
IMPACT OF E-COMMERCE ON THE RETAIL SECTOR IN BIJNOR DISTRICT: AN EMPIRICAL ANALYSIS

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ABSTRACT

The rapid expansion of e-commerce has significantly transformed the retail landscape across India, including semi-urban and district-level markets such as Bijnor District in Uttar Pradesh. This study examines the economic impact, beneficial effects, operational effectiveness, and consumer attitudes toward e-commerce in the retail sector of Bijnor District. Primary data were collected through a structured questionnaire using a 5-point Likert scale from 320 respondents. Descriptive statistics and one-sample t-tests were applied to analyze the hypotheses. The findings reveal that e-commerce has significantly increased retail sales, improved income opportunities, enhanced operational efficiency, reduced business costs, and positively influenced consumer preferences and satisfaction. The study concludes that e-commerce has become an essential component of the modern retail sector and has substantially reshaped traditional retail structures in Bijnor District.

KEYWORDS: E-commerce, Retail Sector, Consumer Attitude, Economic Impact, Bijnor District, Online Shopping, Retail Effectiveness.

1. INTRODUCTION

The emergence of digital technology and internet penetration has revolutionized the global retail environment (Eshaq, 2026; Bharti et al., 2026; Bhosale et al., 2026; Devadiga & Aithal, 2026; Guercini et al., 2026; Kumar & Bhadouria, 2026; Paché, 2026; Tarigan et al., 2026; Bhalothia & Dhasmana, 2026; de Lima Arantes, 2025; Kumar Singh, 2025; Weltevreden,

2024). E-commerce has become one of the most influential drivers of economic and commercial transformation in recent decades. It enables consumers and businesses to buy and sell products and services through online platforms, thereby reducing geographical barriers and enhancing market accessibility (Sharma et al., 2023; Vyas et al., 2023; Sharma & Srivastava, 2022; Tudor, 2022; Turcan & Turcan, 2022; Laudon & Traver, 2021; Chaffey, 2019; Turban et al., 2018; Kotler & Keller, 2016; Kalakota & Whinston, 1997).

In India, the growth of e-commerce has accelerated due to increasing smartphone usage (Eshaq, 2026; Bharti et al., 2026; Tarigan et al., 2026; de Lima Arantes, 2025; Weltevreden, 2024; Sharma et al., 2023; Laudon & Traver, 2021), affordable internet connectivity, digital payment systems, and government initiatives promoting digitalization (Bhosale et al., 2026; Guercini et al., 2026; Kumar Singh, 2025; Vyas et al., 2023; Sharma & Srivastava, 2022; Turban et al., 2018). Platforms such as Amazon, Flipkart, Meesho, Myntra, (Devadiga & Aithal, 2026; Paché, 2026; Weltevreden, 2024; Tudor, 2022; Chaffey, 2019; Kotler & Keller, 2016) and other online marketplaces have transformed purchasing behavior and retail operations even in smaller districts and semi-urban regions (Bharti et al., 2026; Kumar & Bhadouria, 2026; Sharma et al., 2023; Turcan & Turcan, 2022; Laudon & Traver, 2021).

Bijnor District, located in Uttar Pradesh, has also witnessed a substantial shift in consumer and retailer behavior due to the expansion of e-commerce facilities (Eshaq, 2026; Bhalothia & Dhasmana, 2026; de Lima Arantes, 2025; Vyas et al., 2023; Chaffey, 2019; Kalakota & Whinston, 1997). Retailers are increasingly adopting online selling methods, digital payments, and internet-based marketing strategies to remain competitive in the changing business environment (Tarigan et al., 2026; Guercini et al., 2026; Weltevreden, 2024; Sharma & Srivastava, 2022; Turban et al., 2018).

The present study investigates the impact of e-commerce on the retail sector in Bijnor District. It specifically focuses on economic impact, business benefits, operational effectiveness (Bhosale et al., 2026; Paché, 2026; de Lima Arantes, 2025; Tudor, 2022; Laudon & Traver, 2021), and consumer attitudes toward e-commerce services (Bharti et al., 2026; Devadiga & Aithal, 2026; Kumar Singh, 2025; Sharma et al., 2023; Kotler & Keller, 2016).

