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Cross-Border E-Commerce: How the Quality of Logistics Affects Customer Choice. A Case Study from Türkiye

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Abstract This study examines the effects of various dimensions of logistics service quality on customer satisfaction and online repurchase intention of cross-border electronic commerce customers. To reveal these effects, data were collected from 251 volunteer participants living in Turkey through online questionnaires. Partial least squares structural equation modeling (PLS-SEM) was used to evaluate the results. The reliability, discriminant validity, multicollinearity, and effect sizes of the model were also examined, and it was determined that the model reached accurate predictions. The study results show that operational logistics service quality, shipping costs, and order condition positively and significantly affect customer satisfaction. On the other hand, timeliness has no significant effect on customer satisfaction. When the effect of customer satisfaction on online repurchase intention is analyzed, it is found that there is a strong and significant effect. This result reveals that customer satisfaction is among the most important factors shaping customers' repurchase intention in cross-border e-commerce. Factors such as operational service quality, shipping costs, and order condition, which are among the dimensions of logistics service quality, have significant effects on customer satisfaction. Customer satisfaction, in turn, strongly affects repurchase intention.

Keywords Logistics Service Quality · Cross-Border e-Commerce · Online Repurchase Intention · International Marketing · International Trade

JEL Classification L81 · M31 · R41 · C83

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Cross-Border E-Commerce: How the Quality of Logistics Affects Customer Choice. A Case Study from Türkiye

INTRODUCTION

Developments on the internet have transformed the world into a single piece, and according to some, there are no longer any distances in the world. CBEC offers significant opportunities to customers due to the wide range of products it provides and competitive prices (Kim et al., 2017). With globalization and technological developments, e-commerce is increasing its popularity every year and is changing consumption patterns around the world (Ding et al., 2017). E-commerce means purchasing products by transferring money and data over the internet, while consumers can easily make comparisons and access product information through e-commerce (Rosário & Raimundo, 2021). Compared to traditional commerce, e-commerce provides consumers with faster, easier, and more efficient shopping opportunities (Liu et al., 2021). The implementation of e-commerce in different countries is called cross-border e-commerce (CBEC), and this type of e-commerce offers significant opportunities for businesses that want to operate in the international market (Giuffrida et al., 2017). CBEC allows both businesses and individuals to sell abroad without establishing a company. Moreover, CBEC has become indispensable for businesses; it has become an essential tool for any business that wants to grow (Giuffrida et al., 2021).

CBEC has led to support for countries' foreign trade strategies, facilitation of global trade, entry of enterprises into international markets at low cost, and holistic improvement in the value chain (Yang et al., 2023). CBEC significantly reduces expenses such as communication, market research, and management, especially for enterprises in developing economies (Han et al., 2024). In addition, CBEC provides consumers with economic advantages, the opportunity to choose from a wide range of products, the ability to choose from competitive prices, and a different sense of pleasure (Mou et al., 2019). The changing consumer preferences and the fact that consumers can bring the products they want from abroad without using an intermediary cause CBEC to increase every year (Chen et al., 2023). According to the report of Purnell (2023), CBEC is expected to increase by 107% from 2023 to 2028. The global e-commerce volume, which was $1.6tn in 2023, is expected to reach $3.3tn by 2028.

As the number of consumers and shopping figures of the e-commerce system in the global environment increases day by day, it has become an important issue for consumers to be satisfied with the services offered by businesses as well as the products offered (Liu et al., 2021; Taherdoost & Madanchian, 2021). Considering the online shopping environment, delivery, that is, logistics activities, is one of the critical issues that should be considered for customer satisfaction (Zhang et al., 2024). In CBEC, since customers do not have physical contact with the seller, logistics service providers are the most important contact point for customers. Disruptions in logistics activities cause customers to evaluate the seller negatively. Because of the negative evaluation of the seller, customer satisfaction will be affected and repurchases will not occur. In summary, logistics services are an important factor affecting not only the delivery of the product but also the entire e-commerce satisfaction (Oh et al., 2022).

In the past, while the efficiency of logistics activities was a tool that provided businesses with a competitive advantage, today it has become an indispensable concept for businesses to take part in the e-commerce system, and businesses that offer new logistics solutions to needs are ahead of the competition (Kawa, 2017). In addition, transactions for businesses providing logistics services in CBEC are quite complex. Because in this system, orders are collected from different businesses and come randomly. This means unpredictable demand. All these causes logistics activities in CBEC to affect service quality (Giuffrida et al., 2021). In this context, logistics service quality stands out as one of the most important factors affecting consumers' choices in CBEC. The quality of the logistics service provided affects customer satisfaction, which provides businesses with a significant competitive advantage (Liu et al., 2021). According

to the findings of Ngo and colleagues (2025), various dimensions of LSQ, such as on-time delivery, order accuracy, and delivery terms, play a critical role in determining the purchase intentions of younger generations, especially Generation Z. Businesses need to understand customer needs and determine their strategies accordingly for their future success (Taherdoost & Madanchian, 2021).

The growing structure of CBEC and the increasing importance of logistics within this system make this study important. This study aims to contribute to marketing and international trade literature and entrepreneurs, especially by because logistics activities increase customer satisfaction and therefore affect purchase intentions. In the studies conducted in the literature, different keywords have been used to address logistics services. In this study, four fundamentally accepted dimensions of logistics service quality have been addressed, and these dimensions have been linked to online purchase intention through customer satisfaction.

LITERATURE REVIEW

Operational Logistics Service Quality

As market areas continue to globalize and expand, the efficiency, reliability, and effectiveness of logistics services have become important factors affecting customer satisfaction and overall business success. Logistics service quality (LSQ) refers to the provision of the right product at the right time and place, at the right price, and under the right conditions (Zhang et al., 2024). In order to increase customer satisfaction in a global environment, improvements in logistics activities are necessary (Ding et al., 2017). Logistics service providers should constantly differentiate and improve the services they offer. In this way, they should focus on better meeting the needs of consumers and the market (Jian et al., 2022). The success of businesses in logistics activities is an important criterion for the future of e-commerce success (Zhang et al., 2024).

In CBEC, limited transparency in logistics information processes and the use of different information systems make it difficult for customers to track their orders. Inefficient return processes also have negative effects on customer satisfaction (Ding et al., 2017). However, high-quality services offered in logistics services contribute to customer satisfaction by strengthening the position of businesses in the market. Today, logistics services are seen as an important strategy for businesses to gain competitive advantage (Oh et al., 2022).

Studies in the literature have shown that LSQ significantly contributes to customer satisfaction (Lin et al., 2016; Oh et al., 2022; Zhang et al.,2024). Jian et al. (2022) revealed that logistics services are an important factor in purchasing decisions for customers. LSQ is an important driving force in providing competitive advantage to businesses and has positive effects on customer satisfaction (Du, 2019; Oh et al., 2022; Zhang et al., 2024). Since LSQ is considered to be a directly important factor in affecting customer satisfaction, the following hypothesis is proposed about its effect on customer satisfaction.

