Loans	CARE BB	Suspended	Inadequate Safety

Table 2: Table showing credit ratings of Alok Industries Ltd.

Date	Instrument	Rating	Action	Meaning
14 September, 2011	Long term Loans	CARE A+	Reaffirmed	Adequate Safety
3 February, 2012	Long term Loans	CARE A+	Reaffirmed	Adequate Safety
6 July, 2012	Long term Loans	CARE A	Downgraded	Adequate Safety
7 October, 2013	Long term Loans	CARE BBB	Downgraded	Moderate Safety
1 October, 2014	Fixed rate unsecured non-convertible debentures	CARE BBB-	Downgraded	Moderate Safety
27 May, 2015	Fixed rate unsecured non-convertible debentures	CARE BBB-	Suspended	Moderate Safety

Table 3: Table showing credit ratings of Amtek Auto

Date	Instrument	Rating	Action	Meaning
12 July, 2013	Long term Loans	CARE AA	Rating Watch	High Safety
18 April, 2014	Long term Loans	CARE AA	Reaffirmed	High Safety
29 January, 2015	Non-convertible secured debentures/bonds/notes/bills	BWR AA	Initial Rating	High Safety
20 April, 2015	Long term Loans	CARE AA	Reaffirmed	High Safety
21 April, 2015	Non-convertible secured debentures/bonds/notes/bills	BWR AA	Reaffirmed	High Safety
27 May, 2015	Long term Loans	CARE AA-	Downgraded	High Safety
22 July, 2015	Non-convertible secured debentures/bonds/notes/bills	BWR AA	Downgraded	High Safety
7 August, 2015	Long term Loans	CARE AA-	Suspended	High Safety
27 August, 2015	Non-convertible secured debentures/bonds/notes/bills	BWR C	Downgraded	Substantial Risk
7 October, 2015	Non-convertible secured debentures/bonds/notes/bills	BWR D	Downgraded	Default

Table 4: Table showing credit ratings of Electrosteel Steel Ltd.

Date	Instrument	Rating	Action	Meaning
26 April, 2011	Long term Loans	CARE BBB	Reaffirmed	Moderate Safety
23 April, 2012	Long term Loans	CARE BBB	Reaffirmed	Moderate Safety
13 August, 2012	Long term Loans	CARE BB-	Downgraded	Inadequate Safety
29 March, 2013	Long term Loans	CARE B	Downgraded	High Risk
26 June, 2013	Long term Loans	CARE D	Downgraded	Default
14 October, 2013	Long term Loans	CARE B	Upgraded	High Risk
7 July, 2014	Long term Loans	CARE B	Reaffirmed	High Risk
8 July, 2015	Long term Loans	CARE D	Downgraded	Default

Table 5: Table showing credit ratings of Lanco Infratech Ltd.

Date	Instrument	Rating	Action	Meaning
30 May, 2011	Fixed rate unsecured non-convertible debentures	CARE A-	Reaffirmed	Adequate Safety
24 August, 2011	Term loans	CRISIL BBB+	Downgraded	Moderate Safety
5 January, 2012	Fixed rate unsecured non-convertible debentures	CARE BBB+	Downgraded	Moderate Safety
10 February, 2012	Term loans	CRISIL BBB-	Downgraded	Moderate Safety
19 March, 2012	Fixed rate unsecured non-convertible debentures	CARE BBB-	Downgraded	Moderate Safety
7 August, 2012	Term loans	CRISIL BB	Downgraded	Inadequate Safety
21 August, 2012	Fixed rate unsecured non-convertible debentures	CARE BB	Downgraded	Inadequate Safety
23 October, 2012	Term loans	CRISIL D	Downgraded	Default
30 October, 2012	Fixed rate unsecured non-convertible debentures	CARE BB	Withdrawn	Inadequate Safety
23 June, 2015	Term loans	CRISIL D	Reaffirmed	Default

Table 6: Table showing credit ratings of Bhushan Steel

Date	Instrument	Rating	Action	Meaning
14 January, 2014	Long term Loans	CARE A	Downgraded	Adequate Safety
5 March, 2014	Long term Loans	CARE BB	Downgraded	Inadequate Safety
6 August, 2014	Long term Loans	CARE BB	Rating Watch	Inadequate Safety
16 October, 2015	Long term Loans	CARE D	Downgraded	Default

Table 7: Table showing credit ratings of Era Infra Engg Ltd.

Date	Instrument	Rating	Action	Meaning
26 April, 2011	Long term Loans	CARE A+	Reaffirmed	Adequate Safety
29 December, 2011	Long term Loans	CARE A+	Reaffirmed	Adequate Safety
2 August, 2012	Long term Loans	CARE BBB	Downgraded	Moderate Safety
21 June, 2013	Long term Loans	CARE BB+	Downgraded	Inadequate Safety
8 October, 2013	Long term Loans	CARE D	Downgraded	Default

Table 8: Table showing credit ratings of Jaypee Infratech Ltd.

Date	Instrument	Rating	Action	Meaning
19 April, 2012	Long term Loans	CARE BBB+	Reaffirmed	Moderate Safety
3 September, 2012	Long term Loans	CARE BBB+	Reaffirmed	Moderate Safety
18 November, 2013	Long term Loans	CARE BBB+	Reaffirmed	Moderate Safety
10 April,2015	Long term Loans	CARE BBB-	Downgraded	Moderate Safety
10 June, 2015	Long term Loans	CARE BB	Downgraded	Inadequate Safety
25 September, 2015	Long term Loans	CARE D	Downgraded	Default
31 December, 2016	Long term Loans	CARE D	Reaffirmed	Default

Table 9: Table showing credit ratings of Jyoti Structures Ltd.

Date	Instrument	Rating	Action	Meaning
17 August, 2011	Long term Loans	CARE A	Reaffirmed	Adequate Safety
12 December, 2011	Long term Loans	CARE A	Reaffirmed	Adequate Safety
25 September , 2012	Long term Loans	CARE A-	Downgraded	Adequate Safety
11 September, 2013	Long term Loans	CARE BBB	Downgraded	Moderate Safety
8 August, 2014	Long term Loans	CARE BB	Downgraded	Inadequate Safety
19 September, 2014	Long term Loans	CARE C	Downgraded	Substantial Risk
19 September, 2014	Long term Loans	CARE C	Suspended	Substantial Risk

Table 10: Table showing credit ratings of Monnet Ispat & Energy Ltd.

Date	Instrument	Rating	Action	Meaning
6 February, 2012	Long term Loans	CARE AA-	Reaffirmed	High Safety
7 December, 2012	Long term Loans	CARE AA-	Reaffirmed	High Safety
6 Januray, 2014	Long term Loans	CARE A+	Downgraded	Adequate Safety
13 October, 2014	Long term Loans	CARE A-	Downgraded	Adequate Safety
28 November, 2014	Long term Loans	CARE BBB-	Downgraded	Moderate Safety
21 April, 2015	Long term Loans	CARE B+	Downgraded	High Risk
9 July, 2015	Long term Loans	CARE D	Downgraded	Default