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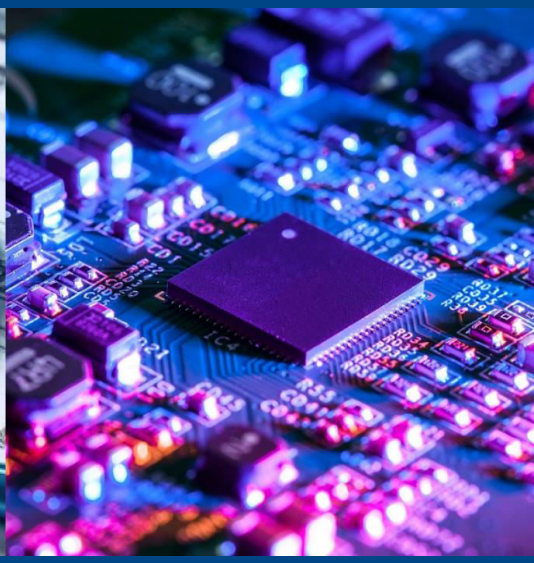

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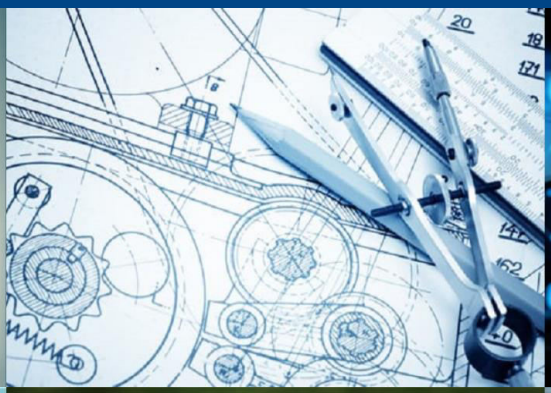

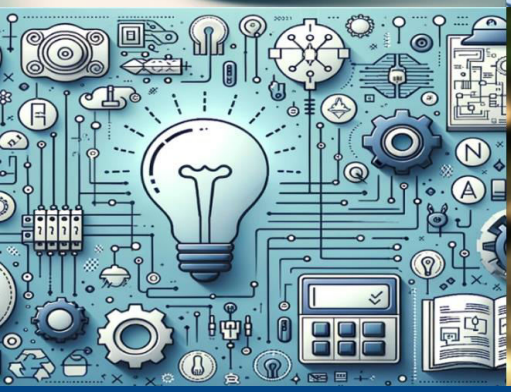

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Financial Performance Heterogeneity between Investment-grade and Non-Investment-grade firms in India

Keerthi Spandana N, Dr. Mansi Kukreja

Student, Faculty of Management Studies, CMS Business School, JAIN (Deemed-to-be-University), Bengaluru, India

Professor, Faculty of Management Studies, CMS Business School, JAIN (Deemed-to-be-University), Bengaluru, India

ABSTRACT: This paper tries to investigate the impact of performance differences between the investment grade companies and the non-investment grade companies in the Indian scenario using a panel data of 60 listed non-financial companies on the National Stock Exchange (NSE) in India, spanning from FY 2020-2025, which will consist of 360 observations. The main aim of the paper is to investigate the effect that credit rating makes any statistically and economically significant impact on accounting performance of firms, irrespective of controlling other factors like firm characteristics and macroeconomic factors. The methodology employed involves performing normality tests through the Shapiro-Wilk test, Mann-Whitney U test, independent samples t-test using Welch's correction, Levene's test for variance homogeneity, and panel regression analysis using year dummy variables and robust standard errors (HC3). Results reveal that investment-grade firms exhibit an average return on assets 12 percentage points higher than those of non-investment-grade firms, along with cash flow to assets 6 to 7 percentage points greater, at the 0.001 level of significance. Investment Grade Premium is illustrated by the operating profit margin at a figure of about 5 percentage points, which is statistically significant at a 5% level of significance. There is no investment grade premium for the EBITDA margin due to the reasons that this measure can be affected by the depreciation cost of firms, which tend to have larger sizes than those in the investment grade category. This finding illustrates the fact that the category without being investment grade experiences greater variation amongst its firms relative to other categories.

KEYWORDS: credit ratings, investment grade, financial performance, panel data, India, information asymmetry, signalling theory

I. INTRODUCTION

Credit ratings represent formal assessment of creditworthiness and can be termed as information intermediaries to reduce uncertainties in between firms and investors. In India, regulation of institutional investors restricts them to invest in only investment grade instruments, thereby pointing to the real impact of investment grade threshold on the performance of companies. The benefits enjoyed by investment grade firms include reduced cost of financing as well as better capital market access, compared to non-investment grade firms that face more financing constraints. Nonetheless, no empirical investigation about the relation between various credit rating grades and their effects on financial performance in India has been done before.

This paper focuses on testing whether Indian listed nonfinancial companies in investment grade perform superior to those falling in noninvestment grade companies based on financial performance measures. Balanced panel data of 60 Indian NSE listed companies from fiscal year 2020 to 2025 has been used in the analysis. The current paper considers balanced panel data of 60 companies comprising of 30 investment grade and 30 non-investment grade companies with total 360 firm-years observations.

1.2 Statement of Research Problem

While it is true that credit ratings are very important, there is no sufficient empirical literature that explains whether the variation between the two types of classifications, IG and NIG, can help explain differences in performance among firms. Previous research has explored factors that affect the credit rating of organizations and market reaction to changes in credit ratings of organizations. What matters most here is whether companies that are classified as IG outperform those classified as NIG when it comes to profitability and operational efficiency. The fundamental question

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is whether ratings are just a reflection of what existed prior to the rating process or if they have some effect on their own.

