

An In-Depth Analytical Investigation of How Capital Structure Affects Listed E-Commerce Companies' Profitability in India

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Abstract:

Technological developments, changing consumer behaviour, and benevolent government regulations have all contributed to the exponential rise of the Indian e-commerce industry in recent years. Due to the significant expenditures sparked by this quick development, the market is now fiercely competitive. Under such circumstances, a company's capital structure—which is the ratio of debt to equity used to fund operations—becomes a crucial factor in determining its long-term viability and financial performance. In a few chosen listed Indian e-commerce companies, this study examines the complex relationship between capital structure, as determined by the debt-equity ratio, and profitability, as determined by important metrics like net profit ratio (NPR), return on capital employed (ROCE), return on assets (ROA), and return on equity (ROE). Considering secondary data from the annual reports of four well-known e-commerce companies—Info Edge Ltd., IRCTC, Zomato Ltd., and PB Fintech Ltd.—spanning six fiscal years (2017–18 to 2022–23), the study takes a quantitative approach. The study investigates the patterns and effects of capital structure choices on profitability using descriptive and inferential statistical tools, such as correlation analysis. Significant variation in financial measures among observations is revealed by descriptive statistics. For example, net profit varies greatly from a loss of -67.51 to a gain of 112.75, highlighting the volatility in profitability, while the debt-equity ratio averages at 0.1175 with moderate variability. In a similar vein, ROCE and ROE show erratic patterns that draw attention to disparities in equity returns and capital efficiency. These results offer a thorough assessment of the chosen companies' financial standing, setting the stage for a deeper analysis. The debt-equity ratio and ROE have a statistically significant and strong negative association (-0.980 , $p < 0.05$), according to correlation analysis, suggesting that increasing leverage has a negative effect on shareholders' returns. Net profit and other profitability metrics (ROCE and ROE) show moderately favourable relationships, although they are not statistically significant, indicating complex interdependencies that need more research. The results highlight the need of careful debt management and the negative effects of excessive leverage on profitability, especially equity returns. Excessive debt can reduce long-term value development, worsen financial risks, and undermine investor confidence. As a result, e-commerce businesses are urged to optimise their capital structures through the implementation of strong risk management procedures, diversification of funding sources, and debt and equity balance. Enhancing profitability and building investor trust also depend on increasing operational effectiveness and keeping open lines of communication with stakeholders. By examining the comparatively understudied relationship between capital structure and profitability in India's rapidly growing e-commerce industry, this study adds to the body of current work. For managers, investors, and legislators, it offers practical insights and techniques for navigating the changing financial landscape and

guaranteeing sustainable growth. Future research could expand the scope by incorporating a larger sample size, exploring sector-specific dynamics, and analysing external factors such as market conditions and regulatory changes. The study's conclusion emphasises how important financial structure is in determining how profitable Indian e-commerce companies are. It provides a sophisticated grasp of the financial tactics required to prosper in a market that is becoming more and more dynamic by utilising empirical data and statistical rigour.

Keywords:

Capital structure, Debt-equity ratio, Return on capital employed, Return on equity.

Introduction:

Owing to favourable government policies, shifting consumer behaviour, and technology improvements, India's e-commerce sector has grown significantly in recent years. This growing industry has drawn significant investments from both domestic and foreign sources, creating a competitive and dynamic environment. In this regard, the capital structure of e-commerce businesses is crucial in establishing their long-term viability and financial stability. The mix of debt and equity financing that businesses use to finance their operations and expansion plans is referred to as their capital structure. It is a process for making strategic decisions that is impacted by a number of internal and external elements, including as market conditions, industry dynamics, the regulatory environment, and company-specific factors. Stakeholders such as investors, managers, legislators, and academics must comprehend the connection between capital structure and profitability since it offers information about the risk profile and financial performance of e-commerce companies. One important indicator of an e-commerce company's capacity to provide returns for shareholders while skilfully controlling expenses and risks is its profitability. The financial performance of businesses in the e-commerce industry is frequently assessed using profitability indicators including net profit margin (NPM), return on equity (ROE), and return on assets (ROA). The effect of capital structure on profitability, however, is still up for discussion and empirical research, especially when it comes to developing nations like India.

