

CORPORATE GOVERNANCE AND CREDIT RATINGS

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Corporate governance is a well-researched concept. The primary focus of the extant literature has been on the relationship of corporate governance with the cost of equity, firm's performance, capital structure and cost of debt. There is negligible research dedicated to its association with credit ratings. An entity with higher ratings is expected to have satisfactory corporate governance practices. The present study examines the impact of compliance of corporate governance provisions by Indian companies on their long-term credit ratings using the ordinal logit regression model. The results suggest that corporate governance is an important determinant of credit ratings. It also documents that the companies with favorable disclosure policies and practices are more likely to get higher ratings.

Keywords: *Corporate Governance, Credit Ratings, Governance Indices, Ordinal Logit Regression.*

JEL classification: G24, G34

1. Introduction

An investment in a company is made with an expectation to earn high returns. The investor not only expects the company's management to safeguard his capital but also to make some value addition to it. Therefore, in order to gain the confidence of the domestic and foreign investor, the management should act in an ethical manner and adopt sound corporate governance practices.

A credit rating is a symbolic indicator of the current view of the relative capacity of the issuer to service its debt obligation in a timely manner, with specific reference to the instrument being rated. In the recent past, many big business and consulting giants like World.com, Enron, Arthur Anderson, Parmalat, etc., have collapsed on account of financial or audit failures. As an aftermath, on one hand, credit rating agencies have been subjected to severe criticism for not being able to issue any warning signals for the investors. On the other hand, there is an increasing emphasis on more effective corporate governance mechanisms. This became a ground for the development of a code of corporate governance - Public

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Accounting Reform and Investor Protection Act of 2002 known as Sarbanes Oxley (SOX) Act, 2002 in USA. Other countries have adopted the code developed by the Organization for Economic Co-operation and Development (OECD) according to their respective business environments.

The Securities and Exchange Board of India (SEBI) has formulated a listing agreement between a company and the stock exchange on which it is listed. This agreement monitors and regulates corporate governance of listed companies. After corporate giants like Satyam and non-banking finance companies floated by C. R. Bansali (CRB scam) with favorable credit ratings and audit reports defaulted causing losses to many small investors, judicious emendations were made in the existing regulations. The Kumar Mangalam Birla Committee on Corporate Governance constituted by SEBI in 1999 added a new clause to this listing agreement in the year 2000 - Clause 49. It mainly focused on corporate disclosures. On the basis of recommendations of Narayana Murthy Committee, SEBI revised Clause 49 on October 29, 2004. This came into operation on January 1, 2006. This involves the management of a listed company to submit a corporate governance compliance report on a quarterly basis. The report includes information on board of directors, audit committee, remuneration committee, shareholders' committee, board meetings, accounting and general disclosures. The statutory requirements relating to corporate governance stipulated by SEBI are intended to make the business environment trustworthy, moral and ethical.

There are various organizations like Institutional Shareholder Services (established in 2002), The Corporate Library (1999) and Governance Metrics International (2000) that assign ratings to the companies on the basis of corporate governance practices. Apart from these organizations, the rating agencies like Moody's Investor Services, Standard and Poor's Rating Services and Fitch Rating Services also consider different aspects of corporate governance for assigning ratings.

In India, all the rating agencies³ provide corporate governance ratings on the basis of an objective and independent analysis of corporate governance practices of a company. These ratings indicate the extent to which an organization abides by the codes and guidelines of corporate governance practices. The corporate governance ratings complement the traditional credit analysis. The degree of corporate governance reflects a company's management quality. In fact, the rating agencies incorporate the quality of a company's

³The rating agencies in India are: Credit Rating and Information Services of India Limited (CRISIL), Investment Information and Credit Rating Agency of India Limited (ICRA), Credit Analysis and Research Limited (CARE), Fitch India, and Brickworks Ratings Pvt. Ltd. SMERA (Small and Medium enterprise Rating Agency) was set up in September, 2012

corporate governance apart from other factors for assigning corporate credit ratings. Credit agencies are concerned with governance because weak governance can impair a firm's financial position and leave stakeholders vulnerable to losses (Ashbaugh-Skaife *et al.*, 2006).

The present research is an empirical study on whether better corporate governance measures lead to better credit ratings of long term debt instruments in India. The objective of the present paper is (i) to examine the relationship of corporate governance measures and credit ratings of companies in India and (ii) to develop a credit rating classification model and determine its accuracy.

The rest of the paper is organized as follows. The next section discusses the related literature. In Section 3, the database, sample design and the variables used in the study are elaborated upon. Section 4 explains the hypotheses and the research methodology. The analysis and interpretation of results is presented in Section 5. Finally, the last section gives the conclusion and policy implications.

2. Review of Empirical Studies

Although corporate governance is a well-researched concept, there are very few studies that have investigated the relationship between corporate governance and credit ratings. Bhojraj and Sengupta (2003), Ashbaugh-Skaife *et al.* (2006) and Alali *et al.* (2012) provide empirical evidence that corporate governance affects credit ratings.

