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Evaluating the Impact of Supply Chain Factors on Customer Satisfaction and Loyalty in Vietnam

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Abstract

Purpose: This study examines key supply chain factors shaping customer satisfaction and their effect on customer loyalty in Vietnam. It explores flexibility, agility, responsiveness, delivery, service quality, cost, personal factors, and product quality to understand how these elements influence satisfaction and subsequently loyalty. **Research Design and Methodology:** Data were collected from 446 Vietnamese consumers and analyzed using structural equation modeling (SEM) to uncover relationships between supply chain variables, customer satisfaction, and loyalty. **Results:** The analysis reveals that flexibility, agility, responsiveness, delivery, service quality, and cost positively influence customer satisfaction, thereby promoting loyalty. Personal factors yield mixed effects, while product quality shows no significant impact. These insights emphasize adopting agile, responsive strategies to meet customer expectations in volatile markets like Vietnam. **Conclusions:** This research enriches the understanding of consumer satisfaction and loyalty drivers in fast-paced environments. Findings highlight the importance of competitive pricing, service quality enhancements, and optimized logistics for timely delivery. By focusing on these areas, companies can improve their market position and strengthen customer loyalty in dynamic business settings. Managers are advised to continuously refine these strategies, incorporating emerging technologies and data-driven insights, to maintain alignment with evolving consumer demands. Such efforts foster long-term loyalty and enhanced market resilience.

Keywords: Supply chain, Customer satisfaction, Customer loyalty, Vietnam, Logistics

JEL Classification Code: D12, L81, M31

1. Introduction

In today's rapidly evolving business environment, the dynamics of customer satisfaction and loyalty within supply chain management are pivotal. This complexity is intensified in emerging markets, where commercial activities are influenced by escalating competition and the swift advancement of information technology, reshaping consumer shopping decisions and expectations (Ivanov,

2020). The Volatility, Uncertainty, Complexity, and Ambiguity (VUCA) framework aptly captures the challenges businesses face, emphasizing the need for supply chains to be responsive and agile to navigate these unpredictable landscapes effectively (Christopher, 2016).

Emerging from this context, flexibility, responsiveness, and agility are crucial for supply chain management. Flexibility is vital for businesses to quickly adapt their operational strategies to changing technologies and market

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conditions (Christofi et al., 2021). Responsiveness has been highlighted by Fruchter and Wiszniewska-Matyszkiel (2024) as essential for meeting immediate customer demands, enhancing both customer experience and satisfaction. Christopher (2016) emphasizes that these strategic capabilities are essential for businesses to adjust

quickly to new market conditions and customer needs and significantly elevate customer perceptions and loyalty. However, existing literature often treats these strategies in isolation without examining their combined impact on customer satisfaction and loyalty. Studies by Choi et al. (2019) and Zhang et al. (2003) have begun to explore these relationships, but a comprehensive understanding still needs to be discovered, particularly in how these strategies interact within the dynamic environments characterized by VUCA. Quite a few studies are looking at customer satisfaction, but the studies only focus on a few aspects such as supply chain efficiency (Freeman and Liedtka, 1991; Zhang et al., 2003; Christopher, 2016; Choi et al., 2019; Fruchter, 2024), logistics services (Gil Saura, 2008; Balinado et al., 2021), competitive advantage of businesses in terms of cost or profit advantages on service quality (Othman et al., 2020; Uzir et al., 2021; Ong et al., 2022). Therefore, a complete study is needed to clarify the relationships that impact customer satisfaction in the supply chain.

In today's rapidly evolving global economy, supply chain management is pivotal in determining business success, particularly in emerging markets such as Vietnam. Vietnam's economy has experienced significant growth, driven by technological advancements, digital transformation, and the rapid expansion of e-commerce. These developments have reshaped consumer expectations, making supply chain efficiency, flexibility, and responsiveness more critical. As businesses increasingly compete on a global scale, understanding the dynamics of customer satisfaction and loyalty within supply chains becomes essential for maintaining a competitive edge.