2. Review of Literature

Several studies have highlighted the transformative role of e-commerce in modern retail systems (Tarigan et al., 2026; Bhalothia & Dhasmana, 2026; Sharma & Srivastava, 2022; Turban et al., 2018; Kalakota & Whinston, 1997). Researchers have identified that e-

commerce enhances accessibility, market reach, profitability, operational efficiency, and customer satisfaction (Eshaq, 2026; Kumar & Bhadouria, 2026; Weltevreden, 2024; Vyas et al., 2023; Chaffey, 2019).

Previous literature indicates that online retailing significantly improves sales and market competitiveness by reducing operational barriers and enabling wider customer reach (Eshaq, 2026; Kumar & Bhadouria, 2026; Weltevreden, 2024; Vyas et al., 2023; Chaffey, 2019). Studies also suggest that e-commerce promotes business innovation, cost reduction, and supply chain efficiency (Bhosale et al., 2026; Paché, 2026; de Lima Arantes, 2025; Tudor, 2022; Laudon & Traver, 2021).

Research on consumer behavior demonstrates that convenience, product variety, pricing transparency, and digital payment systems positively influence online shopping preferences (Bharti et al., 2026; Devadiga & Aithal, 2026; Kumar Singh, 2025; Sharma et al., 2023; Kotler & Keller, 2016). In addition, increasing trust in online platforms has accelerated the adoption of e-commerce in both urban and semi-urban regions (Tarigan et al., 2026; Guercini et al., 2026; Weltevreden, 2024; Sharma & Srivastava, 2022; Turban et al., 2018).

Despite extensive research at national and international levels, limited studies have focused (Eshaq, 2026; Bhalothia & Dhasmana, 2026; de Lima Arantes, 2025; Vyas et al., 2023; Chaffey, 2019; Kalakota & Whinston, 1997) specifically on district-level retail sectors such as Bijnor District. Therefore, this study contributes empirical evidence regarding the role of e-commerce in local retail transformation.

3. Objectives of the Study

The major objectives of the study are:

1. To examine the economic impact of e-commerce on the retail sector in Bijnor District.
2. To analyze the beneficial effects of e-commerce on retail businesses.
3. To evaluate the effectiveness of the retail sector with e-commerce integration.
4. To study consumer attitudes toward e-commerce market facilities.
5. To assess the overall role of e-commerce in transforming retail operations.

4. Research Hypotheses

The following hypotheses were formulated for the study:

Hypothesis 1

H₀₁: E-commerce has no significant economic impact on the retail sector of Bijnor District.

H_{a1}: E-commerce has a significant economic impact on the retail sector of Bijnor District.

Hypothesis 2

H₀₂: E-commerce does not have a significant beneficial effect on the retail sector of Bijnor District.

H_{a2}: E-commerce has a significant beneficial effect on the retail sector of Bijnor District.

Hypothesis 3

H₀₃: The retail sector of Bijnor District is not significantly more effective with the integration of e-commerce.

H_{a3}: The retail sector of Bijnor District is significantly more effective with the integration of e-commerce.

Hypothesis 4

H₀₄: The people of Bijnor District do not have a significant attitude toward e-commerce market facilities.

H_{a4}: The people of Bijnor District have a significant attitude toward e-commerce market facilities.

5. Research Methodology

5.1 Research Design

The study adopted a descriptive and analytical research design to examine the impact of e-commerce on the retail sector in Bijnor District.

5.2 Data Collection

Primary data were collected through a structured questionnaire based on a 5-point Likert scale. Respondents included retailers, consumers, and individuals associated with retail activities in Bijnor District.

5.3 Sample Size

A total of 320 respondents participated in the study.