Bhojraj and Sengupta (2003) used a sample of 1,005 industrial bond issues over 1991-96 to examine the relationship between corporate governance mechanisms and bond ratings. They used ordered probit regression and found that firms having greater institutional ownership and stronger outside control of the board enjoy lower bond yields and higher ratings on their new bond issues.

Ashbaugh-Skaife *et al.* (2006) incorporated the corporate governance variable for predicting credit ratings. They found that corporate governance had a significant explanatory power over and above the firm level risk characteristics. They also found some governance attributes such as block holders, shareholder rights, the power of Chief Executive Officer (CEO) and board independence as significant determinants of credit ratings.

Alali *et al.* (2012) used three different governance scores given in earlier studies (Gompers *et al.*, 2003; Brown and Caylor, 2006; Bebchuk *et al.*, 2009). They concluded that

there is a positive relationship between corporate governance and credit ratings.

The focus of the extant literature has been on studying corporate governance with relation to the cost of equity, firm's performance, capital structure and cost of debt. Some empirical studies (Ashbaugh *et al.*, 2006; Drobetz *et al.*, 2004; Chen *et al.*, 2003) agreed that high corporate governance standards have a positive impact on the access and cost of equity capital. There is an empirical evidence (Kumar, 2005; Jiraporn and Gleason, 2007; Alba *et al.*, 1998) linking high leverage with weak governance. The corporate governance also influences the cost of debt (Khanna and Black, 2007; Beekes and Brown, 2006). There is an extensive literature (Bhagat *et al.*, 2007; Klapper and Love, 2004; Gompers *et al.*, 2003; Drobetz *et al.*, 2004) that associates corporate governance with financial performance. Although there is little research dedicated to its association with credit ratings, firm's performance and cost of capital are in a way reflected in credit ratings. A credit rating is meant to impart a message of a company's efficiency (strong corporate governance), dynamism (performance) and credit worthiness (access and cost of finance). Thus, these are overlapping concepts.

Earlier research analyzed corporate governance components individually such as shareholder rights and accounting standards (Lombardo and Pagano, 2002), disclosure practices (Chen *et al.*, 2003), CEO tenure, board size and outside directors (Wen *et al.*, 2002), ownership concentration and shareholders' rights (Kumar, 2005; Alba *et al.*, 1998). Recent literature is based on a combination of corporate governance attributes and its association with capital structure and firms' performance. Gompers *et al.* (2003) initiated the concept of an overall governance index. They constructed a governance index using 24 governance rules to proxy for the level of shareholder rights for 1500 large firms during the 1990s. A point was added for every provision that reduced the shareholders' rights such that a higher governance index implied higher management power and lower governance index indicated higher shareholders' power. They performed a time series regression and concluded that the firms with democratic set up had higher firm value, profits, sales growth, capital expenditures and made fewer corporate acquisitions. Other studies followed (Bebchuk *et al.*, 2009; Brown and Caylor, 2006; Agarwal *et al.*, 2010; Black *et al.*, 2010) that used a different set of components to compute a composite index to represent corporate governance. Bhagat *et al.* (2007) and Daines *et al.* (2010) criticized the computation of an index to measure corporate governance. They argued that no one index could capture critical nuances for making informed decisions.

There are conflicting opinions favoring both the use of a single index or rating to represent corporate governance and using only most important features like board independence or ownership concentration as a proxy for corporate governance.

3. Database and the Variables

3.1 Data: The sample for the present study is selected through non-probability purposive sampling technique.⁴ The sample includes the companies that have been assigned long term ratings on July 1, 2012 by any of the rating agencies in India that are recognized by SEBI and the Reserve Bank of India (RBI).

The companies belonging to three industries in the manufacturing sector - textile, paper and steel are included in the sample. All the three industries play an important role in the Indian economy. *Indian textile industry* makes significant contribution to industrial output, employment generation and the export earnings of the country. *Indian steel industry* is a core sector and tracks the overall economic growth in the long term. The demand for steel is derived from sectors like automobiles, consumer durables and infrastructure. *Indian paper industry* has become more promising as the domestic demand is on rise. All the three industries that are selected for the present study have shown immense growth potential. The growth and development of these industries have a direct bearing on the economic growth of the nation. The sample includes only those companies for which the corporate governance report (2011-12) could be accessed either from respective companies' websites or from Centre for Monitoring Indian Economy (CMIE)⁵ database.