Several key factors drive the decision to focus this research on Vietnam. First, Vietnam's economic growth and integration into global trade have placed immense pressure on local supply chains to perform efficiently in a highly competitive environment. The rapid expansion of manufacturing, logistics, and retail industries has increased demand for robust supply chain strategies that meet evolving consumer needs. Additionally, Vietnam is an ideal location to study supply chain performance because it operates in a VUCA environment characterized by fluctuating market conditions, unpredictable customer demands, and a dynamic regulatory landscape. These conditions create unique challenges and opportunities for businesses operating in Vietnam, making it an excellent case study for understanding how supply chain strategies can influence customer satisfaction and loyalty.

Second, while much of the existing research on supply chain management focuses on developed markets, there is a notable gap in understanding how these strategies apply in rapidly developing economies like Vietnam. Emerging markets often present different dynamics due to the unique mix of economic growth, shifting consumer behavior, and the need for agile and flexible supply chains to respond to frequent market changes. By focusing on Vietnam, this study addresses this research gap, offering insights into how businesses can optimize their supply chain strategies to thrive in similar volatile markets.

Furthermore, Vietnam's growing importance as a manufacturing hub and its integration into global supply chains highlight the need for agile, flexible, and responsive supply chain management practices. Vietnamese consumers, like those in many emerging markets, have increasingly high expectations regarding service quality, delivery speed, and cost efficiency. Businesses must therefore adapt to meet these expectations to maintain customer satisfaction and build loyalty.

This research evaluates how specific supply chain factors—flexibility, agility, and responsiveness—impact customer satisfaction and loyalty in the context of Vietnam's evolving market. By analyzing these relationships, the study seeks to provide practical insights for businesses operating in volatile and uncertain environments, helping them to better understand the critical role that supply chain strategies play in enhancing customer satisfaction and loyalty. The study also contributes to the broader literature on supply chain management in emerging markets, offering evidence-based strategies for businesses looking to succeed in complex and dynamic market conditions.

The paper is structured as follows: Part 2 reviews the theoretical foundations and develops the research hypotheses. Part 3 details the research methodology, including data collection and analysis. Part 4 presents the findings and discusses their practical and theoretical implications, and Part 5 concludes with the study's contributions and recommendations for future research.

2. Theoretical Frameworks and Hypothesis Development

2.1. Theoretical Frameworks

A robust theoretical framework is essential to investigate the influence of various factors on customer satisfaction and how this satisfaction translates into customer loyalty within supply chain management. This research is grounded in several key theories that comprehensively understand these dynamics.

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.

SERVPERF Model

To dissect the components of service quality that influence customer satisfaction, the SERVPERF Model is employed. This model measures service quality across five dimensions: tangibles, reliability, responsiveness, assurance, and empathy (Cronin & Taylor, 1992). Each dimension provides a structured approach to evaluating critical service aspects within the supply chain, facilitating a detailed assessment of how well the supply chain meets customer expectations. Understanding these dimensions helps pinpoint areas where service improvements can enhance customer satisfaction and loyalty.

Dynamic Capabilities Theory

Dynamic Capabilities Theory emphasizes the importance of agility and flexibility, especially for global companies and supply chain structures, in response to sudden disruptions (Chatterjee & Chaudhuri, 2022). Dynamic capabilities are higher-order features that describe a company's ability to deal with volatile markets in a highly dynamic environment and change the environment (Eckstein et al., 2015). This theory underscores the necessity for supply chains to react quickly and effectively to sudden changes in the external environment, thereby maintaining high customer satisfaction and 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 (Tece, 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.

2.2. Hypothesis Development

The research examines the impact of various factors, such as flexibility, agility, responsiveness, delivery, service quality, cost, personal factors, and product quality, on

customer satisfaction and the effect of satisfaction on loyalty. Based on these factors, hypotheses have been developed.