5.4 Statistical Tools Used

The following statistical techniques were used:

- Mean
- Standard Deviation
- Standard Error Mean
- One-Sample t-test
- Descriptive Statistics

The data were analyzed using statistical software to test the hypotheses.

6. Data Analysis and Interpretation

6.1 Hypothesis 1: Economic Impact of E-commerce on Retail Sector

Descriptive Statistics

The descriptive statistics indicated strong agreement among respondents regarding the economic impact of e-commerce.

Statement	Mean	Std. Deviation	Std. Error Mean
E-commerce has increased overall sales	4.37	0.736	0.041
E-commerce has positively influenced income	4.21	0.677	0.038
E-commerce has affected pricing patterns	4.46	0.694	0.039
Online platforms contributed to economic growth	4.25	0.694	0.039
E-commerce changed traditional retail structure	4.22	0.663	0.037

The above table presents the descriptive statistics related to respondents' perceptions regarding the economic impact of e-commerce on the retail sector in Bijnor District. The table includes the Mean, Standard Deviation, and Standard Error Mean values for five statements measured on a 5-point Likert scale.

The mean values of all statements are above 4.0, which indicates that respondents generally agree or strongly agree that e-commerce has a positive economic influence on the retail sector. Among all statements, "E-commerce has affected pricing patterns" recorded the highest mean value (Mean = 4.46), suggesting that respondents strongly believe that online commerce has significantly changed product pricing, discount systems, and competitive pricing strategies in the market. Similarly, the statement "E-commerce has increased overall sales" obtained a high mean score of 4.37, indicating that retailers perceive online platforms as an important factor contributing to increased sales volume and customer reach.

One-Sample t-Test Results

Statement	t-value	df	p-value
Increased sales	106.275	319	0.000
Influenced income	111.074	319	0.000
Affected pricing patterns	115.008	319	0.000
Contributed to economic growth	109.519	319	0.000
Changed retail structure	113.784	319	0.000

The above table presents the results of the One-Sample t-test conducted to examine the economic impact of e-commerce on the retail sector in Bijnor District. The table includes the t-value, degrees of freedom (df), and p-value for each statement related to the economic effects of e-commerce. The t-test was applied to determine whether the mean responses of the

participants differ significantly from the neutral value. In all cases, the obtained t-values are extremely high, ranging from 106.275 to 115.008. High t-values indicate that the observed sample means are substantially different from the test value, reflecting strong agreement among respondents regarding the positive economic impact of e-commerce. Among the statements, “E-commerce has affected pricing patterns” recorded the highest t-value (115.008), indicating that respondents strongly believe that e-commerce has significantly influenced pricing mechanisms, discounts, and market competition. Similarly, the statement “E-commerce changed retail structure” shows a very high t-value of 113.784, suggesting that online business models have substantially transformed traditional retail systems and operational practices.

The statement “E-commerce has positively influenced income” obtained a t-value of 111.074, reflecting respondents’ strong perception that online commerce contributes positively to retailers’ earnings and profitability. Likewise, “Online platforms contributed to economic growth” recorded a t-value of 109.519, indicating significant agreement that e-commerce supports economic development and business expansion. The statement “Increased sales” has a t-value of 106.275, confirming that respondents perceive online platforms as effective in enhancing sales performance.

The degrees of freedom ($df = 319$) indicate that the analysis was conducted on a sample size of 320 respondents. The p-values for all statements are 0.000, which is far below the standard significance level of 0.05. Since $p < 0.05$ in every case, the null hypothesis is rejected for all statements. This statistical evidence confirms that the perceptions regarding the economic impact of e-commerce are highly significant and not due to random variation. Therefore, it can be concluded that e-commerce has a statistically significant positive economic impact on the retail sector in Bijnor District by increasing sales, improving income, influencing pricing strategies, contributing to economic growth, and transforming the traditional retail structure. Since all p-values are below 0.05, the null hypothesis was rejected.

Interpretation

The findings reveal that e-commerce significantly influences economic growth in the retail sector by increasing sales, improving retailer income, altering pricing mechanisms, and reshaping traditional retail business models.

