

How Shipping Company Satisfies Shippers Through Service Quality in South Korea: The Mediation Role of Trust*

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Abstract

Purpose – This study aims to verify the direct causal relationship between cost competitiveness and global network competitiveness, which are the tangible service quality factors determined by the shipping company, which in turn affect the shipper's customer satisfaction. Additionally, we empirically investigate the intangible, related service qualities determined by shipping companies, such as operational competitiveness and customer relationship quality, and how these then positively affect customer satisfaction through the formation of trust. Therefore, we examine the mediating effect of trust formation among different contractors for shipping services.

Design/methodology – In order to examine the shipping company's tangible and intangible service-qualities perceived by the shipper on customer satisfaction and the process of trust formation between contractors, we collected valid data from 114 respondents out of 200 distributed questionnaires. The respondents consisted of domestic freight forwarders who engage with domestic and international shipping and logistics agencies. Descriptive statistics, confirmatory factor analysis, reliability, convergent and discriminant validities, common method bias, and PLS-SEM (partial least square-structural equation model) were analyzed using the program STATA 16.

Findings – The findings of this study are as follows. First, our results showed that all hypotheses assumed in this study had statistically significant supporting evidence. Second, it was found that the mediating effect of trust was significant in affecting the quality of intangible service- qualities for customer satisfaction. Third, through supplementary analysis, we found that the global network competitiveness of domestic shipping companies will increase in importance in the future. In conclusion, the theoretical and practical implications of these findings are presented.

Originality/value – This study reaffirmed the traditional causal relationship between customer satisfaction and tangible service quality. Additionally, we also contribute to the literature on the understanding of the causal relationship between trust formation and customer satisfaction through intangible interactions from a long-term perspective.

Keywords: Customer Satisfaction, Trust Mediation, Service Quality, Shipping Services, Shipping Companies, Tangible Service quality, Intangible Service quality, Customer Trust

JEL Classifications: F23, L23, L62

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1. Introduction

Customer satisfaction is considered the most important factor, beginning with marketing and management. Factors influencing an increase customer satisfaction may be viewed differently depending on the various perspectives of each research field, but their importance overall is emphasized more in the field of logistics. Logistics service requires a careful approach in all processes, as the components required before and after the transaction between contractors are different from the start (Mentzer, Stank, and Esper, 2008). Therefore, it is more desirable to apply the relational factors which have been proved in individual research, such as existing marketing findings, after additional professional empirical visual examination has been conducted on logistics services (Styles and Ambler, 2003).

Existing studies have focused mainly on the importance of cost when a shipper selects a forwarder (Pearson, 1979), while various other studies have been conducted to examine this relationship during the process of selecting a third-party logistics (3PL) (Bottani and Rizzi, 2006; Liu and Wang, 2009). In addition, the variable of cost was used as an essential metric during the process of deciding on the mode of transportation or supply chain management (SCM) for cooperating with other companies (Fulzele, Shankar, and Choudhary, 2019; Iqbal and Siddiqui, 2017; Jung, Kim, and Shin, 2019; Nagurney et al., 2015). Along this line of analysis, the research has overwhelmingly shown that cost is the most fundamental determining factor for a shipper when choosing a shipping company for the logistic process, where the shipper must select a forwarder and delivers the product.