The sample constitutes of 252 companies - textile (161), paper (34) and steel (57). A set of 47 questions is formulated on the basis of previous literature, mandatory and non-mandatory requirements given in Clause 49 of the Listing Agreement. The questions focus on the board composition, qualifications, board meetings, various committees and their composition, code of conduct and the policies followed by a company. The responses to these questions are manually recorded using the corporate governance reports and the respective websites of the companies. It is found that the SEBI last amended Clause 49 of the Listing Agreement pertaining to corporate governance norms in December 2003.⁶ It is observed after

⁴In non-probability purposive sampling techniques, the sample should meet the criteria set by the researcher. The companies that are included in the sample belong to the selected industries, possess a rating on July 1, 2012 and have complete corporate governance data.

⁵CMIE is considered India's largest and most reliable database on the financial performance of Indian companies. It was established in 1976 and is a leading business information company.

⁶A consultative paper on review of norms of corporate governance in India suggesting further amendments in Clause 49 was published in January, 2012.

examining various corporate governance reports that compliance of the companies has not changed much in the period 2009-2012. Therefore, it is decided to consider corporate governance compliance of financial year 2011-12 for the present research work.

3.2 Variables Used: The dependent and the independent variables used in the study are discussed in the following paragraphsful,

(A) Dependent Variable

The dependent variable (Y_i) is the long term rating of a company i assigned by credit rating agencies in India as on July 1, 2012. The long term credit ratings are issued in alphabetic form and are categorized in six investment grades and four non-investment grades. They further classify companies into sub-categories by attaching a suffix '-' or '+' to indicate the relative position of the issuer within the same category. The ratings are converted to a numerical score for the purpose of statistical analysis. The present study focuses on broad categories. Therefore, positive or negative signs suffixed to ratings are ignored while assigning numerical values. As there are a few observations in the higher (AA, AAA) and the lower categories (D, C), they are merged with the nearest category. Therefore, the present study considers 6 categories of credit ratings ranging from 1 to 6, where 1 denotes the lowest rating and 6 denotes the highest rating. The lowest value is assigned to the lowest rating (highest credit risk). The categorization of the credit ratings into numeric classes in ascending order is presented as follows:

$$Y_i = \begin{cases} 1 \text{ if rating} = \text{D, C} \\ 2 \text{ if rating} = \text{B} \\ 3 \text{ if rating} = \text{BB} \\ 4 \text{ if rating} = \text{BBB} \\ 5 \text{ if rating} = \text{A} \\ 6 \text{ if rating} = \text{AA, AAA} \end{cases}$$

The credit ratings (Y) of a company (i), Y_i , includes the ratings assigned to all bonds, non-convertible debentures, and other debt instruments (excluding public deposits) with original maturity exceeding one year.

(B) Independent Variables

In the present study, the mandatory and non-mandatory requirements given by

Clause 49 are used to determine governance variables. The various aspects of corporate governance are grouped under four sub-indices - Board of Directors, Disclosures, Audit committee, Other committees. These are discussed as follows:

(i) *Board of Directors*: A qualified board with an optimum combination of executive, independent and non-executive director is important for maintaining high standards of corporate governance. The non-executive and independent directors are required to play an advisory and monitoring role without being involved in day-to-day operations of a company. The outside or non-executive directors play an important governance role in relation to the welfare of the investors (Solomon *et al.*, 2003). The presence of outside directors improves the degree of corporate accountability (Denis and McConnell, 2003; Ricart *et al.*, 1999). The separation of the position of the CEO is intended to reduce the possibility of undue influence on the corporate affairs. It ensures balance of power and authority that can strengthen the fundamentals of corporate governance (Kamesam, 2006). CEO duality may constrain board independence as there is a possibility of conflict of interests (Daily and Dalton, 1997). According to the mandatory requirements of Clause 49 of the Listing Agreement, the number of non-executive directors should not be less than fifty percent of the board of directors. In case of a non-executive chairman, at least one-third of the board should comprise of independent directors and in case of an executive chairman (when he is a CEO as well), at least half of the board should comprise of independent directors. The non-mandatory requirements of Clause 49 also recommend that-

- a company may train its board members in the business model of the company as well as the risk profile of the business parameters of the company.
- the performance evaluation of non-executive directors could be done by a peer group comprising the entire board of directors, excluding the director being evaluated.
- independent directors may have a tenure not exceeding, in the aggregate, a period of nine years.

The favorable aspects of corporate governance are reflected by using a binary scale (Gompers *et al.*, 2003) in most cases- a higher value of “1” is assigned if the company either follows the mandatory or non-mandatory requirements given in Clause 49 or complies with sound corporate governance mechanisms that have been empirically proven relevant in the earlier studies and “0” otherwise. Some attributes are assigned scores by developing

thresholds for identifying better governance practices. For example, Clause 49 does not make any recommendation about the size of the board but there is empirical evidence (Yermack, 1996) that neither too large nor too small a board is beneficial for companies. Therefore, the companies are divided into quartiles based on the range of the size of the board in the given sample. A higher score of “1” is assigned to the companies in the second and third quartile and lower score of “0” to companies in the first and fourth quartiles.

The sum of the values assigned to individual attributes of the structure and composition of the board and board meetings gives the sub-index - *Board of Directors*.

