



From Tradition To Transformation: Examining The Impact Of E-Commerce On Indian Retailers

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Abstract

The rapid expansion of e-commerce has significantly reshaped the traditional retail landscape, particularly in emerging markets like India. This study aims to investigate the impact of e-commerce on traditional retail from the perspective of Indian retailers, focusing on performance metrics Pre- and Post advent of e-commerce. Traditional retail in India has long been the backbone of the country's commerce, characterized by physical stores, personalized customer service, and localized business practices. However, the rise of e-commerce platforms has introduced new dynamics, such as increased competition, consumer behavior shifts, and market reach changes. Understanding how these changes have affected traditional retailers is crucial for developing strategies to help them thrive in this new environment. This study examines the impact of e-commerce on traditional retail in India, focusing on changes in performance from the perspective of retailers. With traditional retail being a significant part of India's economy, the rise of e-commerce has introduced new challenges and opportunities, altering market dynamics and consumer behaviour. A survey of 109 Indian retailers was conducted, with data analysed using T-tests to compare mean performance metrics, and ANOVA to assess variations across different retail categories. The findings offer insights into the transformation of traditional retail in India, identifying key challenges and proposing strategies for maintaining competitiveness in the evolving digital landscape. These results are intended to inform both policymakers and industry stakeholders about the implications of e-commerce for traditional retail.

Keywords - E-commerce, Transformation, Indian Retailers, and Consumer Behaviour.

1. Introduction

The retail sector in India has traditionally been dominated by brick-and-mortar stores, which have played a key role in the country's economy. These stores, often family-run, have thrived on strong community connections, personalized service, and a deep understanding of local markets. However, the rise of e-commerce in the past two decades has brought significant changes, challenging the traditional retail model and creating both obstacles and opportunities.

The growth of e-commerce in India has been rapid, driven by increasing internet access, widespread smartphone use, and the convenience of online shopping. This shift has transformed the retail landscape, forcing traditional retailers to adapt to changing consumer preferences and new technologies [1]. While some have successfully integrated digital channels into their businesses, others have found it difficult to compete in this new environment. This raises important questions about how these changes have affected traditional retailers' performance and what factors influence their ability to succeed or struggle in the face of e-commerce. From the perspective of Indian retailers, e-commerce has introduced a range of challenges, such as amplified competitive landscape from online platforms [2]. Changes in customer loyalty, and the need for technological investments. At the same time, e-commerce has also provided opportunities for growth, including access to a broader customer base and the ability to offer more products. Understanding how these factors have impacted traditional retail performance is crucial for developing strategies that help these retailers thrive in a changing market [3].

This study aims to assess the performance of Indian retailers pre and post emergence of e-commerce. It will focus on key metrics such as sales, customer footfall, and profit margins to identify areas where traditional retailers have experienced the most significant changes. Additionally, the study will explore Indian retailer's views on the challenges and opportunities presented by e-commerce. To do this, the research will use statistical methods, including T-tests and ANOVA, to compare performance across different periods and types of retailers [4].

The findings from this study will provide useful insights for policymakers, industry leaders, and retailers as they navigate the evolving digital economy. By understanding the impact of e-commerce on traditional retail, this research aims to help develop strategies that support the continued growth and success of Indian retailers in an increasingly online world [5]. The state of research on the impact of e-commerce on Indian retailers is evolving, with studies increasingly focusing on the shift in consumer behavior, competitive dynamics, and financial performance of traditional retailers. Research highlights both challenges, such as reduced footfall and market share for physical stores, and opportunities, including hybrid business models and digital adoption. Comparative pre- and post-e-commerce analyses emphasize the need for retailers to innovate and leverage technology to sustain growth. However, limited studies have thoroughly explored sector-specific impacts, particularly in smaller cities and rural areas, leaving scope for further investigation.