However, as many transportation companies become increasingly competitive in cost factor reduction and this influence becomes more widespread, non-cost factors are emerging as the main determinants in logistics companies' strategies for increasing competitiveness. Among them, empirical research on the global network and service quality of shipping companies is being conducted from a more multifaceted perspective (Daim, Udbye, and Balasubramanian, 2013; Levine and White, 1961; Pearson, 1979). First, shipping companies have been required to establish a global supply chain network, as cargo transportation has been carried out on a greater international scale and inland transportation connection has become the focal point for securing competitiveness (Boje and Whetten, 1981; Levine and White, 1961; Pruyn and Smidts, 1998). In addition, it has been established that the cooperation between shipping companies positively affects customer satisfaction (Caliskan and Esmer, 2020), and Dyer and Singh (1998) found that such this cooperative relationship between partners leads to a host of improved outcomes, such as higher productivity and greater cost reduction. Second, the process by which the shipper selects a carrier is becoming more akin to that of a transaction or negotiation over time. That is, the characteristic of each deciding factor is highly likely to be more service-oriented, as the probability of being selected as a carrier varies according to the degree of service quality that can be provided (Pearson, 1979). Service quality (SERVQUAL), as proposed by Parasuraman, Zeithaml, and Berry (1988), has been studied in various ways, specifically in literature related to consumer decision-making in various industries. However, existing studies on service quality perception have encountered some limitations, as they have only used SERVQUAL to examine the reasons for customers' rational or irrational behavior patterns (Carman, 1990; Hopkins et al., 1993; Le, Nguyen, and Truong, 2020). The alternative stream consists of a greater number of studies which focus on how models should more fully integrate service quality, customer satisfaction, and provider-customer relations (Durvasula, Lysonski, and Mehta, 1999). If a cooperative relationship is established between the shipowner and the shipper, the cargo and transport they are responsible for will receive better transportation logistic service, thereby eliminating

the uncertainty of the shipping service contract. Besides, in solving the information asymmetry given to each of the shipping companies and shippers, the contract can be considered completely satisfactory if the service provided by the shipping company reaches the level expected by the client (Jung, Kim, and Shin, 2019). In this regard, this implies that studies which use various approaches to examine the internal and external factors determining customer satisfaction are becoming increasingly necessary, as selecting a shipping company with the only SERVQUAL in shipping transportation service may have a limit (Caliskan and Esmer, 2020).

Then, in what ways can the quality of service provided by shipping companies to shippers be differentiated from those of competitors, in order facilitate the signing of contracts and increase overall customer satisfaction? Previous studies dealing with this relationship between service quality, customer satisfaction, and trust formation have found a direct causal relationship between the quality of service and customer satisfaction. However, the empirical attempts at analyzing the benefits of the trust that the shipping company can possibly form and how this can thereby increase the satisfaction of the shipper, have remained insufficient. Furthermore, the focus on the mediating effect of trust was limited to merely manufactured products or commercial services. In previous studies on maritime transport services, we have found that trust works in the following situations: the subsequent effects of customer satisfaction (Fornell, 1992; Oliver, 1981; Tax and Brown, 1998), the process of receiving services (Anderson and Narus, 1990), and shifts in the psychological state of satisfied customers (Yildiz, 2017).

In a shipping industry that requires a high level of expertise (Doney and Cannon, 1997; Mas-Machuca, Marimon, and Jaca, 2021), the operational services provided by shipping companies and the expertise of sales personnel positively initiate and influence the formation of trust with customers (Moorman, Deshpande, and Zaltman, 1993; Swan and Nolan, 1985). Based on the existing literature, this study proposes an emphasis on integrated service quality that is composed of both operational service and customer-oriented service, thereby affecting the trust formation between the shipping company and the shipper and strengthening its overall.

This study reconfirmed the causal relationship between cost and customer satisfaction, which has traditionally influenced transaction behavior, and also attempted to identify the direct causal relationship between a shipping company's global networks and the resultant average level of customer satisfaction. Additionally, with deviation from the focus on the relationship between service quality and customer satisfaction (Cronin Jr and Taylor, 1992; Gunawan and Prasetyo, 2020; Hirata, 2019; Huang, Lee, and Chen, 2019; Yildiz, 2017; Zaibaf, Taherikia, and Fakharian, 2013; Zhong and Moon, 2020), we endeavor to verify whether trust formation plays an important mediating role between the specific factors of service quality, and if it has a direct causal effect on customer satisfaction.

