A study of DuPont Financial Analysis of E-Commerce: A Case Study of Listed Indian E-Commerce Companies

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Abstract

Electronic commerce plays a crucial role in advancing information technology as well as communication. In the era of globalizing economics, many markets became progressively international and competitive. In covid-19 pandemic further leads industries in heavily impacted areas to insource towards local production as global trade was blocked, and e-commerce can aid the economy on an outsized scale. This research paper delves into the financial performance of selected listed Indian e-commerce companies using DuPont analysis and ANOVA techniques. A six-year study spanning from financial year 2017-18 to 2022-23 analysed the financial performance of four prominent companies within the Indian e-commerce sector. Utilizing DuPont analysis, key financial metrics such as net profit margin, asset turnover, leverage ratio, and return on equity (ROE) were assessed to gauge operational efficiency and profitability. While some companies maintained satisfactory ROE averages, others struggled to generate positive returns relative to shareholders' equity, with one company facing significant challenges. However, ANOVA analysis revealed no significant differences in ROE among the selected e-commerce companies, suggesting that observed variations may be attributed to random fluctuation rather than systematic differences. These findings highlight the necessity for further investigation into factors influencing financial performance and the implementation of strategic measures to bolster profitability within the Indian e-commerce landscape.

Keywords - *ROE, ROA, ROCE, Dupont analysis, Net profit margin, Asset turnover ratio, Equity multiplier.*

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Introduction

In India, e-commerce has changed how business is conducted. The Indian e-commerce market is expected to increase from $46.2 billion in 2020 to $ 188 billion in 2025. The In Covid-19 outbreak further encourages entrepreneurship in severely affected places to insource toward the original product because international trade was halted and e-commerce may massively support the economy.

By connecting the net profit margin to total means development, the DuPont model functions as a kind of tool for evaluating managerial success. The DuPont model is an expansion of the ROI rate, which gauges the establishment's overall profitability and operational efficiency. The DuPont study takes into account the business of counting data from financial accounts.

Return on equity is a metric used by investors to gauge how much money a business makes off its equity. Using this, one can ascertain the operation's capacity for profit and if the establishment is a profit creator or a profit burner. So the DuPont Model should be utilised to estimate a company's Return on Equity. Other names for it include "DuPont Identity" and "DuPont Equation."

Three variables, as identified by DuPont Analysis, have an effect on ROE:

- Operating effectiveness as measured by profit margin

- Total asset turnover determines asset utilisation efficiency.

- Leverage on the financial side, as measured by the equity multiplier.

In a nutshell, DuPont analysis is a phrase that divides ROE (Return on Equity) into the aforementioned three corridors.

This report uses Dupont analysis to essentially quantify the financial success of India's named-listed e-commerce industry.

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:

Piyush R. Mehta (2013-14) analysed the annual reports of Axis Bank for the year 2013-14 and shows that Axis Bank has lower leverage ratio and higher Return on Equity. Axis Bank ROE is 15.64% in 2013 and 16.26% in 2014.

Ahmed Arif Almazari, Marginean R., Mihaltan D.C., and Tepes A. (2014) study on performance analysis in the construction industry using the Du-Pont Model uncovered several key insights. They found that within the furniture industry, an increase in equity correlated with potential growth in net income, influenced by various internal and external factors. Despite losses experienced by many companies in 2012, modest returns on sales and assets were observed industry-wide. However, some companies exhibited positive total assets turnover, suggesting potential for improved performance in specific areas.

Muhammad Mubin, Arslan Iqbal and Adnan Hussain (2012) investigated determinants of Return on Assets (ROA) and Return on Equity (ROE) across various sectors of the KSE 100 index. Analyzing 51 companies from 2004 to 2012, the research aimed to identify the most consistent component among Net Profit Margin (NPM), Total Asset Turnover (TAT), and Equity Multiplier (EM) in different industries. Results from ANOVA showed significant variation in Asset Turnover across industries, while Net Profit Margin and Equity Multiplier remained relatively stable across sectors.

Nanavati N.K. (2013) on 'DuPont analysis to measure ROE of satyam computers' found out that company was having negative ROE in the year 2010-11 which of course lead to reduction in equity but the subsequent year it is positive and seems good enough.