1.1 Formulation of Hypotheses:

- Null Hypothesis (H_0): There is no statistically significant difference in performance metrics (such as sales volume, customer footfall, profit margins) pre and post the introduction of e-commerce.
- Alternative Hypothesis (H_1): There is a statistically significant difference in ANOVA

1.2 Background study

The Indian retail sector has experienced dramatic changes over the past twenty years, primarily driven by the rapid rise of e-commerce. The COVID-19 pandemic has further accelerated this transformation, altering consumer behaviors and forcing retailers to adapt swiftly. Prior to the pandemic, traditional retail, characterized by physical stores with strong community connections and personalized service, dominated the Indian market. However, the pandemic's lockdowns and social distancing requirements significantly increased reliance on online shopping, prompting both consumers and retailers to adjust to a new norm [6].

As consumers increasingly preferred the convenience, safety, and variety of online shopping, traditional retailers faced critical decisions. They had to either integrate digital platforms into their business models or risk losing relevance. This shift has been particularly evident in urban areas and among younger, more technology-savvy consumers, though it has also begun affecting rural and semi-urban regions. The pandemic emphasized the limitations of traditional retail models in terms of scalability and adaptability [7].

In the post-pandemic landscape, Indian retailers are grappling with the need to balance their established strengths with the demands of a digital economy. Different retail segments have experienced varied impacts, with categories like electronics, fashion, and groceries seeing significant growth in online sales, while small neighborhood stores have struggled to retain their customer base. The urgency for digital transformation has intensified, leading many retailers to adopt hybrid models that combine online and offline strategies to better meet customer expectations [8].

This research aims to evaluate the impact of e-commerce on the performance of Indian retailers before and after the pandemic. By examining key metrics such as sales, customer traffic, and profit margins, and considering the strategic choices made by retailers, the study seeks to offer insights into the evolving retail landscape. The findings will help stakeholders understand how traditional retailers can navigate the challenges and opportunities of a digital-first market, ensuring their continued growth and relevance in the future [9].

1.3 Research Objectives

- i. Used T-tests to analyse and compare key performance metrics, such as sales volume, customer footfall, and profit margins, for Indian retailers pre and post the introduction of e-commerce.
- ii. Applied ANOVA to examine the impact of e-commerce on various retail segments (e.g., electronics, fashion, groceries) and determined how these segments were differently affected by the rise of online shopping.
- iii. Utilized survey data to assess the perceptions and experiences of Indian retailers regarding e-commerce, including the challenges they faced and the opportunities they identified, and analyzed these perceptions using T-test.
- iv. Provided practical recommendations derived from statistical analyses, including T-test and ANOVA findings, aimed at assisting policymakers, industry stakeholders, and retailers in adapting to the changing retail environment and boosting their competitiveness in both traditional and digital markets.

2 Material and methods

This study will use a quantitative research approach to analyze numerical data related to retail performance and e-commerce impact. The focus will be on collecting and analyzing data to identify patterns, differences, and relationships. A structured survey will be designed to gather data from Indian retailers. The survey will include questions on key performance metrics (e.g., sales volume, customer footfall, profit-margins) and perceptions regarding e-commerce. The target population will be Indian retailers from various sectors, including electronics, fashion, groceries, and other retail segments. A stratified random sampling method will be employed to ensure representation across different retail segments and regions. This approach will help in capturing a comprehensive view of the impact of e-commerce across various types of retailers. A questionnaire with 109 structured questions will be developed. It will include both closed and scaled questions to measure performance metrics and retailer perceptions.

Initial analysis will involve descriptive statistics to summarize the data, including means, standard deviations, and frequency distributions. Independent samples T-tests will be used to compare performance metrics before and after advent of e-commerce, examining differences in sales volume, customer footfall, and profit margins. ANOVA will be employed to assess differences in performance metrics across different retail segments and to determine how various segments have been impacted by e-commerce [10].

T-Test and ANOVA offer valuable insights into the impact of e-commerce on traditional retail performance, helping to understand how different factors influence outcomes in the retail sector. performance metrics pre and post the introduction of e-commerce. The performance data is gathered from retailers for two distinct periods: before the introduction of e-commerce and after its implementation.