+) Customer satisfaction

Customer satisfaction is the degree to which a product or service meets or exceeds the expectations and demands of its consumers. It reflects a customer's satisfaction after purchasing relative to their anticipated satisfaction. Zineldin (1999) describes customer satisfaction as the customer's reaction to the discrepancy between what they receive and anticipate. 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. Srivastava and Sharma (2013) add that customer satisfaction involves a conscious evaluation by the customer, determining whether the quality of the product or service is adequate or appropriate after use. 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) highlight 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. Bowen and McCain (2015) assert that customer loyalty is closely linked to customer satisfaction, with loyalty increasing as customer satisfaction reaches a certain threshold. The greater the customer satisfaction, the higher the likelihood of repeat purchasing behavior (Choi et al., 2019). Fruchter et al. (2022) emphasize that companies that exceed customer expectations can significantly enhance long-term customer loyalty. Therefore, based on this understanding, we hypothesize that:

H1: Customer satisfaction has a significant effect on customer loyalty

+) Flexibility

Flexibility in the global supply chain is a critical factor that enhances a company's ability to respond promptly to various environmental changes and market demands. According to Liao (2020), flexibility enables companies to adapt swiftly to fluctuations in demand, seasonality, and production slowdowns, ultimately contributing to improving high-quality products and services. Katsaliaki et al. (2022) further emphasize that flexibility allows firms to efficiently address challenges such as poor supplier performance, delivery issues, and introducing new products and markets.

Agility in the supply chain refers to a company's ability to rapidly adapt to changes, innovate, and manage

unexpected events with minimal disruption. Flexibility is a fundamental component of agility, allowing firms to reconfigure their operations and supply chain processes swiftly in response to new opportunities and challenges. Katsaliaki et al. (2022) highlight that flexibility is essential for responding to new products and markets, a core aspect of agility.

Rosenzweig et al. (2003) indicate that flexibility is positively associated with customer satisfaction. Companies with flexible operations are better equipped to handle variability and uncertainty, leading to higher customer satisfaction. Operational flexibility, which includes volume flexibility (the ability to adjust the precise number of products ordered) and mix flexibility (the ability to offer various products), has significantly influenced customer satisfaction. Therefore, we hypothesize that:

H2: Flexibility has a significant effect on agility

H3: Flexibility has a significant effect on customer satisfaction

+) Agility

Agility in the supply chain context refers to the ability of a company to swiftly adapt to changes in market conditions, demand fluctuations, and other external factors (Kumar et al., 2018). This rapid adaptation is crucial for maintaining operational effectiveness and promptly meeting customer needs. Nandi et al. (2021) highlight that an agile supply chain can respond efficiently and profitably to changes in international markets, encompassing immediate operational adjustments and strategic shifts for long-term success. By being agile, companies can quickly modify their operations to address unforeseen challenges, thus enhancing their responsiveness. Customer satisfaction is heavily influenced by a company's ability to consistently meet or exceed customer expectations. An agile supply chain enhances this capability by allowing companies to adapt rapidly to changes in demand, production schedules, and market conditions (Kumar et al., 2018). This swift adaptability ensures that customer needs are addressed promptly, contributing to a positive customer experience and demonstrating the company's commitment to high service standards. Nandi et al. (2021) argue that agility in the supply chain leads to more effective and efficient responses to market dynamics, positively impacting customer satisfaction. Consequently, it is hypothesized that:

H4: Agility has a significant effect on responsiveness

H5: Agility has a significant effect on customer satisfaction

+) Responsiveness

Responsiveness in supply chain management refers to a company's ability to promptly and effectively react to significant changes or continuous fluctuations in the market environment (Narver, Slater, & MacLachlan, 2004). This capability is crucial for maintaining high levels of customer

satisfaction, as it ensures that companies can meet customer needs and expectations even in dynamic conditions. Companies prioritising responsiveness aim to optimize performance in given situations rather than merely creating new opportunities. In a global supply chain context, responsiveness demonstrates a company's ability to efficiently address sudden disruptions and manage unforeseen circumstances (Azaron et al., 2021). Furthermore, Fruchter and Wiszniewska-Matyszek (2024) examined how understanding customer characteristics and enhancing responsiveness can align customer expectations with quality, maximizing long-term profits. This alignment between customer expectations and the company's ability to meet them promptly is a key driver of customer satisfaction. Based on these insights, we hypothesize that:

H6: Responsiveness has a significant effect on customer satisfaction

+) Delivery

The significance of delivery in supply chain management has been well-documented, particularly in its direct impact on customer satisfaction. Lai and Yang (2009) demonstrated that perceived dependability, which includes timely and accurate delivery, significantly enhances user satisfaction. This finding highlights the importance of reliability in delivery times and the accuracy of deliveries as critical components of fulfilling customer expectations. Similarly, Swink et al. (2007) confirmed that efficient delivery services positively correlate with customer satisfaction (CS). Their research suggests that reliability in delivery times and the condition of goods upon arrival are essential for maintaining high levels of customer satisfaction. The timely and accurate delivery of products ensures that customers receive their orders as expected, contributing to a positive overall experience. Furthermore, Stank et al. (1999) discussed how delivering high value—which encompasses not just product quality but also the punctuality and reliability of delivery services—can elevate customer satisfaction levels. This underscores the importance of delivery as an operational concern and a crucial customer touchpoint directly affecting their satisfaction and perception of service quality. Based on these insights, we hypothesize that:

H7: Delivery has a significant effect on customer satisfaction

+) Service quality

Service quality is a critical determinant in the success or failure of the supply chain, with customers playing a pivotal role in pricing and evaluating the services they receive (Limakrisna & Ali, 2016; Balinado et al., 2021). Cronin and Taylor (1992, 1994) with the SERVPERF model, argue that the level of customer perception of a business's service performance best reflects service quality. SERVPERF

measures service quality across five dimensions: tangibles, reliability, responsiveness, assurance, and empathy. These dimensions comprehensively evaluate how well a service meets customer expectations. SERVPERF questionnaires are used to gauge service quality, allowing suppliers to identify areas for improvement. Regularly enhancing service quality is essential for suppliers to remain competitive, retain current customers, and attract new ones. Consequently, prioritizing customer satisfaction becomes a fundamental strategic objective. Based on these insights, we hypothesize that:

H8: Service quality has a significant effect on customer satisfaction

+) Cost

Cost management is widely acknowledged as a critical factor in supply chain effectiveness and directly impacts customer perceptions. Effective cost management strategies ensure that the supply chain operates efficiently without sacrificing quality, directly influencing customer satisfaction (Pagell & Krause, 2002). Chavez et al. (2016) argue that initiatives focusing on integrating customer-centric practices, such as green supply chain management influenced by customer pressure, not only enhance operational metrics, including cost, but also lead to improvements in flexibility, delivery, and quality—each of which is closely tied to customer satisfaction. Additionally, research by Swink et al. (2007) supports the connection between cost efficiency as a component of operational performance and higher levels of customer satisfaction. Their findings suggest that when companies manage costs effectively, ensuring that efficiency gains do not compromise service quality, customer satisfaction will likely increase. Effective cost management allows companies to provide better value to customers, maintaining competitive pricing while delivering high-quality products and services. Based on these insights, we hypothesize that:

H9: Cost has a significant effect on customer satisfaction.

+) Personal factors

Personal factors such as geographic area, gender, and age significantly impact customer satisfaction. According to Zeithaml and Bitner (2003), these factors collectively shape customer expectations and satisfaction. Customers from different regions may experience varying access levels to products and services, encounter diverse cultural norms, and live under unique economic conditions, shaping their expectations and perceptions. Situational factors, including geographic area, are crucial in determining customer satisfaction. For instance, customers in urban areas might have higher expectations for service speed and product availability than those in rural areas. Gender also plays a significant role in customer satisfaction. Bryant and Cha (1996) highlight that men and women often have different

preferences and expectations. For example, women may prioritize empathy and assurance more than men, who might focus on tangibles and reliability. These gender-based preferences can influence overall satisfaction levels. Age impacts customer satisfaction by affecting preferences, expectations, and adaptability to technology. Different age groups have distinct service expectations; younger customers may prioritize speed and convenience, while older customers may value personalized service and reliability. Understanding these age-related differences enables companies to design and deliver services that cater to the specific needs of various age groups, thereby enhancing overall customer satisfaction. Based on these insights, we hypothesize that:

H10: Personal factors (area, gender, age) have significant effects on customer satisfaction

+) Product quality

Product quality is a critical determinant of customer satisfaction, forming the foundation upon which customer perceptions and loyalty are built. Some studies on customer satisfaction levels show that customer satisfaction is governed by the quality of the product and how effectively the supply chain performs (Choi et al, 2019). According to Heskett (2002), delivering high-quality products is integral to an effective business strategy, directly influencing customer satisfaction. The literature consistently emphasizes that while high-quality products can lead to customer satisfaction, satisfaction alone does not always result in loyalty. This asymmetry suggests that other factors may also influence loyalty, but the impact of product quality on satisfaction remains significant. McDougall and Levesque (2000) provide empirical evidence supporting the strong relationship between product quality and customer satisfaction. Their study indicates that various aspects of service quality, including the condition of delivered products, significantly impact customer satisfaction. This underscores the importance of ensuring that products meet or exceed customer expectations regarding reliability, durability, and performance. Furthermore, research by Parasuraman et al. (1991) highlights that perceived quality is a key predictor of customer satisfaction. When customers perceive that a product is of high quality, they are more likely to be satisfied with their purchase, which can lead to repeat business and positive word-of-mouth recommendations. Based on these insights, we hypothesize that:

H11: The quality of the product has a significant effect on customer satisfaction

The research model for this study incorporates both first-order and second-order constructs to provide a comprehensive analysis of the relationships between key supply chain strategies and their impact on customer

satisfaction and loyalty. Most variables, including flexibility, agility, responsiveness, delivery, cost, and product quality, are treated as first-order constructs, measured directly by survey items. However, service quality (SERVQUAL) is conceptualized as a second-order construct comprising five dimensions: tangibles, reliability, responsiveness, assurance, and empathy. These dimensions are first-order constructs that together form the overall service quality variable. The research model is proposed in Figure 1.

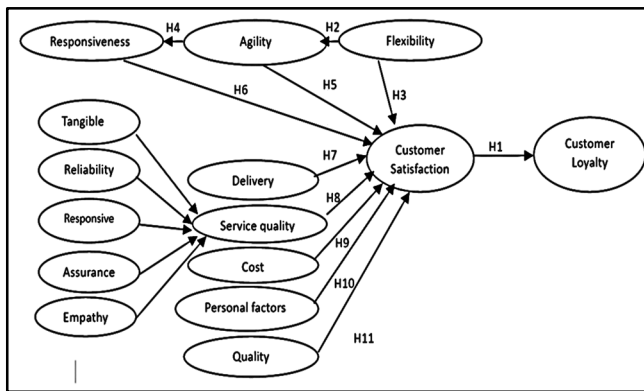


Figure 1: Research Model

3. Research Methods and Materials

This study employs a two-phase approach to systematically evaluate how combined supply chain strategies—flexibility, responsiveness, and agility—affect customer satisfaction and loyalty within a VUCA environment. The study focuses on the context of Vietnam, where supply chain dynamics are evolving rapidly due to increasing technological adoption and consumer expectations. A survey was conducted among 446 consumers to gather empirical data on their experiences and perceptions of supply chain performance, particularly focusing on flexibility, responsiveness, agility, delivery, service quality, cost, and personal factors.