Botika M. (2012) examines the use of DuPont analysis in evaluating abnormal returns in the Romanian market. It delves into DuPont components to identify their impact on stock abnormal behaviour. Results reveal an intriguing evolution: strong correlations between cumulative abnormal returns and profitability, as well as ROA, were observed in 2007. How-

ever, 2008 and 2009 were marked by unpredictability among investors. Conversely, 2010 resembled 2007 in data patterns but with variations. Ultimately, the research concludes that DuPont components are crucial for analysing abnormal stock returns effectively.

K. Kartikeyan and S. Christina Sheela (2012) state that DuPont analysis is an important tool for judging the earning power of the firm. It is a type of comprehensive measure of profitability of firm also considering the tax related decisions.

Despite extensive research on the impact of capital structure on profitability using DuPont analysis, significant gaps remain. Most studies focus on specific industries or companies, limiting the generalizability of findings across different sectors. Additionally, there is a lack of comprehensive analysis integrating external economic factors that may influence profitability metrics. Further research could explore these relationships across a broader range of industries and economic contexts, providing a more holistic understanding of how capital structure impacts profitability.

Objective of the study

- To assess whether the return on equity (ROE) of selected listed Indian e-commerce companies shows significant variation over the study period.

Hypothesis

H_0= Return on Equity of selected listed Indian e-commerce companies does not differ significantly during the study period

H_1= Return on Equity of selected listed Indian e-commerce companies differs significantly during the study period

Research Methodology

The research strategies take into account the type and source of the data gathered to achieve the researcher's objectives. To achieve the goals of the research, quantitative data has been collected.

Data collection

This particular analysis is based entirely on secondary data that was obtained from chosen listed Indian e-commerce companies published annual reports. Other company-related data was gathered from official websites and other resources.

Period: The study covers a six financial year period, starting from 2017–18 and ending in 2022–23.

Sample of Study: The market capitalization was taken into account when choosing the sample units.

Table 1: List of Sample Companies

S.No	Company Name
1.	Info edge Ltd
2.	Indian railway catering & tourism (IRCTC)
3.	Zomato Ltd
4.	PB Fintech ltd

Mode of Study: The quantitative research approach is used to find out the findings of the research study. Since numerical and secondary data are used, the quantitative approach is taken into account to be a suitable approach for the study. "Statistical analysis is employed to describe an account for the observed variability in the data". This involves the method of analysing the data that has been collected. The upper level of statistical significance for hypotheses testing was set at 5%. Statistical analysis involves both descriptive and empirical statistics.

Sampling Techniques & Statistical tools:

The sampling techniques and statistical tools used in this paper provide a comprehensive framework for analyzing the impact of capital structure on profitability.

Purposive sampling was employed to select specific e-commerce companies (Info Edge Ltd, IRCTC, Zomato Ltd, and PB Fintech Ltd) based on their relevance to the Indian e-commerce sector.

Longitudinal study, which is allowed for the analysis of financial data across multiple years (2018 to 2023) for these firms, facilitating performance comparisons.

Time-series analysis was conducted to examine trends over time, providing insights into the companies' financial dynamics.

Descriptive statistics, which show case for key financial ratios under study.

ANOVA (Analysis of Variance) was utilized to test for significant differences in return on equity (ROE) among the selected companies, assessing whether variability in ROE between firms exceeded that within individual companies. Together, these techniques and tools enable a targeted and effective analysis of the financial performance of the selected e-commerce firms.

Descriptive statistics are used to describe and summarize the behavior of the variables in a study. They refer to the ways in which a large number of observations are reduced to interpretable numbers such as averages and percentages. Inferential statistics are used to draw conclusions about the reliability and generalizability of the findings. In order to test the research hypotheses; the inferential tests used include the Correlation Analysis. Descriptive statistics are used to describe and summarize the behavior of the variables in a study. They refer to the ways in which a large number of observations are reduced to interpretable numbers such as averages and percentages. Inferential statistics are used to draw conclusions about the reliability and generalizability of the findings. In order to test the research hypotheses; the inferential tests used include the Correlation Analysis.

Result & Discussion

Analysis by Dupont

A DuPont analysis is used to calculate the return on equity for a company (ROE). DuPont analysis is a useful method for sorting out the various elements that influence equity return (ROE). This information can be used by an investor to assess which financial actions have a bigger influence on changes in ROE. Investors use research like this to compare the organizational effectiveness of two related organizations.

