



Research Paper

A Study on Significant Differences in Credit Ratings by Rating Agencies in India

Pramita Kastha

¹(Dept. of Electronics and Communication Engineering, Indian Institute of Technology, Kharagpur)

ABSTRACT: Credit rating of companies have been gaining a lot of importance lately, especially after the US financial crisis. Investors use these ratings as important information for various financial purposes and investment decisions. In this paper, we investigate if there were any differences in the credit ratings provided by different credit rating agencies to the same companies through statistical analysis, and if any, why so.

KEYWORDS: Credit Rating, Credit Rating Agencies, Standard Deviation, Paired Difference t-Test

Received 06 June, 2021; Revised: 18 June, 2021; Accepted 20 June, 2021 © The author(s) 2021.
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I. INTRODUCTION

Credit ratings are letter designations assigned by credit rating agencies, which evaluate the credit worthiness of a debtor (a company in the case of corporate credit ratings) based on its ability to pay back debt and the likelihood of default. (Kaur & Kaur, 2011) in their study on rating methodologies of credit rating agencies said Credit Rating is the symbolic indicator of current opinion of rating agencies regarding the relative capability of issuer of debt instrument, to service the debt obligations as per contract. The corporations with specialized functions namely, assessment of the likelihood of the timely payments by an issuer on a financial obligation is known as Credit Rating Agencies.

II. PROBLEM DEFINITION

ICRA Limited and CRISIL, India's two biggest credit rating agencies' rating rationale includes analyzing business risk as well as financial risk, yet sometimes their credit ratings for the same companies differ. This difference in the ratings by two agencies for the same companies created a lot of confusion and some of the companies' ratings were inflated in the US, and when these agencies suddenly downgraded the ratings, it led to a crisis, which is now known as the subprime crisis. Therefore, our problem lies in the difference in the credit ratings assigned by different Credit Rating Agencies to the same companies in India, if any, which was one of the major reasons of subprime crisis in the US. Although Credit Rating Agencies have different concepts and measurements of the probability of default, various studies found a great similarity for investment grade ratings (Cantor and Packer, 1997). There have also been evidences of difference in rating scales once we move beyond the two largest agencies. For example, ratings for the same issuer tend to be lower for the two largest agencies (CRISIL & ICRA) as compared to others such as CARE, FITCH etc. The difference in the ratings is usually due to different rating scales or simply the selection bias. If all agencies rate all firms, then differences in the agencies' average ratings can be interpreted as differences in their rating scales, however many firms do not get rated by other agencies such as CARE, CIBIL, FITCH, as a result observed differences between the ratings of these agencies may reflect the effects of sample selection bias. The selection bias is important because issuers that expect a low rating from a third agency are unlikely to request one. The major problem is while both the agencies have equivalent rating grades and scales (ranging from AAA to D for both CRISIL & ICRA) and almost all investors/analysts/ regulators treat these ratings as the same, yet there are subtle differences in what the credit ratings for the two agencies measure. (Ghosh, 2013) in his study of differences in S&Ps and Moody's Credit ratings mentioned that CRISIL ratings are the opinions on the probability of default by a corporate and Moody's ratings are based on expected losses reflecting both the probability of default and expected financial losses i.e Loss Given Default. Our problem essentially is that is there any difference in the ratings assigned by CRISIL & 12 ICRA to the same companies and we will try to analyze if there is any difference or not by using statistical comparison of the long-term debt rated by CRISIL &

ICRA. Although (Kaur & Kaur, 2011) in their study Credit Rating in India, used profitability ratios to assess whether there is any difference and found out that rating agencies use consistent methodology while assigning a particular rating grade and there was no significant difference in the value of all ratios that belonged to different sets of similarly rated companies yet there were some exceptions to the quick ratio of AA rated companies by CRISIL as there was significant difference in this ratio. In the next section, we will try to state the objectives and methodology and then statistically try to prove if there are actually any significant differences in the ratings.

III. OBJECTIVE

CRISIL and ICRA are India's two biggest and most important credit rating agencies and their ratings are widely used for both regulatory and investment purposes. While both agencies have equivalent rating grades (ranging from AAA+ to D) yet there are some subtle differences in what the credit ratings for two agencies measure. This was one of the reasons of the subprime crisis in the US. The main objective of the paper is to assess the consistency in rating methodology of each individual rating agency by taking companies belonging to same rating class (within group) including AAA, AA, A and BBB as sample and with the help of statistical tools, analyzing the significant differences in the ratings, if any. The objective of this study is to find the significant differences in credit ratings by CRISIL and ICRA in India. A statistical comparison of credit ratings from the two agencies segmented by industry sectors, listed or non-listed; has been analyzed to see whether there are any clear differences between them. The differences will be analyzed by comparing the companies on the basis of ratings given by both the agencies, then on the basis of industry to see whether there are any differences in the ratings assigned for that industry segment, then the market capitalization will also take into account and finally bifurcation on the basis of whether the company is listed or not listed and if there are any significant differences between the listed companies and not listed companies rated by both CRISIL and ICRA.