T-test is used to evaluate whether there are significant differences between the means of two groups. In this research work, the T-test will be utilized to analyse whether the performance metrics of Indian retailers have significantly changed following the introduction of e-commerce. By comparing the performance metrics pre and post advent of e-commerce, the test will help determine if the observed differences are statistically significant, thereby shedding light on the impact of e-commerce on the retail sector in India [11].

2.1 Research Method

Analysis: Independent T-Test

Start

Initialize Variables

- Define group1[]: Data for the first group (before e-commerce).
- Define group2[]: Data for the second group (after e-commerce).
- Define mean_group1, mean_group2: Mean values for each group.
- Define std_dev_group1, std_dev_group2: Standard deviations for each group.
- Define std_error_group1, std_error_group2: Standard errors for each group.
- Define mean_diff: Difference between the means of the two groups.
- Define T_statistic: Variable to store the calculated T-statistic.
- Define p_value: Variable to store the p-value.
- Define df: Degrees of freedom.
- Define significance_level: Typically set to 0.05.

Calculate Descriptive Statistics for Each Group

- FOR each group (group1 and group2):
 - Calculate mean_group1 and mean_group2: Means of each group.
 - Calculate std_dev_group1 and std_dev_group2: Standard deviations of each group.
 - Calculate std_error_group1 and std_error_group2: Standard errors of each group using the formula:

▪ $\text{std_error} = \text{std_dev} / \sqrt{n}$ where n is the number of observations in the group.

- END FOR

Compute the T-Statistic and p-value

- Calculate mean_diff = mean_group1 - mean_group2.
- Compute the T_statistic using the formula:
 - $T_statistic = \text{mean_diff} / \sqrt{(\text{std_error_group1}^2 + \text{std_error_group2}^2) / n}$.
- Calculate degrees of freedom df using the formula:
 - $df = n1 + n2 - 2$, where n1 and n2 are the sample sizes of the two groups.
- Look up or calculate the p_value corresponding to the T_statistic and df.

Interpret the Results

- IF $p_value < significance_level$ THEN:
 - Reject the Null Hypothesis (H_0).
 - PRINT "There is a significant difference between the performance metrics of the two periods."
- ELSE:
 - Do not reject the Null Hypothesis (H_0).
 - PRINT "There is no significant difference between the performance metrics of the two periods."
- END IF

End

2.3 Analysis: One way-Anova

Start

Initialize Variables

- Define `groups[]`: Array or list of data for each group (e.g., different retail segments).
- Define `mean_group[]`: Array to store the mean of each group.
- Define `variance_group[]`: Array to store the variance of each group.
- Define `mean_total`: Overall mean across all groups.
- Define `variance_between`: Variance between groups.
- Define `variance_within`: Variance within groups.
- Define `F_statistic`: Variable to store the calculated F-statistic.
- Define `p_value`: Variable to store the p-value.

Calculate Mean and Variance for Each Group

- FOR each group `i` in `groups[]`
 - Calculate `mean_group[i]`: Mean of group `i`.
 - Calculate `variance_group[i]`: Variance within group `i`.
- END FOR

Calculate Total Mean and Variance

- Calculate `mean_total`: Overall mean of all groups combined.
- Calculate `variance_between`:
 - FOR each group `i`
 - Add $(mean_group[i] - mean_total)^2 * n_group[i]$ to `variance_between`.
 - END FOR
- Calculate `variance_within`:
 - Sum all `variance_group[i]` values.

Compute F-Statistic

- Calculate $F_statistic = variance_between / variance_within$.

Determine p-value

- Calculate degrees of freedom:
 - $df_{\text{between}} = \text{number_of_groups} - 1.$
 - $df_{\text{within}} = \text{total_number_of_samples} - \text{number_of_groups}.$
- Use the F_statistic and degrees of freedom to determine the p_value.