H_1: Operational logistics quality has a positive and significant impact on customer satisfaction.

Timeliness

Timeliness can be expressed as the logistics unit approving the order after receiving the order, receiving it, and delivering it to the consumer in the shortest time possible (Du, 2019). In addition, timeliness gives consumers an idea about the consistency and reliability of the service provider company (Uvet et al., 2024). In the literature, Michnik and Lo (2009) defined the concept of timeliness as being on site early or at the right time. Time utility is seen as one of the most traditional and important dimensions in logistics activities (Uvet, 2020). Today, customers want to reach the products they purchase immediately without long waiting times. This increases the importance of fast and timely delivery of orders (Akil & Ungan, 2022).

With the rapid development of technologies and therefore increasing customer expectations every day, the concept of timeliness in e-commerce is increasing its importance day by day (Zhang et al., 2016). In online shopping, extended delivery times significantly negatively affect customer satisfaction (Harrison & Kortuem, 2018). While timeliness

increases service quality, it is also a factor that increases costs for both businesses and consumers (Harrison & Kortuem, 2018). Many studies in the literature have found that delivering products on time in logistics activities is highly effective on customer satisfaction (Du, 2019; Ellitan, 2023; Murfield et al., 2017; Uvet et al., 2024). Similarly, Akil and Ungan (2022) revealed the positive effect of timely delivery of products in logistics activities on customer satisfaction in their studies with samples from Türkiye. However, it should not be forgotten that logistics failures, such as delivery delays, can discourage customers from future purchases. It can be stated that timely and reliable logistics services are an absolute necessity in maintaining customer loyalty (Kawa & Światowiec-Szczepańska, 2021). Since timeliness, an important part of logistics services, is considered an important factor on customer satisfaction, the following hypothesis is proposed about its effect on customer satisfaction.

H_2: Timeliness has a positive and significant impact on customer satisfaction.

Shipping Costs

Shipping cost is a fee calculated for sending the product to the buyer. When businesses list their products and determine their prices, they calculate the shipping cost and determine a pricing strategy accordingly (Muljono and Setiyawati, 2019). In the case of CBEC, logistics costs are high and market demand is uncertain. In this uncertain environment, businesses try to increase consumers' willingness to buy by providing free logistics services (Guo & Shang, 2023). For example, Temu attracted attention with its free shipping slogan. Chinese phone brand Xiaomi offers its customers free shipping services through Aliexpress (Guo and Shang, 2023). It should also be noted that problems such as payment complications and customs procedures are likely to negatively affect service quality and may lead to lower customer satisfaction levels in cross-border e-commerce compared to local logistics (Li, 2022). Studies show that logistics-related problems, such as long transit times and high shipping costs, are significant obstacles to the success of cross-border e-commerce (Ding et al., 2017; Xu & Ye, 2017).

Han et al. (2024) revealed that consumers are willing to bear the logistics cost for high-priced products but are not willing to bear an additional cost for logistics for low-priced products. In addition to the initial purchase cost in CBEC; Huang and Chang (2019) mentioned in their study that there are additional costs such as communication, waiting, and return costs in cross-border e-commerce.

Although CBEC offers many advantages to consumers (Mou et al., 2019); since it requires high transportation costs (Hazarika & Mousavi, 2021), many studies in the literature have stated that cost can be an important inhibitory factor in CBEC and can affect consumers' purchase intention (Kalinić et al., 2018; Hazarika & Mousavi, 2021; Mou et al., 2019). Zhang et al. (2024) stated that logistics service quality is an important factor affecting customer satisfaction in CBEC.

Ding et al. (2017) stated that 36% of customers in CBEC were dissatisfied due to high shipping costs. Another study (Tsai & Chang, 2022) revealed that 68% of customers in e-commerce added items to their carts for free delivery. Since providing free logistics services is an important marketing tool, the following hypothesis was proposed about the effect of shipping costs on customer satisfaction.

H_3: Shipping cost has a positive and significant impact on customer satisfaction.

Order Condition

The concept of order condition refers to the integrity of orders when they reach the customer (Akil and Ungan, 2022). Order condition refers to the delivery of the product to the customer without spoilage or damage throughout the entire supply chain after the order is received (Ellitan, 2023). Ensuring that incoming orders are delivered to customers in the correct condition and without damage is an important criterion for customer satisfaction and business success (Ho et al., 2012). Order condition is seen as one of the most important dimensions in logistics activities (Uvet, 2020). Studies in the literature have concluded that order condition significantly affects customer satisfaction (Sutrisno et al., 2019; Uvet, 2020). Similarly, in a study conducted by Akil and Ungan (2022) specifically in Turkey, the positive effect of order

condition on customer satisfaction was revealed. Accordingly, the following hypothesis was proposed regarding the effect of order condition on customer satisfaction.

H_4: Order condition has a positive and significant impact on customer satisfaction.

Customer Satisfaction

Customers are the most fundamental factor for businesses to continue their activities and therefore have a great impact on their competitiveness (Hu, 2022). Especially for businesses that produce similar and low value-added products, customer satisfaction is at the forefront in gaining competitive advantage (Xu et al., 2022). Since customer satisfaction has a significant impact on the development and growth of businesses, it is carefully examined by many businesses (Taherdoost & Madanchian, 2021). In online shopping, consumers are satisfied with their shopping to the extent that their needs are met (Ting & Nam, 2016). Oh et al. (2022) stated that in CBEC, consumers first attach importance to the stability of delivery, then to issues such as quality of delivery and return logistics. Zhang et al. (2024) stated that logistics activities have a positive effect on customer satisfaction, but each dimension comes to the fore in different sectors. In addition, Liu et al. (2015) stated that working with professional logistics service providers in CBEC contributes to increasing customer satisfaction.

Logistics services in CBEC are seen as one of the important factors that provide businesses with a competitive advantage in the market with their role in both reducing operating costs (Uvet, 2020) and increasing customer satisfaction (Uvet, 2020; Vu et al., 2020). Anshu et al. (2022) stated that logistics activities, such as delivering products on time in online sales, customers being able to easily return these products or having the opportunity to change the product if they wish, play an important role in the success of businesses by affecting the attitudes of customers. Customer satisfaction acts as a mediating force in the relationship between logistics quality and repurchase intentions. Studies consistently show that improved logistics quality—coupled with attentiveness to customer service—leads to enhanced satisfaction levels, which subsequently drive repeat purchase behaviors (Nugroho et al., 2020). For example, Lin et al. (2023) highlight that there exists a significant correlation between logistics service quality and customer satisfaction, establishing that higher satisfaction levels are integral to fostering customer retention and encouraging repeat buyers (Lin et al., 2023).

