



Factors Affecting Customer Satisfaction Towards Logistics Service Quality in Ba Ria - Vung Tau, Vietnam

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ABSTRACT: This study investigates the factors influencing customer satisfaction with logistics service quality in Ba Ria - Vung Tau, Vietnam using the SERVPERF model. Data were collected from 250 enterprises and analyzed using Cronbach's Alpha, Exploratory Factor Analysis, Pearson correlation, and multiple regression. The results confirm that responsiveness, assurance, and tangibles have significant positive effects on customer satisfaction, with responsiveness showing the strongest impact. In contrast, empathy and reliability were not found to have significant effects in the final model. The findings also indicate that satisfaction varies across business sectors but shows no significant differences based on firm size or years of operation. These results suggest that logistics service providers should prioritize improving service responsiveness, staff competence, and physical facilities to enhance customer satisfaction.

KEYWORDS: Customer satisfaction, Logistics service quality, Logistics services, SERVPERF, Vietnam.

1. INTRODUCTION

Since Vietnam opened its market under the commitments of the World Trade Organization, domestic logistics enterprises have faced significant competitive pressure from foreign logistics corporations such as DHL, UPS, and FedEx. This situation has required local companies to improve their service quality in order to survive and remain competitive. Furthermore, due to the rapid accessibility of information, customers today can easily switch services and move to logistics companies that provide better service quality, making competition in the industry increasingly intense.

Meeting customer satisfaction has therefore become a vital issue for the survival and development of domestic logistics service providers. High logistics service quality (LSQ) enhances customer satisfaction, thereby contributing to increased sales revenue (Baki et al., 2009). Customer satisfaction has a positive impact on customer loyalty toward goods and services (Gil-Saura et al., 2008; Chen et al., 2007) and is considered a decisive factor in the success of service providers (Pham & Chansyna, 2020). Customers' perceptions of service quality influence their loyalty through their satisfaction with the service. However, many service companies in general, and logistics service providers in particular, tend to focus more on acquiring new customers while neglecting existing ones, despite the fact that profits generated from existing customers are often higher than those from new customers due to lower marketing and customer acquisition costs.

Previous studies on customer satisfaction with LSQ have mainly focused on factors such as service performance, measured by order fulfillment time (Mentzer et al., 2001) or order processing time (Rafele, 2004). In addition, corporate image has been considered an important factor in evaluating LSQ (Thai, 2013). Other factors such as operational service quality and technical service quality (Juga et al., 2010) have also been incorporated into LSQ. Rafele (2004) proposed two factors, namely tangible components and information activities, in the model for evaluating customer satisfaction with LSQ.

The importance of service value has also been emphasized in many studies. The value delivered to customers is a prerequisite for their satisfaction and loyalty (Lan et al., 2016). An imperfect logistics process is one of the fundamental causes of customer dissatisfaction when using logistics services. Transaction errors or service failures significantly affect customer satisfaction (Xu & Cao, 2009). In the logistics sector, empathy is also considered a crucial dimension that influences customer expectations regarding LSQ (Baki et al., 2009). However, a limitation of these studies is that they have not identified differences in satisfaction levels among different customer groups based on gender, firm size, or business sector.

This study employs the SERVPERF model to evaluate the impact of service quality dimensions on customer satisfaction with logistics services in the Northern provinces of Vietnam. Additionally, the study examines differences in customer satisfaction levels with LSQ based on firm characteristics, including years of operation, business sector, and company size.



2. LITERATURE REVIEW

Currently, several models are widely used to evaluate service quality, including the expectation-perception gap model (SERVQUAL), the performance-only model (SERVPERF), and the importance-performance analysis model (IPA).

The SERVQUAL model, proposed by Parasuraman and Leonard (1988), measures service perception through five dimensions of service quality, including: Reliability (the ability to deliver services as promised and on time from the first attempt); Responsiveness (the willingness of staff to provide prompt service to customers); Assurance (employees' professional competence and their courteous and friendly service manner); Empathy (the caring and individualized attention provided to customers); Tangibles (the physical appearance of employees, appropriate uniforms, and equipment used to deliver services).