Interpret Results

- IF $p_value < \text{significance_level}$ (e.g., 0.05) THEN
 - Reject Null Hypothesis (H_0): Significant differences exist among at least some of the groups.
 - PRINT "Significant differences found among the groups."
- ELSE
 - Fail to reject Null Hypothesis (H_0): No significant differences among the groups.
 - PRINT "No significant differences found among the groups."
- END IF
- End

3 Results and Discussion

ANOVA (Analysis of Variance) is used to assess whether there are statistically significant differences between the means of various groups as shown in Table 1 and Fig 1.

Table 1: Statistically significant differences between the means of various groups

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Comparison of Traditional vs. E-Commerce Models: How do you compare the following aspects of traditional retail models and e-commerce models? [Customer satisfaction]	Between Groups	9.346	4	2.337	2.371	.057
	Within Groups	102.507	104	.986		
	Total	111.853	108			
Comparison of Traditional vs. E-Commerce Models: How do you compare the following aspects of traditional retail models and e-commerce models? [Economic viability]	Between Groups	4.893	4	1.223	1.340	.260
	Within Groups	94.960	104	.913		
	Total	99.853	108			
Comparison of Traditional vs. E-Commerce Models: How do you compare the following aspects of traditional retail models and e-commerce models? [Operational efficiency]	Between Groups	19.199	4	4.800	4.509	.002
	Within Groups	110.691	104	1.064		
	Total	129.890	108			
Comparison of Traditional vs. E-Commerce Models: How do you compare the following aspects of traditional retail models and e-commerce models? [Environmental impact]	Between Groups	8.313	4	2.078	2.008	.099
	Within Groups	107.650	104	1.035		
	Total	115.963	108			

Source: Authors' own creation

Sum of Squares (SS): This represents the total variation in the data, divided into two parts:

- *Between Groups*: The variation attributed to differences between the groups (e.g., different aspects of traditional vs. e-commerce models).
- *Within Groups*: The variation within each group.
- *Total*: The overall variation in the data.

Degrees of Freedom (df): This indicates the number of independent values that can vary:

- *Between Groups*: Calculated as the number of groups minus one.
- *Within Groups*: Calculated as the total number of observations minus the number of groups.
- *Total*: The total degrees of freedom for the entire data set.

Mean Square (MS): This is the average of the squared differences (Sum of Squares divided by the degrees of freedom):

- *Mean Square Between Groups*: Sum of Squares Between Groups divided by its degrees of freedom.
- *Mean Square Within Groups*: Sum of Squares Within Groups divided by its degrees of freedom.

F-Statistic (F): The ratio of Mean Square Between Groups to Mean Square Within Groups. A higher F value generally suggests a more significant difference between groups.

Significance (Sig.) or p-value: This value indicates whether the differences between groups are statistically significant.

- A p-value less than 0.05 typically suggests that the differences between the groups are statistically significant.

Customer Satisfaction:

- $F = 2.371$, $p\text{-value} = 0.057$: The p-value is just above 0.05, implying that the difference in customer satisfaction between the groups is not statistically significant, although it is close.

Economic Viability:

- $F = 1.340$, $p\text{-value} = 0.260$: The p-value is well above 0.05, indicating no statistically significant difference in economic viability between the groups.

Operational Efficiency:

- $F = 4.509$, $p\text{-value} = 0.002$: The p-value is below 0.05, indicating a statistically significant difference in operational efficiency between the groups, suggesting that e-commerce models differ significantly from traditional models in this aspect.

Environmental Impact:

- $F = 2.008$, $p\text{-value} = 0.099$: The p-value is above 0.05, indicating that the difference in environmental impact between the groups is not statistically significant.