The first phase involved conducting a pilot qualitative study using questionnaires adapted from previous studies. The survey items for flexibility, delivery, and cost were adapted from Wong et al. (2011); service quality items were based on Parasuraman et al. (1991), Cronin and Taylor (1992, 1994), Farooq et al. (2018), and Maghsoodi et al. (2019); agility and responsiveness items were derived from Kazancoglu (2022); and product quality items were taken from Rozekhi et al. (2016) and Peri (2006). A 5-point Likert scale (ranging from 1 = “Strongly Disagree” to 5 = “Strongly Agree”) was used to measure responses. A pilot test was conducted with ten individuals, and their feedback led to further refinements. The reliability and validity of the scales were confirmed through these preliminary steps. Data were

collected through an online survey distributed via email and Zalo Group to various target groups, including students, their families, colleagues, and association members of the Vietnam Association for Logistics Manpower Development and the Hanoi Logistics Association. The survey comprised two sections: personal information and factors influencing purchasing decisions based on respondents' experiences. In total, 446 usable responses were collected after eliminating incomplete or invalid responses. The sample of 446 respondents is well-suited for this study on customer satisfaction and loyalty due to its diverse demographic and socioeconomic composition (Table 1).

The second phase involved a formal quantitative analysis using STATA 16 software to process the data. Structural equation modeling (SEM) was applied to analyze the hypothesized relationships between variables.

Table 1: Descriptive Statistics of Respondents (N=446)

	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

4. Results and Discussion

4.1. Results

The descriptive statistics and correlation results are presented in Table 2, which includes the mean, standard deviation, and Cronbach’s alpha for each variable. Cronbach’s alpha values, all above 0.6, indicate accepted reliability where the objective is to identify and develop constructs (Hair et al., 2010). The average values suggest that respondents generally agree with the observed variables, as they fall within the 3.41-4.20 range. Customer loyalty has a slightly lower mean value (3.8744) but still indicates agreement. The low standard deviations across variables indicate consistent responses among participants.

Table 2: Validity Analysis and Descriptive Statistic and Correlation

Variables	Cronbach's Alpha	Mean	Std. Deviation
Flexibility (lh)	0.685	4.1475	0.49616
Agility (nn)	0.825	4.0503	0.48970
Responsiveness (du)	0.789	4.1140	0.49544
Service quality (dv)	0.898	4.2142	0.44251
Quality product (cl)	0.691	4.1883	0.56126
Cost (cp)	0.704	4.1753	0.55049
Delivery (gh)	0.703	4.1756	0.52957
Customer satisfaction (hl)	0.687	4.1271	0.49949
Customer loyalty (tt)	0.613	3.8744	0.47159

The SEM model was employed to examine the relationships between the constructs developed in the study. The results of Bartlett's test of Sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy confirm the suitability of the data for factor analysis. The KMO coefficient is 0.968, which is well above the threshold of 0.5, and Bartlett's Test of Sphericity is significant ($p < 0.05$), indicating that factor analysis is appropriate (Table 3). Additionally, the factor loadings for all items on each scale exceed 0.5, demonstrating strong construct validity.

Table 3: KMO and Bartlett's Test

Measure	Value
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.968
Bartlett's Test of Sphericity	
Approx. Chi-Square	7752.395
df	445
Sig.	0.000

Table 4: Estimated Results

Variables	(1) hl	(2) tt	(3) du	(4) nn	(5) lh
du	0.1635*** (0.0595)				
nn	0.1683*** (0.0583)		0.5981*** (0.0422)		
dv	0.3245*** (0.0652)				
gh	0.0821* (0.0437)				
cl	0.0328 (0.0368)				
cp	0.1286*** (0.0431)				
gt	-0.0479 (0.0296)				
tuoi	0.0571*** (0.0141)	0.0983*** (0.0171)			
lh	0.0206 (0.0556)		0.2787*** (0.0418)	0.7618*** (0.0299)	
kv	-0.0006 (0.0492)				

Variables	(1) hl	(2) tt	(3) du	(4) nn	(5) lh
hl		0.3491*** (0.0399)			
var(e.hl)					0.0911*** (0.0061)
var(e.tt)					0.1734*** (0.0116)
var(e.du)					0.0774*** (0.0052)
var(e.nn)					0.0972*** (0.0065)
Constant	0.1126 (0.1589)	2.0570*** (0.1702)	0.5372*** (0.1176)	0.8916*** (0.1248)	
Observations	446	446	446	446	446