Tufahati et al. (2021) and Yun and Park (2022) stated that customer satisfaction usually results in repurchases and mentioned the importance of the effect of ongoing repurchases on customer satisfaction for the continued profitability of businesses. Studies in the literature have shown that satisfaction in online shopping has a positive effect on repurchase intention (Johan et al., 2020; Miao et al., 2022; Ginting et al., 2023). Since businesses can achieve their goals largely through customer satisfaction, the proposed hypothesis is as follows.

H_5: Customer satisfaction quality has a positive and significant impact on customer satisfaction.

Online Repurchase Effect

Repurchasing is an important factor in the profitability of businesses (Johan et al., 2020). Before consumers decide to repurchase, they perform many cognitive evaluations in their decision-making processes. In this process, necessary information is evaluated, problems and needs are identified, and evaluations are made regarding the purchase and after (Amoako et al., 2023). Because of the evaluations made, the measure of whether customers will repurchase is customer satisfaction (Pandiangan et al., 2021). Repurchase intention is often based on customers' past experiences. Therefore, customer satisfaction with their purchases is the most fundamental factor in repurchase decisions (Fared et al., 2021).

While Mou et al. (2019) stated that values such as monetary savings, convenience, and product offerings have the strongest impact on repurchase intention, Oh et al. (2022) stated that satisfaction with businesses in CBEC has a significant impact on customer purchases. Research conducted by Ata and colleagues, specifically in Türkiye, reveals a reciprocal relationship between customer satisfaction and purchase intentions. According to the research findings,

increased customer satisfaction positively affects both purchase intention and repurchase intention, increasing customer loyalty in e-commerce (Ata et al., 2021).

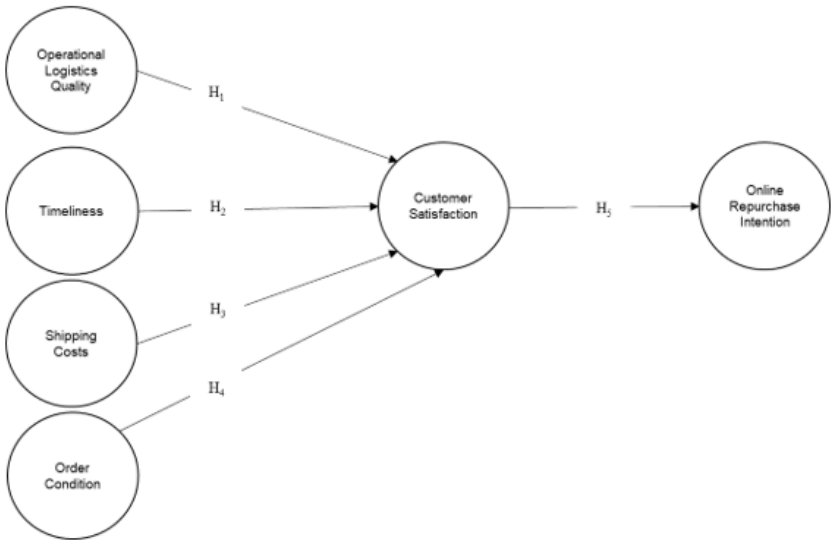
Logistics activities play a crucial role in customer satisfaction in online shopping and, consequently, in repeat purchase decisions. Anshu et al. (2022) stated that customers in online shopping are concerned with logistics issues, such as the location of products and when they will be delivered. Examining the role of logistics and customer tracking services clearly demonstrates the link between operational efficiencies and consumer satisfaction. Hasan's study argues that inadequate post-purchase tracking can negatively impact repurchase intentions (Hasan, 2025). Incorporating third-party logistics into customized e-commerce frameworks helps evaluate the overall customer experience and ensures consumers feel valued and cared for beyond the point of sale.

RESEARCH MODEL

Based on the studies in the literature, the research model was created and shown in Figure 1.

Figure 1

Research model



METHODOLOGY

Purpose and Design

The research was conducted to determine which dimensions of logistics quality affect cross-border electronic commerce shoppers and to what extent, and to determine this effect on satisfaction and repurchase intention. The study determined the effect of operational logistics quality, timeliness, shipping costs, and order condition dimensions on customer satisfaction and the effect of customer satisfaction on online repurchase intention. A literature review was conducted, research hypotheses were determined, and a research model was established. According to the literature review, no study addresses the issue in the context of cross-border e-commerce as in this study. In this context, it can be stated that the study provides an original theoretical and practical contribution and aims to guide marketing professionals and practitioners.

Population and Sample

The study data were collected from the participants over 18 years of age who shop from e-commerce sites that send products from across the border to Turkey. Convenience sampling method was preferred in this study. Convenience sampling is a non-probability and widely used sampling technique in which participants are selected according to their suitability, ease of access to participants for the researcher, and willingness to participate, rather than systematic

selection of participants (D'Ambrosio et al., 2021). This method is preferred in many studies and research areas due to its practicality and cost-effectiveness. Researchers generally prefer convenience sampling when faced with limited time, budget, or access to a larger population (D'Ambrosio et al., 2021; Iqbal et al., 2018; Mete et al., 2019). In this study, convenience sampling was used for many reasons, such as ease of access to participants, cost effectiveness, budget constraint, and practicality.

Regarding the sample size, there are different proposals to determine the minimum sample size required for PLS-SEM analysis. However, the widely accepted rule is the '10-fold rule', which suggests a minimum sample size of ten times the number of indicators in the model (Kock and Hadaya, 2016). According to the ten-fold rule, the number of indicators leading to a dimension in this study is five, and it can be stated that 50 participants provide the minimum number for this study. In addition, the generally accepted rule for structural equation modeling is that the sample size exceeds 200. In other words, any number of participants over 200 is considered large for structural equation modeling (Bilici, 2024; Sivo et al., 2006). The number 251, the sample number of this study, is in the large sample class for structural equation modeling to be performed.

Data Collection Tools and Procedure

The study data were collected between 10.09.2024 and 17.09.2024 by an online survey administered via Microsoft Forms. Ethical approval for the study was obtained from the Research and Publication Ethics Committee of Bursa Uludağ University (Social and Humanities Sciences Research and Publication Ethics Committee) in session no. 2024-12 dated December 27, 2024 (Decision No: 21). Informed consent was obtained from all participants prior to data collection, and the data were collected anonymously and used solely for scientific purposes.

The questionnaire form consisted of two sections. In the first section, questions were asked to determine the demographic distribution of the participants. In the second section, 25 scale items were included to measure participants' perceptions of operational logistics quality, timeliness, shipping costs, order condition, customer satisfaction, and repurchase intentions in the context of cross-border electronic commerce shopping. The items measuring operational logistics service quality were adapted from Jian et al. (2024); the items related to timeliness, order condition, and customer satisfaction were adapted from Akil and Ungan (2022); the shipping cost items were adapted from Tedjakusuma et al. (2024); and the online repurchase intention items were adapted from Tsai and Huang (2007).

