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Financial Factors Determining CARE's Ratings

Rahul Gupta*

Abstract

Rating agencies evaluate a number of qualitative and quantitative factors while assigning rating to a particular company. Standard mathematical formulas do not exist for determining credit ratings. Instead, credit rating agencies use their experience and judgement in assigning ratings. What factors rating agencies consider significant in providing ratings to the companies is an important question. The present study aims to contribute to the above mentioned area by identifying the financial determinants of credit ratings assigned to Indian companies by CARE, one of the top rating agencies of India. Ordered probit analysis is used on unbalanced panel data with credit rating as the dependent categorical variable and six financial factors viz. size, liquidity, profitability, interest coverage, leverage, and growth as the independent variables. Results from ordered probit analysis indicate that the likelihood of credit ratings to be on higher side is more with increase of size, liquidity, profitability, interest coverage, growth and with a decrease in leverage. Further, size, profitability, and leverage are found to be statistically significant factors at the 1% level; liquidity and growth at the 5% level and interest coverage at the 10% level.

Keywords: Credit Rating, Financial Determinants, India, CARE

Introduction

In the present highly competitive & deregulated economy and rapidly growing capital market, investors place high value on the systematic assessment credit risk. Kumar and Rao (2012) defined credit risk as the risk of default to meet the debt service obligations by the borrower as and when they arise, which is considered as an important factor for investment decisions of investors. Cantor (2004) underscored credit risk as one of the most active areas of recent financial research. Most of the studies in financial research have used credit rating as a proxy measure for credit risk (Murcia, Murcia, Rover, & Borba, 2014). Standard & Poor's (S&P), one of the top global rating agencies, has defined credit rating as "the opinion of a rating agency about the ability and willingness of the issuer, may be a corporation/firm or state or city government, to meet its financial obligations in full and on time" (Standard & Poor's, 2010). In simple words, it reflects the credit worthiness of the borrowers and the probability that the borrowers will honour the principal and interest liabilities on due dates (Kaur & Kaur, 2011). Credit rating is considered important for investors and lenders as it provides to them superior information at low cost, acts as the basis for proper risk and return trade-off and induces healthy discipline on borrowers (Gordon & Natarajan, 1999; Bhalla, 2008). Further, Papaikonomou (2010) revealed that rating agencies provide valuable service for development of capital markets when they deliver a credible assessment of the default probability of the companies and their credit instruments. This consequently results in reducing the information asymmetry of the investors and enhances their confidence in investing in the rated instruments. While assigning a rating score to companies and their instruments a number of qualitative and quantitative factors are evaluated by rating agencies. Standard mathematical formulas do not exist for determining credit ratings. Instead, credit rating agencies use their experience and judgement to determine what information, both public and private, be considered in assigning a rating to a particular company (Kumar & Rao, 2012). Adams, Burton, and Hardwick (2003) stated that knowledge about these factors can assist the users in decision making. This led to the emergence of identification of rating determinants or factors affecting credit ratings as one important stream of credit rating research. This stream takes into account the probability of variation in credit ratings based on the financial characteristics of the companies and their capital market conditions (Poon &

* Research Scholar, department of Commerce, University of Jammu, J&K, India.
Email: rahulg_cool@rediffmail.com

Chan, 2008). Financial ratios and characteristics of the companies are mostly used to describe the ratings in this line of research (Bouzouita & Young, 1998).

Following this stream of research, the objective of the present study is to identify the financial factors determining the credit ratings assigned by Credit Analysis and Research Ltd. (CARE), one of the top credit rating agencies of India, to the Indian companies. Financial factors are defined as the measures which are obtained from the financial statements of an entity and are usually expressed in monetary terms. The importance of financial factors is widely accepted because their impact is easily measurable (Grunert, Norden, & Weber, 2005). The better the financial measures/indicators of an entity, the lower is its financial risk which in turn strengthens its ability to meet its financial obligations and thus expected to have a positive effect on its credit rating (Adams et al., 2003; Roje, 2005; Murcia et al., 2014; Venkiteshwaran, 2014).