1.3 Review of Literature

One of the key difficulties associated with capital structure research is the difficulty that occurs due to the fact that there are two theories in existence currently, namely trade-off theory and pecking order theory, which are believed to be the two major theories behind a choice between debt and equity in terms of sources of funds. The trade-off theory may be defined as the theory, which tries to achieve the optimum debt level by lowering the cost of debt as compared to financial distress and bankruptcy keeping in mind the benefits in terms of taxation (Myers, 1984). Contrary to pecking order theory, companies according to trade-off theory usually make use of their internal resources. The above-mentioned problem by Myers and Majluf (1984) on the nature of information may be translated into a situation where the corporation has no option but to abandon profitable ventures because they have to find a means of raising funds by selling low-priced stocks to fund their ventures. This issue may cause the corporation to have certain amount of financial flexibility as far as the cash balances and the borrowing capacity is concerned. The credit ratings have evolved in the assessment of the credit worthiness of corporations. This is due to the fact that credit ratings determine the risk of default on the part of companies to meet their obligations. Naeem (2012) argues that credit ratings play a role that affects the financing of corporations especially in their accessibility to the debt capital market. Leveraged corporations have average credit ratings relative to those with high and low credit ratings. The firms rated highly might have low leverage so as to maintain their good rating, and low-rated firms might be restricted in borrowing funds through capital market. The leveraged ratios of rated companies would be high compared to the unrated companies since there would be reputation that would lower the cost of the creditor surveillance (Faulkender and Petersen 2006). Another vital output of credit ratings is efficient investment because it is founded on a sound monitoring system, which can assist in preventing overinvestment and underinvestment. Khoo et al. (2025) opine that the process that the credit rating agencies would use during the monitoring process may assume different forms, including that of credit watch, where the organization can rectify the situation before the rating is lowered due to the fact that the process would be very costly. The changes in credit rating would result in the change in the way the firm practices risk management. The typical situation is that the organization will have a tendency to reduce its risk-taking behavior once its credit rating drops below the level that can enable it to take investments. When managers are overconfident, they will not maximize their acquisitions when they are confronted with the threat of downgrading their credit ratings. Kaur and Dey (2025) provide empirical evidence that can confirm the effectiveness of the size of the board of directors and gender diversity in determining the creditworthiness of Indian firms. The determining variables of capital structure in a developing country like Indonesia include profit levels as firms with profits always look into utilizing the profits for limiting debt utilization. As per the studies conducted by Ndruru & Ananda (2025), the firm's size along with liquidity influence capital structure as a result of the firm's size. Other variables that dictate the capital structures are the dividend policies of which John Lintner (1956) discovered that dividends were smooth and sticky. Variables that influence the quality of financial reporting may be numerous and heterogeneous, which are corporate governance, audit committees, and technology among others. According to Shamsudin et al. (2026), audit committees that are capable of using financial skills make a considerable contribution to increasing the quality of financial reporting. It is projected that the application of new technology like blockchain and artificial intelligence will have a positive effect on the financial reporting accuracy. Besides, the effect of IFRS adoption on the quality of accounting has been studied in different countries. In contrast with their previous model, the five-factor model proposed by Fama and French (2014) had two other factors profitability and investments. The model was used by Jiao and Lilti (2017) to the China A-shares case, and the researchers determined that the model could not explain the variations better than the three-factor model. In addition to this, studies in asset pricing models have shown that there is a positive correlation between the anticipated returns of equities and the profitability, but negative between the returns of equities and investment. Sovereign credit downgrade might bring about a ceiling effect that affects the local corporates during the sovereign credit rating downgrades. The economic implications of the ceiling effect are numerous as there will be expensive cost of capital among all firms whether successful or not. The creditworthiness affects the decision of the debt maturities in such a way that corporates make sure that they match the assets and liabilities maturities to reduce the liquidity risk. According to Diamond (1991), rollover risk ensures an inverse link between rating and maturities such that the medium credit quality corporates issue long maturities of debt. Top rated corporates give short maturities of debts since they are sure of rollover of the debt. The UK data analysis also supports the notion that unrated firms would be the most interested in copying firms with low ratings, particularly in regards to the low capacity to obtain financing solutions by long-term sources. The output of the propensity score matching and the Heckman two step selection models validate the fact that a rating can effectively augment investment efficiency by five percent relative to those unrated firms which can be

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compared to it. Besides, tangible assets ratios, and sales growth are further important in an industry like utilities, because the government regulations do influence the gearing level.

1.4 Identification of Research Gaps

The study is based on four major justifications. Firstly, rating movement studies receive more attention than rating classification studies. It suggests that rating movement is a response to short-term reactions in the market, whereas there is no evidence of a long-term performance difference between them. Secondly, the existing literature has a focus on developed nations, where the standards for determining investment grade bonds are very stringent. It implies that there is a greater threshold effect in India. Thirdly, the existing literature assumes that the rating is the outcome, highlighting the determinants of ratings and not the impacts of financial performance.

1.5 Theoretical Underpinnings

The present study relies on four distinct theoretical foundations. According to information asymmetry theory, rating agencies ensure that the level of informational inefficiency is low and thus lower the cost of financing for IG-rated corporations. As per signalling theory, proposed by Ross in 1977, the ratings of any organization are considered reliable signals of quality, which attract institutional and long-term investments irrespective of observable variables. Credit risk theory shows that IG-rated organizations have lower cost-of-capital effects because their risk premiums are lower, and their capital maturity is high, as evidenced by Kisgen and Strahan in 2010. Lastly, according to financial constraints theory, proposed by Kaplan and Zingales in 1997, the rating thresholds are related to investment and cash flows. IG-rated firms have access to credit markets; however, non-IG-rated companies have difficulties in obtaining investment finance and have higher cash flow variability.

II. SCOPE OF THE STUDY

The sample includes 60 firms that are non-financial firms listed on the stock exchange NSE for FY2020 – FY2025, and the sample includes 30 IG and 30 NIG firms. Financial firms have been excluded from the sampling due to their unique regulatory environment. There are 14 different industries represented in the sampling. Firms are classified based on whether they belong to the category of IG, which comprises BBB- and above ratings, and NIG, which has ratings of BB+ and below. The five firms having BBB- rating have been included under NIG firms to provide differentiation between IG and NIG.

2.1 Research objectives

There are three specific objectives for which the study was conducted. The first objective involves examining whether there exist any significant differences between IG firms and NIG firms in terms of certain financial performance measures such as Return on Assets (ROA), Operating Profit Margin (OPM), EBITDA margin, and Cash Flow/Assets ratio. The second objective includes examining whether these differences persist even after controlling for other factors like firm size, leverage, growth rate in sales, firm age, and the state of the macroeconomy.