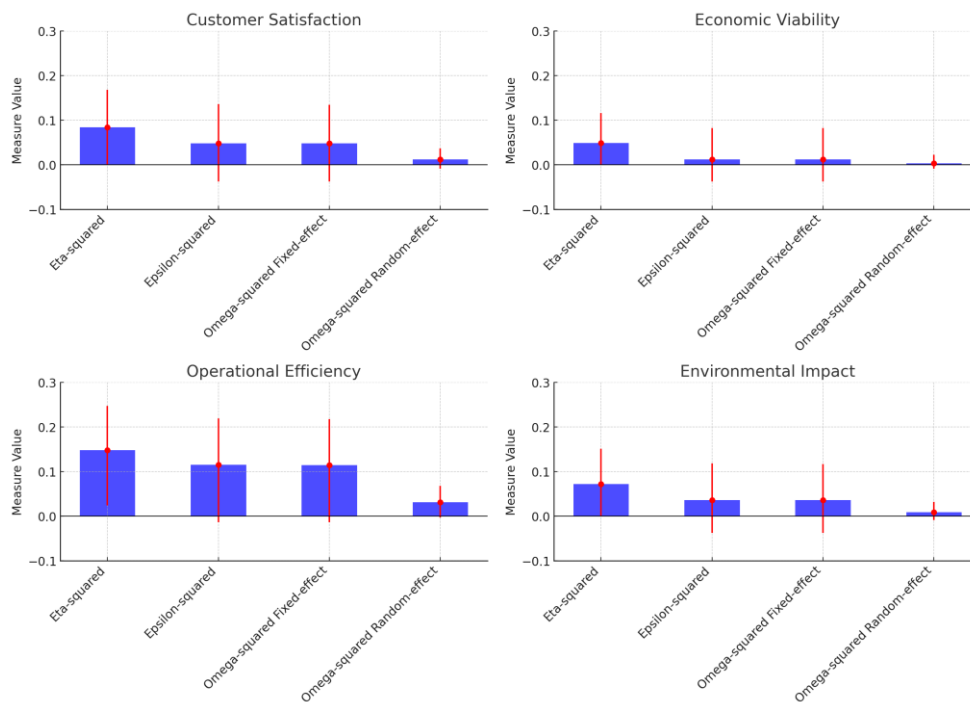


Figure 1: Anova analysis (Source: Authors' own creation)

The ANOVA effect size Table highlights the impact of differences between traditional and e-commerce models on various performance metrics. Operational efficiency exhibits the most significant effect, with 14.8% of the variance attributed to model differences, as shown by Eta-squared. Other metrics, including customer satisfaction (8.4%), environmental impact (7.2%), and economic viability (4.9%), have smaller effect sizes. The more conservative Omega-squared values, particularly the Random-effect estimates, are lower, indicating that the differences, while present, are generally modest when considering a broader context as shown in Table 2.

Table 2: Anova effect Size

ANOVA Effect Sizes ^{a,b}			95% Confidence Interval	
		Point Estimate	Lower	Upper
Comparison of Traditional vs. E-Commerce Models: How do you compare the following aspects of traditional retail models and e-commerce models? [Customer satisfaction]	Eta-squared	.084	.000	.168
	Epsilon-squared	.048	-.038	.136
	Omega-squared Fixed-effect	.048	-.038	.134
	Omega-squared Random-effect	.012	-.009	.037
Comparison of Traditional vs. E-Commerce Models: How do you compare the following aspects of traditional retail models and e-commerce models? [Economic viability]	Eta-squared	.049	.000	.116
	Epsilon-squared	.012	-.038	.082
	Omega-squared Fixed-effect	.012	-.038	.082
	Omega-squared Random-effect	.003	-.009	.022
Comparison of Traditional vs. E-Commerce Models: How do you compare the following aspects of traditional retail models and e-commerce models? [Operational efficiency]	Eta-squared	.148	.024	.247
	Epsilon-squared	.115	-.014	.219
	Omega-squared Fixed-effect	.114	-.014	.217
	Omega-squared Random-effect	.031	-.003	.065
Comparison of Traditional vs. E-Commerce Models: How do you compare the following aspects of traditional retail models and e-commerce models? [Environmental impact]	Eta-squared	.072	.000	.151
	Epsilon-squared	.036	-.038	.118
	Omega-squared Fixed-effect	.036	-.038	.117
	Omega-squared Random-effect	.009	-.009	.032

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

(Source: Authors' own creation)