SERVPERF is a variation of the SERVQUAL model proposed by Cronin and Taylor (1992). In the SERVQUAL model, customer satisfaction with service quality is measured based on both expectations and perceptions (Service quality = Perception - Expectation). In contrast, the SERVPERF model measures service quality solely based on customer perceptions.

SERVPERF and SERVQUAL use the same perception measurement scale; however, SERVPERF eliminates the expectation component. Specifically, the SERVQUAL questionnaire consists of two sections, each containing 22 items. The first section identifies customer expectations regarding service providers in general. Respondents indicate their expectations for logistics service providers without evaluating any specific company. The second section measures customer perceptions of the service quality of a particular firm based on their actual experience. Meanwhile, the SERVPERF scale also uses 22 items similar to the perception section of SERVQUAL but excludes the expectation component.

Cronin and Taylor (1992) argued that the SERVQUAL model of Parasuraman and Leonard (1988) may cause confusion between customer satisfaction and customer attitudes. Therefore, the use of the SERVQUAL scale may affect data quality, potentially reducing reliability and the stability of observed variables. Consequently, measuring service quality using the SERVPERF model (Cronin & Taylor, 1992) is considered more convenient due to its shorter questionnaire, time efficiency, and reduced risk of misunderstanding among respondents.

Since the introduction of the SERVPERF instrument by Cronin and Taylor (1994), it has demonstrated its effectiveness in evaluating logistics service performance. Several studies in maritime freight logistics services have applied these models and compared SERVPERF analysis results with those obtained from SERVQUAL.

In the SERVPERF model examining satisfaction with service quality, five major dimensions directly influence customer satisfaction (see Figure 1):

Tangibles (T): The tangibles dimension refers to the physical appearance of facilities, equipment, personnel, and communication materials. This dimension includes basic criteria such as modern equipment, well-dressed and professional staff appearance, comfortable and convenient facilities.

Reliability (Ry): The reliability dimension reflects the ability to perform promised services dependably and accurately. This includes criteria such as: The company consistently fulfills its commitments to customers; Services are delivered correctly the first time; Staff provide support when customers encounter difficulties; Services are delivered within the committed timeframe; The company minimizes service errors.

Responsiveness (Rs): Responsiveness refers to the willingness and readiness of employees to provide services to customers. This dimension includes criteria such as: Employees accurately inform customers when services will be performed; Employees provide prompt services; All orders are handled regardless of contract size; Urgent or unexpected orders are handled quickly; Employees provide enthusiastic customer support.

Assurance (A): The assurance dimension refers to employees' knowledge, courtesy, and their ability to inspire trust and confidence. This includes criteria such as: Employees create trust through their service attitude; Employees always show respect toward customers; Customers feel secure when using the service.

Empathy (E): The empathy dimension reflects the level of care and individualized attention provided to customers. This includes criteria such as: Customers feel individually cared for by the company; Employees pay attention to each customer; Employees understand specific customer requirements; Employees provide satisfactory answers to customer inquiries; Convenient service hours are provided for customers.

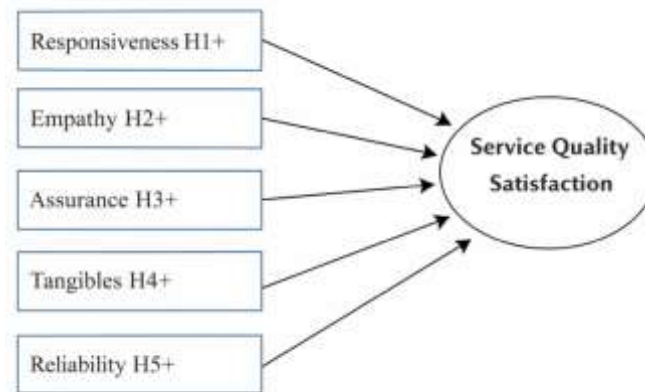


Figure 1. Factors affecting service satisfaction according to the SERVPERF model

3. METHODOLOGY

3.1. Scale

This study employs a five-point Likert scale. In this scale, level 1 corresponds to “Strongly disagree” and level 5 corresponds to “Strongly agree” with the statements presented in the questionnaire. Although theoretically, scales with more response levels may provide higher measurement accuracy, scales with more than seven levels may easily cause confusion among respondents. Therefore, the authors decided to use a five-point Likert scale.