2.2 Framing of Research Hypothesis

These hypotheses for this research have been developed based on the theories of information asymmetry, signaling, credit risks, and financial constraints. The following are the three hypotheses to be used in testing during this research.
H01: The mean financial performance of investment-grade firms equals that of non-investment-grade firms (muIG = muNIG). Tested via Mann-Whitney U test (primary) and Welch's t-test (supplementary) for each performance metric.
H2: Credit rating classification is positively associated with financial performance after controlling for firm size, leverage, sales growth, and firm age. Tested via Pooled OLS and Year Fixed Effects panel regression with HC3 robust standard errors.
H3: Non-investment-grade firms exhibit greater variability in financial performance than investment-grade firms. Tested via Levene's test and coefficient of variation comparison.

2.3 Research Design

The research will use ex post facto design and quantitative research approach, with balanced panel data. The descriptive analysis and outcomes of Shapiro-Wilk tests are useful in determining the appropriate inferential approach to use. Panel regressions will be conducted using two approaches, namely the Pooled Ordinary Least Square model, which includes the age of the firm as a control variable, and Year Fixed Effect Model, where year dummy variables for FY2021 to

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FY2025 are used, and FY2020 is taken as the base year. There is no need for firm fixed effects since the IG dummy variable is a constant across time periods.

2.4 Methods for Data Collection and Variables of the Study

The credit rating data shall be obtained from the public portal of CRISIL, CARE Ratings, ICRA, and India Ratings, with CRISIL serving as the primary source for ratings, in the case that multiple credit ratings are assigned. Financial data will be obtained from Screener.in for the period FY2020-FY2025. The independent variables will include Return on Asset (ROA=net profit/total assets), Operating Profit Margin (OPM=operating profit/net sales), EBITDA Margin (operating profit + depreciation/net sales), and Cash Flow to Asset Ratio (CF/Assets=operating cash flow/total assets). The key independent variable will include IG Dummy (1 if the company is classified as IG, and 0 otherwise). Control variables will include Log(Total Assets) (a proxy for firm size), debt/equity ratio (leverage), annual percentage change in net sales (growth in sales), and age (years since incorporation).

III. TECHNIQUES FOR DATA ANALYSIS

In this research, the methodology to be used entails the use of multi-method approaches of quantitative analysis, which have been developed on the basis of the three objectives of the study.

In this research, the analysis of the data will entail the use of a sequential approach, which begins at the stage of describing the sample population and concludes with multivariate panel regression.

The first method that will be used to analyze the data will be the calculation of descriptive statistics. The aim of the technique is to find out the average values of the measures of performance and control variables.

Secondly, the technique of the Shapiro-Wilk test will be used to establish whether the data is normally distributed. The reason why this test will be performed is due to the fact that it is only possible to decide whether to use parametric or non-parametric techniques after knowing about the nature of data distribution. The testing of the difference between the two groups will utilize two approaches. For the parametric approach, the independent samples t-test known as the Welch t-test is utilized. For the non-parametric approach, the Mann-Whitney U test is used. Given that most of the hypotheses about normal distribution were rejected, the Mann-Whitney U test can be regarded as the main inferential tool.

The test for heterogeneity, which tests the third hypothesis, is the fourth analytical tool. Intra-group variation is estimated through the Coefficient of Variation Calculation. The process entails division of the standard deviation by the absolute mean before multiplication of the solution by one hundred. In testing the third hypothesis, Levene's Test for Equality of Variances will be conducted.

Multivariate Panel Regression Analysis is the fifth analytical tool that will be applied in testing the second hypothesis. In the multivariate panel regression analysis, there are two different types of models; these include pooled OLS and year fixed effects models using FY2021-FY2025 dummy variables. Fixed Firm Effects will not be considered in the model due to the time-invariant nature of the investment grade dummy variable.

3.1 Hypotheses Testing and Methods

There are three research hypotheses taken into account and tested by means of different approaches to the statistical analysis. There is a particular aim of research associated with every research hypothesis and an adequate method chosen for the hypothesis testing.

The research hypothesis H**01** states that the mean performance of investment grade firms equals the mean performance of non-investment grade firms. There are two tests employed for testing the research hypothesis mentioned above, namely Mann-Whitney U test and Welch's independent samples t-test. The following is an argument supporting the choice of the former as the most suitable test for H01 null hypothesis:

According to Shapiro-Wilk tests, some financial ratios are distributed non-normally neither in the total sample nor in its sub-samples. To begin with, this test is utilized as an independent test to check null hypothesis concerning each of four performance ratios – ROA, OPM, EBITDA, and CFA.

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Secondly, the hypothesis H**2** is based on the assumption that the correlation between classification in terms of credit ratings and financial performance is positive taking into account other factors that are characteristic of a business. This hypothesis can be tested using the OLS regression approach where the variable 'investment grade' will be introduced into the model among other explanatory variables in order to calculate the model by employing two approaches – pooled OLS and fixed effect models throughout the year. In this case, the null hypothesis will be that the coefficient of the dummy variable investment grade equals zero. If a significant positive coefficient is obtained, it indicates that the classification in the investment grade category is another determinant of financial performance along with other firm characteristics such as size, leverage, sales growth, age, and macroeconomics.

According to the third hypothesis, H3, the non-investment-grade firms exhibit more variance compared to the investment-grade firms. To test this hypothesis, Levene's test for equality of variances will be utilized to check whether the variances of the different measures are equal between the two groups of firms or not. Moreover, the coefficient of variation for both classes will be analyzed. In this regard, the null hypothesis to be tested is that the two coefficients of variation are the same for both categories of firms. If the null hypothesis is rejected, then the hypothesis H3 is true.
To determine whether there is consistency within the regression equation, initially, the continuous variables will be winsorized depending on the first and ninetieth percentiles. As far as the multicollinearity issue is concerned, pairwise correlations among the independent variables in the regression can be used. Regression model 2 is formulated considering the impact of the macroeconomic shock due to the coronavirus (COVID-19) pandemic experienced in the fiscal years 2020 to 2021 and its normalization afterward.