(ii) *Disclosures*: The degree of transparency and accountability determines the quality of its disclosure standards. The corporate governance code laid down in Clause 49 requires the companies to disclose financial and non-financial information on their respective websites and corporate governance reports. The disclosure practices and policies followed by an enterprise reflect its commitment towards its existing and prospective stakeholders. The disclosures enable the investors to assess a company's past and future performance and correctly perceive its risk profile so as to aid them in making informed decisions (Gilson, 2000).

The procedure used for computing sub-index of disclosure practices is as follows: a value of “1” is assigned to a favorable attribute and “0” otherwise. The exceptions are - “Qualifications of the director on the website” is assigned “0” if there is no information regarding the qualifications of the directors, “1” if the corporate governance report gave a brief resume of the director being appointed or reappointed (Clause 49 IV (G)) and “2” if the company provided detailed information on the qualifications of all the directors on its website. This is done to give credit to the companies that apprise the stakeholders of the capabilities of the people in charge of the corporate affairs. A similar method is used for assigning scores to disclosure of remuneration of the directors and annual reports on the respective website with higher values being assigned to the company that makes better disclosures.

The sum of the values assigned to individual attributes under general, financial and other policy disclosures give the sub-index - *Disclosures*.

(iii) *Audit Committee*: The audit committee is the most important in terms of scope of activities. An efficient audit Committee can improve the quality of financial reporting, ensure an effective internal control system, and increase reliability of financial statements. Since any committee is as good as its members, it is important that all the members have

relevant experience and expertise in finance and accounts. The sub-index for *Audit Committee* is computed by averaging the values assigned to attributes in accordance with the procedure adopted for the first two sub-indices.

(iv) *Other Committees*: Although Clause 49 lays down certain mandatory requirements with regard to the composition and functioning of the audit committee, the constitution of other committees is included under non-mandatory requirements. (However, this is set to change if SEBI's proposals issued in "Consultative paper on revising CG norms" dated January 4, 2013 are implemented).

Nevertheless, the presence of committees to decide the remuneration of the director resolving shareholders' grievances or selecting independent directors is an important indicator of a company's corporate governance process. The present study includes information regarding remuneration and shareholders' committee (along with audit committee) to compute the corporate governance index as these are included in the suggested list of items Clause 49.

Remuneration Committee: Kumar Mangalam report recommends that "a remuneration committee should bring about objectivity in the compensation package while striking the balance between the interest of the company and the shareholders". The package should be good enough to attract and retain talent. At the same time, there should be no undue payment hidden from stakeholders. Since it is a non-mandatory requirement under Clause 49, the very existence of a remuneration committee is considered a favorable attribute. The other attributes with respect to remuneration committee are assigned values on the same lines as for the first two sub-indices. Since remuneration packages are fixed annually, it is not required that the committee meets frequently.

Shareholders' Committee: Clause 49 requires that a shareholders' committee be constituted to look into redressal of shareholders' complaints like transfer of shares, non-receipt of annual report, non-receipt of dividend and so on.

The average scores for remuneration committee and shareholders' committee are aggregated to get the sub index - *Other Committee*.

The four sub-indices are further transformed into *Composite Corporate Governance* on the basis of their respective mean values. If the computed composite index is found to be above its mean value, it is assigned a value of "1" implying strong corporate governance. If it is found to be below the mean value, it is assigned a value of "0" implying weak corporate governance

(v) *Industry*: The study covers the companies belonging to the selected three manufacturing industries - textile, steel and paper. Nominal values are assigned to the three industries and the industry variable is included in the models to examine if the nature of industry impacts the credit ratings.

3. Research Methodology

Based on the objectives and review of literature, a set of empirical classifications in the form of alternative hypotheses have been formulated (i) to validate the model and (ii) determine the influence of predictors on the credit rating.

In order to examine the validity of the model, the *chi-square* statistic is used to test the following alternative hypotheses:

H1: that the model with corporate governance attributes relating to board of directors, disclosures, audit committee, other committees and industry as independent variables is valid.

In order to examine the relationship between the corporate governance variables and credit ratings, alternative hypotheses are formulated as follows:

H2: that the structure and composition of board of directors is positively related to the credit ratings.

H3: that the disclosure practices are positively related to the credit ratings.

H4: that the structure and composition of audit committee is positively related to the credit ratings.

H5: that the structure and composition of other committees is positively related to the credit ratings.

H6: that the industry influences the credit ratings.

In order to examine the relationship between the overall corporate governance and credit ratings, the alternative hypothesis is formulated as follows:

H7: that corporate governance is positively related to the credit ratings.