The present study becomes relevant because of the lack of studies on credit ratings in the Indian context. Most of the studies on determinants of credit ratings are conducted in developed countries like UK, U.S.A., and Australia, hence, the effect in other markets, particularly in emerging economies, is still not clear. Also the factors determining credit ratings in developing countries/emerging economies have not been sufficiently analysed and their identification is an important research issue which needs to be explored further (Murcia et al., 2014). Particularly in Indian context no such study related to the determinants of credit ratings assigned to companies has been found to the best of the knowledge.

Further, most of the research on credit ratings has been confined to the ratings provided by Global rating agencies approved as Nationally Recognised Statistical Rating Organisations (NRSROs) by the U.S. Securities and Exchange Commission (SEC) and particularly to the ratings provided by the Big Three that is S&P, Moody's and Fitch. However, very few studies have used the credit ratings provided by national rating agencies, which are not recognised as NRSROs. So, the present study also gains relevance as it takes into consideration the ratings assigned by CARE, one of the top Indian credit rating agencies.

Review of Literature

This section has two divisions. The first division relates to the review of literature on CARE and the second division highlights the review of literature related to the factors affecting credit ratings.

Credit Analysis and Research Ltd. (CARE)

CARE was incorporated in April 1993, and is a credit rating information and advisory services company. It was promoted by Industrial Development Bank of India (IDBI) in joint collaboration with Canara Bank, Unit Trust of India (UTI), private sector banks and financial services companies (Kaur & Kaur, 2011). It is one of the top rating agencies of India, the other two being Credit Rating and Investor Services of India Ltd. (CRISIL) and Investment Information and Credit Rating Agency of India Ltd. (ICRA). CARE is recognised and approved by the Securities and Exchange Board of India (SEBI) as well as the Reserve Bank of India (RBI) and both the institutions use the ratings provided by these agencies for various regulatory purposes (Kumar & Rao, 2012). The rating process followed by CARE for assigning the ratings is as depicted in Fig. 1.

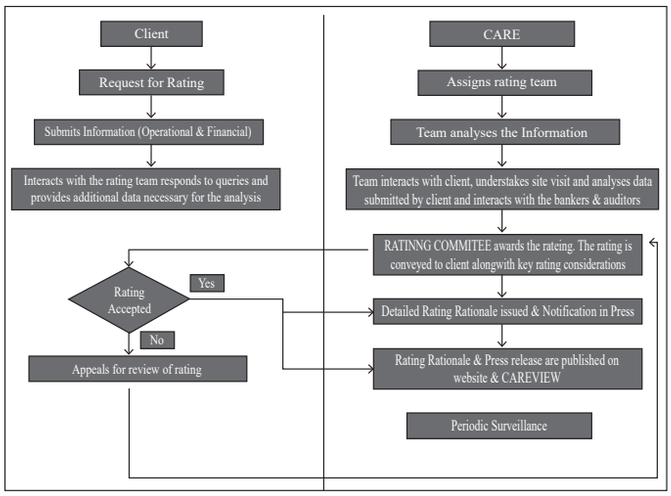

Fig. 1: Rating Process Followed by CARE

Source: www.careratings.com/get-rated/get-rated.aspx

The long term debt rating symbols and definitions used by CARE are given in Fig. 2.

Symbols	Rating Definition
CARE AAA	Instruments with this rating are considered to have the highest degree of safety regarding timely servicing of financial obligations. Such intruments carry lowest credit risk.
CARE AA	Instruments with this rating are considered to have high degree of safety regarding timely servicing of financial obligations. Such instruments carry very low credit risk.
CARE A	Instruments with this rating are considered to have adequate degree of safety regarding timely servicing of financial obligations. Such instruments carry very low credit risk.
CARE BBB	Instruments with this rating are considered to have moderate degree of safety regarding timely servicing of financial obligations. Such instruments carry very low credit risk.
CARE BB	Instruments with this rating are considered to have moderate risk of default regarding timely servicing of financial obligations.
CARE B	Instruments with this rating are considered to have high risk of default regarding timely servicing of financial obligations.
CARE C	Instruments with this rating are considered to have very high risk of default regarding timely servicing of financial obligations.
CARE D	Instruments with this rating arein default or are expected to be in default soon.

Modifiers {"+" (plus) / "-" (minus)} can be used with the rating symbols for the categories CARE AA to CARE C. The modifiers reflect the comparative standing within the category.