3.2 Data Analysis and Interpretation

3.2.1 Panel Dataset Description

The balanced sample consists of 360 observations from 60 non-financial companies listed on the NSE market, where each of them has an equal number of IG and NIG companies amounting to 30 for both groups during the time horizon of FY2020-FY2025. The firms make a total contribution of six years of observation. There are 14 different sectors: IT, Pharmaceuticals, Consumer Goods, Automobiles, Chemicals, Engineering, Power, Metals, Construction, Hospitality, Agriculture, Logistics, Oil and Gas, and Telecommunications. More firms belong to IGs in the IT and Pharmaceuticals sectors due to their capital intensity.

As shown in Table 3.1 below, it is a sample data set from the panel data set. The table consists of the first 15 observations from the total panel data and consists of two complete firms samples and samples for the year 2020 to 2022 of another firm. With the help of Table 3.1, you can get an idea about the panel data set and also the performance numbers that are involved. Rows with investment grade firms are highlighted in blue color whereas other firms are highlighted with orange color.

Table 3.2: Panel Dataset Extract: First 15 Observations

Sl no.	Company Name	Sector	Year	Credit Grade	ROA %	OPM %	EBITDA Mgn %	CF/ Assets %	Log (Assets)	Debt/ Equity	Sales Growth %
1	ABB India Limited	Engineering & Capital Goods	2020	Investment Grade	2.88	5	6.67	4.19	8.93	0	—
2	ABB India Limited	Engineering & Capital Goods	2021	Investment Grade	6.43	8	9.65	8.05	9	0	19.12
3	ABB India Limited	Engineering & Capital Goods	2022	Investment Grade	10.9	11	12.52	7.96	9.14	0	23.57
4	ABB India Limited	Engineering & Capital Goods	2023	Investment Grade	11.29	14	15.48	12.28	9.31	0	21.93
5	ABB India Limited	Engineering & Capital Goods	2024	Investment Grade	15.1	19	20.02	10.75	9.42	0	16.67
6	ABB India Limited	Engineering & Capital Goods	2025	Investment Grade	12.23	15	16.58	8.95	9.52	0	8.33
7	Alembic Limited	Pharmaceuticals & Healthcare	2020	Non-Investment Grade	17.51	4	8.11	0.48	7.29	0	—
8	Alembic Limited	Pharmaceuticals & Healthcare	2021	Non-Investment Grade	1.42	15	20.27	-0.08	7.79	0	0
9	Alembic Limited	Pharmaceuticals & Healthcare	2022	Non-Investment Grade	7.49	18	24.36	-0.68	7.88	0	5.41
10	Alembic Limited	Pharmaceuticals & Healthcare	2023	Non-Investment Grade	8.36	32	37.01	1.77	7.7	0	62.82
11	Alembic Limited	Pharmaceuticals & Healthcare	2024	Non-Investment Grade	9.82	36	41.4	0.99	7.75	0.01	23.62
12	Alembic Limited	Pharmaceuticals & Healthcare	2025	Non-Investment Grade	14.05	42	47.3	3.44	7.83	0.02	41.4
13	Allcargo Logistics	Shipping, Logistics & Transport	2020	Non-Investment Grade	7.64	7	10.17	6.02	8.58	0.58	—
14	Allcargo Logistics	Shipping, Logistics & Transport	2021	Non-Investment Grade	6.08	6	9.04	4.51	8.9	0.33	42.91
15	Allcargo Logistics	Shipping, Logistics & Transport	2022	Non-Investment Grade	10.52	7	7.97	8.85	9.17	0.39	81.58

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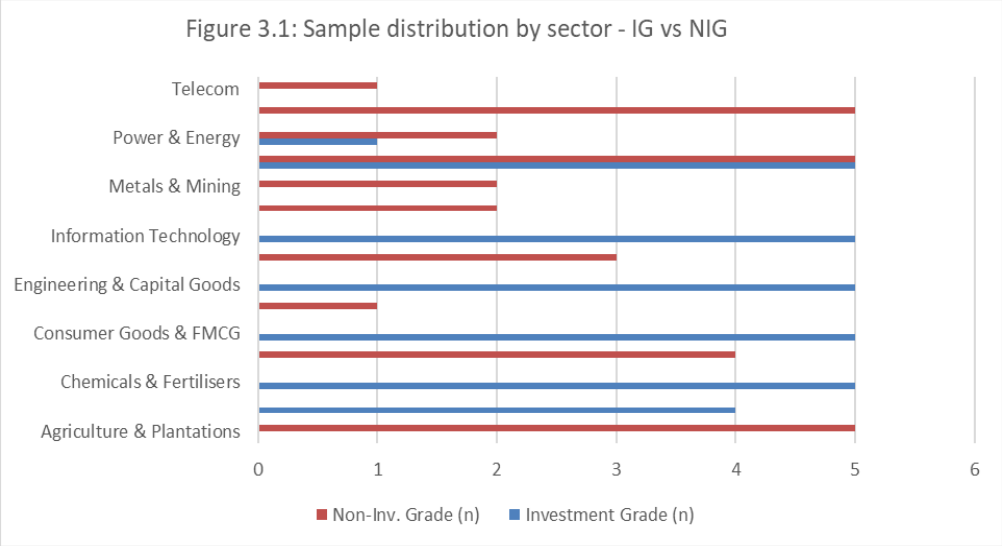

A table showing the manner in which the firms are categorized under the investment and non-investment grade companies by sectors is shown in Figure 3.1 below. From the above categorization, it is evident that there is no restriction to selecting firms from any particular industry, thus improving generalizability. Several firms within the investment grade category belong to the Information Technology industry as well as Pharmaceutical industry due to their success.