The Model: Ordinal Logit Regression is used to study the relationship between credit ratings and the corporate governance variables. This is one of the techniques recommended for the analysis of ordered, categorical, non-quantitative choices, outcomes and responses. (Agresti, 2002; Greene, 2002; O'Connell, 2006).⁷ The credit rating (Y) of a

⁷For details, refer to Appendix.

company (i) is a latent variable and is related to independent variables (X_j) through an unobserved linking variable (Y_i^*) as follows:

$$Y_i^* = \alpha_i + X_j \beta_{ij} \quad (1)$$

where X_j is a vector of independent variable, j , β_{ij} is the vector of the estimated coefficients of a company (i) for independent variable j . The linear model is related to the dependent variable (Y_i) by a link function (Y_i^*). This is referred to as the logit link. This link function is a transformation of the cumulative probabilities of the ordinal outcome to be used in the estimation of the model.

The relationship of the credit ratings with corporate governance is examined using two models:

Model (1): The four sub-indices computed for board of directors, disclosures, audit committee and other committees along with the industry variable are treated as independent variables. It is presented in the following equation:

$$Y_i^* = \left[\log \left[\frac{\text{Prob}(Y \leq Y_i^*)}{\text{Prob}(Y > Y_i^*)} \right] \right] = \alpha_i + \beta_{i1} (\text{Board of Directors}) + \beta_{i2} (\text{Disclosures}) + \beta_{i3} (\text{Audit committee}) + \beta_{i4} (\text{Other committees}) + \beta_{i5} (\text{Industry}) \quad (2)$$

Model (2): The composite corporate governance index along with the industry variable are treated as independent variables. The composite corporate governance index is computed by aggregating the four sub- indices. It is presented as follows:

$$Y_i^* = \left[\log \left[\frac{\text{Prob}(Y \leq Y_i^*)}{\text{Prob}(Y > Y_i^*)} \right] \right] = Y_i^* \alpha_i + \beta_{i1} (\text{Composite Corporate Governance}) + \beta_{i2} (\text{Industry}) \quad (3)$$

In the ordinal logit model, the *cumulative* probabilities are used rather than probabilities for discrete categories - the probability of companies achieving level 5(rating A) or below, 4(rating BBB) or below and so on.

4. Analysis and Interpretation of Results

A. Preliminary Investigations

The sub-indices are treated as independent variables for assessing their influence on credit ratings. The preliminary investigations of the explanatory variables and their relationship with credit ratings did not indicate any multicollinearity problem as all the significant correlations are much less than 0.7(Table A1.1). The descriptive statistics of corporate governance and its components show proximity between the mean and the median

values (Table A1.2). This implies that the distribution of the composite index as well as sub-indices is symmetrical. The composite corporate governance has a range of 48 which implies that the sample has a mix of companies with strong and weak corporate governance practices. The company with weakest corporate governance is about 5.6 standard deviations away from the company with strongest corporate governance. However, none of the components shows higher standard deviation than that of the average corporate governance index. The audit committee sub-index shows the least variance (s.d=0.13644) and range (1.18) among the components of corporate governance. It implies that all the companies are adequately following norms for the structure, composition and conduct of audit committees. The coefficients of variation for board of directors, disclosure practices, audit committees and other committees are 25 per cent, 42 per cent, 17 per cent and 33 per cent respectively. This shows that there is highest dispersion around the mean of disclosure practices followed by other committees and board of directors and least dispersion around the mean of audit committee variable.

B. Frequency Distribution of Ratings Assigned in the Sample

The sample constitutes of 252 companies and the observed ratings are presented in Table 1. There are 51 per cent of the ratings assigned in the investment grade and 49 per cent of the ratings in the speculative grade. If a company is chosen at random from the sample, the unconditional odds of it being in the investment grade are approximately equal to its being in the speculative grade. The highest proportion (32 per cent) of the total companies are assigned category BBB. There are only 5 per cent of the total companies in the higher category AA and AAA.

Table 1: Frequency Distributions of Credit Ratings

<i>Credit Ratings</i>	<i>Category Code</i>	<i>Frequency</i>	<i>Cumulative Frequency</i>	<i>Per cent</i>	<i>Cumulative Per cent</i>
D,C	1	37	37	14	14
B	2	22	59	09	23
BB	3	64	123	26	49
BBB	4	80	203	32	81
A	5	36	239	14	95
AA, AAA	6	13	252	05	100
Total		252		100	

C. Statistical fittings

Model (1) The parameter estimates of the model in which sub-indices are treated as independent variables are summarized in Table 2.

On the basis of likelihood ratio test, the model with the five explanatory variables depicts a significant relationship with the credit ratings. (*Chi-square* statistic for testing the significance of the model with predictors is significant at 1 per cent level (p-value = .000)).