Fig. 2: Long Term Debt Rating Symbols and Definitions Used by CARE

Source: www.careratings.com/market-segments/corporates-debt-rating.aspx

CARE issues the rating based on the information provided by the company, in-house databases and data from other sources that it considers reliable. The analytical framework of CARE's rating methodology is divided into two interdependent segments. The first deals with the operational characteristics and the second with the financial characteristics. Besides quantitative factors, qualitative aspects like assessment of management capabilities play a very important role in arriving at the rating for an instrument. The relative importance of qualitative and quantitative components of the analysis varies with the type of issuer. The Rating is provided on the basis of experienced and holistic judgement, based on the relevant quantitative and qualitative factors affecting the credit quality of the issuer.

Financial Factors Affecting Credit Ratings

Rating agencies analyse a number of financial factors (like liquidity, profitability, leverage, etc.) while assigning the ratings to the companies (ICRA, 2009; Ministry of Finance, 2009). A number of studies have explored the financial determinants of credit ratings in a foreign context.

Adams et al. (2003) identified the factors that influence the ratings assigned to UK-based direct insurers by two of the leading global rating agencies- A.M Best and S&P. Regarding A.M Best's ratings, the findings revealed liquidity, organisational form and profitability to have a significant positive association with credit ratings. However, regarding S&P's ratings, the study reported that profitability and liquidity are positively and significantly related to while leverage is negatively but significantly related to credit ratings. Another study by Roje (2005) examined the accounting variables' role in explaining long term credit ratings. The study revealed that profitability, size, and tangible book value to total assets are positively related, whereas leverage, long term debt, current ratio, volatility of earnings, and sales growth are negatively related to credit ratings. The study also remarked that all the variables are significantly associated with credit ratings. Further, leverage and sales growth are reported to be less important than other variables in the study. A study by Bone (2010) tried to verify whether or not it is possible to predict corporate ratings using a set of financial indicators in the case of a world renowned Argentine oil company. The study found earnings (EBITDA) and short term debt over total debt (STD/TD) to be the most relevant indicators in predicting the selected company's rating.

Al-khawaldeh (2012) evaluated the impact of the firm characteristic factors upon the credit rating of Jordanian firms. The study concluded profitability to be positively associated with credit rating, and leverage and loss propensity to be negatively related to credit ratings. Further,

size and growth potential are reported to be strongly and positively associated with credit ratings whereas the type of sector and audit found to have no relation with credit ratings. A comprehensive study by Murcia et al. (2014) in Brazil reported five factors, namely leverage, internationalisation, performance in the financial market, profitability and growth as significant determinants of credit ratings. The study suggested that a considerable work has been done in the US and other developed countries on determinants of credit rating. However, a little work in this context has been done in emerging economies like India and the effect in these economies is still unclear. Venkiteshwaran (2014) examined the impact of corporate assets' turnover on credit rating. The study concluded the likelihood of higher credit ratings is more with higher turnover in corporate assets. Thus, there is a dearth of literature available on the credit rating system on Indian companies identifying the various financial factors which are significant for getting a high credit score.

Methodology

This section is divided into two parts. First, data collection steps and the various variables along with their proxies are given. Then the statistical technique applied is discussed.

Data and Sample

To achieve the objectives, the present study considered Indian companies' ratings and financial information for the period 2009-15, which is available in PROWESS database. PROWESS is a database of Indian companies' financial performance created by The Centre for Monitoring Indian Economy Pvt. Ltd. (CMIE). It covers listed companies, public limited companies, government companies, some private limited companies, some cooperatives and even some business entities other than companies. The annual report of the company is the most important source of the database. For listed companies, PROWESS also provides data sourced from the stock exchanges which includes share prices, changes in capital structure, and announcements made by the companies or by the exchanges. The database also contains public information released by the rating agencies on their websites and in the media. Prowess provides time-series data beginning 1989-90 and it is updated every day.

Regarding the dependent variable i.e RATING, the credit ratings issued by CARE during the period 2009-15 for companies registered and operating in India were used, which were available in the PROWESS database. The period of 2009-15 is selected because very few credit rating observations were available in the database before 2009 and the data after the year 2015 was not fully updated for all the companies at the time of data collection. The study focuses on CARE's ratings only because CARE is the rapidly growing credit rating agency in India. Almost its entire revenue is coming from the rating business and it has a much better operating margin and profit after tax than other rating agencies like CRISIL and ICRA.