3.2. Sample

Due to limitations in accessing enterprises from different regions, the authors focused on surveying manufacturing and import-export companies using logistics services in Ba Ria - Vung Tau, Vietnam. A non-probability convenience sampling method was applied, and the survey was conducted online from January 25, 2021, to February 10, 2021. The questionnaires were distributed to respondents through Facebook groups of logistics service users in Vietnam and via email.

Exploratory Factor Analysis (EFA) requires a minimum sample size of 50, preferably 100, and a minimum observation-to-variable ratio of 5:1. This means that each measured variable requires at least five observations. The research model in this study includes 24 variables; therefore, a minimum of $24 \times 5 = 120$ observations was required. The authors surveyed 280 enterprises using logistics services in Vietnam and obtained 250 valid responses.

The questionnaires were distributed to various respondents, including directors, deputy directors, department managers, specialists, and staff. At each job position, respondents were considered capable of providing objective evaluations of the service quality they experienced. Each enterprise had only one representative participating in the survey.

3.3 Questionnaire design

The study applies a six-factor model, including: (i) Responsiveness, (ii) Tangibles, (iii) Assurance, (iv) Empathy, (v) Reliability, and (vi) Satisfaction. These factors are represented and evaluated through observed variables (each factor consists of three to five observed variables).

After revising and finalizing the questionnaire, the authors conducted a pilot survey with 30 enterprises. Based on the feedback and responses collected, the questionnaire was further refined to improve clarity and appropriateness of the wording. The final questionnaire consisted of two main sections: 1) Questions on general information of the respondents, including personal and company information; 2) Core questions describing the variables of the research model.

4. RESULTS AND DISCUSSION

4.1. Survey sample

The survey results indicate that the number of female respondents was higher than that of male respondents, accounting for 54% and 46%, respectively. Regarding job positions, 19 respondents were directors (7.6%), 24 were department managers (9.6%), and 207 were employees (82.8%). The number of employee respondents was significantly higher than that of directors and managers in

order to ensure the reliability of the survey data, as these employees are the ones who directly work with logistics service providers in supporting domestic and international goods transportation activities.

Table 1. Descriptive statistics of the research sample

Group	Category	Frequency	Percentage (%)
Gender	Female	135	54.0
	Male	115	46.0
Position	Director	19	7.6
	Deputy Director	0	0
	Department Manager	24	9.6
	Deputy Manager	0	0
	Employee	207	82.8
Years of operation	5 years or more	8	3.2
	From 1 to under 5 years	199	79.6
	Under 1 year	43	17.2
Business sector	Agriculture - Forestry - Fisheries	1	0.4
	Industry - Manufacturing	9	3.6
	Services	8	3.2
	Trading	231	92.8
Firm size	Micro enterprises	200	80.0
	Small enterprises	37	14.8
	Medium enterprises	6	2.4
	Large enterprises	7	2.8
Type of enterprise	Joint-stock company	66	26.4
	Limited liability company	179	71.6
	Private enterprise	4	1.6
	Other types	1	0.4

The proportion of enterprises that had more than five years of experience using logistics services since their establishment was the lowest, accounting for only 3.2%. Meanwhile, enterprises operating for less than one year accounted for 17.2%, and those operating from one to five years accounted for the highest proportion at 79.6%.

In terms of business sectors, 231 trading enterprises participated in the survey, accounting for 92.8% of the total sample. Other sectors such as agriculture – forestry - fisheries, industry - manufacturing, and services accounted for relatively small proportions, at 0.4%, 3.6%, and 3.2%, respectively.

Regarding firm size, most of the surveyed enterprises were small and micro-sized firms, accounting for 94.8% of the sample, while medium and large enterprises accounted for only 5.2%.

In terms of business type, joint-stock companies and limited liability companies accounted for the majority, at 26.4% and 71.6%, respectively. Meanwhile, private enterprises and other business types accounted for an insignificant proportion, with only four private enterprises and one enterprise of another type participating in the survey. In practice, the limited liability company model is quite common in Vietnam because most of these companies operate on a small or medium scale.



