

The Impact of Reverse Logistics and Delivery on Customer Satisfaction in the supply chain in Vietnam

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ABSTRACT

Introduction: In the current context, when the market in Vietnam has many great fluctuations, the competitive pressure of businesses is increasing, the strong development of information technology and e-commerce is extremely exciting, making it difficult to increase customer satisfaction in the supply chain.

Objectives: This study focuses on reverse logistics and examines the impact of reverse logistics and delivery on customer satisfaction in the supply chain.

Methods: Based on a survey of 446 consumer customers in Vietnam, using regression using SPSS software.

Results: Research shows that reverse logistics and delivery both have a positive impact on customer satisfaction.

Conclusions: Some of the recommendations made include: first, businesses need to include the content of reverse logistics activities in their sales and operation policies. Second, enterprises need to invest in strengthening transportation activities through self-investment, being proactive in transportation activities or establishing the selection of strategic transportation service providers to ensure the requirements of speed, time and quality of delivery.

Keywords: reverse logistics, delivery, customer satisfaction, economic management.

INTRODUCTION

In the current economic context, in the process of development, businesses always face a lot of competitive pressure. To be able to survive and maintain its position, businesses can create a competitive advantage in price or value or both. For businesses doing business in the market, meeting customers in the market it serves is the goal that the business aims for. From the customer's perspective, they will only buy when the product brings value to the customer. Therefore, to meet customers, in other words, businesses need to bring value to customers. By increasing the quality of goods and customer service, while reducing costs and shortening the time to deliver goods to customers, customer value increases (Murphy & Knemeyer, 2018).

In Murphy & Knemeyer's (2018) view, product availability goes beyond customer loyalty. Therefore, the factor of delivery quickly, to the right place, at the right time, will be very important. Customer services provide customers with good experience. Customer service is defined as the ability to manage logistics to satisfy users in terms of delivery time, reliability, communication (feedback), and convenience (Kerin, Hartley, & Rudelius, 2014). Customer service includes all activities that impact the flow of information, product flow, and cash flow between the business and its customers. Customer service as a philosophy, such as performance metrics or an activity aimed at providing customer satisfaction. Customer service is reflected through performance indicators such as on-time delivery, order completion rate. Customer service is considered a specific task that businesses must perform to meet customer order requirements including order processing, invoicing, product returns, and complaint handling (Coyle, Novack, Gibson, & Langley, 2021). Reverse logistics can also be considered as one of the implementing factors to improve customer service. Because it makes shoppers more secure when buying a product and unfortunately that product has problems that need to be exchanged, returned or refunded.

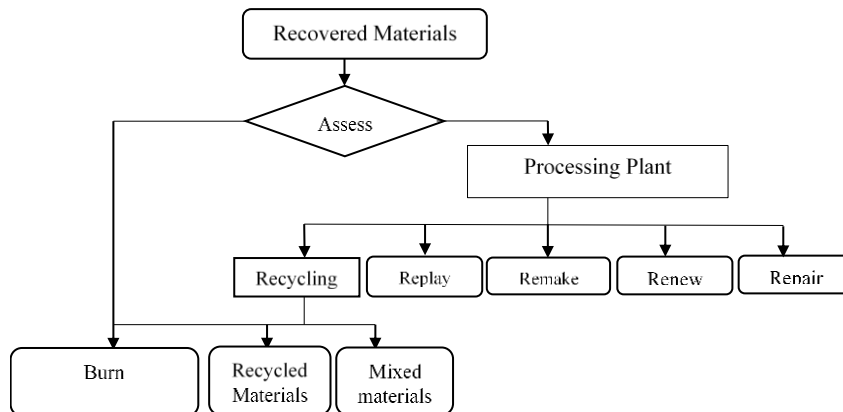
Some studies in Vietnam have only recently linked reverse logistics activities in general and waste management activities. Therefore, the gap of this study is to study whether reverse logistics and delivery activities have an impact on customer satisfaction. From there, it makes recommendations for businesses to help improve customer

satisfaction and increase business efficiency. To clarify the research issues in addition to the general information and introduction, the rest of the paper is presented as follows: Part 2 is the theoretical basis, Part 3 is Theoretical background, literature review and Research and Methodology, Part 4 is Findings and discussion, and Part 5 is Conclusion.