Like other previous studies (Roje, 2005; Kang & Liu, 2007), the present study utilises long-term debt rating issued to companies by CARE. Financial firms are excluded from the final sample, because of their different standards of accounting and differences in interpretation of various ratios (Murcia et al., 2014). Further, only the rating as on 31st March of every year of the selected period for every company has been considered. The ratings have been originally classified into eight categories. However, very few companies have been assigned ratings of 1, 2, 3, and 8. So, ratings classes have been redefined by incorporating ratings 1, 2, and 3 into class 4 and rating 8 into class 7 and finally a 4 level classification has been used in the study. The original and new classifications are as described in Table 1.

Table 1: Credit Rating Categories

Rating	Category Original	Category Final
CARE AAA	8	4
CARE AA+, CARE AA, CARE AA-	7	
CARE A+, CARE A, CARE A-	6	3
CARE BBB+, CARE BBB, CARE BBB-	5	2
CARE BB+, CARE BB, CARE BB-	4	1
CARE B+, CARE B, CARE B-	3	
CARE C	2	
CARE D	1	

Source: Author's own

Six financial variables, namely size, liquidity, profitability, interest coverage, leverage and growth and are considered as independent variables in the present study. The proxies considered in the present study to represent the independent variables are summarised in Table 2.

Table 2: Proxies Used for Independent Variables

Variable	Proxy
SIZE (Size)	Sales Turnover
LIQ (Liquidity)	Current Ratio (Current Assets/Current Liabilities)
PROF (Profitability)	Profit after Tax
COV (Interest coverage)	Interest Coverage Ratio (EBIT/Interest)
LEV (Leverage)	Debt/Equity
GRO (Growth)	[(Total Assets) IInd Year – (Total Assets)Ist Year] / (Total Assets)Ist Year

Source: Author's own

During the period of study the relevant data were available for 140 companies. So, our dataset represents an unbalanced panel structure with 648 observations representing 140 companies for the period 2009-15. Since the value of PROF, COV and GRO can be negative, which can lead to the wrong interpretation and results by the statistical technique applied, these variables are converted to positive values by adding the minimum (most negative) value of each variable from the other values of the respective variables. Also normalisation of the data is done by taking the natural log of the values of all the independent variables, and these logged variables are then finally used in the analysis.

Statistical Technique

Since the dependent variable (RATING) is an ordinal variable, the present study follows prior research (e.g., Adams et al., 2003; Attig, Ghoul, Guedhami, & Suh, 2013; Venkiteshwaran, 2014) and use an ordered probit model instead of the standard linear regression model (OLS). The main feature of an ordered model is the existence of an ordinal discrete dependent variable This model is more appropriate than the usual regression ones, due to the ordinal and discrete nature of the rating (Bone, 2010). A variable is said to be ordinal if its values indicate categories having some sort of ranking, for example, degree of satisfaction. Though it does not represent a scale variable, the different levels can be ordered like highly satisfied, satisfied, etc. Same applies to credit ratings, that are designated in categorical terms (BB, A, AA, etc.) which represent a variable capacity to fulfil debt obligations. Only the order among the various values can be inferred, but not the actual difference among them (Murcia et al., 2014).

In ordered probit analysis, the dependent ordinal variable is related to a set of independent variables through an unobservable linking variable. In the present study, the credit rating as a dependent variable map into a partition of the range of the linking variable. Like other discrete choice models, there is no conditional mean function for interpretation as the dependent variable, which is the rating level in the present study, is just an ordered label for a non-quantitative outcome. In ordered choice models, neither the magnitude nor the signs of the estimated coefficients can be interpreted. Only the partial effects of independent variables on the probabilities of the dependent variable are meaningful. The only certain thing about the sign of the coefficients is that a positive sign represents that an increase in the independent variable will result in a corresponding increase in the probability associated with the highest value of the dependent variable (Greene & Hensher, 2010 cited in Venkiteshwaran, 2014). The statistical model for the present study is given as:

$$RATINGit = \beta0 + \beta1SIZEit + \beta2LIQit + \beta3PROFit + \beta4COVit + \beta5LEVit + \beta6GROit + eit$$

where RATING is the dependent variable having ordinal values from 1 to (1 being the lowest and 84 being the highest category); SIZE, LIQ, PROF,….., GRO are the selected independent variables; β's are the coefficients of the respective independent variables; 'i' represents different companies; 't' represents time and 'e' represents the error term.