ROE= Net Profit × Total Assets Turnover ×Financial Leverage

Net profit Ratio: The net profit ratio, a key part of DuPont analysis, measures how efficiently a company converts revenue into net income after expenses. A higher ratio signals better profitability and cost management, while a lower ratio may indicate lower profitability or higher expenses relative to revenue. Analysts use this ratio to gauge operational efficiency

and its impact on return on equity (ROE). The formula for calculating:

Net Profit Ratio = (Net Income / Revenue)

Table 2: Net profit ratios of sample units

Year	Info Edge Ltd	IRCTC	Zomato Ltd	PB Fintech Ltd
2018	**0.19**	**0.14**	**-0.21**	**-0.59**
2019	**0.25**	**0.16**	**-0.49**	**-0.32**
2020	**0.16**	**0.23**	**-1.05**	**0.16**
2021	**0.25**	**0.24**	**-0.51**	**0.15**
2022	**5.71**	**0.35**	**-0.3**	**-2.9**
2023	**0.19**	**0.28**	**0.02**	**-0.55**
Average	**1.125**	**0.233333**	**-0.42333**	**-0.675**
Variance	**5.04663**	**0.005987**	**0.132387**	**1.29547**
Minimum	**0.16**	**0.14**	**-1.05**	**-2.9**
Maximum	**5.71**	**0.35**	**0.02**	**0.16**

Source: Computed from financial data obtained from annual report of the companies

Interpretation

The net profit ratio across the selected e-commerce companies fluctuated over the years. Info Edge Ltd exhibited a significant increase in 2022, while IRCTC and Zomato Ltd showed variations without a clear trend. PB Fintech Ltd experienced negative values in certain years, indicating potential challenges. On average, Info Edge Ltd had the highest net profit ratio, while Zomato Ltd had the lowest. The variance in ratios suggests varying levels of stability and performance among the companies. Overall, the net profit ratios offer insights into the profitability dynamics of these e-commerce firms over the given period.

i) **Assets Turnover:** The asset turnover ratio in DuPont analysis measures how efficiently a company generates sales from its assets. It's calculated as Revenue divided by Average Total Assets. A higher ratio suggests better asset utilization for revenue generation, while a lower ratio may indicate inefficiency. This ratio provides insight into operational efficiency and profitability. When combined with a high net profit margin ratio, a high asset turnover ratio contributes to a stronger return on equity (ROE). The formula for calculating the asset turnover ratio is:

Asset Turnover Ratio = Revenue / Average Total Assets

Table 3: Assets Turnover of Sample Units

Year	Info Edge Ltd	IRCTC	Zomato Ltd	PB Fintech Ltd
2018	0.35	0.64	0.25	0.08
2019	0.37	0.72	0.3	0.03
2020	0.41	0.7	0.71	0.01
2021	0.21	0.25	0.19	0.03
2022	0.1	0.49	0.21	0.01
2023	0.17	0.7	0.21	0.02
Average	0.27	0.58	0.31	0.03
Variance	0.02	0.34	0.001	0.001
Minimum	0.1	0.25	0.19	0.01
Maximum	0.41	0.72	0.71	0.08

Source: Computed from financial data obtained from annual report of the companies

Interpretation

The asset turnover ratio measures a company's efficiency in generating revenue from its assets. In this table, Info Edge Ltd consistently maintains a moderate asset turnover ratio, indicating steady revenue generation relative to its asset base. IRCTC exhibits a relatively high asset turnover ratio, suggesting effective asset utilization leading to substantial revenue gen-

eration. Zomato Ltd demonstrates fluctuating performance but generally maintains a relatively high asset turnover ratio, indicating efficient use of assets to generate revenue. PB Fintech Ltd has the lowest asset turnover ratio, implying a less efficient utilization of assets to generate revenue compared to the other companies. Overall, while there are fluctuations, the companies generally show varying degrees of effectiveness in utilizing their assets to generate revenue, with IRCTC being the most efficient and PB Fintech Ltd being the least efficient.