By investigating the connection between capital structure and profitability among Indian e-commerce businesses, this study seeks to close this gap. Through the use of a thorough analytical methodology and empirical data from a sample of top e-commerce companies, this study aims to offer important insights into the factors that influence capital structure choices and their effects on financial performance. In order to maximise capital structure and boost profitability in the Indian e-commerce business, the research also attempts to provide actionable advice for investors, e-commerce companies, legislators, and other stakeholders. All things considered, this study adds to the body of knowledge already available on corporate finance, capital structure theory, and the dynamics of the e-commerce sector. It also provides players with useful information for navigating the quickly changing Indian e-commerce market.

Review Of Literature

In order to find the impact of capital structure on the profitability of an establishment, plenty of exploration has been accepted so far by colourful experimenters all over the world. The review of comparable major studies is as follows:

The relationship between capital structure and corporate performance in China's e-commerce sector is complex and multifaceted, as evidenced by various studies. Zhang et al. (2022) found that a balanced capital structure positively influences performance, highlighting the importance

of short-term liabilities and asset turnover (Zhang et al., 2022). Lorca et al. (2019) emphasized that companies with established commitments in e-commerce outperform those relying solely on B2B or B2C models, suggesting that strategic engagement in e-commerce enhances profitability ("Shaping Success: The Synergy of Marketing, Regulation, and Technology in Boosting E-Commerce Performance in China", 2024). Additionally, the inverted U-shaped relationship between capital structure and performance, as noted by multiple studies, indicates that both excessive and insufficient leverage can hinder performance ("Capital Structure and Enterprise Performance: Evidence from Non-financial Companies in China", 2023). Trust factors significantly impact consumer purchase intentions in e-commerce, further complicating the performance landscape (Shi, 2023). The integration of internet technologies into business operations significantly enhances firm effectiveness, particularly in the buying process, as evidenced by Romero and Rodriguez (2010), who noted a 2.9% improvement in effectiveness for enterprises utilizing the internet for purchasing (Saeed et al., 2023). Conversely, the selling process did not yield similar benefits, highlighting the nuanced impact of internet use on business performance. Wymer and Regan (2005) identified 16 statistically significant factors influencing the adoption of electronic enterprise information technologies, underscoring the complexity of technology integration (Dun & Santoro, 2024). Furthermore, the literature suggests that effective internet marketing strategies are crucial for enhancing competitiveness and operational efficiency (Korolev, 2024). The optimization of customer communication on online platforms is also vital, as it can streamline processes and improve sales outcomes (Shamina & Paderina, 2024). Overall, these findings underscore the necessity for firms to adopt a nuanced approach to capital structure and e-commerce strategies to optimize performance in a competitive environment (Xu, 2024).

Every piece of literature discussed here focusses on a single sector. There have been conflicting findings in the literature about the relationship between capital structure and corporate performance. As a result, there has been much discussion about the connection between capital structure and firm value. Other theories have surfaced, aside from the groundbreaking work by Modigliani and Miller (1958), which downplays the significance of the theory of capital structure and its 1958 revision. Following arguments and studies, such as Myers and Majluf's (1984) Static Trade-off Theory and their (1984) Pecking Order Theory, which contend against static trade-off theory, there are empirical studies that highlight the connections between capital structure and, consequently, the profitability/performance of firms.

Objectives of the Research

To examine the trend of capital structure and profitability ratios and the relationship between capital structure, as indicated by the debt-equity ratio, and profitability measures, such as the net profit ratio, return on capital employed, return on assets, and return on net worth, among a selection of listed e-commerce companies in India.

Hypothesis:

H0: There is no significant impact of the debt-equity ratio on the profitability measures of the selected listed e-commerce companies in India.

Ha: There is a significant impact of the debt-equity ratio on the profitability measures of the selected listed e-commerce companies in India.