Results

Descriptive Analysis of Independent Variables

The descriptive analysis covering the respective minimum value, maximum value, mean and standard deviation of the independent financial variables is provided in Table 3.

Table 3: Descriptive Analysis of Independent Variables

Variables	N	Minimum	Maximum	Mean	Standard deviation
SIZE (Crores)	648	17.85	107438.67	3100.29	9219.04
LIQ (Times)	648	0.10	9.35	1.19	0.62
PROF (Crores)	648	247.64	3699.60	1614.36	278.11
COV (Times)	648	3.06	229.83	11.04	14.46
LEV (Times)	648	0.01	58.22	1.82	3.32
GRO (Times)	648	0.00	4.84	0.79	0.25

Source: Author's compilation

Stationarity

While working with time series data, one important thing to be analysed is its stationarity. A time series is said to be stationary when its mean and variance does not change systematically over time. The behaviour of a non-stationary time series can be examined only for the time period under consideration and its generalisation to other time periods is not possible. Therefore, non-stationary time series do not possess a high practical value for the purpose of forecasting (Gujarati, 2004). The stationarity of the data in the present study is established by the most widely used test of stationarity i.e the unit root test. In the terminology of time series analysis, a stationary time series is said to be integrated of zero order, or in short I(0). But it is an I(1) series, if one difference operation is needed to get stationarity. And a time series is I(n) if 'n' difference operations are needed to achieve stationarity. An I(0) series is without any roots on or within the unit circle, but an I(1) or integrated time series of higher order possess roots on or within the unit circle. So, analysing the existence of unit roots is considered similar as that of examining stationarity in the time series (Wang, 2005). The null hypothesis in a unit root test is the presence of a unit root, i.e., the non-stationarity of the series. The alternative hypothesis assumes the stationary of the series. The rejection of null hypothesis indicates the stationarity of the time series.

Levin, Lin, and Chu (LLC) test has been used to identify the stationarity of the relevant variables. The LLC considers the heterogeneity of various sections but because of the serial correlation, that cannot be eliminated completely, it is less effective in testing small samples. It assumes that the individual processes are cross-sectionally independent and all the series are presumed to be stationary under the alternative hypothesis In the present study, the probability value of all the variables, as per LLC test, is below 0.05 (at 5% significance level). This shows that all the variables are stationary or without any unit root at level i.e. I(0). Results of the panel unit root test for each variable is presented in Table 4.

Table 4: Unit Root Test Results

Variables	Levin, Lin and Chu test		Results
	Level		
	T-stat	Prob. Value	
CREDIT RATING	-7.01	0.00	I(0)*
SIZE	-18.49	0.00	I(0)
LIQ	-15.09	0.00	I(0)
PROF	-32.96	0.00	I(0)
COV	-28.18	0.00	I(0)
LEV	-10.15	0.00	I(0)
GRO	-22.32	0.00	I(0)

* I(0) means Stationary at level

Source: Author's compilation

Results of Ordered Probit Model

Table 5 shows the results of the ordered probit model, along with the significance and respective coefficient for each variable.

Table 5: Results of Ordered Probit Model

	Coefficient	Standard Error	Z	P>z
SIZE	1.046302	0.082497	12.68	0.00
LIQ	0.474789	0.226483	2.10	0.03
PROF	2.084438	0.664504	3.14	0.00
COV	0.724488	0.418815	1.73	0.08
LEV	-1.364504	0.152478	-8.95	0.00
GRO	0.992482	0.459022	2.16	0.03

Number of obs. = 648 *LR chi2 = 369.34*

Prob > chi2 = 0.0000 *Pseudo R2 = 0.2089*

Source: Author's compilation

The likelihood ratio chi-square of 369.34 along with a p-value of 0.0000 shows that the model is statistically significant as a whole, in comparison to the null model having no predictors. Pseudo R-squared, a nonlinear. A value of a 0.2089 is quite satisfactory considering a cross-section data set of 648 observations.