Data Analysis Method

Partial Least Squares Structural Equation Modeling (PLS-SEM) is preferred by many researchers from many disciplines due to its unique advantages and flexibility in handling complex models. One of the leading reasons for the preference of this method is its predictive ability, which allows researchers to focus on maximizing the variance explained in the dependent variables, as is common in covariance-only SEM (structural equation modeling) approaches. Regarding estimating models with latent and observed variables, covariance-based structural equation modeling (CBS-SEM) follows the explanation-oriented paradigm focusing primarily on goodness-of-fit measures. PLS-SEM, on the other hand, is a 'causal-predictive' approach to enable simultaneous explanation and prediction-oriented model evaluations (Hair et al., 2017, Sharma et al., 2022; Sarstedt et al., 2022; Legate et al., 2021). With this feature, PLS-SEM is more suitable for exploratory research where the primary goal is to determine the relationships between constructs rather than verifying existing theories (Cepeda-Carrión et al., 2019; Sarstedt et al., 2022).

PLS-SEM has become particularly popular in social sciences due to its ability to handle non-normal data distributions, smaller samples, and complex models with multiple indicators. When used correctly, PLS-SEM can be a magic solution in many researches (Uşaklı and Küçükergin, 2018; Hair et al., 2017). Unlike traditional SEM methods that require large samples and normally distributed data, PLS-SEM can effectively analyze datasets that do not meet strict assumptions. This makes this method more applicable to marketing and social sciences (Bayaga, 2023; Ali et al., 2018; Hair et al., 2019). PLS-SEM includes both formative and reflective measurement models. This allows researchers to model

constructs that reflect the underlying latent variables (Hanafiah, 2020; Cepeda-Carrión et al., 2019; Legate et al., 2021). This versatility of PLS-SEM becomes more important in areas where constructs are complex.

The data obtained from the answers given by the participants were analyzed using Smart PLS 4.0 statistical software. In the analysis process, a two-step approach was followed. First, the measurement model was evaluated in terms of construct reliability, convergent validity, and discriminant validity using composite reliability, Cronbach's alpha, average variance extracted, Fornell-Larcker criterion, HTMT ratio, and cross-loadings. Then, the structural model was tested through path coefficients, t-values, and p-values obtained by bootstrapping with 5000 subsamples, and the model's predictive power (R^2, Q^2) and effect sizes (f^2) were assessed. Additionally, variance inflation factor (VIF) values were calculated to check for multicollinearity among independent variables.

RESULT AND ANALYSIS

In the analysis phase, demographic distributions were determined first. Then, measurement model analysis was performed to reveal the validity and reliability of the scale. Finally, the model was tested using the structural equation method.

Demographic Characteristics of the Sample

Table 1 shows the demographic distribution of the individuals who participated in the survey.

Table 1

The demographic characteristics of the sample.

Characteristics		N	%
Gender	Male	123	49.00%
	Female	128	51.00%
Marital Status	Single	121	48.21%
	Married	130	51.79%
Age	18-20	18	7.17%
	21-25	30	11.95%
	26-30	25	9.96%
	31-35	52	20.72%
	36-40	73	29.08%
	41-45	38	15.14%
	≥ 45	15	5.98%
Job	Unemployed and other groups	45	17.93%
	The Public Sector	59	23.51%
	The Private Industry	147	58.57%
Education	Primary and secondary education	8	3.19%
	High School	33	13.15%
	Associate degree	27	10.76%
	Bachelor's degree	148	58.96%
	Master's and Doctoral degrees	35	13.94%
Income (Turkish Lira / TRY)	≤ 15.000	33	13.15%
	15.001–30.000	54	21.51%
	30.001 - 45.000	40	15.94%
	45.001–60.000	80	31.87%
	60.0001 - 75.000	29	11.55%

Characteristics	N	%
≥ 75.001	15	5.98%
Total	251	100.00%

The demographic data of the research in Table 1 show the diversity of cross-border electronic commerce shoppers. 51% of the participants are female and 49% are male. When the participants' marital status is analyzed, 51.79% are married and 48.21% are single. It is seen that there is a balanced distribution in terms of marital status and gender. When the age groups are analyzed, it can be stated that the group that participated in the questionnaire the most consisted of participants between the ages of 36 and 40 with 29.08%.

In comparison, the age group that participated in the questionnaire the least consisted of participants aged 45 and over with 5.98%. In the demographic variable of occupational distribution, 58.57% of the participants work in the private sector, 23.51% in the public sector, and 17.93% are unemployed, retired, or not working. According to the level of education, 58.96% of the participants are undergraduate graduates. When the educational status is analyzed in general, individuals with higher education constitute the majority of the participants. When the income level variable is analyzed, the largest income group consists of participants between TRY 45,001 and TRY 60.000 with 31.87%. When the demographic data are evaluated in general, it can be stated that the participants in the research are generally middle-aged, working in the private sector, and have higher education.

Measurement Model

Before the research model analysis, the reliability and validity of the constructs in the study were evaluated. CR (Composite Reliability) and Cronbach's Alpha coefficients were used for this evaluation. AVE (Average Extracted Variance) and factor loading values were used to determine the convergent validity.

The threshold accepted in the literature for factor loading values is 0.70. However, some studies suggest that a factor loading of 0.50 or 0.60 is an acceptable threshold if the model reliability and validity are satisfactory (Noh, 2023; Jote, 2023). In his study, Rianto (2024) stated that statements with factor loadings below 0.40 must be removed from the model, and statements with factor loadings between 0.40 and 0.70 can be retained if they do not negatively affect AVE and CR values (Rianto, 2024).

AVE value measures the amount of variance captured by the indicators of a construct compared to the amount of variance caused by measurement error. AVE's generally accepted threshold value is 0.50 (Bilici, 2024). A threshold value of 0.50 means that at least 50% of the variance in the indicators should be explained by the construct (Noh, 2023; Jote, 2023).

CR is an index that assesses the internal consistency of indicators measuring a latent variable. The threshold value for CR is 0.70. A CR value of 0.70 indicates acceptable reliability (Jote, 2023; Wismantoro and Susilowati, 2021). If the CR value takes a value between 0.70 and 0.90, it is considered a good value (Natalia, 2018).

Like the CR value, Cronbach's Alpha value is also used to evaluate the internal consistency of the statements in the scale. Values above 0.70 for Cronbach's Alpha indicate good reliability (Bilici, 2024; Jote, 2023; Wismantoro and Susilowati, 2021). For Cronbach's Alpha, values above 0.80 indicate excellent reliability, whereas values below 0.60 indicate inadequate reliability (Zanjirchi et al., 2019; Kinel et al., 2021). CR and Cronbach's Alpha values are often used together to assess reliability. However, since the CR value generally considers the different loadings of the indicators, it is considered a more accurate reliability measure in the context of PLS-SEM (Natalia, 2018).

The abbreviations, factor loadings, CR, AVE, and Cronbach's alpha values of the statements in the scale are shown in Table 2.