Research Methodology

A. Conceptualization

In order to achieve the set objectives of the study, the researchers have employed ratio analysis. These ratios are employed so on confirm the relationship between capital structure

Profitability Ratio (Dependent variable)	Leverage Ratio (Capital structure ratio) (Independent variable)
Net Profit Ratio	Debt to equity Ratio
Return on Capital employed Ratio	
Return on Equity	

and profitability.

B. Data Base

- 1) Sources of Information- This study is predicted on secondary data. Data is gathered through annual reports of selected Listed E-Commerce companies and therefore the published data of these companies.
- 2) Period of Study – For our research study 6 financial years i.e., from 2017-18 to 2022-23 is taken into account.
- 3) Sample Units: The market capitalization was taken into account when choosing the sample units shown below.

Table1: Sample Listed Companies

S.NO	Company Name
1)	Info edge ltd
2)	IRCTC
3)	Zomato ltd
4)	PB Fintech ltd

C. Study Mode

The results of the research study are obtained using the quantitative research approach. Given the utilisation of numerical and secondary data, the quantitative technique is considered appropriate for the research. "Statistical analysis is used to explain how the data's observed variability can be explained." This includes the process of analysing the gathered data. For testing hypotheses, a 5% threshold for statistical significance was established. The 2-tailed threshold of significance was used to calculate the results of all statistical tests. Both descriptive and empirical statistics are used in statistical analysis.

Result and Discussions

Debt to Equity Ratio

The debt-to-equity ratio is used to assess a company's financial leverage. The D/E ratio is a crucial measure in corporate finance. It assesses how much a company depends on debt to fund its operations as opposed to fully owned assets.

$$\text{Debt-Equity Ratio} = \frac{\text{Total Debt}}{\text{Total shareholder's Equity}}$$

Ratio of net income

Net profit margin is used to calculate a company's profit margin as a proportion of total sales (Net Revenue). The ratio of net profit to total sales, represented as a percentage, is called the net profit margin (also known as net income).

$$\text{NPR} = \text{Net profit after tax} / \text{Net revenue} * 100$$

Return on Capital Employed (ROCE)

It gauges how effectively a business makes money off of the capital it uses. It is determined by dividing the capital employed (total assets less current liabilities) by earnings before interest and taxes (EBIT). The ROCE formula is:

$$\text{ROCE} = \text{EBIT} / \text{Capital Employed}$$

Return on Equity

Return on equity (ROE) is a metric used to quantify a company's profitability as a percentage. The company's net income is divided by shareholders' equity to get the ROE. Consequently, the ratio is constructed from the perspective of the investor rather than the business.

$$\text{ROE} = \text{Net income} / \text{Shareholder's equity}$$

Table 2: Financial ratio of e-commerce companies

Company	Period	D/E Ratio	NP	ROCE	ROE
Info edge ltd	2018	0	19.92	8.63	8.65
	2019	0	25.65	18.55	12.12
	2020	0.04	16.15	18.04	8.45
	2021	0.01	24.66	7.65	5.93
	2022	0	571.05	3.93	63.86
	2023	0.01	19.04	7.86	3.76
	Average	0.01	112.745	10.77667	17.12833
IRCTC	2018	0	14.96	32.52	23.22
	2019	0	16.5	38.98	28.81
	2020	0.06	23.22	51.34	39.8
	2021	0.05	24.25	14.1	12.94
	2022	0.06	35.31	44.07	35.22
	2023	0.03	28.4	49.78	40.58
	Average	0.03333	23.7733	38.465	30.095
Zomato Ltd	2018	0.02	-21.15	-3.33	-6.3
	2019	0.04	-49.21	-52.01	-19.24
	2020	2.04	-104.91	-91.73	-407.55
	2021	0.01	-51.69	-4	-11.42
	2022	0	-30.4	-7.5	-6.54
	2023	0.03	2.48	0.63	0.56
	Average	0.35667	-42.48	-26.3233	-75.0817
PB Fintech Ltd	2018	0	-59.04	-2.29	-5.67
	2019	0.18	-31.65	-0.66	-1.65

	2020	0.09	15.94	2.42	0.47
	2021	0.05	15.4	1.85	0.64
	2022	0.03	-290.43	-4.33	-4.34
	2023	0.04	-55.28	-0.99	-1
	Average	0.065	-67.51	-0.66667	-1.925

(Source : From Money Control & Economics Times)

D/E Debt to equity ratio (D/E)

Net Profit Ratio (NP)

Return on Capital Employed (ROCE)

Return on Equity (ROE)

Inference: The selected e-commerce enterprises' financial ratios from 2018 to 2023 show clear performance patterns.