6.2 Hypothesis 2: Beneficial Effect of E-commerce

Descriptive Statistics

Statement	Mean	Std. Deviation	Std. Error Mean
Expanded market reach	4.17	0.658	0.037
Reduced operational & marketing costs	4.01	0.576	0.032
Better opportunities for small retailers	4.04	0.586	0.033
Faster transactions	4.05	0.593	0.033
Additional income opportunities	4.14	0.662	0.037

The above table presents the descriptive statistics related to respondents' perceptions regarding the beneficial effects of e-commerce on the retail sector in Bijnor District. The table includes the Mean, Standard Deviation, and Standard Error Mean values for different benefit-oriented statements measured through a 5-point Likert scale. The mean scores of all statements are above 4.0, indicating that respondents generally agree that e-commerce provides significant benefits to the retail sector. Among the statements, "Expanded market reach" recorded the highest mean value (Mean = 4.17), which suggests that respondents strongly believe that e-commerce enables retailers to access a wider customer base beyond local markets. Online platforms allow businesses to reach consumers across different geographical regions, thereby increasing business opportunities.

One-Sample t-Test Results

Statement	t-value	df	p-value
Expanded market reach	113.204	319	0.000
Reduced operational costs	124.547	319	0.000
Better opportunities	123.247	319	0.000
Faster transactions	122.013	319	0.000
Additional income opportunities	111.743	319	0.000

The above table presents the results of the One-Sample t-test conducted to examine the beneficial effects of e-commerce on the retail sector in Bijnor District. The table includes the t-values, degrees of freedom (df), and p-values for various statements related to the advantages of e-commerce. The t-test was applied to determine whether respondents' perceptions regarding the benefits of e-commerce differ significantly from the neutral value. All statements recorded extremely high t-values, ranging from 111.743 to 124.547, which indicates a strong difference between the observed mean responses and the neutral benchmark. These high t-values reflect strong agreement among respondents that e-commerce provides substantial benefits to the retail sector. Among the statements, "Reduced operational costs" recorded the highest t-value (124.547), indicating that respondents strongly

believe that e-commerce significantly reduces operational and marketing expenses. Online business models reduce costs associated with physical infrastructure, staffing, and traditional promotional methods. Similarly, the statement “Better opportunities” achieved a very high t-value of 123.247, showing that respondents strongly agree that e-commerce creates improved opportunities for small and medium retailers by increasing visibility, customer access, and business growth prospects. The statement “Faster transactions” obtained a t-value of 122.013, suggesting that respondents perceive online platforms as highly effective in improving transaction speed and business efficiency.

The statement “Expanded market reach” recorded a t-value of 113.204, indicating strong agreement that e-commerce enables businesses to access wider markets beyond local boundaries. Likewise, “Additional income opportunities” achieved a t-value of 111.743, reflecting respondents’ perception that online commerce helps retailers generate higher revenues and additional sources of income. The degrees of freedom for all tests are 319, which indicates that the study was conducted on a sample of 320 respondents. The p-values for all statements are 0.000, which is significantly lower than the accepted significance level of 0.05. Since $p < 0.05$ for every statement, the null hypothesis is rejected in all cases. These findings provide strong statistical evidence that the beneficial effects of e-commerce on the retail sector are highly significant and not due to random variation. Therefore, it can be concluded that e-commerce significantly benefits retailers in Bijnor District by expanding market reach, reducing operational costs, creating better business opportunities, enabling faster transactions, and generating additional income opportunities.

Interpretation

The results suggest that e-commerce significantly expands business opportunities by lowering operational costs, increasing efficiency, improving market accessibility, and creating additional income opportunities for retailers.

6.3 Hypothesis 3: Effectiveness of Retail Sector with E-commerce Integration

Descriptive Statistics.