3.3.3 Descriptive Statistics

Table 3.2: Full Sample, Investment grade, and non-investment grade Descriptive statistics

	Full Sample (n=360)			Investment Grade (n=180)			Non-Investment Grade (n=180)		
Variable	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**	**Mean**	**Median**	**SD**
ROA %	8.52	7.96	10.32	14.27	13.56	7.88	2.77	1.85	9.21
OPM %	18.12	18.00	18.48	21.93	21.00	14.22	14.31	14.00	21.30
EBITDA Margin %	25.39	23.29	19.94	26.00	24.67	18.50	24.78	21.86	21.31
CF/Assets %	12.65	10.16	15.94	14.48	13.55	7.66	10.81	6.28	21.08
Log(Total Assets)	9.70	9.52	1.49	10.35	10.13	1.13	9.06	8.92	1.54
Debt/Equity	0.28	0.07	0.91	0.13	0.00	0.33	0.43	0.40	1.22
Sales Growth %	9.85	9.61	22.16	11.30	11.27	12.37	8.40	6.35	28.77
Firm Age (years)	55.19	43.00	26.77	62.57	58.00	21.25	47.78	33.00	29.62

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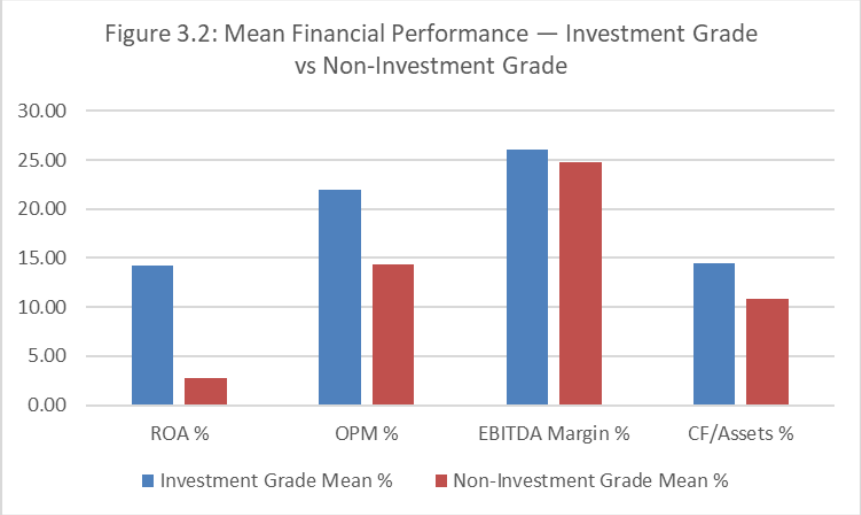

Table 3.2 illustrates the results of descriptive statistics on a per-group basis. The mean ROA for IG firms is 14.27%, while the mean ROA for NIG firms is 2.77% (a difference of 11.50%). The mean OPM for IG firms is 21.93%, while the mean OPM for NIG firms is 14.31% (a difference of 7.62%). The EBITDA margin between IG and NIG firms is almost converging at 26.00% and 24.78%, respectively, with only a difference of 1.22% since large IG firms tend to record higher additions to depreciation, thus boosting the margin. The mean CF/Assets ratio for IG firms is 14.48%, while the mean CF/Assets ratio for NIG firms is 10.81%, with only a difference of 3.67%. The standard deviation of NIG firms is 21.

3.3.4 Normality Testing and Group Difference Tests

Table 3.3: Shapiro-Wilk Normality Test Result

Variable	IG p-value	IG Normal?	NIG p-value	NIG Normal?
ROA %	0.3979	Yes	0.0231	No
OPM %	0.0000	No	0.0001	No
EBITDA Margin %	0.0000	No	0.0013	No
CF/Assets %	0.0085	No	0.0000	No

From the results of the Shapiro-Wilk test, it is evident that only ROA in IG group (p = 0.398) does not have normal distribution; however, all other performance indicators do not have normal distribution. Therefore, the Mann-Whitney U test is used.

Table 3.4: Group difference tests and Heterogeneity Analysis: Investment Grade vs Non-Investment Grade

	Group Means		Welch T-Test		Mann-Whitney U — Primary		Levene Test		Dispersion CV%	
Variable	IG Mean	NIG Mean	t-stat	p-value	U-stat	p-value	F-stat	p-value	CV IG%	CV NIG%
ROA %	14.27	2.77	12.732	0.0000	16074	0.0000 ***	1.113	0.2800 ns	55.2	332.8
OPM %	21.93	14.31	3.991	0.0001	19791	0.0000 ***	21.347	0.0000 ***	64.8	148.8
EBITDA Margin %	26.00	24.78	0.579	0.5630	18702	0.0156 *	15.823	0.0001 ***	71.2	86.0
CF/Assets %	14.48	10.81	2.199	0.0289	20109	0.0000 ***	4.970	0.0262 *	52.9	195.0

Note: *** p<0.001, * p<0.05, ns=not significant. CV=SD÷|Mean|×100. Higher CV_NIG% = greater within-group dispersion.

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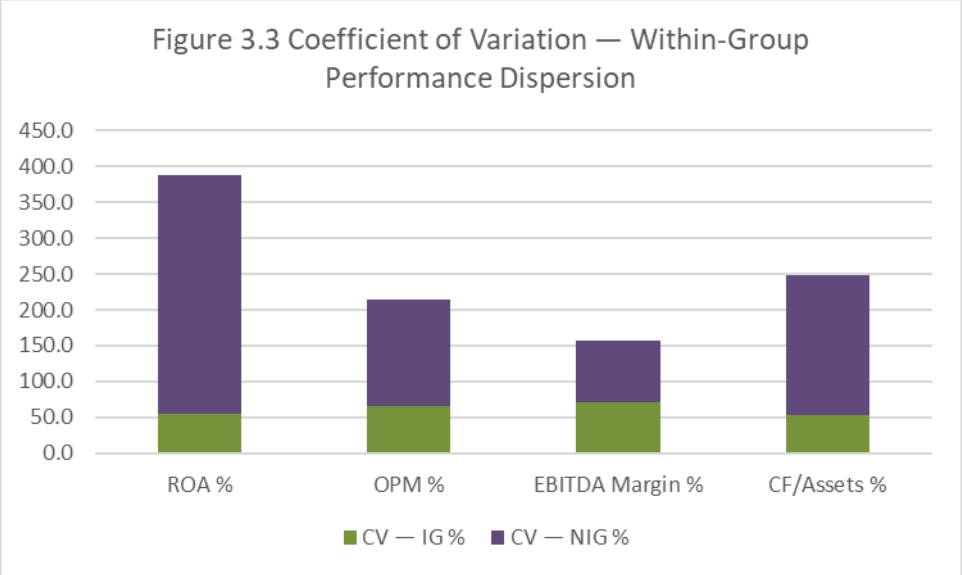
ROA, OPM, and CF/Assets show significant differences, $p<0.001$, based on the result obtained using the Mann-Whitney U test. While there are significant differences between EBITDA Margin at the level of 5 percent, $p=0.016$, still this is insignificant with the difference being just 1.22 percent points. As per Welch's t-test, ROA is significant at $t = 12.732$, $p < 0.001$, as well as OPM is significant, $t = 3.991$, $p = 0.001$. However, difference in EBITDA Margin is not significant since there is no difference in distribution.