Info Edge Ltd. continuously keeps its debt-to-equity (D/E) ratio low, averaging 0.01; this indicates a solid financial base and little reliance on outside borrowing. Its Net Profit (NP) fluctuates a lot, though, with an exceptional 2022 jump to ₹571.05 crore, probably from one-time gains, which skews the average to ₹1112.75 crore. With the exception of the 2022 anomaly, return on equity (ROE) and return on capital employed (ROCE) show decreasing patterns after 2019, suggesting possible inefficiencies and decreased profitability over time. The business struggles to sustain steady operational and equity returns in spite of its sound financial standing.

IRCTC, on the contrary continuously performs well and has little to no debt (average D/E of 0.033). With averages of 23.77%, 38.47%, and 30.10%, respectively, its NP and profitability ratios, including ROCE and ROE, continue to be outstanding. These indicators show consistent growth and effective use of capital, with ROE and ROCE reaching their highest points in 2023. IRCTC is a dependable and well-managed business in the industry, as evidenced by its strong financial structure and impressive results.

Zomato Ltd. offers a different picture, with significant financial volatility and losses across the majority of the time frame. Due to extensive borrowing in 2020, it has an average D/E ratio of 0.36, indicating significant financial leverage. With the exception of 2023, the company's net present value (NP) remains negative, while profitability ratios like ROCE and ROE continue to show negative trends, averaging -26.32% and -75.08%, respectively. Even while 2023 saw a minor improvement in NP and better ROCE and ROE, Zomato's total performance still shows ongoing issues with capital efficiency and profitability.

PB Fintech Ltd. likewise has trouble making money; aside from 2020 and 2021, it has negative net present values for the majority of the years. Although the company's D/E ratio is modest (average 0.065), its profitability ratio trend is uneven, with negative averages for ROCE (-0.67%) and ROE (-1.93%). The inability to maintain operational efficiency is shown in a notable decline in NP and ROCE in 2022. PB Fintech's financials show persistent instability and inefficiencies, notwithstanding the occasional beneficial outcome.

In summary, a broad range of performance trends are revealed by the financial analysis of the chosen e-commerce enterprises from 2018 to 2023, highlighting their disparate operational and financial efficiencies. With very little debt and modest income, Info Edge Ltd. exhibits a solid

financial base. However, there is a need for more continuous performance improvement as seen by the deteriorating trends in its operational efficiency and returns on equity. The significance of continuous growth as opposed to reliance on sporadic events is further highlighted by anomalies, such as the remarkable increase in net profit in 2022. In contrast, IRCTC stands out as a clear leader in terms of efficiency and financial stability, with low debt and strong profitability indicators. Its continuous, high returns on equity and capital utilised throughout the years demonstrate effective capital utilization and effective management practices. On the other hand, Zomato Ltd. and PB Fintech Ltd. encounter considerable obstacles in their pursuit of operational efficiency and profitability. Zomato's financial history is marked by excessive leverage and ongoing losses, with a ray of hope in 2023 when it revealed a little increase in net profit. Even with this improvement, the company's overall performance still shows basic problems with cost control and return generation. Similar to this, PB Fintech experiences erratic outcomes, as seen by its generally poor profitability indicators. Its operational inefficiencies and the necessity of strategic realignment to ensure sustainable growth are further highlighted by the significant losses in 2022.

Overall, Zomato and PB Fintech reflect the inherent difficulties and financial instability that many e-commerce businesses encounter in fiercely competitive industries, but IRCTC and Info Edge demonstrate financial stability and the possibility of consistent growth. For long-term success in the e-commerce industry, this analysis emphasises the significance of strategic management, cost control, and effective capital allocation.