THEORETICAL BASIS

Reverse logistics is the process of planning, implementing, and controlling the flow efficiently to save the cost of raw materials, inventory, finished goods, and related information from the point of consumption to the point of origin with the aim of recovering value or proper disposal (Nguyen Thi Van Nga, 2020).

Diagram 1: Reverse logistics operation flow diagram



(Source: Nguyen Thi Van Nga, 2020)

According to Mugoni et al. (2023), reverse logistics will include basic characteristics such as not prioritizing speed; difficulties in forecasting; the quality and value of recovered products in reverse logistics are not uniform; the reverse logistics process is complicated and has the appearance of members in the downstream logistics flow; reverse logistics costs are difficult to predict and higher than downstream logistics; The two popular reverse logistics organization options today are in-house (self-organizing reverse logistics) and outsourcing (outsourcing reverse logistics activities). Businesses can either partially outsource or outsource entirely.

THEORETICAL BACKGROUND, LITERATURE REVIEW

Theoretical background

+ Expectancy Disconfirmation Theory (EDT)

The Expectancy Disconfirmation Theory (EDT) posits that customer satisfaction results from the gap between a service or product's expected and perceived performance (Oliver, 1980). In supply chain management, EDT explores how discrepancies in service delivery- such as delivery times, product quality, or responsiveness- impact customer satisfaction. Customers are likely to be satisfied when their expectations are met or exceeded, which fosters customer loyalty.

+ Contingency Theory

Contingency Theory concerns firms' dynamic and strategic management capabilities, which can integrate, build, and reorganize internal and external capabilities to solve problems in rapidly changing environments (Teece, 2014). This theory suggests that the effectiveness of supply chain strategies depends on the fit between the company's internal capabilities and the external environmental conditions. Firms that can align their supply chain strategies with the demands of their operating environment are more likely to achieve higher customer satisfaction and loyalty.

+ Customer satisfaction

Customer satisfaction is the degree to which a product or service meets or exceeds the expectations and demands of its consumers. Farooq et al. (2018) further explain that customer satisfaction is an individual's perception or feelings towards the service or product they received compared to their expectations. Gremler and Brown (1996) show that

loyalty is the degree to which a customer demonstrates repeat purchase behavior towards a supplier, holds a positive disposition towards the supplier, and considers using only this supplier when needing that service. Zeithaml et al. (1996) highlights that loyalty, measured from an affective perspective, includes the intention to frequent a service supplier, continue purchasing the same type of service or brand in the future, and recommend it to others. Customer satisfaction is a marketing technique that focuses on customer behavior post-purchase, which is crucial in governing customer loyalty and repeat buying behavior. The greater the customer satisfaction, the higher the likelihood of repeat purchasing behavior (Choi et al., 2019).

+ Delivery

The importance of delivery in supply chain management has been fully recognized, especially the direct impact on customer satisfaction. Lai and Yang (2009) demonstrated that perceived reliability, including timely and accurate delivery, greatly enhances user satisfaction. This finding highlights the importance of reliability in delivery times and the accuracy of deliveries as critical components to meeting customer expectations. Similarly, Swink et al. (2007) confirmed that efficient delivery services correlate positively with customer satisfaction (CS). Their research shows that reliability of delivery times and the condition of goods upon arrival is essential to maintaining high levels of customer satisfaction. Timely and accurate product delivery ensures that customers receive their orders as expected, contributing to a positive overall experience. Furthermore, Stank et al. (1999) discussed how providing high value – including not only product quality but also punctuality and reliability of delivery services – can enhance customer satisfaction. This emphasizes the importance of delivery as an operational concern and as a key customer touchpoint that directly affects their satisfaction and perception of service quality.

+ Reverse Logistics (RL)

Farida et al (2024) show thhe attitudes, moral norms, and consequence awareness of the consumers significantly affected their recycling intentions. Perceived behavior and subjective norms did not affect this desire. In Indonesia, consumer behavior after PET consumption primarily involves disposal. This study improves the understanding of consumer behavior and can help businesses and governments to implement strategies that encourage consumers to return used PET goods.