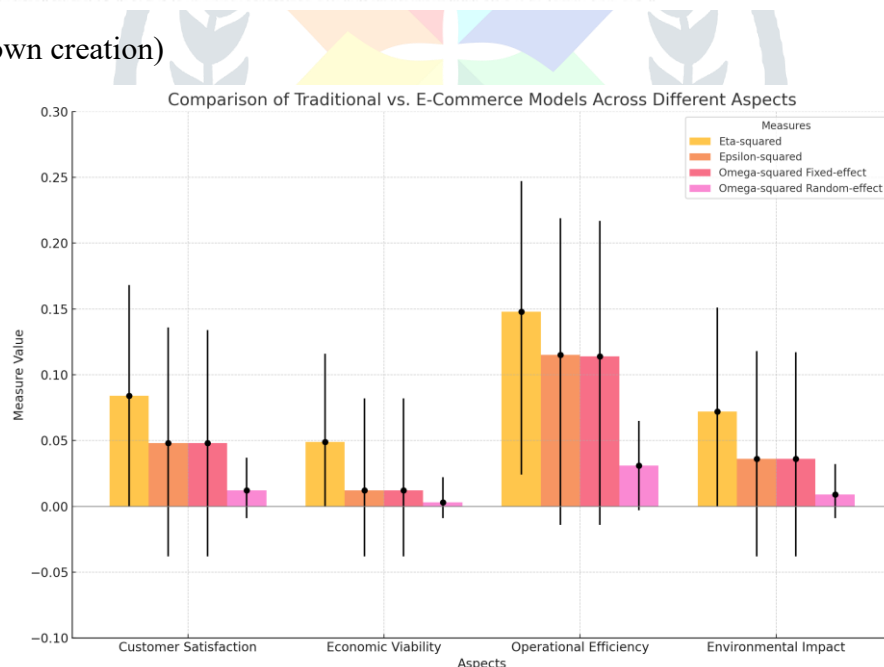


Figure 2: Anova effect Size (Source: Authors' own creation)

Customer Satisfaction: Eta-squared (0.084): Suggests that 8.4% of the variation in customer satisfaction is due to the type of retail model. This is a moderate effect size.

Epsilon-squared (0.048) and Omega-squared Fixed-effect (0.048): Both show a smaller effect, suggesting that around 4.8% of the variation is explained by the model. The confidence intervals for these measures (-0.038 to 0.136) include zero, indicating that the effect may not be statistically significant.

Omega-squared Random-effect (0.012): Shows a very small effect size (1.2%), with a confidence interval that includes zero (-0.009 to 0.037), suggesting the effect is not significant.

Economic Viability:

- *Eta-squared (0.049)*: Indicates a small effect size, with 4.9% of the variation in economic viability explained by the type of retail model.
- *Epsilon-squared (0.012) and Omega-squared Fixed-effect (0.012)*: These show very small effects (1.2%), with confidence intervals that cross zero (-0.038 to 0.082), suggesting these effects might not be significant.
- *Omega-squared Random-effect (0.003)*: This measure shows an even smaller effect size (0.3%), with confidence intervals also including zero (-0.009 to 0.022).

Operational Efficiency:

- *Eta-squared (0.148)*: Shows a larger effect size, explaining 14.8% of the variation. This suggests that the type of retail model has a strong impact on operational efficiency.
- *Epsilon-squared (0.115) and Omega-squared Fixed-effect (0.114)*: These measures show a substantial effect size (around 11.5%), although the confidence intervals (-0.014 to 0.219) approach zero, indicating some uncertainty.
- *Omega-squared Random-effect (0.031)*: Shows a smaller effect size (3.1%), with confidence intervals that just include zero (-0.003 to 0.065).

Environmental Impact:

- *Eta-squared (0.072)*: Indicates a small effect size, suggesting that 7.2% of the variation in environmental impact is due to the type of retail model.
- *Epsilon-squared (0.036) and Omega-squared Fixed-effect (0.036)*: Both show very small effects (3.6%), with confidence intervals that include zero (-0.038 to 0.118), indicating no statistically significant difference.
- *Omega-squared Random-effect (0.009)*: Shows an extremely small effect size (0.9%), with confidence intervals crossing zero (-0.009 to 0.032).