IV. RESEARCH METHODOLOGY

4.1 DATA AND SOURCES OF DATA

We use ratings data for Indian companies (both listed and non-listed). The sample size is restricted by data availability, i.e., we select only those companies which are rated by CRISIL as well as ICRA both. The data includes the companies which are currently rated by both CRISIL and ICRA and whose ratings have not been suspended or withdrawn. The data is taken from secondary sources and it is readily available from various electronic sources such as Bloomberg, Thomson Reuters, CRISIL rating scan, ICRA's website and rating guide. For this study the dataset has been limited to the Indian Companies and their long-term ratings. The list of companies includes listed as well as non-listed companies. The main concern here is that the universe of firms rated by both CRISIL and ICRA is much smaller than the total firms that are rated by either one of them or any other agency. This is because getting a credit rating involves a huge cost and therefore not many companies get themselves rated by more than one agency. Out of the total companies i.e., 15544 only 280 had credit ratings from both the agencies as on March 31, 2014. The common companies are much lower as it also includes Private Limited companies which are generally rated by only one agency. The data has been sorted according to the industry to which each company belongs to and with their ratings and market capitalization and will be analyzed corresponding to these parameters. The following table shows the classification of ratings as to what each rating signifies regarding the safety and the risk of default.

Table 1: Ratings Classification

Ratings	Classification
AAA	Highest degree of safety regarding timely servicing of financial obligations, lowest credit risk
AA	High degree of safety, very low credit risk
A	Adequate degree of safety, low credit risk
BBB	Moderate degree of safety, moderate credit risk
BB	Moderate risk of default
B	High risk of default
C	Very high risk of default
D	Ratings are in default or expected to be in default

For the long-term ratings modifiers {"+" (plus) / "-"(minus)} can be used with the rating symbols for the categories [ICRA] AA to [ICRA] C. The modifiers reflect the comparative standing within the category.

Since letter ratings cannot be easily analyzed by statistical methods, therefore number ranks from 0-19 have been assigned to each rating notch starting with AAA assigned as 0. The higher number represents a lower rating and lower credit strength. The difference in ranks (rating gap) will help in measuring the number of notches that a long-term rating by the two agencies differs from each other. For the purpose of this paper a positive rating gap will represent a higher CRISIL rating as compared to ICRA's rating. So, for example, if the

long-term rating for a company rated by CRISIL is BBB+ and BBB- by ICRA, then the rating gap is +2 and on the other hand if the rating by CRISIL is BBB- and rating by ICRA is BBB, then the rating gap is -1.

Table 2: Ranking chart for CRISIL and ICRA's ratings

CRISIL	ICRA	Rank
AAA	AAA	0
AA+	AA+	1
AA	AA	2
AA-	AA-	3
A+	A+	4
A	A	5
A-	A-	6
BBB+	BBB+	7
BBB	BBB	8
BBB-	BBB-	9
BB+	BB+	10
BB	BB	11
BB-	BB-	12
B+	B+	13
B	B	14
B-	B-	15
C+	C+	16
C	C	17
C-	C-	18
D	D	19

The companies chosen belonged to several different industries and have been classified by us into 13 different industries for the purpose of comparison. The industries are namely; Technology, Media & Telecom, Financial Institutions, FMCGs, Auto & Auto components, Metals & Mining, Chemicals, Pharmaceuticals & Textiles, Construction & engineering, Oil & Gas, Education, Health & Consumer Service, Containers & Packaging, Distribution, Electrical Equipment, F&B. These industries have also been assigned ranks from 1-13 respectively. The following table represents the industry sectors along with their ranks for the purpose of statistical analysis.

Table 3: Industry classification and Ranks

Industry	Rank
Auto and Auto Components	1
Chemicals, Pharmaceuticals and Textiles	2
Construction and Engineering	3
Containers and Packaging	4
Distribution	5
Education, Health and Consumer Services	6
Electrical Equipment	7
F & B	8
Financial Institutions	9
FMCG	10
Metals and Mining	11
Oil, Gas and Power	12
Technology, Media and Telecom	13

Now, since we have ratings from the two agencies for the same set of firms, a paired test would be more relevant for our dataset. We also classify the companies on the basis of whether they are listed or non-listed and assign them ranks for the purpose of statistical comparison. The companies that are listed are coded as

1 and those which are no listed are coded as 0. The following table represents the ranks to the listed/ non-listed companies.