The research model proposes to use least squares regression (OLS) to examine the impact relationship of the Reverse Logistics (RL) and Delivery (GH) variables to Customer satisfaction (HL)

$$HL = \beta_0 + \beta_1 RL + \beta_2 GH + \mu$$

Based on research, we hypothesize that:

H1: Reverse Logistics has a significant effect on customer satisfaction

H2: Delivery has a significant effect on customer satisfaction

Literature review

Some studies on reverse logistics activities in some economic sectors such as Graczyk and Witkowski (2011) in their research have focused on economic optimization and reverse logistics processes in plastic manufacturing enterprises. Bupe G Mwanza et al. (2017) presented the manufacturer's perspective on the organization of reverse logistics for plastic products in Colombia. In addition to the systems approach, integrated concepts are also required, such as the concept of environmental design, the concept of green supply chain management, the concept of reverse logistics, and the concept of system design. Based on the simplification of the issues discussed and to facilitate understanding, plastic waste management techniques will be developed mathematical models. Gemechu Abdissa et al. (2022) presented the role of reverse logistics in the recycling of used plastic bottles and waste management in Ethiopia.

Shulman et al (2010) proposes an analytical model to examine how consumers' purchase and return decisions are affected by a retailer's pricing and restocking fee decisions. The analysis of Nageswaran et al. (2024) helps explain the reasons behind omnichannel retailers' decisions to offer full refunds or charge fees for online returns. Wagner and Martínez-de Albéniz (2020) demonstrate that lenient return policies can boost sales but also increase retailers' cost. In RL, the customer serves as the provider. Thus, customers' involvement in post-consumption product-recall programs significantly affects the RL performance (Gaur & Mani, 2018). With the development of RL, greater emphasis has been placed on recycling from the perspective of recyclers (remanufacturing). However, the consumer perspective has not received much attention in terms of implementation.

Research and Methodology

We surveyed the literature to identify questions and measure for variables. Dimensions such as delivery (Wong et al., 2011); reverse logistics (Farida et al., 2024). All goods from customer requirements and expectations, were measured on a five-point Likert scale from 1 (not at all) to 5 (to a great extent). The instruments for customer satisfaction were measured using a five-point scale from 1 (strongly disagree) to 5 (strongly agree). Because the scales adopted from the literature were all in English, to ensure the reliability of the questionnaire, the original scales were first developed in English and then translated into Vietnamese. We modified some questions to improve translation accuracy and make them relevant to environmental management practices in Vietnam. To ensure content validity, the questionnaire was sent to a scholar in the field of logistics and supply chain management for review and feedback before administering the survey. Based on their feedback, we've revised the wording of some questions. We then conducted a pilot test with ten people. Additionally, one of the authors of the current study held several discussions with these people to clarify the meaning of the questions. The terminology has been adjusted once again to better suit the target population. Table 1 shows the descriptive statistics of all the respondents.

Table 1: Descriptive statistics of respondents (N=446)

Characteristics	Category	Frequency (N)	Percentage (%)
Gender	Male	167	37.4
	Female	278	62.4
	Prefer not to say	1	0.2
Age	Under 18 years old	2	0.5
	18-25 years old	106	23.8
	26- 30 years old	9	2
	31- 45 years old	191	42.8
	46- 60 years old	128	28.7
	60 years old and above	10	2.2
Area	Rural	39	8.7
	City	407	91.3
Estimated Monthly Income	Under 3 million dong	81	18.2
	From 3- 10 million dong	29	6.5
	From 10- 30 million dong	197	44.2
	From 30- 50 million dong	91	20.4
	50 million dong and above	48	10.7

(Source: Author caculate by using SPSS 22 software)

The survey participants were mainly women (62.4%) because women were more interested in shopping than men. The main age of the subjects is 31-45 years old. This age group has a fairly stable and good income. They are also a group with a lot of experience and shopping experience, so opinions on shopping views will be highly reliable. Most of the survey group was in the city (91.3%). This is a highly competitive area in commercial activities, so it will help the research to understand the research question in the best way. Regarding the income level of the group of subjects participating in the concentrated survey, from 10 to 50 million VND. This group will have a certain amount of financial autonomy, so their decisions will be independent in procurement and help with research.

Descriptive Statistics and Correlation

For more detailed information, see Table 2, along with the results of the average value of each variable.

Table 2: Validity Analysis and Descriptive Statistic and Correlation

	Mean	Std. Deviation	N
HL	4.1271	.49949	446
RL	4.07	.529	446
GH	4.1756	.52957	446

(Source: Author calculated by using SPSS 22 software)

Based on the descriptive statistics, Table 2 shows that the respondents have a high consensus view, with an average value of 4.1.