3.3.5 Heterogeneity Analysis



Note: CV = SD÷|Mean|×100. A higher CV indicates greater relative dispersion. Ratio = CV_NIG ÷ CV_IG.
Within-group variation in NIG firms is considerably larger than that of IG firms in terms of all variables examined (Table 3.4, Figure 3.3). The NIG CV in ROA is 332.8%, while it is only 55.2% in IG (ratio 6.0x); in OPM, 148.8% against 64.8% (ratio 2.3x); and in CF/Assets, 195.0% versus 52.9% (ratio 3.7x). For OPM and CF/Assets, Levene's Test proves significant at $p < 0.001$ and $p = 0.026$

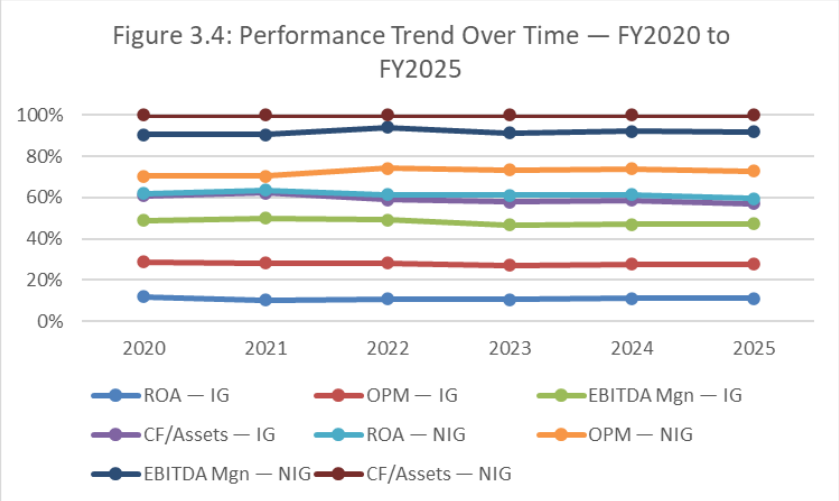


Figure 3.4 below showing the trend in the six years. The gap between ROA of IG firms and non-IG firms remains unchanged throughout the period even during the tough years such as FY2020 and FY2021 due to the outbreak of the coronavirus pandemic. That is why this clearly shows that the gap found is not cyclical but rather structural. The OPM

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shows recovery after hitting the bottom during FY2021 in both firms, although IG firms were more successful compared to non-IG firms.

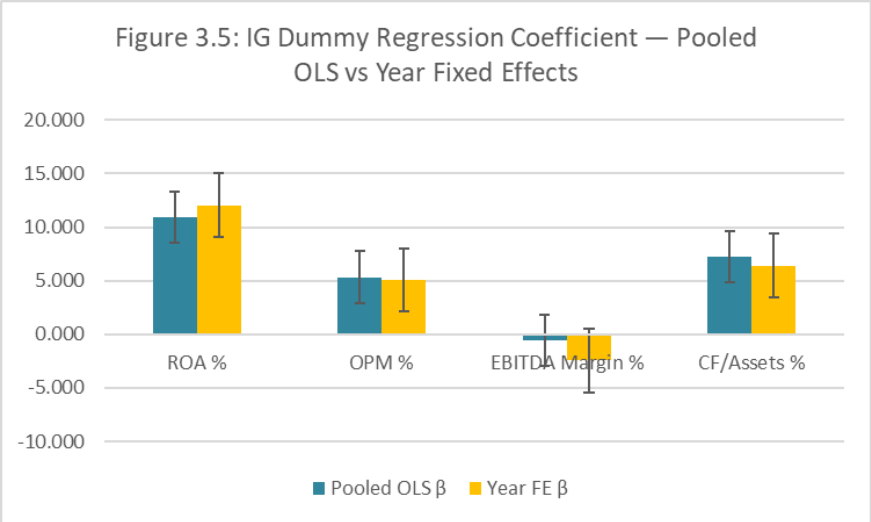
3.3.6 Panel Regression Result

Table 3.5: Panel Regression Results: Pooled OLS (Panel A)

	M1: ROA		M2: OPM		M3: EBITDA Margin		M4: CF/Assets	
Variable	**Coeff**	**p-val**	**Coeff**	**p-val**	**Coeff**	**p-val**	**Coeff**	**p-val**
Panel A — Pooled OLS (with Firm Age control)								
Constant	5.772†	0.0811	0.608	0.9265	2.851	0.7325	37.530**	0.0073
IG Dummy ★	**10.929*** **	0.0000	**5.345***	0.0196	**-0.596**	0.8123	**7.214*** **	0.0000
Log(Total Assets)	-0.762*	0.0250	1.324	0.1134	2.658**	0.0085	-2.641*	0.0365
Debt/Equity	0.300	0.6222	1.239	0.3695	0.927	0.5840	-2.511	0.3202
Sales Growth %	0.084**	0.0014	0.217***	0.0008	0.112†	0.0732	0.014	0.7113
Firm Age (years)	0.068***	0.0006	-0.005	0.8987	-0.084*	0.0466	-0.045	0.1140
N	**299**		**299**		**299**		**299**	
R^2	**0.3779**		**0.13**		**0.0671**		**0.1021**	
Adj.R^2	**0.3673**		**0.1151**		**0.0511**		**0.0868**	