Leverage Ratio

The leverage ratio, or equity multiplier, in DuPont analysis measures a company's reliance on debt financing relative to equity. It's calculated as Average Total Assets divided by Average Shareholders' Equity. A higher ratio indicates higher debt relative to equity, signalling greater financial leverage and risk. While a high leverage ratio can amplify returns on equity if asset returns exceed debt costs, it also increases financial risk and interest expense. Conversely, a lower ratio suggests lower risk but potentially lower returns on equity, highlighting the balance between risk and return in a company's capital structure. The formula for calculating the leverage ratio is:

Leverage Ratio = Average Total Assets / Average Shareholders' Equity

Table 4: Leverage Ratios of Sample units

Year	Info Edge Ltd	IRCTC	Zomato Ltd	PB Fintech Ltd
2018	1.25	2.43	1.22	1.05
2019	1.27	2.42	1.29	1.01
2020	1.28	2.45	4.96	1.01
2021	1.16	2.16	1.13	1.02
2022	1.16	2.04	1.04	1
2023	1.18	2.05	1.05	1
Average	1.216667	2.258333	1.781667	1.015
variance	0.003146667	0.038616667	2.433816667	0.00035
minimum	1.16	2.04	1.04	1
maximum	1.28	2.45	4.96	1.05

Source: Computed from financial data obtained from annual report of the companies

Interpretation: The financial leverage ratio indicates the degree to which a company relies on debt financing. In this table, all companies demonstrate relatively low leverage ratios, with Info Edge Ltd and IRCTC averaging around 1.22 and 2.26 respectively, indicating modest reliance on debt. Zomato Ltd exhibits a higher average ratio of 1.78, suggesting a comparatively higher dependence on debt financing. PB Fintech Ltd maintains the lowest leverage ratio, averaging around 1.02, indicating minimal reliance on debt. Overall, while there are variations, the companies generally show moderate to low dependence on debt financing, with Zomato Ltd being relatively higher and PB Fintech Ltd being the lowest.

Return on Equity (ROE)

Is a financial metric that evaluates a company's profitability by decomposing it into three components: net profit margin, asset turnover, and financial leverage. ROE is calculated as the product of these three components, representing the profitability generated by each unit of equity investment. This analysis provides insights into the drivers of ROE, helping stakeholders understand how effectively the company generates profits from its equity base, its operational efficiency, and its leverage.

ROE= Net Profit × Total Assets Turnover ×Financial Leverage

Table 5: Return on Equity of Sample Units

Year	Info Edge Ltd	IRCTC	Zomato Ltd	PB Fintech Ltd
2018	0.08	0.23	-0.07	-0.05
2019	0.12	0.29	-0.19	-0.02
2020	0.09	0.4	-4.1	0.004
2021	0.06	0.13	-0.12	0.007
2022	0.66	0.36	-0.07	-0.04
2023	0.03	0.41	0.005	-0.16
Average	0.173333	0.303333	-0.7575	-0.04317
Variance	0.057746667	0.011906667	2.6854975	0.003797
Minimum	0.03	0.13	-4.1	-0.16
Maximum	0.66	0.41	0.005	0.007

Source: Computed from financial data obtained from annual report of the companies

Interpretation

The Return on Equity (ROE) ratio assesses a company's profitability relative to shareholders' equity. In this table, Info Edge Ltd and IRCTC maintain moderate ROE averages of 17.33% and 30.33% respectively, indicating satisfactory returns on equity. However, Zomato Ltd exhibits a significantly negative average ROE of -75.75%, suggesting substantial losses relative to shareholders' equity, likely due to high liabilities or operating inefficiencies. PB Fintech Ltd also demonstrates a negative average ROE of -4.32%, indicating subpar returns on equity. Overall, while Info Edge Ltd and IRCTC show healthy returns, Zomato Ltd and PB Fintech Ltd face challenges in generating positive returns relative to shareholders' equity, with Zomato Ltd experiencing the most significant difficulties.

ANOVA Analysis

ANOVA (Analysis of Variance) is a statistical technique used to compare means across multiple groups or treatments to determine if there are statistically significant differences between them. It assesses whether the variability observed between groups is greater than the variability observed within groups. ANOVA helps researchers determine if there are differences in means and if those differences are likely due to real effects or simply due to random variation.

Table 6: Anova Analysis

ANOVA					
ROE					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	3.341	5	0.668	0.831	0.545
Within Groups	14.482	18	0.805		
Total	17.824	23			

Interpretation

The ANOVA table provided offers a detailed statistical analysis of the Return on Equity (ROE) among selected listed Indian e-commerce companies over the study period, providing insights into the hypotheses regarding potential differences in ROE during this time frame. The null hypothesis (H0) posits that there are no significant differences in ROE among these companies, while the alternative hypothesis (H1) suggests otherwise. The ANOVA results reveal an F-statistic of 0.831 and a corresponding p-value of 0.545.