4.2. Reliability

The reliability analysis results show that the Cronbach’s Alpha coefficients of the Rs, T, A, E, and Ry scales are all greater than 0.6, indicating acceptable measurement reliability. The Corrected Item-Total Correlation coefficients of the observed variables belonging to the Rs, T, and A factors meet the required threshold, as all values are greater than or equal to 0.3. Meanwhile, the observed variables E5 and Ry3 were removed from the model because their Corrected Item-Total Correlation coefficients were lower than 0.3.

After removing variables E5 and Ry3, the Cronbach’s Alpha results of all six scales were greater than 0.7, indicating good reliability. Furthermore, the observed variables of the six scales all had Corrected Item-Total Correlation values greater than or equal to 0.3, confirming the internal consistency of the constructs. Therefore, these variables were considered satisfactory and retained for further analysis.

Table 2. Cronbach’s Alpha reliability test results after item removal

Factor	Item	Corrected Item-Total Correlation	Cronbach’s Alpha if Item Deleted
Responsiveness (CA = 0.847)	Rs1	0.691	0.809
	Rs2	0.640	0.820
	Rs3	0.489	0.857
	Rs4	0.705	0.802
	Rs5	0.772	0.781
Tangibles (CA = 0.738)	T1	0.485	0.740
	T2	0.648	0.561
	T3	0.599	0.617
Assurance (CA = 0.741)	A1	0.528	0.704
	A2	0.607	0.611
	A3	0.568	0.654
Empathy (CA = 0.739)	E1	0.513	0.690
	E2	0.543	0.673
	E3	0.574	0.655
	E4	0.496	0.700
Reliability (CA = 0.806)	Ry1	0.421	0.838
	Ry2	0.771	0.676
	Ry4	0.774	0.699
	Ry5	0.596	0.787
Satisfaction (CA = 0.751)	S1	0.487	0.767
	S2	0.686	0.544
	S3	0.607	0.639

4.3. EFA

EFA was conducted to reduce the number of independent variables into a smaller set of representative factors while preserving the explanatory meaning and information of each factor group.



Table 3. KMO and Bartlett’s test results before item removal

Test	Indicator	Value
Bartlett’s Test of Sphericity	KMO Measure of Sampling Adequacy	0.850
	Approx. Chi-Square	2297.876
	df	171
	Sig.	0.000

Table 4. Total variance explained before item removal

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.556	34.505	34.505	6.556	34.505	34.505
2	2.598	13.676	48.181	2.598	13.676	48.181
3	1.555	8.183	56.364	1.555	8.183	56.364
4	1.076	5.662	62.026	1.076	5.662	62.026
5	1.009	5.310	67.336	1.009	5.310	67.336
...
19	0.111	0.582	100.000			

The KMO (Kaiser-Meyer-Olkin) coefficient reported in the table is 0.850, satisfying the required condition, thus confirming that factor analysis is appropriate. The significance value of Bartlett’s Test is 0.000 (< 0.05), indicating that the Bartlett test is statistically significant and that the observed variables are correlated within the factors.

The Total Variance Explained is 67.336% ($\geq 50\%$), indicating that the EFA model is appropriate. Considering the total variance as 100%, the extracted factors explain 67.336% of the variance, while 32.664% of the variance of the observed variables remains unexplained.

Table 5. Rotated Component Matrix before item removal

Variable	Component 1	Component 2	Component 3	Component 4	Component 5
Rs4	0.802				
Rs5	0.768				
Rs2	0.762				
Rs1	0.759				
E1	0.700				
E3	0.611				
E2	0.520				
Rs3					
E4					
A2		0.789			
A3		0.755			



Variable	Component 1	Component 2	Component 3	Component 4	Component 5
A1		0.566			
T2			0.867		
T3			0.736		
T1			0.723		
Ry5				0.951	
Ry2				0.859	
Ry1					0.952
Ry4				0.565	0.737

A factor loading of 0.5 is considered an acceptable threshold for sample sizes ranging from 120 to under 350. The results show that only observed variables with factor loadings greater than 0.5 were retained. However, three problematic variables were identified: Rs3 and E4 had factor loadings lower than the required threshold of 0.5, and Ry4 loaded onto two factor groups with a loading difference of 0.172, which is lower than the acceptable difference of 0.3.