Table 2: Model (1): Parameter Estimates

<i>Model Estimates</i>		<i>Coefficients</i>		
Thresholds	α_1	-3.249		
(intercepts)	α_2	-2.633		
	α_3	-1.369		
	α_4	1.255		
	α_5	1.838		
<i>Predictors</i>	<i>β-coefficient</i>	<i>Standard Error</i>	<i>Wald test</i>	<i>p-value</i>
Board of Directors	-0.202	0.231	0.766	0.381
Disclosures	-0.919	0.243	14.369	0.000
Audit Committee	-0.132	0.233	0.314	0.575
Other Committees	0.351	0.236	2.269	0.132
Industry- Textile	-1.095	0.290	14.257	0.000
Industry-Paper *	-1.613	0.403	16.035	0.000
<i>Overall model fit</i>				
Log Likelihood test	<i>Chi-square</i> Statistic (p-value)		8.97 (0.000)	
Equal Slope Assumption	<i>Chi-square</i> Statistic (p-value)		34.03(0.084)	
Pearson coefficient			0.40	
Pseudo R-Square			0.18	

Note: *Steel is the reference category

Pearson's chi-square statistic for the model also confirms that the observed data is consistent with the fitted model. In case of Pearson's chi-square statistic, if the p-value is large (>.05), it is concluded that the data and the model predictions are similar. (The null hypothesis is that the fit is good and a p-value >.05 leads to acceptance of this hypothesis). The Nagelkerke R² implies that the selected variables explain approximately 18 per cent of the variation in the outcome variable - credit ratings. This is because there are many other variables considered by the rating agencies for assigning the credit ratings. Therefore,

alternative hypotheses 3 and 6 are accepted. This implies that the predictors - disclosures and industry have a significant relationship with credit ratings.

The intercepts and the beta-coefficients of the significant variables can be used to estimate the cumulative odds - the odds of being at or below a certain category for a given attribute. These also can be used to estimate the odds ratios at each split. Odds ratio describes the relative odds for being in a certain category for values of X_j differing by 1 unit (O'Connell, 2005). For unfavorable attribute (coded 0), the intercepts for each cumulative category ($\hat{a}_1, \hat{a}_2, \hat{a}_3, \hat{a}_4$ and \hat{a}_5) are the cumulative logits-the log odds of getting a rating at or below a certain category. This can be exponentiated to get the odds of a company with unfavorable attribute of being assigned a rating at or below a certain category. Similarly, cumulative logits for companies with favorable attribute (coded 1) can be found by

$$\ln(Y_i^*) = \hat{a}_i + \hat{a}_j(1).$$

As the equal slope assumption is satisfied in the given model, the beta-coefficient (logit) remains same for all the cumulative rating categories. Hence, odds ratio can be found by exponentiating the \hat{a} values of all the significant independent variables. These are presented in Table 3.

Table 3: Model (1) Odds Ratio

<i>Significant Independent Variables</i>	<i>β coefficient (logits)</i>	<i>exp^β (Odds Ratio)</i>
Disclosure practices*	-0.919	0.3980
IndustryTextile**	-1.095	0.3345
Industry Paper**	-1.613	0.1992

Note: *Reference category is favorable corporate governance attribute, **Reference category is the steel industry

Disclosures: The results indicate that companies with unfavorable disclosure policies and practices are less likely to get a higher credit rating as compared to the companies with favorable disclosure policies and practices. It implies that the odds of a company with favorable disclosure policies and practices being at or below any category are only 0.39 times the odds of a company with unfavorable disclosure policies and practices. In other words, a company with favorable disclosure policies is 2.5 times (1/0.39) more likely to be in the higher categories.

Industry: The results indicate that a company in the steel industry is likely to get higher rating category as compared to textile and paper industry. The odds of a company in

steel industry being at or below any category are 0.33 and 0.20 times the odds of a company belonging to textile and paper industry respectively. Steel industry feeds other important industries like defense, construction, railways, power, transport and so on. The steel industry is considered as the backbone of the economy and is often indicative of economic progress, as it plays a critical role in infrastructure and overall economic development. As compared to steel industry, paper and textile industry are highly fragmented and unorganized. The rating agencies consider the impact of the industry while assessing a company. Therefore, nature of the industry is an important factor for assigning ratings.

Model (2): The parameter estimates of the composite corporate governance variable and industry are summarized in Table 4. On the basis of likelihood ratio test, model (2) depicted significant relationship of credit ratings with composite corporate governance and industry (Chi-square statistic = 29.27, p-value = .000) thus, leading to acceptance of the alternative hypothesis 7. Pearson's chi-square statistic (.06) for the model also confirms that the observed data is consistent with the fitted model. The Nagelkerke R² implies that the selected variables explain approximately 11 per cent of the variation in the outcome variable i.e. credit ratings.