Table 3.6: Panel Regression Results: Year fixed effects (Panel B)

Panel B — Year Fixed Effects (FY2021–FY2025)								
Constant	8.151**	0.0016	0.729	0.9073	-1.819	0.8135	29.002**	0.0078
IG Dummy ★	**12.025*** **	0.0000	**5.080***	0.0339	**-2.432**	0.3389	**6.383*** **	0.0000
Log(Total Assets)	-0.860*	0.0123	1.263	0.1482	2.786**	0.0067	-2.591*	0.0411
Debt/Equity	0.561	0.3960	1.502	0.2866	0.738	0.6664	-2.580	0.3110
Sales Growth %	0.099**	0.0010	0.243***	0.0002	0.141*	0.0322	0.036	0.3132
N	**300**		**300**		**300**		**300**	
R^2	**0.3538**		**0.137**		**0.0613**		**0.1067**	
Adj.R^2	**0.336**		**0.1133**		**0.0355**		**0.0821**	
Year FE	Yes (FY2021–25)		Yes (FY2021–25)		Yes (FY2021–25)		Yes (FY2021–25)	



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The results for pooled OLS are contained in table 3.5, while year fixed effects results are presented in Table 3.6. In the ROA regression, IG premium is 10.929 pp ($p<0.001$) and 12.025 pp (year FE, R squared of approximately 0.35-0.38). The stability of the estimates points towards a structure advantage. Log (Total Assets) has a negative sign while Sales growth coefficient has a positive sign. For OPM, IG premium is 5.345 pp ($p=0.020$) and 5.080 pp (year FE, R Squared approximately 0.13). When we look at EBITDA margin, the IG dummy does not produce statistically significant results (IG Dummy = -0.596, $p=0.812$; Year FE = -2.432, $p=0.339$). However, log(Total Assets) is found to be much more significant (approximately 2.7-2.8, $p<0.01$) and this reinforces the artifact resulting from the size of the firm. For CF/Assets, the premium is 7.214 pp ($p<0.001$) and 6.383 pp (year FE, $p<0.001$). H2 finds its validation for ROA and CF/Assets while

IV. RESEARCH OUTCOME AND FINDINGS

The study examines financial performance heterogeneity between investment-grade and non-investment-grade firms in India using a balanced panel of 60 NSE-listed non-financial firms observed over six financial years from FY2020 to FY2025. The findings are summarised in Table 4.1 and discussed in detail below.

Table 4.1: Summary of Research Findings by Performance metric

Metric	IG Mean	NIG Mean	Difference	Mann-Whitney	Regression (IG Dummy β)	Conclusion
ROA %	14.27%	2.77%	+11.50 pp	$p < 0.001$ ***	β = +10.93 (Pooled) β = +12.03 (Year FE)	**STRONGLY SUPPORTED**
OPM %	21.93%	14.31%	+7.62 pp	$p < 0.001$ ***	β = +5.35 (Pooled) β = +5.08 (Year FE)	**SUPPORTED**
EBITDA Margin %	26.00%	24.78%	+1.22 pp	$p = 0.016$ *	β = −0.60 ns β = −2.43 ns	**NOT SUPPORTED in regression**
CF/Assets %	14.48%	10.81%	+3.67 pp	$p < 0.001$ ***	β = +7.21 (Pooled) β = +6.38 (Year FE)	**STRONGLY SUPPORTED**

4.1.1 Findings

A. Investment-grade firms exhibit significantly higher return on assets

It is clearly understandable that the main problem associated with the relevance and significance of this research paper is that the ROAs of companies with investment grade rating are higher compared with ROAs of companies without an investment grade rating. The ROA of companies with investment grade rating is 14.27% while the ROA of companies with non-investment grade rating is 2.77%. Moreover, there is statistical evidence on the difference in the distribution of ROAs of firms with investment grade rating versus non-investment grade rating based on the results of Mann-Whitney U Test with p-value = 0.001. Furthermore, it can be seen through regression analysis that despite considering other variables like firm size, leverage ratio, sales growth, and year fixed effect, there will always be a significant difference in ROAs. In the year fixed effect model, for example, the ROA of companies with investment grade rating is significantly higher than ROA of companies without an investment grade rating by 12.03%.

B. Investment-grade firms exhibit significantly higher operating profit margin

Whereas, regarding the operating profit margin, the former group of firms holds values of 21.93 percent, whereas non-investment grade firms have a value of 14.31 percent, which shows a difference of 7.62 percent. According to Mann-Whitney test, the null hypothesis is rejected with a significance level of 0.001. As observed from the regression formula given above, the values of dummy variables were significantly different for both the models of pooled ordinary least squares and year fixed effects model, where the beta coefficients of the dummy variable were 5.345 and 0.020 in the case of pooled OLS model, whereas for year fixed effects, they were 5.080 and the significance level was 0.034.

C. EBITDA margin does not show a significant investment-grade premium after controls

However, one more intriguing comment about the ratio of the EBITDA margin can be drawn. First, the difference in the mean values of the two categories is not that significant and the difference is only 1.22 percentage points. The statistical

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significance achieved at the five percent level (p=0.016) as compared to the Mann-Whitney U test is acceptable, but this level is totally removed with the regression analysis. Regression coefficients of the dummy variable investment grade against the EBITDA margin in the OLS using pooled data and model using year fixed effects are insignificant and in the negative: -0.596 and -2.432 respectively (p>0.05). The natural logarithm of total assets is the best predictive variable with a coefficient of 2.7 to 2.8 in both of the models. Considering the trend above, it will not be hard to note that the investment grade variable does not play significant roles in the process of explaining the EBITDA margin when the firm size remains constant. This is explained by the following reasons. The EBITDA margin calculation entails element of costs in the form of depreciation costs. The bigger companies experience higher costs of depreciation as compared to the smaller companies. Thus, the EBITDA margin will be exaggerated among the firms in the investment grade category due to the higher depreciation costs.