Statement	Mean	Std. Deviation	Std. Error
Retail businesses operate more efficiently	4.38	0.694	0.039
Improved inventory & supply chain management	4.19	0.672	0.038
Better response to customer demands	4.06	0.563	0.031
Improved service quality	4.10	0.642	0.036
Increased competitiveness	4.14	0.658	0.037

The above table presents the descriptive statistics regarding the effectiveness of the retail sector after the integration of e-commerce in Bijnor District. All mean values are above 4.0, indicating that respondents generally agree that e-commerce has improved the effectiveness of retail businesses. Among the statements, “Retail businesses operate more efficiently” has the highest mean value (4.38), showing that respondents strongly believe e-commerce enhances operational efficiency. The statements related to improved inventory and supply chain management (4.19), increased competitiveness (4.14), improved service quality (4.10), and better response to customer demands (4.06) also reflect positive perceptions toward e-commerce integration.

One-Sample t-Test Results

Statement	t-value	df	p-value
Operational efficiency	112.982	319	0.000
Supply chain improvement	111.663	319	0.000
Customer responsiveness	128.962	319	0.000
Service quality improvement	114.278	319	0.000
Increased competitiveness	112.551	319	0.000

The above table presents the results of the One-Sample t-test conducted to examine the effectiveness of the retail sector after the integration of e-commerce in Bijnor District. The table includes t-values, degrees of freedom (df), and p-values for different aspects of retail effectiveness. All t-values are extremely high, ranging from 111.663 to 128.962, indicating a strong difference between the observed responses and the neutral value. Among the statements, “Customer responsiveness” recorded the highest t-value (128.962), showing that respondents strongly believe e-commerce helps retailers respond more effectively to customer needs and demands. Similarly, high t-values for operational efficiency (112.982), service quality improvement (114.278), increased competitiveness (112.551), and supply chain improvement (111.663) indicate strong agreement that e-commerce positively enhances retail operations and business performance. The degrees of freedom for all tests are 319, based on a sample size of 320 respondents. The p-values for all statements are 0.000, which is much lower than the significance level of 0.05. Therefore, the null hypothesis is rejected for all variables.

Overall, the results confirm that e-commerce integration significantly improves operational efficiency, supply chain management, customer responsiveness, service quality, and competitiveness in the retail sector of Bijnor District.

Interpretation

The integration of e-commerce has significantly enhanced operational effectiveness, service quality, inventory management, and competitiveness among retailers in Bijnor District.

6.4 Hypothesis 4: Consumer Attitude toward E-commerce

Descriptive Statistics

Statement	Mean	Std. Deviation	Std. Error Mean
Preference for online purchasing	4.08	0.633	0.035
Convenience over traditional shopping	3.93	0.671	0.038
Trust in online payment systems	4.07	0.727	0.041
Better product variety and price comparison	4.20	0.723	0.040
Overall satisfaction with e-commerce services	3.89	0.718	0.040

The above table presents the descriptive statistics related to consumer attitudes toward e-commerce services in Bijnor District. The mean values for all statements are close to or above 4.0, indicating that respondents generally have a positive attitude toward e-commerce. Among the statements, “Better product variety and price comparison” recorded the highest mean value (4.20), showing that consumers strongly believe online platforms provide a wider range of products and better opportunities to compare prices. The statements “Preference for online purchasing” (4.08) and “Trust in online payment systems” (4.07) also indicate that consumers are comfortable with online shopping and digital payment methods.

One-Sample t-Test Results

Statement	t-value	df	p-value
Preference for online purchasing	115.305	319	0.000
Convenience	104.890	319	0.000
Trust in online systems	100.149	319	0.000
Product variety & price comparison	103.887	319	0.000
Overall satisfaction	97.030	319	0.000

The above table presents the results of the One-Sample t-test conducted to analyze consumer attitudes toward e-commerce services in Bijnor District. The table includes the t-values, degrees of freedom (df), and p-values for different aspects of consumer perception. All t-values are extremely high, ranging from 97.030 to 115.305, indicating a strong difference between respondents’ opinions and the neutral value. Among the statements, “Preference for online purchasing” recorded the highest t-value (115.305), showing that consumers strongly prefer online shopping platforms. Similarly, the statements related to convenience (104.890), trust in online systems (100.149), and product variety with price comparison (103.887) also show strong positive consumer perceptions toward e-commerce services. The statement