Table 4: Ranks to the listed/non-listed companies

Company	Rank
Listed	1
Non-Listed	0

So, we have a sample of 280 companies with ratings obtained from CRISIL as well as ICRA (given the codes 1-19). Along with this, our dataset also consists of industry codes (from 1-13).

4.2 The Experiment

Using the dataset constructed as mentioned above, we use the Paired Difference t Test to check- (i) whether there is a significant difference in ratings for all companies, (ii) whether there is a significant difference in ratings for companies disaggregated by industry sectors and (iii) whether there is a significant difference in ratings for companies disaggregated by industry sectors. The Paired Difference t Test compares one set of measurements with a second set from the same sample. It is often used to compare before and after scores in experiments to determine whether significant change has occurred. A *t*-test is any statistical hypothesis in which the test statistic follows a Student's *t* distribution if the null hypothesis is supported. It can be used to determine if two sets of data are significantly different from each other.

The formula for *t*-test is-

$$t = \frac{\bar{x} - \Delta}{s/\sqrt{n}}$$

In the above formula, \bar{x} is the mean of the change scores, Δ is the hypothesized difference (0 if testing for equal means), *s* is the sample standard deviation and *n* is the sample size.

A paired difference t test will be used to test the null hypothesis that the average ratings from both agencies do not differ significantly. We run the tests for overall sample, individual industry sectors, listed and unlisted companies and companies on basis of their market capitalization, which will help us to find the trends in differences in credit ratings. We will be using simple t test (paired difference of means test) first, as our objective is to see if any significant difference is there in the means of population. The t test is conducted on paired data where the null hypothesis would be that there are no significant differences in the means of the ratings given by CRISIL and ICRA. The paired *t* test assumes that the data are measured on an interval or a ratio scale and are normally distributed.

For the purpose of our analysis, we will use hypothesis testing.

Null hypothesis: $H_0: \mu_1 = \mu_2$ (There is no significant difference in the ratings by two agencies)

Alternate hypothesis: $H_1: \mu_1 \neq \mu_2$ (There is a significant difference in the ratings by two agencies) Significance level is $\alpha = 0.05$

μ_1 = mean value of the ratings assigned ICRA to the same set of companies. μ_2 = mean value of the ratings assigned ICRA to the same set of companies.

With the help of the methodology explained above, we would perform statistical paired sample t test and analyse the results on the basis of tables obtained from performing the test. This will help us in checking whether our null hypothesis is true or false, i.e whether there are any significant differences in the ratings assigned by CRISIL and ICRA limited to the same set of companies. The test would be performed for all companies, companies belonging to specific industry, i.e industry wise whether the significant difference is there or not for any particular industry and also whether there is any significant difference for companies which are listed or non-listed.

V. RESULTS AND DISCUSSION

The following tables shows the results of the paired sample test conducted for all the companies to check whether there are any significant differences in the ratings assigned by ICRA and CRISIL to the common set of companies.

Table 5: Paired Sample Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1: ICRA CRISIL	10.3679	280	4.87886	0.29157
	10.7357	280	5.41948	0.32388

The above table shows the mean of the ratings by both ICRA and CRISIL and there is a positive gap between the two, which is 0.36786. This means that CRISIL has given higher ratings to the companies in general as compared to ICRA.

Table 6: Paired Samples Test

	Paired Differences					t	df ^a	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of Difference				
				Lower	Upper			
All ICRA- Companies: CRISIL	-0.36786	2.17769	0.13014	-0.62404	-0.11167	-2.827	279	0.005

From the above tables, it is clear that CRISIL had higher average ratings than ICRA at a significance level 0.05. Now according to Table 6, t statistic is -2.827 with 279 degrees of freedom. The p value is 0.005 which is lower than 0.05. Therefore, if $p < 0.05$, we reject the null hypothesis.