D. Investment-grade firms generate significantly stronger cash flows relative to assets

The second-best result is linked with the impact of the ratio of the cash flow to assets on ROA. In general, the average value of the cash flow to assets ratio in the investment grade population group is equal to 14.48%, while the corresponding figure in the non-investment grade population group is equal to 10.81%. The aforementioned finding can be statistically confirmed by applying the Mann Whitney U test at the level of significance of 0.001. However, the application of the regression analysis indicates that even in the presence of all other independent variables, the aforementioned relationship remains true not only for the year fixed effects model, but also for the pooled OLS estimation method, where the gap between the investment grade and non-investment grade populations reaches 6.38 percentage points (p<0.001) and 7.21 percentage points (p<0.001) respectively. It is noteworthy that the aforementioned result concerning the cash flow to assets ratio is very significant, because the cash flow is superior to accrual profit.

E. Non-investment-grade firms exhibit substantially greater within-group performance heterogeneity

What makes this research unique is the fact that the NIG group cannot be described as homogeneous. As regards the Coefficient of Variation of ROA, the value is 332.8% for the NIG group and only 55.2% for the IG group. The absolute difference here is 6.0. When it comes to the OPM Coefficient of Variation, the value is 148.8% for the NIG group and 64.8% for the IG group. The absolute difference is 2.3. With regards to the Coefficient of Variation of CF/Assets, the value is 195.0% for the NIG group and 52.9% for the IG group, which gives us the absolute difference of 3.7. In terms of the Levene's Test on Equality of Variance, we have to note the significant statistical differences between the variance values for both the NIG and IG groups when it comes to OPM (p<0.001) and CF/Assets (p=0.026). Speaking about the sample of the NIG group, we should emphasize the presence of various types of companies within the NIG group, characterized by the different level of financial distress, ranging from almost IG companies having relatively good performance to companies described as D.

4.1.2 Outcomes

Table 4.2: Hypothesis testing outcomes

Hyp.	Null Hypothesis	Evidence	Outcome
H01	μIG = μNIG (no mean difference)	Rejected for ROA, OPM, and CF/Assets at p < 0.001; marginally rejected for EBITDA Margin at p = 0.016	**REJECTED (ROA, OPM, CF/Assets)**
H2	IG Dummy β = 0 (no independent effect)	ROA: β = +12.03 (p < 0.001); OPM: β = +5.08 (p = 0.034); CF/Assets: β = +6.38 (p < 0.001); EBITDA Margin: ns	**PARTIALLY SUPPORTED**
H3	CV_IG = CV_NIG (equal dispersion)	NIG CV is 2.3x–6.0x higher across all metrics; Levene significant for OPM and CF/Assets	**SUPPORTED**

In this context, it could be stated that the evidence acquired through the performed analysis could be considered adequate enough to support the presented research hypothesis. Specifically, it should be noted that the evidence gathered concerning ROA and CF/Assets measures could be regarded as quite a convincing investment grade premium, which has nothing to do with the year control applied when computing it. As far as the OPM measure is concerned, there appears to be some evidence supporting the put forward hypothesis, yet it is not quite that compelling in comparison with the aforementioned measures.

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4.2 Theoretical Implications The findings conform to the signaling model where the IG premium still exists despite adjusting for differences among firms' observable characteristics; in other words, being investment grade matters in terms of financing. The ROA premium of approximately 12% is significant after adjusting for other factors; hence, supporting the information asymmetry model. Concerning India where there are restrictions for institutional investors who invest in NIG stocks, the significance of the certification feature of CRISIL, CARE Ratings, and ICRA becomes more apparent. Some support can be found for the financial constraint theory from the IG premium on CF/Assets and from the high standard deviation value of 3.7 times on NIG CF/Assets. The use of the EBITDA metric cannot serve as an effective comparison performance measure due to the systemically different firm size across the two categories of companies.

4.3 Managerial Implications

For corporate management, the premium for ROA of ~12 percentage points and CF/Assets of 6-7 percentage points are structurally sound financing opportunities; companies close to the investment-grade level should consider credit quality management a strategically critical issue. For institutional investors and credit analysts, the low IG coefficient of variation is assurance enough of financial stability, whereas the NIG category calls for in-depth due diligence that goes beyond simple classification. For banks, the investment-grade cutoff point has its own information content that supports its use as an underwriting sieve. For regulatory authorities, the robust correlation between IG designation and financial performance is proof positive of using rating cutoffs in defining the eligibility of institutional investors.

4.4 Limitations of the Study

The limitations can be presented as follows: first, the sampling of 60 medium to large-sized firms listed at NSE may prove to be non-representative of small-sized Indian firms and unlisted Indian firms. Second, the IG/NIG classification used in this study is time-invariant in nature and ignores intra-period changes in the credit rating. Third, there may exist certain issues in the application of conservative approach by considering BBB- firms as NIG firms against the classification adopted in other researches. Fourth, the data obtained from Screener.in differs slightly from the data taken from annual reports of the company, and analysis period chosen is only six years.

4.5 Conclusion

The outcomes of the present research work provide an organized evidence of a superior level of financial performance by means of higher ROA and a higher ratio of Cash Flow to Assets in case of investment grade Indian non-financial firms as compared to their peers who are not investment grade firms. Among the 360 samples of firms operating in the fiscal years of 2020 to 2025, a significant difference of approximately 12 percentage points and a marginal difference of 6-7 percentage points in case of ROA and Cash Flow / Assets ratio, respectively, are witnessed between IG firms and their non-IG counterparts, after controlling for the impact of variables like firm size, firm leverage, sales growth, and macroeconomic variations. A significant difference of about 5 percentage points is seen in favor of IG firms in OPM. The outcome of EBITDA margin regression does not show any statistical significance in case of IG firms even after accounting for the effect of firm size.

4.6 Scope for Future Research

There are four directions that could be pursued for further research. Firstly, using event studies or dynamic panels in order to measure firm performance around rating upgrades and downgrades could lead to a more accurate causal inference. Secondly, including additional companies, not only large, listed and rated ones but small ones as well, into the dataset would make the results more generalizable. Thirdly, conducting an analysis at the industry level would allow researchers to understand whether or not the IG performance premium is sector-specific.

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