Table 5: Hypothesis Testing Results

	Description	Accepted/Rejected
H1	Customer satisfaction has a significant effect on customer loyalty	Accepted
H2	Flexibility has a significant effect on agility	Accepted
H3	Flexibility has a significant effect on customer satisfaction	Rejected
H4	Agility has a significant effect on responsiveness	Accepted
H5	Agility has a significant effect on customer satisfaction	Accepted
H6	Responsiveness has a significant effect on customer satisfaction	Accepted
H7	Delivery has a significant effect on customer satisfaction	Accepted
H8	Service quality has a significant effect on customer satisfaction	Accepted
H9	Cost has a significant effect on customer satisfaction	Accepted
H10	Personal factors (area, gender, age) have significant effects on customer satisfaction	Partially Accepted (only age)
H11	The quality of the product has a significant effect on customer satisfaction	Rejected

4.2. Discussion

H1, which posits that customer satisfaction significantly influences customer loyalty, is accepted, confirming the strong connection between satisfied customers and their likelihood of repeat business (Gremler & Brown, 1999). Customer loyalty is crucial for businesses seeking long-term competitive advantages, particularly in markets where customer retention is more cost-effective than customer acquisition. The acceptance of H2, showing a significant link between flexibility and agility, reinforces the role of flexibility as a key enabler of supply chain agility. Greater flexibility in operations allows companies to respond more quickly to unexpected changes in market conditions, enhancing their overall agility.

H3, which proposed that flexibility would significantly impact customer satisfaction, was ultimately rejected. This result indicates that, although flexibility is an important operational characteristic in supply chain management, its effects on customer satisfaction may be more indirect. Specifically, flexibility enhances supply chain agility (H2) and responsiveness (H4), which directly improves customer satisfaction. This aligns with the literature highlighting flexibility as a foundational capability, enabling a supply chain to respond quickly and effectively to changing market demands (Liao, 2020). However, customers may not immediately perceive the benefits of flexibility unless it leads to visible improvements in service attributes like speed of delivery or responsiveness to their needs. Therefore, while flexibility is critical in enabling agile and responsive supply chain strategies, it does not independently drive customer satisfaction in the Vietnamese market context.

The rejection of H3 may also be attributed to specific market characteristics in Vietnam. In emerging economies like Vietnam, customers often prioritize more visible factors such as cost, delivery, and service quality over the internal flexibility of the supply chain (Swafford, Ghosh, & Murthy, 2008). The relatively low-income levels and heightened sensitivity to price in such markets may overshadow the perceived value of flexibility. This suggests that, while flexibility is important for supply chain performance, its impact on customer satisfaction may be mediated by other factors such as agility and responsiveness, which have more immediate and tangible effects on the customer experience.

Agility, in turn, significantly affects both responsiveness (H4) and customer satisfaction (H5), further underscoring its importance in supply chain management. Agility enables businesses to adapt quickly to fluctuations in customer demand, ensuring they can meet customer expectations in real time (Nandi et al., 2021). This swift adaptability is particularly critical in the context of Vietnam, where rapid technological advancements and the growth of e-commerce have heightened consumer expectations for service speed and responsiveness (Christopher, 2016). The ability to respond quickly to changes in customer preferences or market conditions directly enhances customer satisfaction, as shown by the acceptance of H5 and H6. Responsive supply chains that can deliver products efficiently and meet customer expectations contribute significantly to a positive customer experience (Fruchter & Wiszniewska-Matyskiel, 2024).

The results for delivery (H7) and service quality (H8) also highlight the importance of operational reliability in shaping customer satisfaction. The significant positive relationship between delivery performance and customer satisfaction indicates that customers value timely and accurate deliveries, contributing to their overall perception of service quality (Stank et al., 1999). As measured by

tangibles, reliability, and responsiveness, service quality emerged as one of the strongest determinants of customer satisfaction. This finding is consistent with the SERVPERF model, which posits that service quality is a key driver of customer perceptions and behaviors (Cronin & Taylor, 1992). High service quality can be a major differentiator in competitive markets, particularly where product offerings are similar across competitors.