Therefore, after removing variables Rs3, E4, and Ry4 from the model and re-running the EFA, the following results were obtained:

Table 6. KMO and Bartlett’s test results after item removal

Test	Indicator	Value
Bartlett’s Test of Sphericity	KMO Measure of Sampling Adequacy	0.853
	Approx. Chi-Square	1724.890
	df	120
	Sig.	0.000

Table 7. Total variance explained after item removal

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.845	36.534	36.534	4.146	25.914	25.914
2	1.915	11.970	48.503	2.138	13.364	39.278
3	1.486	9.286	57.790	2.023	12.647	51.924
4	1.011	6.320	64.110	1.950	12.186	64.110

The KMO coefficient was 0.853, satisfying the condition of $0.5 \leq KMO \leq 1$, indicating the suitability of factor analysis. The significance value of Bartlett’s Test remained 0.000 (< 0.05), confirming the statistical significance of the test and the correlations among the observed variables. The number of extracted factors was reduced to four, as only factors with Eigenvalues ≥ 1 were retained in the analytical model. The Total Variance Explained was 64.110% ($\geq 50\%$), further confirming the appropriateness of the EFA model.



Table 8. Rotated Component Matrix after item removal

Variable	Component 1	Component 2	Component 3	Component 4
Rs4	0.811			
Rs5	0.781			
Rs1	0.769			
Rs2	0.758			
E1	0.706			
E3	0.581			
E2	0.534			
A2		0.803		
A3		0.756		
A1		0.580		
T2			0.841	
T1			0.748	
T3			0.724	
Ry2				0.932
Ry5				0.845
Ry1				0.523

In the subsequent EFA conducted for the independent variables, the rotated factor matrix no longer showed any problematic variables. The KMO coefficient was 0.638, satisfying the condition of $0.5 \leq KMO \leq 1$, indicating the suitability of factor analysis. The Bartlett’s Test significance value remained 0.000 (< 0.05), confirming statistical significance and the correlations among observed variables within the factors.

Table 9. Factor analysis results for the dependent variable

Item	Factor loading
S1	0.738
S2	0.882
S3	0.830
Eigenvalue	2.012
Cumulative variance explained (%)	67.064
KMO	0.638
Bartlett’s Test (Sig. = 0.000)	

The number of factors extracted from the EFA for the dependent variables was one, as only factors with Eigenvalues ≥ 1 were retained. The Total Variance Explained was 64.110% ($\geq 50\%$), indicating that the EFA model was appropriate.

The EFA extracted only one factor from the observed variables S1, S2, and S3. The results indicate that only one factor was extracted and factor rotation was not applicable. This finding suggests that the scale ensures unidimensionality and that the observed variables of the dependent variable demonstrate good convergence.

4.4. Pearson correlation analysis

After removing the variables Rs3, E4, E5, Ry3, and Ry4, Pearson correlation analysis was conducted.

Table 10. Pearson correlation analysis

Variables	S	Rs	E	A	T	Ry
S Pearson Correlation	1	0.884**	0.828**	0.705**	0.431**	0.158*
Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.012
N	250	250	250	250	250	250

* and ** indicate significance levels of 5% and 1%, respectively.

The Pearson correlation coefficient is considered statistically significant when the significance value (Sig.) is less than 0.05. The results indicate that all factors are correlated with the Satisfaction factor (S) at the 1% significance level, except for the Reliability factor (Ry), which shows a correlation with Satisfaction at the 5% significance level. All independent variables show a positive linear relationship with the dependent variable. Responsiveness (Rs) and Satisfaction (S) exhibit the strongest correlation, with correlation coefficients of 0.884 and 0.828, respectively, at the 5% significance level.

4.5. Multiple regression analysis

Multiple regression analysis was conducted with five independent variables, including Responsiveness (Rs), Empathy (E), Assurance (A), Tangibles (T), and Reliability (Ry), while Satisfaction (S) was treated as the dependent variable.