Descriptive analysis: It involves summarizing and presenting data to provide insights into its key characteristics, such as central tendency, variability, and distribution. It aims to describe and understand the features of a dataset without making inferences or drawing conclusions beyond the data itself.

Table 3: Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Debt Equity	4	0.01	0.36	0.1175	0.16358
Net Profit	4	-67.51	112.75	6.6325	80.54764
ROCE	4	-26.32	38.47	5.5675	26.86596
ROE	4	-75.08	30.10	-7.4450	46.96973
Valid N (listwise)	4				

Inference: A thorough summary of the four e-commerce enterprises' major financial ratios for the given time period can be found in the descriptive statistics table that is provided. The debt-to-equity (D/E) ratio, net profit (NP), return on equity (ROE), and return on capital employed (ROCE) are all included in the table. The central patterns and variability of these ratios across the companies are summarised by these data.

The Debt-to-Equity ratio, which shows a very low amount of debt across these organisations, has a minimum value of 0.01 and a maximum value of 0.36. Although the majority of businesses maintain low levels of debt, there is a noticeable degree of variety, especially with one company

having a substantially higher ratio (0.36), as seen by the average D/E ratio of 0.1175, with a standard deviation of 0.16358.

The range of numbers for Net Profit (NP) is -67.51 crore at the lowest and 112.75 crore at the highest. The standard deviation is relatively high (80.54764), indicating substantial profit volatility, despite the mean net profit of 6.6325 crore. This implies that the sample's businesses show notable variations in profitability, with some suffering large losses and others making big gains. While Info Edge's 2022 positive net profit greatly distorts the average, the negative readings, particularly in businesses like Zomato and PB Fintech, indicate times of financial or considerable losses.

The average Return on Capital Employed (ROCE) is 5.5675%, with a standard deviation of 26.86596 and a range of -26.32% to 38.47%. This large disparity suggests that although some businesses are effectively using their capital to produce returns, others are dealing with serious inefficiencies or losses. The high standard deviation indicates that the capital utilisation performance of the companies is highly varied, with some times showing significant increases (as was the case for IRCTC in 2023) and others reporting negative returns, especially for companies like Zomato.

Lastly, there is even more variation in Return on Equity (ROE), which ranges from -75.08% to 30.10%. With a standard deviation of 46.96973 and a mean ROE of -7.4450%, the returns generated on shareholders' equity exhibit significant volatility. This negative average and high variability indicate that, generally speaking, the companies are not providing their equity investors with favourable returns, with times of significant losses—particularly in Zomato and PB Fintech—playing a significant role in this conclusion.

All things considered, the data points to a sector that is marked by high levels of financial volatility, with businesses making both large gains and losses. The significant fluctuations in these financial measures, especially in NP, ROCE, and ROE, highlight the difficulties e-commerce businesses confront in generating returns, being profitable, and using capital efficiently. The companies' generally prudent use of debt is indicated by the low average D/E ratio throughout the sample; this could be a calculated move to prevent financial hardship in a turbulent market.

Correlation analysis:

It is a statistical technique for determining how strongly and in which direction two variables are related. It measures the relationship between changes in one variable and changes in another. Usually represented by the letter "r," correlation coefficients vary from -1 to +1. A significant positive connection is shown by a correlation coefficient near +1, which means that when one variable rises, the other one also tends to rise. A correlation value around -1, on the other hand, denotes a high negative connection, meaning that when one variable rises, the other tends to fall. There is little to no linear relationship between the variables when the correlation coefficient is around zero. In a variety of disciplines, such as epidemiology, psychology, economics, and finance, correlation analysis is useful for identifying trends, forecasting outcomes, and guiding decision-making processes.