Cost (H9) also significantly influences customer satisfaction, particularly in price-sensitive markets like Vietnam. The positive relationship between cost management and customer satisfaction reflects that consumers in emerging economies often prioritize affordability when evaluating their purchasing decisions. Effective cost management enables companies to offer competitive prices without sacrificing quality, which is crucial for maintaining customer satisfaction in such markets. Interestingly, product quality (H11) did not significantly affect customer satisfaction, which could suggest that Vietnamese consumers are more focused on price and service factors than on premium product attributes. This finding is consistent with research suggesting that in developing markets, consumers may prioritize affordability over product quality (Homburg et al., 2005).

Finally, the study revealed that personal factors (H10) have a mixed influence on customer satisfaction, with only age showing a significant effect. This suggests that older customers have higher satisfaction levels, possibly due to their greater experience and familiarity with products and services, which leads to more realistic expectations (Anderson et al., 1994). The lack of significant effects for geographic area and gender may reflect broader trends in urbanization and gender equality in access to goods and services, which have leveled the playing field regarding customer satisfaction.

5. Conclusions, Limitations and Suggestions for Future Research

5.1. Conclusions

This study underscores the critical role of responsive and agile strategies in supply chain management to enhance customer satisfaction, which fosters customer loyalty. By providing empirical evidence from the Vietnamese context, the research highlights the nuanced effects of supply chain strategies on customer satisfaction and loyalty. The findings emphasize that reducing costs, ensuring safe and fast delivery, and delivering excellent service quality are essential strategies for businesses aiming to boost customer satisfaction and loyalty. The primary contribution of this research lies in its empirical validation of the significant

impact of supply chain agility, responsiveness, and service quality on customer satisfaction and loyalty within the Vietnamese market. This study bridges a gap in the literature by exploring these relationships in a developing economy, providing insights that are particularly relevant for businesses operating in similar contexts. The research demonstrates that customer satisfaction significantly enhances customer loyalty. As customers age, their consumption behavior stabilizes, leading to increased loyalty. This finding suggests businesses should deliver positive customer experiences to build long-term loyalty. The study also highlights that providing prompt deliveries and responsive services directly increases customer satisfaction, proving that meeting customer expectations in terms of service is crucial in Vietnam.

From a policy perspective, the findings suggest that encouraging businesses to adopt agile and responsive supply chain strategies can improve overall market efficiency and customer satisfaction. Policymakers should consider creating an environment that supports digital transformation and technological advancements in supply chain operations. The research indicates that managers should focus on logistics to shorten delivery times, reduce costs, and enhance service quality to increase customer satisfaction. Businesses should target middle-aged and older customers, as this demographic is easier to satisfy and tends to exhibit higher brand loyalty. Developing strategies that cater to the specific needs of this group can lead to sustained customer loyalty.

5.2. Limitations and Suggestions for Future Research

The study presents several limitations that should be acknowledged. Firstly, the reliance on self-reported data introduces subjective biases, as respondents' perceptions and interpretations of the questions may vary. This can lead to consistency in the responses. Additionally, the cross-sectional design of the research captures data at a single point in time, limiting the ability to draw conclusions about the causality and dynamics of customer satisfaction and loyalty over time. The geographical focus on Vietnam may also restrict the generalizability of the findings to other regions or countries with different economic, cultural, and market conditions. While several important factors were considered, the study did not encompass all potential variables influencing customer satisfaction and loyalty. The survey distribution methods may have introduced response bias, reaching a more tech-savvy and urban demographic, thus affecting the representativeness of the findings.

To address these limitations, future research should consider employing longitudinal designs to capture changes in customer satisfaction and loyalty over time and expanding the geographical scope to include diverse regions

and countries for better generalizability. Incorporating a detailed market classification to analyze the impact of different supply and demand dynamics and exploring additional variables would provide a more comprehensive understanding. Utilizing mixed methods, including qualitative approaches, can offer deeper insights into customer perceptions and behaviors. Ensuring a more representative sample by reaching out to diverse demographic groups, including rural and less tech-savvy populations, and examining the impact of external factors and market trends on customer satisfaction and loyalty will provide a more holistic view.

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