Table 4: Model (2) Parameter Estimates

<i>Model Estimates</i>		<i>Coefficients</i>		
Thresholds	α_1	-3.092		
(intercepts)	α_2	-2.482		
	α_3	-1.244		
	α_4	1.342		
	α_5	1.890		
<i>Explanatory Variables</i>	<i>β coefficient</i>	<i>Std. error</i>	<i>Wald test</i>	<i>p-value</i>
Composite Corporate Governance*	-0.685	.231	8.773	.003
Industry- Textile	-1.064	.284	14.000	.000
Industry-Paper **	-1.631	.400	16.668	.000
<i>Overall model fit</i>				
Log Likelihood test	<i>Chi-square</i> Statistic (p-value)		29.27	(.000)
Equal Slope Assumption	<i>Chi-square</i> Statistic (p-value)		19.85	(.07)
Pearson coefficient			0.06	
Pseudo R-Square			0.11	

Note: *Reference category is favorable corporate governance attribute, **Reference category is the steel industry

As in model (1), the intercepts and the beta-coefficient of the composite governance variable and industry variable can be used to estimate the odds ratio (by exponentiating the $\hat{\alpha}$ values of the significant independent variables). These are presented in Table 5.

Table 5: Model (2) Odds Ratio

<i>Significant Independent Variables</i>	<i>β-coefficient (logits)</i>	<i>exp^{β} (Odds Ratio)</i>
Composite Corporate Governance*	-0.685	0.5040
IndustryTextile**	-1.064	0.3450
Industry Paper**	-1.631	0.1957

Note: *Reference category is favorable corporate governance attribute, **Reference category is the steel industry

Composite Corporate Governance: The results lead to the acceptance of alternative hypothesis 7. They indicate that companies with weak corporate governance practices are less likely to get a higher credit rating as compared to the companies with strong corporate governance practices. It implies that the odds of a company with strong corporate governance being at or below any category are only .50 times the odds of a company with weak corporate governance. In other words, a company with favorable corporate governance practices is $2(1/.50)$ times more likely to be in the higher categories.

Industry: The results of model (2) also confirm that a company in the steel industry is likely to get higher rating category as compared to textile and paper industry. The odds of a company in steel industry being at or below any category are .34 and .19 times the odds of a company belonging to textile and paper industry respectively. The probability of a company in the steel industry getting higher rating is approximately same in both the models.

D. Classification Results

Table 6 presents the accuracy of the ordinal logit regression model using the corporate governance variables in classifying the credit ratings.

There is a possibility of making correct classifications even if there is no relationship between dependent and independent variable. This is referred to as accuracy by chance (Schwab, 2007). The proportional by chance accuracy rate is set at 27 per cent⁸.

Model (1) treats the four corporate governance sub-indices and industry as independent variables. The overall classification success is 44 per cent which is above the set criteria (27 per cent). It is also noted that 29 per cent of the ratings are misclassified only by a category.

⁸From Table 1, one gets $0.14^2+0.09^2+0.26^2+0.32^2+0.14^2+0.05^2) \times 1.25$.

Table 6: Classification Accuracy

Model (1)	Ratings classified by the model						
Credit Ratings	D,C	B	BB	BBB	A	AA,AAA	Total
D,C	9	0	5	23	0	0	37
B	2	0	10	10	0	0	22
BB	4	0	22	38	0	0	64
BBB	3	0	16	59	2	0	80
A	1	0	2	32	1	0	36
AA,AAA	0	0	1	11	1	0	13
Total	19	0	56	173	4	0	252
<i>Model (1) Correct Classifications 44per cent Missed by 1 Category 29per cent</i>							
Model (2)	Ratings classified by the model						
Credit Ratings	D,C	B	BB	BBB	A	AA,AAA	Total
D,C	5	0	18	14	0	0	37
B	3	0	12	07	0	0	22
BB	5	0	24	35	0	0	64
BBB	3	0	21	56	0	0	80
A	0	0	6	30	0	0	36
AA,AAA	0	0	4	09	0	0	13
Total	16	0	85	151	0	0	252
<i>Model (2) Correct Classifications 38per cent Missed by 1 Category 40per cent</i>							

Model (2) treats composite corporate governance variable and industry as independent variables. The overall classification success is 3 per cent and 40 per cent of the ratings are misclassified only by a category.

It is found that most of the instruments that are assigned higher ratings than the observed ratings belong to the speculative grade and most of the instruments that are assigned lower ratings than the observed ratings belong to the investment grade. There are around 30 per cent debt instruments that are overrated by both the models. This implies that these instruments have fared well on the corporate governance parameters. However, the rating agencies consider other factors of the issuer like financial health, market position, operating efficiencies, growth potential and so on while assessing the debt instruments. The

adverse influences of these factors may have overshadowed the positive impact of corporate governance attributes and the credit rating agency may have assigned them lower ratings. A similar argument may be given for the 27 per cent underrated debt instruments vis-à-vis observed ratings. The positive influence of other factors that are considered by the credit agencies may have negated the unfavorable corporate governance practices. It is also possible that the rating agencies are more conservative while assigning investment grade ratings.