Table 2

Measurement model analysis results

Dimensions and Abbreviations	Factor Loading	Cronbach's Alpha Value	Composite reliability value	Average Variance Extracted Value
Customer Satisfaction				
I feel happy when I buy products from this shopping site. (CSAT1)	0.864	0.877	0.915	0.730
It is enjoyable to do business on this shopping site. (CSAT2)	0.859			
I want other websites that do online shopping to be as good as this site. (CSAT3)	0.864			
I am generally satisfied with the transactions related to this shopping site (CSAT5).	0.830			
Operational Logistics Service Quality				
I am satisfied with the cargo tracking service provided by the platform. (OLSQ1)	0.829	0.889	0.919	0.693
I am satisfied with the ability to track orders. (OLSQ2)	0.822			
I am satisfied with the platform delivering goods at the specified time. (OLSQ3)	0.847			
The platform provides shorter delivery times than its competitors. (OLSQ4)	0.841			
Shipments are usually delivered on time. (OLSQ5)	0.824			
Online Repurchase Intention				
I consider myself a loyal customer of e-commerce site I use. (OPE1)	0.812	0.881	0.918	0.737
I will shop from e-commerce site I use again in the near future. (OPE2)	0.872			
When a need arises and I make a purchase, this e-commerce site is my first choice. (OPE3)	0.880			
I intend to interact with this e-commerce site within the next year. (OPE4)	0.869			
Order Condition				
The products I order are sent with appropriate protection and packaging as required. (ORCOND1)	0.887	0.875	0.923	0.800
The products I order are delivered without damage. (ORCOND2)	0.918			
There is no damage to the delivered products caused by the transportation process. (ORCOND3)	0.878			
Shipping Costs				
E-retailer offers free product delivery. (SCOST1)	0.826	0.766	0.864	0.680
E-retailer provides low-cost delivery. (SCOST2)	0.832			
There are no additional hidden costs of the customer for product delivery to the home address or pick-up point. (SCOST3)	0.815			
Timeliness				
Deliveries are made on the date specified at the order stage. (TIME1)	0.847	0.804	0.871	0.628
The time between placing an order and receiving the order is short. (TIME2)	0.823			

Dimensions and Abbreviations	Factor Loading	Cronbach's Alpha Value	Composite reliability value	Average Variance Extracted Value
The time between placing an order and receiving the order is fixed. (TIME3)	0.757			
The rate of non-compliance with the specified delivery time is low. (TIME4)	0.738			

TIME5, ORDCOND4, and CSAT4 statements with factor loadings below 0.50 were excluded from the analysis.

In Table 2, factor loadings, Cronbach's alpha, composite reliability (CR), and average variance extraction (AVE) values were evaluated for each construct.

Factor loadings indicate how well the indicators represent the constructs, and the factor loading threshold value accepted in the literature is 0.70. Although all of the factor loadings shown in Table 2 are above 0.70, it can be stated that some of the items in the 'Timeliness' dimension (e.g. TIME3 and TIME4) have lower factor loadings than the others (0.757 and 0.738) but still above the threshold value.

Cronbach's Alpha and CR values were used to measure reliability. The fact that the Cronbach's Alpha values of all constructs except one (Shipping Costs) are above 0.80 indicates that the internal consistency of the constructs is at an excellent level, and the Cronbach's Alpha value of 0.766 for the Shipping Costs dimension indicates a good level of reliability for this dimension. In addition, CR values above 0.70 indicate that the latent variables are highly reliable with their indicators. In particular, the CR values of 'Order Condition' and 'Online Repurchase Intention' constructs are close to 0.90, indicating that these constructs are highly reliable (Natalia, 2018).

AVE values express the amount of variance captured by the constructs from the indicators, and a value of 0.50 is generally accepted as a threshold (Bilici, 2024). According to the table, AVE values for all constructs are above 0.50, and it is seen that they explain more than 50% of the variance obtained from the indicators of the constructs. The AVE value of 0.80 for the 'Order Condition' dimension shows that this construct has a high explanatory power.

It can be stated that the factor loadings, Cronbach's Alpha, CR, and AVE values for the constructs used in the study are well above the accepted threshold values, and the model is reliable and valid. In light of these findings, it is seen that this model, created to determine the effect of logistics service quality dimensions on customer satisfaction and repurchase intention, has a robust structure.

Fornell-Larcker criterion and Heterotrait-Monotrait Ratio (HTMT) are tools used to determine discriminant validity in PLS-SEM. Discriminant validity is important to ensure that the constructs in a model are distinct from each other and to accept the integrity of the model's findings. The Fornell-Larcker criterion is based on the condition that the square root of the AVE values for each construct should be greater than the correlations between that construct and all other constructs in the model. Researchers widely prefer the Fornell-Larcker criterion to determine discriminant validity (Bilici, 2024; Lobo et al., 2022; Wicaksari, 2024). The discriminant validity results of the Fornell and Larcker criterion are shown in Table 3.

Another tool used to determine discriminant validity is the HTMT criterion. This criterion provides a more detailed perspective to assess discriminant validity by comparing the average correlations between items in different constructs (heteroattribute correlations) with the average correlations within the same construct (monoattribute correlations). Although the HTMT value varies according to the research context, ideally, it should not exceed 0.90 according to the literature (Bilici, 2024; Wundavalli et al., 2022). However, there are also opinions that HTMT values related to the threshold value should not exceed 1 (Garson, 2016). Compared to the Fornell-Larcker criterion, the HTMT criterion stands out as a more stringent discriminant validity test in cases where the constructs may appear similar (Bilici, 2024; Roemer et al., 2021). Both criteria are used together to comprehensively evaluate discriminant validity (Bilici, 2024; Lasanthika et al., 2021; Zahid & Rao, 2022). Using these methods together allows researchers to cross-validate their results, providing

empirical validation of constructs through theoretical and statistical analysis. The discriminant validity results of the HTMT criterion are shown in Table 4.

Table 3

Discriminant validity results of the fornell and larger criterion

	Customer Satisfaction	Online Repurchase Intention	Operational Logistics Service Quality	Order Condition	Shipping Costs	Timeliness
Customer Satisfaction	0.854					
Online Repurchase Intention	0.815	0.859				
Operational Logistics Service Quality	0.735	0.702	0.833			
Order Condition	0.748	0.667	0.742	0.895		
Shipping Costs	0.712	0.648	0.645	0.630	0.824	
Timeliness	0.680	0.700	0.799	0.700	0.707	0.793

According to Table 3, discriminant validity is provided for the Fornell and Larcker criterion (the square root of the AVE value is higher than the other values in the column). Accordingly, it can be stated that the constructs are separated.

In order to evaluate the discriminant validity in a more robust and binary structure, the HTMT criterion was also evaluated together with the Fornell and Larcker criterion.