2. Literature Review and Hypothesis Development

2.1. Shipping Service Quality

In a seminal study by Pearson (1979) on the operating factors affecting the efficiency and competitiveness of the shipping industry, although logistics costs were recognized as playing a pivotal role, the importance of services provided by shippers received little attention. Bottani and Rizzi (2006) and Liu and Wang (2009) confirmed that cost factor should not be excluded through a presentation on a measurement factor for selecting a 3PL service provider which

made use of a multi-criteria decision-making technique. Furthermore, the cost of logistics was vital when determining the supply chain management (SCM) or transportation mode (Fulzele, Shankar, and Choudhary, 2019; Iqbal and Siddiqui, 2017; Jung, Kim, and Shin, 2019; Nagurney et al., 2015).

Meanwhile, Pearson (1979) suggested a new perspective, where the shipper's selection of carriers could be service-oriented rather than price-oriented, thereby considering it as a part of the actual transaction process which encompassed the product distribution. According to Bowersox et al. (1981), the shipper, as a customer, makes the selection and contract decisions based on how they perceive the overall quality of the service provided by the carrier. In Daim, Udbye, and Balasubramanian (2013), service quality was the most crucial factor out of the six factors when shippers were selecting a 3PL provider, which was identified through the AHP technique.

The ongoing literature on service quality is mainly based on findings from Parasuraman, Zeithaml, and Berry (1988). They defined perceived service quality as an overall decision or attitude related to the excellence of service, and that while it is connected to the concept of performance, it is also defined as the degree of difference between the expectations versus perceptions of consumers. A multi-item scale referred to as SERVQUAL and composed of five determinants of service quality (i.e., tangible, reliability, responsiveness, confidence, and empathy), was then developed and used to confirm verification power in various industries.

Similarly, Carman (1990) pointed out its limitations, mainly through the discovery of differences in the differential effects and results of SERVQUAL across a wide variety of service industries. As a result of attempting to verify the perception of shippers and 3PL companies in the United States through the application of SERVQUAL to the transport industry, Hopkins et al. (1993) found that there were massive differences in the perception of quality between shipowners and shippers in terms of whether the promised service in the contract would be fulfilled. Caliskan and Esmer (2020), also through the use of SERVQUAL, have found that reliability and responsiveness greatly influence port logistics service quality, and have thereby proposed alternatives to increase customer satisfaction. However, since the quality of port logistics service is affected by a variety of other factors, such as service price, customer relationship quality, and product processing procedures, there may be limitations in using only SERVQUAL for measurement. Durvasula, Lysonski, and Mehta (1999) argued that SERVQUAL could only be applied to B2B marketing, and not B2C marketing. They also emphasized the need for further research on models which comprehensively integrate service quality, customer satisfaction, and the dynamics of provider and customer relationships. Putting together these above discussions, extant studies on service quality recognition using SERVQUAL in the analysis shipping services have limitations in presenting an integrated model that could be combined with intangible elements.

2.2. Customer Satisfaction

The definition of customer satisfaction can have a variety of different meanings, depending on whether it is the process or outcome that is being emphasized. For example, Hunt (1977) focused on the elevation of customer satisfaction, and defined the achievement of customer satisfaction as an instance where the consumption experience was better than what the customer had expected. On the other hand, Oliver (1981), who focused on the obtainment of results, defined customer satisfaction as a composite psychological state that results from a complex combination of both inconsistent expectations and the consumer's prior feelings about consumption experience. Thus, a company focusing on customer satisfaction outcomes will view decisions about the emotional satisfaction or dissatisfaction of consumers as

outcomes stemming from consumption. Conversely, the attention on the process itself focuses on the degree of satisfaction or dissatisfaction through the evaluation that is perceived by the consumer during the psychological process of consumption.

Shipping companies are equipped with a customer satisfaction analysis system for the purposes of measuring the quality of service or the corporate image they provide to customers, and they thereby exploit such results for purpose of improving corporate management through regular satisfaction inspections (Nagurney et al., 2015). Therefore, the target of analysis in this study was a domestic shipping company that collects cargo from direct shippers or several direct shippers, and then exports self-manufactured products, imports for needs, and requests transportation.