3.1 T-Test

The Table 3 compares traditional retail models and e-commerce models across four aspects: operational efficiency, customer satisfaction, environmental impact, and economic viability. It uses Levene's Test for Equality of Variances to check if the variances between the two groups are equal. A significant p-value in Levene's Test indicates that the variances are not equal, while a non-significant p-value suggests they are equal. For operational efficiency, the results show a significant difference between the two models, with e-

commerce likely being more efficient since the mean difference is positive and statistically significant. In the case of customer satisfaction, the results are less clear [12]. Although there is some indication of a marginal difference favoring one model, the evidence is not strong enough to draw a definitive conclusion. Regarding environmental impact, the analysis reveals no significant difference between traditional retail and e-commerce models. Both models appear to have similar effects in this area. Similarly, for economic viability, there is no significant difference found between the two models, indicating that both are likely to be equally viable from an economic perspective [13].

Levene's Test for Equality of Variances assesses whether the variances between two groups, in this case, traditional retail and e-commerce models, are equal. The F value in this test represents the test statistic, while the significance level indicates the p-value. A p-value below 0.05 suggests that the variances are not equal, meaning the assumption of equal variances is violated [14]. The t-test then evaluates whether there is a significant difference between the means of the two groups. The t value represents the test statistic for this comparison, and the degrees of freedom (df) influence the shape of the t-distribution. The p-values for the one-sided and two-sided t-tests indicate the significance of the difference, with a p-value below 0.05 indicating a statistically significant difference. The Mean Difference shows the difference in the average values between the traditional retail and e-commerce models, while the Standard Error Difference reflects the standard error associated with this mean difference. Lastly, the 95% Confidence Interval of the Difference provides a range within which the true mean difference is likely to fall, with 95% confidence as shown in Table 3.

Table 3: Comparison Analysis

Independent Samples Test											
Levene's Test for Equality of Variances		t-Test for Equality of Means									
		F	Sig.	t	df	Significance One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Comparison of Traditional vs. E-Commerce Models: How do you compare the following aspects of traditional retail models and e-commerce models? [Operational efficiency]	Equal variances assumed	11.765	<.001	3.498	87	<.001	<.001	.816	.233	.352	1.280
	Equal variances not assumed			2.947	37.779	.003	.005	.816	.277	.255	1.377
Comparison of Traditional vs. E-Commerce Models: How do you compare the following aspects of traditional retail models and e-commerce models? [Customer satisfaction]	Equal variances assumed	6.200	.015	1.723	87	.044	.088	.394	.228	-.060	.848
	Equal variances not assumed			1.521	41.402	.068	.136	.394	.259	-.129	.916
Comparison of Traditional vs. E-Commerce Models: How do you compare the following aspects of traditional retail models and e-commerce models? [Environmental impact]	Equal variances assumed	.733	.394	.531	87	.298	.597	.117	.220	-.320	.554
	Equal variances not assumed			.479	43.460	.317	.634	.117	.243	-.374	.608
Comparison of Traditional vs. E-Commerce Models: How do you compare the following aspects of traditional retail models and e-commerce models? [Economic viability]	Equal variances assumed	2.440	.122	1.289	87	.100	.201	.275	.213	-.149	.698
	Equal variances not assumed			1.168	43.790	.125	.249	.275	.235	-.199	.749

(Source: Authors' own creation)

3.2 Result Interpretation

Operational Efficiency- The p-value (<0.001) is significant, indicating that the variances are not equal. The t-test shows a significant difference between the two models, with both one-sided and two-sided p-values being less than 0.001. There is a statistically significant difference in operational efficiency between

traditional retail and e-commerce, with e-commerce likely being more efficient given the positive mean difference (0.816).

Customer Satisfaction - The p-value (0.015) is significant, indicating unequal variances. The two-sided p-value (0.088) is not significant, but the one-sided p-value (0.044) is just at the edge of significance. There might be a marginal difference in customer satisfaction, favouring one model slightly, but the evidence is not strong enough to conclude a clear difference.