Table 4

Discriminant validity results according to the HTMT criterion

	Customer Satisfaction	Online Repurchase Intention	Operational Logistics Service Quality	Order Condition	Shipping Costs	Timeliness
Customer Satisfaction						
Online Repurchase Intention	0.925					
Operational Logistics Service Quality	0.828	0.789				
Order Condition	0.852	0.760	0.839			
Shipping Costs	0.861	0.789	0.774	0.760		
Timeliness	0.789	0.822	0.919	0.816	0.896	

Table 4 shows that the threshold value requirements of the HTMT criterion are met. According to these results, the constructs used in the study have discriminant validity.

Another important criterion used in PLS-SEM to assess the discriminant validity of constructs within a model is the cross-loadings table, known as "item-level discriminant validity". The Cross-Loadings table specifically shows the loadings of each statement on all constructs. In this respect, it allows researchers to evaluate whether statements are loaded more strongly on the intended construct than others. The Cross-Loadings table is a necessary and recommended criterion to verify that the constructs in the model measure different concepts and do not measure the same things in their definitions or measurements (Henseler et al., 2014; Seočanac, 2024; Qureshi et al., 2023).

The most common approach determined to ensure the validity of the cross-loadings table is that an indicator loads below the corresponding construct. It is not the loading of a dimension belonging to a construct on any other construct in the model but the accumulation of the highest values belonging to the same construct under the column belonging

to the same construct. In other words, in this analysis, to ensure discriminant validity, each statement must have weak relationships with other latent variables, except for the latent variable it is theoretically related to.

This criterion is generally supported by the Fornell-Larcker criterion, which states that the square root of the average variance extracted for each construct should be greater than the correlations between that construct and all other constructs (Henseler et al., 2014; Seočanac, 2024; Qureshi et al., 2023). The Heterotrait-Monotrait (HTMT) ratio has emerged as a more robust alternative for assessing discriminant validity, as it can provide a clearer awareness of the relationships between constructs compared to traditional methods such as cross-loadings (Sohaib et al., 2020; Kante, 2018). However, the full determination of discriminant validity and the use of this trio of constructs together for a robust model will increase the predictive power of the research.

The Cross Loadings table is made to verify the distinctiveness of the constructs and to identify possible problems with the assignment of loadings related to the statements. By examining the loadings accumulated under the relevant dimension, researchers can identify statements that do not work as intended in the research. As a result, adjustments can be made in the model, such as removing poorly performing statements or re-evaluating the theoretical framework (Franke & Sarstedt, 2019; Li, 2024; Qureshi et al., 2023). This process is important to ensure that the constructs are represented correctly and that the model is reliable and valid for higher-level analyses. In short, the Cross Loadings table in PLS-SEM is a basic tool, like the HTMT ratio and the Fornell-Larcker criterion, to assess discriminant validity by ensuring that the constructs are measured differently and accurately. The Cross Loadings table confirms the theoretical distinctions between the constructs and has the feature of being a diagnostic tool to improve measurement models.

Table 5

Cross loadings

Abbreviations	Customer Satisfaction	Online Repurchase Intention	Operational Logistics Service Quality	Order Condition	Shipping Costs	Timeliness
CSAT1	0.864	0.666	0.605	0.658	0.620	0.575
CSAT2	0.859	0.662	0.602	0.622	0.607	0.515
CSAT3	0.864	0.711	0.591	0.623	0.611	0.579
CSAT5	0.830	0.739	0.709	0.651	0.593	0.649
OLSQ1	0.576	0.506	0.829	0.563	0.496	0.583
OLSQ2	0.595	0.539	0.822	0.605	0.504	0.591
OLSQ3	0.583	0.587	0.847	0.620	0.503	0.641
OLSQ4	0.644	0.656	0.841	0.617	0.593	0.732
OLSQ5	0.654	0.619	0.824	0.676	0.577	0.760
OPE1	0.671	0.812	0.575	0.586	0.579	0.618
OPE2	0.702	0.872	0.638	0.574	0.531	0.608
OPE3	0.723	0.880	0.596	0.563	0.553	0.586
OPE4	0.700	0.869	0.600	0.569	0.563	0.593
ORCOND1	0.674	0.594	0.711	0.887	0.549	0.647
ORCOND2	0.695	0.623	0.638	0.918	0.577	0.618
ORCOND3	0.636	0.572	0.644	0.878	0.565	0.615
SCOST1	0.531	0.531	0.484	0.443	0.826	0.558
SCOST2	0.570	0.550	0.543	0.484	0.832	0.633
SCOST3	0.646	0.521	0.560	0.612	0.815	0.560
TIME1	0.659	0.626	0.774	0.711	0.616	0.847
TIME2	0.549	0.619	0.650	0.526	0.588	0.823
TIME3	0.493	0.458	0.550	0.466	0.511	0.757

Abbreviations	Customer Satisfaction	Online Repurchase Intention	Operational Logistics Service Quality	Order Condition	Shipping Costs	Timeliness
TIME4	0.410	0.493	0.510	0.472	0.517	0.738

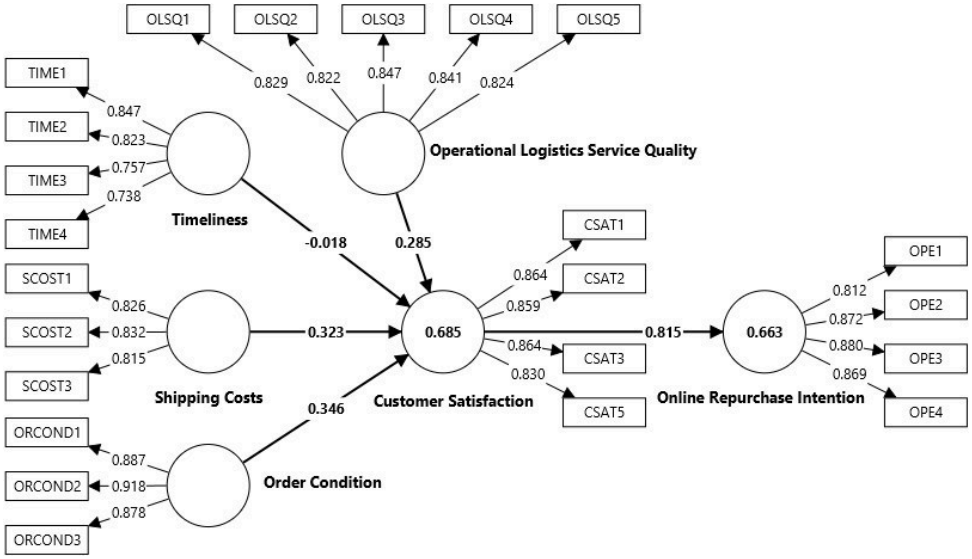
The cross-loadings table in Table 5 is used to evaluate the discriminant validity of the model in PLS-SEM. This table allows examining how strongly each indicator loads on the structure it belongs to and whether its relationships with other structures are weak. Table 5 shows that each indicator has the highest loading under its structure. For example, the CSAT1 indicator loads on the Customer Satisfaction (CSAT) structure with a high value of 0.864, whereas its loadings on other structures are quite low (for example, 0.666 on the Online Repurchase Intention (OPE) structure and 0.605 on the Operational Logistics Service Quality (OLSQ) structure). These results show that discriminant validity is strongly provided at the item level. Other items also have higher loadings under their own structures, and their loadings with different structures are lower. For example, the OLSQ3 indicator loaded on the operational logistics service quality (OLSQ) construct with a high value of 0.847, while its loadings on other constructs (e.g., 0.587 with OPE, 0.503 with shipping costs) were lower. These results clearly indicate that the constructs measure independent and different concepts. All constructs in the table are located with high values under their own dimension. These results show the internal consistency and discrimination of the relevant constructs. In short, the values in the cross-loadings table show that the constructs successfully measure different concepts and that discriminant validity is achieved. The results of the cross-loadings table increase the validity of the model together with the HTMT and Fornell-Larcker criteria and provide more reliable estimates.