Interpreting these findings, the F-statistic indicates the ratio of the variability among group means to the variability within groups. In this context, the F-statistic of 0.831 suggests that the variability in ROE between the groups is relatively small compared to the variability within the groups. Additionally, the p-value of 0.545 indicates that the observed F-statistic is not statistically significant at conventional significance levels (usually $p < 0.05$). Therefore, there is insufficient evidence to reject the null hypothesis.

In essence, the ANOVA analysis suggests that the differences observed in ROE among the selected e-commerce companies during the study period could be due to random variation rather than systematic differences between the groups. Consequently, the findings do not support the alternative hypothesis of significant differences in ROE among these companies. This implies that the ROE of the selected listed Indian e-commerce companies may not vary significantly over the study period, highlighting the need for further investigation into the factors influencing their financial performance.

Conclusion

In conclusion, The ANOVA analysis indicates no significant differences in Return on Equity (ROE) among the selected Indian e-commerce companies over the study period. While Info Edge Ltd and IRCTC maintain satisfactory ROE averages, Zomato Ltd and PB Fintech Ltd struggle to generate positive returns relative to shareholders' equity, with Zomato Ltd facing the most significant challenges. Further investigation into factors influencing financial performance, such as operating efficiency and capital structure, is needed. Strategies to improve ROE for underperforming companies, including optimizing cost structures and enhancing revenue streams, should be explored. Overall, while the ANOVA analysis provides

insights, deeper examination and strategic interventions are necessary to address performance disparities and enhance financial health in the Indian e-commerce sector.

References

Almazari, A. A., Marginean, R., Mihaltan, D. C., & Tepes, A. (2014). Performance analysis in the construction industry using the DuPont model [Unpublished manuscript].

Botika, M. (2012). Use of DuPont analysis in evaluating abnormal returns in the Romanian market [Unpublished manuscript].

Doorasamy, M. (2016). Using DuPont analysis to assess the financial performance of the top 3 JSE listed companies in the food industry. *Investment Management and Financial Innovations*, *13*(2), 29–44. https://doi.org/10.21511/imfi.13(2).2016.04

Kartikeyan, K., & Sheela, S. C. (2012). Financial performance of pharmaceutical industry in India using DuPont analysis. *European Journal of Business and Management*, *4*(2), 45-55.

Lorca, P., et al. (2019). Impact of e-commerce sales on profitability and revenue: The case of the manufacturing industry. *Engineering Economics*, *30*(5), 544–555. https://doi.org/10.5755/j01.ee.30.5.21254

Mehta, P. R. (2015). DuPont analysis on Axis Bank [Unpublished manuscript].

Mohanasundari, M. (2020). Using DuPont analysis to assess the financial performance of selected companies in the plastic industry in India. *Gedrag en Organisatie*, *33*(2). https://doi.org/10.37896/gor33.02/287

Mubin, M., Iqbal, A., & Hussain, A. (2012). Determinants of Return on Assets (ROA) and Return on Equity (ROE) across various sectors of the KSE 100 index [Unpublished manuscript].

Nanavati, N.K.(2013). Dupont analysis to major return on equity of satyam computer services limited. Paripex-*Indian Journal of Research*, 2(3), 38-40.

Panamaldeniya, & Menike, P. (2021). The impact of DuPont model parameters on financial performance: A study on listed companies in the food, beverage and tobacco industry group in Sri Lanka. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4117506

Rogova, E. (2014). DuPont analysis of the efficiency and investment appeal of Russian oil-extracting companies. In *The 8th International Scientific Conference 'Business and Management 2014'* (pp. 1–6). Vilnius Gediminas Technical University Publishing House Technika. https://doi.org/10.3846/bm.2014.021

Zhu, K., & Kraemer, K. (2002). E-commerce metrics for net-enhanced organizations: Assessing the value of e-commerce to firm performance in the manufacturing sector. *Information Systems Research*, *13*(2), 275–295.

Davidson, W. Analysis of profitability using the DuPont analysis. (2020). In *Financial Statement Analysis*. Wiley. https://doi.org/10.1002/9781119743217.ch3