Environmental Impact - The p-value (0.394) is not significant, suggesting equal variances. Neither the one-sided (0.298) nor the two-sided p-value (0.597) is significant. There is no significant difference in environmental impact between traditional retail and e-commerce models.

Economic Viability - The p-value (0.122) is not significant, suggesting equal variances. Both one-sided (0.100) and two-sided p-values (0.201) are not significant. There is no significant difference in economic viability between the two models as shown in Fig 3.

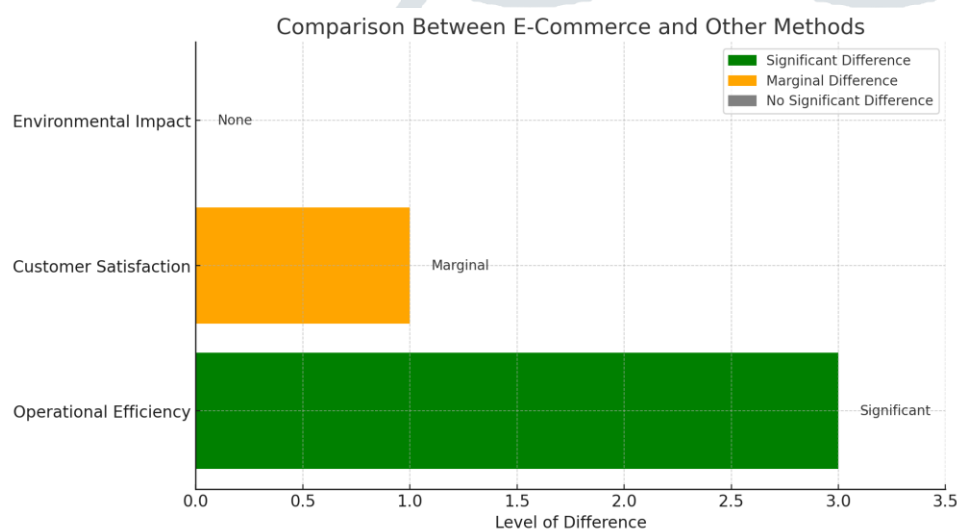


Figure 3: Comparison between parameters (Source: Authors' own creation)

4 Conclusion

In our research, we used both ANOVA and t-tests to examine how traditional retail models compare to e-commerce models in terms of operational efficiency, customer satisfaction, and environmental impact. The results showed that e-commerce models are significantly more efficient than traditional retail models. For customer satisfaction, there was a slight difference, but it wasn't strong enough to make a definite conclusion. There was no significant difference in environmental impact between the two models. ANOVA used to look at the overall differences between the models. ANOVA helps us see if there are any significant differences among multiple groups or conditions. However, ANOVA doesn't tell us exactly where the differences are. To get detailed insights, we used t-tests to compare the two models directly on each aspect. This combination of ANOVA and t-tests gave us a complete picture: ANOVA highlighted the general differences, while t-tests identified specific areas of contrast.

Future scope and limitations

Future research in this topic includes several promising directions, including exploring consumer insights to understand how their preferences and buying behaviour shape the interplay between e-commerce and traditional retail. Longitudinal studies could provide a comprehensive view of the evolving dynamics between these two sectors, revealing long-term trends and adaptations. Investigating the role of emerging technologies such as artificial intelligence, augmented reality, and omnichannel strategies in enhancing the competitiveness of traditional retailers could yield actionable strategies. Additionally, global comparisons may uncover unique factors influencing Indian retailers and enable valuable cross-border learning. However, this study also has limitations, such as relying on self-reported data, which may introduce biases. The focus on performance metrics, while valuable, overlooks qualitative aspects like customer relationships and brand loyalty, which are critical in assessing e-commerce's impact. Moreover, the dynamic and continuously evolving retail landscape presents challenges in capturing the full extent of ongoing technological advancements, necessitating further exploration in future studies.

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