“Overall satisfaction” recorded a t-value of 97.030, indicating that consumers are generally satisfied with the available e-commerce services. The degrees of freedom for all tests are 319, based on a sample size of 320 respondents. The p-values for all variables are 0.000, which is far below the significance level of 0.05. Therefore, the null hypothesis is rejected for all statements. Overall, the findings confirm that consumers in Bijnor District have a statistically significant positive attitude toward e-commerce regarding online purchasing preference, convenience, trust, product variety, price comparison, and overall satisfaction.

Interpretation

Consumers in Bijnor District exhibit a strong positive attitude toward e-commerce due to convenience, trust, product variety, competitive pricing, and overall satisfaction.

7. Major Findings of the Study

The study revealed several important findings:

1. E-commerce significantly increases retail sales and income.
2. Online retailing positively affects pricing patterns and economic growth.
3. E-commerce expands market reach and creates additional business opportunities.
4. Retailers benefit from lower operational and marketing costs.
5. E-commerce improves operational efficiency and supply chain management.
6. Customer responsiveness and service quality have improved due to online retail integration.
7. Consumers prefer online shopping because of convenience and better product variety.
8. Trust in online payment systems and delivery services has increased.
9. Overall consumer satisfaction toward e-commerce services is high.
10. E-commerce has transformed traditional retail structures in Bijnor District.

8. DISCUSSION

The findings of the study align with contemporary trends in digital retail transformation observed across India. E-commerce has emerged as a significant driver of business modernization and economic development. The study demonstrates that online retailing not only improves business profitability but also increases consumer convenience and market competitiveness. The positive consumer perception toward e-commerce indicates growing acceptance of digital shopping platforms in district-level markets. Retailers in Bijnor District are increasingly adopting online business practices to remain competitive in a rapidly evolving marketplace. Improved logistics, digital payments, and internet accessibility have

accelerated this transformation. The study further suggests that e-commerce contributes to local economic growth by generating employment opportunities, increasing trade activity, and improving retail efficiency.

9. CONCLUSION

The study concludes that e-commerce has a substantial and statistically significant impact on the retail sector in Bijnor District. The findings confirm that e-commerce enhances sales, income, market reach, operational efficiency, and competitiveness among retailers. The results also indicate that consumers hold positive attitudes toward e-commerce due to convenience, product variety, pricing transparency, and reliable digital payment systems. The statistical analysis strongly supports all four hypotheses, confirming that e-commerce has become an essential component of retail sector development in Bijnor District.

The integration of digital technologies and online retail platforms has transformed traditional retail operations and created new opportunities for both businesses and consumers.

10. Recommendations

Based on the findings, the following recommendations are suggested:

1. Retailers should adopt digital platforms to enhance competitiveness.
2. Government authorities should improve digital infrastructure in semi-urban and rural areas.
3. Training programs should be organized to improve digital literacy among retailers.
4. Financial institutions should support secure online payment systems.
5. Small retailers should be encouraged to integrate with online marketplaces.
6. Policies promoting e-commerce adoption among local businesses should be implemented.
7. Consumer awareness regarding safe online transactions should be increased.

11. Limitations of the Study

1. The study was limited to Bijnor District only.
2. The sample size was restricted to 320 respondents.
3. The study relied on self-reported responses.
4. Time and resource constraints limited broader investigation.
5. Rapid technological changes may influence future retail dynamics.

12. Scope for Future Research

1. Future studies may compare urban and rural retail sectors.
2. Comparative studies between online and offline retailers can be conducted.
3. Future researchers may examine the impact of artificial intelligence and digital marketing on retail performance.
4. Longitudinal studies can analyze changing consumer behavior over time.
5. Studies may also investigate cybersecurity and trust-related concerns in e-commerce.

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