Structural Model

The structural equation model of the research is presented in Figure 2.

Figure 2

Analysis Results of the Measurement Model



The PLS-SEM method was preferred for the analysis of the research model whose results are shown in Figure 2. The data were analyzed using Smart PLS 4.0 software. R^2 and f^2 values were calculated to evaluate the effect of the model, and linearity and path coefficients were determined using the PLS algorithm. In addition, Q^2 values were obtained using the PLSpredict module to measure the model's predictive ability. In order to test whether the PLS path coefficients are statistically significant, bootstrapping analysis with 5000 sub-samples was performed, and t values were calculated as a result of this analysis. The findings related to the research model are presented in Table 5.

Table 6

PLS-SEM analysis results.

Hypothesis	Paths	Standardized β Coefficient	Standard Error	t Value	P Value	Result
H_1	Operational Logistics Service Quality->Customer Satisfaction	0.285	0.081	3.502	0.000	Accept
H_2	Timeliness->Customer Satisfaction	−0.018	0.075	0.234	0.815	Reject
H_3	Shipping Costs->Customer Satisfaction	0.323	0.073	4.403	0.000	Accept
H_4	Order Condition->Customer Satisfaction	0.346	0.081	4.242	0.000	Accept
H_5	Customer Satisfaction->Online Repurchase Intention	0.815	0.030	27.282	0.000	Accept

Five hypotheses were tested to examine the effects of different dimensions of logistics service quality on customer satisfaction and online repurchase intention of cross-border electronic commerce shoppers. While evaluating the results, for the effect to be significant, the p value should be 0.05 and below, and the t value should be 1.96 and above. As a result of the calculation of the obtained data, operational logistics service quality has a positive and significant effect on customer satisfaction (β = 0.285, t = 3.502, p = 0.000). According to this result, operational logistics service quality is an important factor that increases customer satisfaction. However, the effect of timeless on customer satisfaction was negative and insignificant (β = −0.018, t = 0.234, p = 0.815). This result shows that the timeliness dimension does not significantly affect satisfaction.

The effect of shipping costs on customer satisfaction is positive and significant (β = 0.323, t = 4.403, p = 0.000). This result shows that favorable shipping costs are an important factor that increases satisfaction. Similarly, the relationship between order condition and customer satisfaction is positive and significant (β = 0.346, t = 4.242, p = 0.000). It is concluded that information about order condition positively affects customer satisfaction.

When the relationship between customer satisfaction and online repurchase intention was analyzed, a strong and significant effect was observed between these two dimensions (β = 0.815, t = 27.282, p = 0.000). According to this calculated result, customer satisfaction is one of the most determining factors in customers' online repurchase behavior. In summary, it can be stated that operational service quality, shipping costs, and order condition factors, which are among the dimensions of logistics service quality, significantly affect customer satisfaction, and satisfaction strongly affects repurchase intention.

In PLS-SEM, measures such as R^2, f^2, Q^2 and Variance Inflation Factor (VIF) are used to evaluate model performance and validity. Each measure serves different purposes, such as assessing the model's explanatory power, predictive ability, and multicollinearity between the predictor dimensions.

R^2 (Coefficient of Determination) measures the proportion of variance in the dependent variable that can be explained by the independent variables in the model in PLS-SEM. A higher R^2 value indicates a better model fit. In the literature for R^2 value, 0.75 and above is considered a strong value, 0.50 and above is considered a moderate value, and 0.25 and above is considered a poor value (Leguina, 2015; Hair et al., 2019). These criteria are important because they reflect how well the model can predict the results based on the latent constructs included in the model (Mohammad vd., 2019; Henseler vd., 2016).

The f^2 value, which measures the effect size, gives an idea about the strength of the relationships in the model by measuring the effect of the independent variable on the dependent variable. To calculate this value, the change in R^2 is calculated when a dimension is added to the model. In the literature, 0.02 (small), 0.15 (medium), and 0.35 (large) are accepted as values to interpret f^2 (Bilici, 2024; Leguina, 2015; Hair et al., 2019). These values indicate the relative values and importance of the predictors in the model, which can guide researchers in theory development and practical applications (Elbaz & Haddoud, 2017; Shmueli et al., 2019).

The Q^2 value, which measures the predictive relevance, reveals the model's predictive ability by evaluating how well the model predicts the observed data. The Q^2 value is derived from the bootstrapping procedure, which involves systematically removing data points from the model and assessing the model's ability to predict these removed values. A Q^2 value greater than zero indicates that the model has predictive relevance (Leguina, 2015; Hair et al., 2019). This value is important in exploratory research. Because it supports verifying the applicability of the model in scenarios where the model is adapted to practice (Naseri et al., 2020; Pasagi et al., 2022).

The VIF value is used to detect multicollinearity between independent variables in the model. A VIF value exceeding the threshold value of 5 indicates a multicollinearity problem, suggesting that coefficient estimates may not be reliable (Ansori et al., 2021; Bilici and Türkoğlu, 2024; Kock, 2015, Özdemir et al., 2019). In PLS-SEM, multicollinearity must be detected and controlled to ensure that the relationships between variables are accurately represented and interpreted (Ansori et al., 2021; Kock, 2015).

Table 6 presents the calculated R^2, f^2, Q^2 and VIF values of the model created in this study.

Table 7

R^2, f^2, Q^2 and VIF values.

Paths	R^2	f^2	Q^2	VIF
Operational Logistics Service Quality->Customer Satisfaction	0.685	0.076	0.664	3.401
Timeliness->Customer Satisfaction		0.000		3.443
Shipping Costs->Customer Satisfaction		0.152		2.171
Order Condition->Customer Satisfaction		0.152		2.505
Customer Satisfaction->Online Repurchase Intention	0.663	1.971	0.555	1.000

With the data in Table 6, the explanatory power, effect size, predictive ability, and multicollinearity between variables were evaluated.

When the R^2 values in Table 6 are examined, it is seen that logistics service quality, timeliness, shipping costs, and order condition dimensions explain 68.5% of customer satisfaction. This result shows that the independent variables have a moderate effect on customer satisfaction. Similarly, it can be stated that customer satisfaction explains 66.3% of online repurchase intention. According to these results, the model explains the relationship between the variables at a moderate level.