The respective signs of the coefficients of the independent variables describe their relationship with credit rating as the dependent variable. Regarding the size of the company, measured in terms of sales turnover, the results show a positive relationship with credit ratings assigned. So, it can be inferred that with an increase in size credit rating is more likely to be on the higher side as firms with larger size possess more opportunities and resources to spread their risks over a bigger range of markets and products and they provide lower risk to the investors (Ashbaugh-Skaife, Collins, & LaFond, 2006; Aman & Nguyen, 2013). Further, size is found to have a statistically significant relationship with credit rating at 1% level as indicated by the p value of 0.00. Similar results are reported by the studies of Roje (2005), Ashbaugh-Skaife et al. (2006), Aman and Nguyen (2013) and Attig et al. (2013). Credit rating is also found to be positively related to the liquidity position of the company and tends to be on the higher side with an increase in liquidity as higher liquidity indicates a better ability of a company to balance its current liabilities with current assets, which can be easily converted into money which in turn indicates less risky position of the company (Roje, 2005). Also the p value of 0.03 indicates liquidity to be a statistically significant predictor of credit rating at 5% level. These results are also supported by the earlier study of Adams et al. (2003). Again, as expected, the positive sign of the coefficient reflects that with the increase in profitability the likelihood of the credit ratings on better side is more because profitable firms provide much better guarantees to holders of the debt that their debts will be repaid (Aman & Nguyen, 2013). Also the assessment of profitability helps regulators of the industry and financial analysts to analyse the firm's ability for investing the surpluses effectively and efficiently in generating new business (Adams et al., 2003). There exists statistically significant effect of profitability on credit rating at 1% level as indicated by the corresponding p value of 0.000. Previous studies of Adams et al. (2003), Roje (2005) and Murcia et al. (2014) support the results.

Results further depict positive relationship between interest coverage and credit rating which means that the probability of getting higher credit rating increases with increase in interest coverage. The reason might be that this ratio reflects the ability of the company to generate cash flows to cover interest expenses and its higher values reflect lower default risk and are likely to enhance corporate credit ratings (Attig et al., 2013). It is also found to be a significant determinant of credit rating but at 10% level.

Negative and significant relationship is found between leverage, proxied by debt-equity ratio, and credit rating. So, it can be inferred that increase in leverage shifts the likelihood of credit ratings towards lower side. This might be due to the reason higher leverage means more indebtedness which indicates a more risky position of the company. Similar results are established by the previous studies of Roje (2005), Ashbaugh-Skaife et al. (2006), and Murcia et al. (2014). The results also signify positive relationships between growth (measured by change in total assets) and credit rating. Further, the p value of 0.03 indicates that growth is a statistically significant determinant of credit rating at 5% level. Higher growth reflects favourable conditions of the company and industry and presents good prospects for future financial performance and improvement in economic value and thus helps the company in obtaining a higher credit rating.

Thus, the selected variables are found to be relevant factors determining the credit ratings. The variables size, profitability and leverage are found to be statistically significant factors at the 1% level; liquidity and growth at the 5% level and interest coverage at the 10% level.

Conclusion

How rating agencies provide ratings to the companies poses an important question both from the academicians and practitioners perspective. While a considerable research has been done on determinants of credit ratings in the US and other developed countries and that too on the ratings provided by global agencies, little is known in this context in emerging economies like India and on the ratings provided by local agencies. So, the present study identifies the financial determinants of credit rating assigned to Indian companies by the one of the top credit rating agencies of India i.e., CARE. Ordered Probit Model analysis is employed on an unbalanced panel data with credit rating being the dependent variable and six explanatory variables, namely: size, liquidity,

profitability, interest coverage, leverage, and growth. The sample comprises of 648 credit rating observations assigned to Indian companies during the period 2009-15 by the selected agency. The analysis in the study shows that the likelihood of credit ratings to be on higher side is more with increase of size, liquidity, profitability, interest coverage, growth and with a decrease in leverage. Further, size, profitability and leverage are found to be statistically significant factors at the 1% level; liquidity and growth at the 5% level and interest coverage at the 10% level.

In the present study ratings provided only by CARE are considered. So, in future other rating agencies of India can also be included. Further, the present study identifies only the financial determinants of credit ratings whereas in future non-financial determinants can also be studied. Also, comparative studies on the determinants of credit ratings provided by different rating agencies can be done in future.

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