Table 7: Industry wise test scores and significance values for statistical tests

Industry		Paired Differences					t	df ^a	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of Difference				
					Lower	Upper			
Auto and Auto Components	ICRA-CRISIL	0.47619	2.37948	0.51924	-0.60693	1.55931	0.917	20	0.370
Chemicals, Pharmaceuticals and Textiles	ICRA-CRISIL	-0.78049	2.16232	0.33770	-1.46300	-0.09798	-2.311	40	0.026
Construction and Engineering	ICRA-CRISIL	-0.66667	1.75810	0.26208	-1.19486	-0.13848	-2.544	44	0.015
Containers and Packaging	ICRA-CRISIL	0.42857	0.78680	0.29738	-0.29909	1.15624	1.441	6	0.200
Distribution	ICRA-CRISIL	0.61905	1.96153	0.42804	-0.27383	1.51193	1.446	20	0.164
Education, Health and Consumer Service	ICRA-CRISIL	-0.386667	2.87518	0.74237	-5.45889	-2.27444	-5.209	14	0.000
Electrical Equipment	ICRA-CRISIL	-0.33333	0.65134	0.18803	-0.74717	0.08051	-1.773	11	0.104
F&B	ICRA-CRISIL	-0.26471	1.60130	0.27462	-0.82343	0.20402	-0.964	33	0.342
Financial Institutions	ICRA-CRISIL	-0.26087	1.35704	0.20008	-0.14212	0.66386	1.304	45	0.199
FMCG	ICRA-CRISIL	1.000	4.79583	2.14476	-4.95481	6.95481	0.466	4	0.665
Metals and Mining	ICRA-CRISIL	0.06667	2.76371	0.71359	-1.46383	1.59716	0.093	14	0.927

From the results obtained in Table 7, we can conclude that most of the industries had statistically no significant differences between

CRISIL and ICRA ratings. The only exceptions were three industries namely Chemicals, Pharmaceuticals & Textiles and Construction & Engineering and Education, Health & Consumer Services that in total constituted 101 companies out of the total dataset of 280 companies. For Chemicals, Pharmaceuticals & Textiles, the t value was -2.311 and the p value was 0.026 that was lower than 0.05. Therefore, we rejected the

null hypothesis and conclude that there is a significant difference in ratings assigned by CRISIL and ICRA to the companies belonging to this industry sector. Similarly, for Construction & Engineering, the t value was 2.544 and p value was 0.015 that was lower than 0.05 and therefore the null hypothesis is rejected. The same way for the industry Education, Health & Consumer Services, the t value was -5.209 and the p value was 0.000 that was lower than 0.05 and null hypothesis was rejected. For the remaining 10 industries, the statistical tests show that there were no significant differences in ratings obtained by companies from CRISIL and ICRA.

Now we will also check for the significant differences in ratings obtained by companies by both the agencies on the basis of their listing, i.e., whether the companies are listed or non-listed. The following table provides the statistical scores for listed companies rated by both CRISIL and ICRA Limited.

Table 8: Statistical scores for listed companies

	Paired Differences					t	df ^t	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of Difference				
				Lower	Upper			
Listed Companies: ICRA-CRISIL	0.12500	1.09985	0.19443	-2.7154	0.52154	0.643	31	0.525

From table 8, the t value is .643 and the p value is .525. The p value i.e., $.525 > 0.05$, which means that we do not reject the null hypothesis. Hence, we conclude that for listed companies there is no significant difference in the ratings given by CRISIL and ICRA. Now we will see whether there is any difference in the ratings obtained by non-listed companies. The following table shows the statistical scores for non-listed companies.

Table 9: Statistical scores for non-listed companies

	Paired Differences					t	df ^t	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of Difference				
				Lower	Upper			
Non-Listed Companies: ICRA-CRISIL	-0.43145	2.27363	0.14438	-0.71582	-0.14709	-2.988	247	0.003

Table 9, gives us the t statistic value for non-listed companies i.e., -2.988 and the p value is 0.003. Since p value i.e., $0.003 < 0.05$, we reject the null hypothesis and conclude that there is a significant difference in the ratings obtained by them from two different credit rating agencies such as CRISIL and ICRA. Thus, we know that out of our total dataset, i.e. 280 companies only 32 were listed and the rest were non-listed and hereby we conclude that since there is a significant difference in the ratings of non-listed companies, three core industries such as chemicals, pharmaceuticals & textiles; education, health & consumer service and construction and engineering and also for the overall companies there is a significant difference in the credit ratings obtained by two different rating agencies, in general ratings given by two credit rating agencies (CRISIL & ICRA) differ from each other significantly. There is no concrete reason as to why this difference but it has observed that credit ratings are often subjective.

Overall, it appears that ICRA has a bias towards lower rating as compared to CRISIL. It is imperative for investors, regulators and analysts to note that the two ratings are not equivalent and should not be treated as the same as it provides valuable insights to investors in taking financial investment decisions as these credit ratings help them to compare risks associated with it and offers diverse views on the creditworthiness of an investment.

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