When the effect size is evaluated, the effect of operational logistics service quality on customer satisfaction is small ($f^2 = 0.076$), whereas shipping costs and order condition have moderate effects ($f^2 = 0.152$). The timeliness dimension does not significantly affect customer satisfaction ($f^2 = 0.000$). On the other hand, the effect of customer satisfaction on online repurchase intention is huge ($f^2 = 1.971$). This result shows that customer satisfaction strongly influences purchase behavior.

Q^2 values reveal the predictive ability of the model. The Q^2 value for customer satisfaction is 0.664 and 0.555 for online repurchase intention. Both values indicate that the model has good predictive power. These results indicate that the model can be used in practical applications and accurately predict customer satisfaction.

When the VIF values in Table 6 are analyzed, it is seen that the values vary between 2.171 and 3.443. According to this result, since all values are below 5, there is no multicollinearity problem in the model.

In summary, while shipping costs and order condition have significant effects on customer satisfaction, the effect of operational logistics service quality is weaker compared to other dimensions. The timeliness dimension also does not significantly affect customer satisfaction. There is no multicollinearity problem in the model, and it can be stated that the model is robust regarding explanatory and predictive relevance.

DISCUSSION AND CONCLUSION

This study provides information about the dimensions of logistics quality that affect customer satisfaction in cross-border e-commerce and consumer opinions. The research results reveal that operational logistics service quality (OLSQ), transportation costs, and order status positively and significantly affect customer satisfaction, whereas on-time delivery does not have an effect. These results are parallel to the studies in the literature that mention the importance of operational logistics service quality (OLSQ) (Lin et al., 2016; Ding et al., 2017; Oh et al., 2022; Zhang et al.,2024), transportation costs (Kalinić et al., 2018; Hazarika & Mousavi, 2021; Mou et al., 2019), and order status (Sutrisno et al., 2019; Uvet, 2020; Akil & Ungan, 2022) in increasing customer satisfaction when evaluated specifically in e-commerce. In particular, the strong effect of customer satisfaction on online repurchase intention highlights the important and unique role of logistics quality in promoting customer loyalty and repeat purchases (Johan et al., 2020; Tufahati et al., 2021; Miao et al., 2022; Yun & Park, 2022; Ginting et al., 2023). The results of this study are consistent with the existing literature that mentions the importance of logistics service quality. LSQ is very important to meet customer needs and create competitive advantages in e-commerce, and with the rapid growth and expansion of cross-border e-commerce, the leading role played by logistics becomes more important. The success of logistics significantly affects the sustainable development of cross-border e-commerce (Zhang, 2023). It can also be stated that the quality of logistics services significantly affects customer satisfaction, especially in cross-border e-commerce, where complexities such as customs procedures and payment problems arise (Li, 2022). It is also among the findings of studies in the literature that various dimensions of logistics service quality, such as the stability of delivery and the adequacy of information services, positively affect customer satisfaction and repurchase intentions (Oh et al., 2022).

The rejection of the hypothesis regarding the effect of on-time delivery on customer satisfaction, which is a result of this study, is an interesting result. This suggests that other factors may overshadow the importance of on-time delivery in cross-border e-commerce. In particular, the motivation of consumers shopping cross-border from Turkey suggests the idea of the product being affordable rather than speed. However, a separate study is needed to confirm this idea. This result contradicts some studies in the literature that suggest the importance of delivery speed in customer satisfaction (Choi et al., 2019; Wang et al., 2021). The need for a detailed understanding of customer satisfaction dynamics in this study contributes to the extensive literature on e-commerce logistics, indicating that while on-time delivery may be important, factors such as operational quality, shipping costs, and order conditions may play a much more important role in shaping customer perceptions and behaviors. In short, this study reinforces the importance of logistics service quality in cross-border e-commerce and most of the results regarding the direct and indirect effects of logistics on customer satisfaction and repurchase intentions. The awareness gained from this research will support e-commerce businesses that sell products online to cross-border customers to develop their logistics strategies to improve customer experiences and encourage repeat purchases.

Theoretical Implications

The study's consideration of logistics service quality as a multidimensional structure offers a new perspective to the literature in this field. It has been revealed that operational logistics service quality, order status, and transportation costs make significant contributions to customer satisfaction. These inferences show that logistics service quality is not just about on-time delivery but that a multidimensional structure can create deeper and more complex effects on customer perceptions.

Another theoretical contribution of the study is the finding that on-time delivery does not have a significant effect on customer satisfaction. Although this result contradicts some previous studies emphasizing the importance of on-time delivery, it shows that other factors, especially transportation costs and operational quality, shape customers' perceptions and behaviors more in the context of cross-border e-commerce. This strengthens the idea that logistics service quality is a structure that goes beyond traditional criteria such as time and speed and that customer satisfaction is shaped by different dimensions.

Finally, the strong effect of customer satisfaction on online repurchase intention demonstrates the power of customer loyalty and logistics service quality on long-term customer behavior. In this context, the study contributes to the literature by highlighting the indirect effects of logistics service quality dimensions on customer satisfaction and repeat purchasing behavior.

Managerial Implications

The results of this research suggest that cross-border e-commerce businesses should strengthen their strategies for operational logistics service quality and order status to increase customer satisfaction and repeat purchase intention from a managerial perspective. Increasing operational quality in logistics processes positively affects customer satisfaction and experience and provides businesses with the opportunity to get ahead in the competition. Reducing logistics costs and reflecting this advantage to customers can encourage customer satisfaction and, therefore, repeat purchase behavior. Cross-border consumers, who are in search of affordable products, especially for products sent from abroad to Turkey, are sensitive to transportation costs. Therefore, ensuring efficiency in transportation processes and following transparent cost policies can increase customer satisfaction and repeat purchase behavior. On the other hand, the insignificance of the effect of on-time delivery on satisfaction guides businesses to develop cost- and quality-oriented logistics strategies rather than time-oriented competition. The search for price advantage, especially for consumers shopping cross-border from Turkey, may become more important than fast delivery speed. Therefore, it can be suggested to managers that businesses improve customer satisfaction with price-oriented strategies.

Limitations

This research was conducted on consumers who shop cross-border from Turkey. Therefore, the results obtained may not be valid for consumers in countries with different cultural and economic structures. Note that the expectations of consumers outside Turkey and the importance they give to logistics quality may be different. In addition, even if the research reveals that the effect of on-time delivery on satisfaction is not significant, the reasons behind this situation should be examined in depth. Studies that examine the importance of on-time delivery in more detail, especially for different consumer groups or product categories, may change the general validity of this result of the research. Finally, the study was limited to only quantitative data. The analysis of qualitative data in the studies suggests that consumer perceptions regarding logistics service quality can be better understood. In order to understand consumer behavior more comprehensively, it would be appropriate to expand future research with both quantitative and qualitative methods.

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