Table 4: Correlations Analysis

		DebtEquity	NetProfit	ROCE	ROE
DebtEquity	Pearson Correlation	1	-0.539	-0.825	-.980*
	Sig. (2-tailed)		0.461	0.175	0.020
	N	4	4	4	4
NetProfit	Pearson Correlation	-0.539	1	0.484	0.543
	Sig. (2-tailed)	0.461		0.516	0.457
	N	4	4	4	4
ROCE	Pearson Correlation	-0.825	0.484	1	0.921
	Sig. (2-tailed)	0.175	0.516		0.079
	N	4	4	4	4
ROE	Pearson Correlation	-.980*	0.543	0.921	1
	Sig. (2-tailed)	0.020	0.457	0.079	
	N	4	4	4	4

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

Inference:

Relationships between the four e-commerce enterprises' financial variables—Debt-to-Equity ratio (Debt Equity), Net Profit (Net Profit), Return on Capital Employed (ROCE), and Return on Equity (ROE)—are revealed by the correlation analysis table. Every other variable has a negative correlation with the debt-to-equity ratio. In particular, it exhibits a statistically significant negative association (-0.980) with ROE at the 0.05 level (p -value = 0.020), suggesting that poorer returns on equity are linked to higher debt. Although not statistically significant (p -value = 0.175), the correlation with ROCE is likewise negative (-0.825), indicating that there is a relationship but it is weaker and less trustworthy. Debt Equity and Net Profit have a moderately negative (-0.539) but not statistically significant (p -value = 0.461) association, suggesting that debt levels do not strongly influence net profits in this sample.

Net Profit, which has a weak but positive connection with both ROCE (0.484) and ROE (0.543). Both have p -values above 0.05, but neither is statistically significant. This implies that although net profit and both capital and equity return have a little positive correlation, it is not significant enough to draw a conclusion about a meaningful relationship in this sample. The substantial positive correlation (0.921) between ROCE and ROE, which is almost significant (p -value = 0.079), indicates that businesses with higher returns on capital employed also typically produce higher returns on equity. Even if they seem to move together, the data is insufficiently strong to make a clear conclusion because this link is not statistically significant at the 0.05 level.

All things considered, the analysis shows that the debt-to-equity ratio and ROE have a strong and substantial inverse relationship, suggesting that greater leverage tends to lower shareholder

profitability. Although they shed some light on the overall patterns, the other associations are not statistically significant and should be evaluated cautiously.

Conclusion:

In summary, the main objective of this study was to investigate the capital structure trend, as indicated by the debt-equity ratio, and how it affected a number of profitability metrics, such as net profit, return on equity (ROE), return on capital employed (ROCE), and return on assets (ROA), in a chosen sample of Indian listed e-commerce businesses. The results show that capital structure and profitability are significantly correlated, with higher debt levels (as determined by the debt-equity ratio) generally having a negative impact on profitability, particularly return on equity (ROE). This provides validity to the alternative hypothesis (H_a), which proposed that the debt-to-equity ratio significantly affects these enterprises' profitability metrics. In particular, the study revealed that firms with greater leverage had lower returns on equity, indicating that debt might be a factor limiting profitability. The study also discovered that, although the debt-equity ratio was negatively correlated with ROCE, net profit, and other profitability metrics, these correlations were not always statistically significant. This suggests that, in addition to capital structure, other important factors that affect profitability include management practices and market conditions.

This study's future scope may involve expanding the sample size to include more e-commerce businesses, which would offer a more thorough understanding of the financial performance of the industry. A longer time frame for the investigation could assist take into consideration market fluctuations and cyclical tendencies that could affect how capital structure and profitability are related. Furthermore, adding more variables like market competition, managerial tactics, and macroeconomic considerations could help us better grasp how dynamic the e-commerce sector is. Future studies should also examine the qualitative facets of business performance, such as innovation and leadership calibre, which are not fully represented by financial measurements but could have a big influence on profitability.

There are various restrictions on this study. Only four businesses make up the limited sample size, which might not accurately reflect the larger Indian e-commerce market. The analysis may overlook long-term patterns and the impact of shifting market conditions because it only looks at the 2018–2023-time frame. Furthermore, the study ignores qualitative elements like competitive pressures, client behaviour, and strategic decisions in favour of quantitative data like financial ratios. Additionally, external factors that could affect financial performance—such as economic crises or changes in regulations—are not taken into account. These restrictions might be addressed in future studies to offer a more thorough comprehension of the financial dynamics of the e-commerce industry.

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