In both the models, most of the classifications are made in categories BB and BBB with maximum correct classifications in the category BBB. Most of the classifications are made in the category BB and BBB - highest speculative category and lowest investment category. This implies that most of the companies' compliance of corporate governance requirements is mediocre. They seem to be just about complying mandatory requirements to protect themselves from any kind of scrutiny by the regulatory authorities. The results also show that companies from the steel industry are most compliant with respect to corporate governance requirements, followed by textile and paper industry.

5. Conclusion

Credit rating agencies are concerned with governance as poor governance can damage a firm's financial position and leave its stakeholders vulnerable to losses. Consistent with prior research, it is found that credit ratings are positively related to corporate governance. The empirical evidence supports the positive role of corporate governance for companies relying on debt. The time, effort and cost incurred by a company in implementing corporate governance practices may translate into good credit ratings and thus, lower the cost of debt. Thus, good governance may benefit the issuer ultimately. The findings corroborate the recommendations made by SEBI in its consultative paper on "Review of Corporate Governance Norms in India" (January, 2013) to align the existing corporate governance norms in India with the provisions of the Companies Bill 2012 and also to enhance the corporate governance practices in listed companies. In the wake of cases of financial frauds and illegal collective investment schemes, the amendments are intended to increase financial transparency and disclosure in order to lower default and remove information asymmetry. The ineffective corporate governance and inadequate disclosure have been identified as some of the reasons for recent financial crises and corporate debacles. High standards for disclosures are an elemental theme of the modern corporate regulatory system, which encompasses providing timely and accurate information to its

shareholders, lenders and potential investors. The study lays a special emphasis on the general, financial and other policy disclosure practices of a company. The companies should maintain effective communication with all its stakeholders so as to enhance public understanding of a company's activities, policies and performance with regard to environmental and ethical standards.

The statutory requirements relating to corporate governance stipulated by SEBI are intended to make the business environment trustworthy, moral and ethical. The credit rating agencies admit that the benefits that accrue to the stakeholders are more important than the mere compliance of corporate governance mechanism. The corporate governance sub-indices are not indicative of the quality of the corporate governance mechanism nor do they mean that high index will imply higher value creation for the stakeholders of the company. Nevertheless, it cannot be denied that the compliance with Clause 49 statutory regulations is the starting point for corporate governance assessment by any rating agency. An entity with higher ratings is expected to have satisfactory corporate governance practices. However, information on corporate governance alone is not enough for assigning credit ratings.

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Table A1.1: Correlation Matrix

	<i>Board of directors Pearson's coefficient Sig.(2 tailed)</i>	<i>Disclosures Pearson's coefficient Sig.(2 tailed)</i>	<i>Audit committee Pearson's coefficient Sig.(2 tailed)</i>	<i>Other Committee Pearson's coefficient Sig.(2 tailed)</i>
Board of Directors	1			
Disclosures	-.002 (.979)	1		
Audit Committee	.081 (.198)	.207*(.001)	1	
Other Commiittees	.063 (.319)	.222**(.001)	.159(.012)	1

** Correlation is significant at the 0.01 level (2-tailed), * Correlation is significant at the 0.05 level (2-tailed).

Table A1.2: Descriptive Statstics

<i>Sub-index/ Index</i>	<i>Mean</i>	<i>Median</i>	<i>Std. Deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Board of Directors	2.6014	2.57	0.67217	1.10	4.38
Disclosures	1.9320	2.04	0.81909	0.00	4.47
Audit Committee	0.7656	0.79	0.13644	0.00	1.18
Other Committees	2.6065	2.87	0.87993	0.00	3.80
Composite Corporate Governance Index	3.2633	44.8550	8.54464	13	61
Average Corporate Governance index	5.4079	5.6050	1.06809	1.63	7.63

A. Ordinal Logit Regression

This is one of the techniques recommended for the analysis of ordered, categorical, non-quantitative choices, outcomes and responses (Agresti, 2002; Greene, 2002; O'Connell, 2006). It is used when there is dependence of a polytomous ordinal response on a set of predictors, which may be categorical or continuous. This procedure is referred to as PLUM (Polytomous Universal Model) in Statistical Package for Social Sciences (SPSS). Ordinal Logit Regression generalizes basic linear regression such that it can be used for dependent variable that may not have a normal distribution. Ordinal regression does not have some of the assumptions of linear regression. To name a few, it does not assume linearity between the dependent and independent variables, normality of the variables, homoscedasticity of the dependent variable and the independent variables do not need to be metric (interval or ratio scaled). However, it assumes that dependent variable be meaningfully coded, linearity between the logit of the outcome variable and independent variables, low correlation

between independent variables, no outliers and a sufficiently large sample. An important assumption underlying ordinal regression is that the relationship between each pair of outcome groups is the same. In other words, ordinal regression assumes that the coefficients that describe the relationship between the lowest versus all higher categories of the response variable are the same as those that describe the relationship between the next lowest category and all higher categories and so on. This is called proportional odds or parallel lines or equal slope assumption.