Applying “Cronbach’s α ” reliability test, all latent values surpass 0.6, and this proof is sufficient to conclude that the study content has reasonable reliability.

RESULTS

Structural Model Test

The model structure describes the cause-and-effect relationships between latent variables built based on the content of the theory. The results of model testing are shown in Table 3.

Table 3: Impact model

Variable (HL)	Coefficient	Standard Error	Statistics	P-value
C	1,603	0,171	9,401	0,0000***
RL	0.079	0,041	1,898	0,058*
GH	0.528	0,041	12,761	0,0000***

(Source: The author estimates using SPSS 22 software)

(Note: *** and * correspond to statistical significance levels with significance levels of 1% and 10%)

Table 3 explains the results of the direct effect test. The direct effect of RL on HL is significant ($\beta = 0.079$, $p < 0.1$) so H1 is accepted. In addition, delivery has a significant effect on HL ($\beta = 0.528$, $p < 0.01$) so H2 is accepted.

$$HL = 1,603 + 0.079RL + 0.528GH$$

Based on the results of the impact of independent variables, it is shown that delivery activities have a strong impact on customer satisfaction. This is perfectly in line with the theory of measuring the quality of customer service in terms of delivery time. The delivery to customers is carried out quickly, stably and accurately to help customers trust and increase customer satisfaction. The model results show that the impact level is up to 0.528 times. Therefore, businesses that want to increase customer satisfaction in the context of fierce competition today need to focus on downstream logistics activities, establish delivery activities by doing it themselves or working long-term with freight forwarders to ensure that orders are made and delivered to customers as required.

DISCUSSION

The impact results also show that reverse logistics has a positive impact on customer satisfaction although the impact is not as high as the delivery factor. The impact of reverse logistics activities on satisfaction reached 0.079 times. When customers buy goods in case the product is defective or not in accordance with the order, the seller has a product recall policy to help buyers rest assured that the seller ensures that the product is delivered according to the order. For businesses that proactively carry out reverse logistics activities because of social responsibilities on environmental factors, reducing emissions into the environment, saving input material costs, etc. helping businesses achieve their business goals. In addition, the reputation and green image of the business are improved in the eyes of consumers. For customers, they will likely be willing to buy products from businesses that have reverse logistics activities because of the environment, and customer satisfaction is improved.

CONCLUSIONS

Reverse logistics is a complex and costly operation for businesses. However, in the context when customers are becoming more and more fastidious. The requirements of customers are getting higher and higher, promoting forward logistics activities, including delivery and reverse logistics activities, will help increase customer satisfaction. From there, businesses can attract and retain customers, helping to expand their market share. Some solutions are offered to businesses in Vietnam today to increase customer satisfaction through reverse logistics and delivery. First, businesses need to include the content of reverse logistics activities in their sales and operation policies. Secondly, enterprises need to invest in strengthening transportation activities through self-investment, being proactive in transportation activities or establishing the selection of strategic transportation service providers to ensure the requirements of speed, time and quality of delivery. The study focused on clarifying the impact of reverse logistics

and delivery on customer satisfaction. However, some limitations in the study have not mentioned the overall subjective and objective factors of businesses that affect customer satisfaction. The scope of the new research is concentrated in the northern region of Vietnam, but the research sample has not been expanded to the national or international scale.

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APPENDIX

Table 4: Regression Models

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations			Collinearity Statistics	
	B	Std. Error	Beta			Zero-order	Partial	Part	Tolerance	VIF
(Constant)	1.603	.171		9.401	.000					
1 RL	.079	.041	.083	1.898	.058	.367	.090	.072	.743	1.346
GH	.528	.041	.560	12.761	.000	.602	.518	.482	.743	1.346

a. Dependent Variable: HL

(Source: Author regression using SPSS)

Table 5: Model Testing

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.606 ^a	.367	.364	.39824	.367	128.524	2	443	.000	1.564

a. Predictors: (Constant), GH, RL

b. Dependent Variable: HL

(Source: Author regression using SPSS)

Table 6: Anova Testing

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	40.766	2	20.383	128.524	.000 ^b
Residual	70.256	443	.159		
Total	111.022	445			

a. Dependent Variable: HL

b. Predictors: (Constant), GH, RL

(Source: Author regression using SPSS)

Diagram 1: Dependent variable standard distribution graph (HL)