Table 11. Model fit assessment

Model	R	R ²	Adjusted R ²	Standard Error of the Estimate	Durbin-Watson
1	0.911 ^a	0.831	0.828	0.29701	2.086

The adjusted R-squared value is 0.828, indicating that 82.8% of the variation in customer satisfaction with LSQ is explained by the five independent variables, while the remaining 17.2% is explained by factors outside the model and random error. This result demonstrates that the linear regression model has a high level of fit with the sample data.

Since the Variance Inflation Factor (VIF) values of Rs and E were greater than 2, and the VIF value of E was higher than that of Rs, the Empathy variable (E) was removed from the model to address the multicollinearity issue. The regression results after addressing multicollinearity are presented in Table 12.

Table 12. Regression results after item removal

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
Constant	0.408	0.207		-1.973	0.050		
Rs	0.777	0.038	0.699	20.430	0.000	0.590	1.694
A	0.306	0.040	0.256	7.615	0.000	0.613	1.630
T	0.069	0.030	0.067	2.299	0.022	0.820	1.219
Ry	0.030	0.038	0.021	0.802	0.423	0.066	1.035

The Reliability variable (Ry) was also removed because its significance value was greater than 0.05. The standardized regression coefficient (Beta) of Responsiveness (Rs) is the largest, indicating that this factor has the strongest influence on changes in the dependent variable. The relative impact of the independent variables on the dependent variable, in descending order, is Assurance (A), Tangibles (T), and Reliability (Ry).



The positive Beta coefficients of Rs, A, and T indicate that these variables have a positive effect on the dependent variable (S). Service capability (Assurance) is identified as an important factor influencing customer satisfaction with service quality in this study (Lan et al., 2016). However, Empathy was not found to have a significant impact on customer satisfaction with logistics services in Ba Ria - Vung Tau, which contrasts with the findings of Baki et al. (2009). The VIF values of the remaining variables are all below 2, confirming that multicollinearity is no longer present in the model.

Thus, the standardized regression equation is: $S = 0.699R_s + 0.256A + 0.067T$

Table 13. Hypothesis testing results

Hypothesis	Sig.	Result
H1: Responsiveness has a positive impact on customer satisfaction with logistics services	0.000	Supported (p < 0.001)
H2: Empathy has a positive impact on customer satisfaction with logistics services	—	Not supported
H3: Assurance has a positive impact on customer satisfaction with logistics services	0.000	Supported (p < 0.001)
H4: Tangibles have a positive impact on customer satisfaction with logistics services	0.022	Supported (p < 0.05)
H5: Reliability has a positive impact on customer satisfaction with logistics services	0.423	Rejected (p > 0.05)

Based on the testing and regression results, three factors were confirmed to significantly affect customer satisfaction with LSQ among service providers in Ba Ria - Vung Tau, including Responsiveness, Assurance, and Tangibles, at significance levels of 1% and 5% (Table 13). These findings are consistent with the results of Baki et al. (2009). However, there is no empirical evidence supporting a positive effect of Reliability on customer satisfaction with logistics services.

With a mean value close to zero and a standard deviation of 0.002, the collected data follow a normal distribution and therefore do not violate the assumption of linearity.

5. CONCLUSION

The SERVPERF model has been proven to be effective in evaluating the factors influencing customer satisfaction with the LSQ of enterprises. The research results confirm the important roles of three factors (responsiveness, empathy, and tangibles) in enhancing the satisfaction levels of business customers regarding LSQ in Ba Ria - Vung Tau, Vietnam. Notably, customer satisfaction among enterprises using logistics services differs across business sectors, whereas differences in years of operation and firm size do not appear to significantly affect satisfaction levels with logistics services.

This study also has several limitations. First, the survey was conducted only among enterprises operating in the Northern provinces of Vietnam; therefore, the generalizability of the findings remains somewhat limited. Second, the study was conducted over a relatively short period from January 2021 to March 2021, while customer satisfaction with logistics services in Vietnam may change over time due to continuous service improvements by providers or external market shocks such as the COVID-19 pandemic.

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