2.3. Trust

According to Crosby, Evans, and Cowles (1990), the love of relational quality is an overall measure of mutual dependence, as well as the degree to which the expectations and needs of parties are met based on a series of successful (or unsuccessful) events taking place in the past. Gundlach and Murphy (1993) found that trust plays a vital role in guiding the bilateral exchange behaviors where a higher level of relational interaction is desired, or in the expectations during the process of building a lasting relationship. As the most fundamental concept for developing a relationship-based integrated model, trust has been discussed as the means of knowing how to maintain and develop healthy mutual relationships, and also takes into consideration the state of recognition that one party has when they are most likely to believe in another partner or entity (Wilson, 1995).

Within the context of shipping services, the characteristics which influence the formation of trust between customers and partners can be best approached at the corporate level (e.g., firm size, reputation, willingness to provide customized services, information sharing, transaction period) or at the individual level (e.g., expertise, influence, preference, similarity, frequency of business-related communication) (Doney and Cannon, 1997). For example, Doney and Cannon (1997) found that the expertise of a salesperson can further build a customer's trust in a company, mainly by increasing the confidence that the salesperson can deliver his promises to customers. Similarly, Moorman, Deshpande, and Zaltman (1993) found that the high degree of salespeople's discretion within an organization results in a high degree of credibility from those outside of the organization. In other words, in the industry of shipping, which overall requires a high level of expertise, it can be assumed that the expertise and discretion of salespeople is an essential factor in the building of customer trust. Furthermore, container lines need to improve customer satisfaction and loyalty in order to maintain the health of long-term customer relationships. Through the adoption of a social exchange theory approach, Balci, Caliskan, and Yuen (2019) found that a relational bonding strategy for customer satisfaction and loyalty was of utmost vital importance in container shipping. In other words, the relationship between the customer and the supplier during the process of service provision is challenging to maintain without trust, as it ultimately requires greater psychological compliance in the long term, than merely during the contract relationship (Al-Ansi, Olya, and Han, 2019). Yuen et al. (2018) also found that the relationship between shipping practices and shipper's loyalty was ultimately mediated by the shipper's perceived value of the delivery process, the shipper's trust, and the cost of the overall transaction.

2.4. Tangible Service Quality and Customer Satisfaction

Drawing from previous studies on service quality, we found that an integrated model that

connects customer satisfaction and customer relation is necessary to understand the decision-making mechanism by which shippers select shipping companies. Hurley and Estelami (1998) found that service quality and satisfaction are actually separate concepts, and that there exists a causal relationship between the two. By surveying customer satisfaction on shipping service quality, Kannan (2010) found that shipping service quality consists of various factors (i.e., fare, customer service, operation service, reputation, infrastructure, schedule management, technical capacity, and communication), and that fare determines the perceived quality of service performance the most. As a result of the verification of whether operational, personal, and technical service quality, in the form of 3PL service quality, affects the satisfaction and loyalty of buyers, Juga, Juntunen, and Grant (2010) found that operational service quality has the most significant impact on customer satisfaction, while technology-related aspects have little effect overall. As shippers recognize the technical operation portion of the shipping company as a requirement for basic competency, it implied that the effect on satisfaction is significant, and depends on how efficiently each contracted transaction is operated.

Moreover, as cargo transportation is carried out on an international scale, and inland transportation connectivity is becoming central for the securing of competitiveness, a global supply chain network has become an essential priority for shipping companies. Boje and Whetten (1981) and Levine and White (1961) defined the service network as the cooperation necessary to improve service quality through the provision of a complex and integrated service within a cooperative system between each organization participating in the service creation process. For example, the cooperation and flexibility between companies further strengthened the relationship with customers in the B2B market (Lostakova and Pecinova, 2014), and the shortened service delivery time increased customer satisfaction overall (Pruyn and Smidts, 1998). In addition, the seamless network connections between shipping companies positively affected shippers' levels of satisfaction and loyalty (Caliskan and Esmer, 2020). In short, shipping companies can increase customer satisfaction through concrete cooperation that builds a reliable global network. Furthermore, a network-based cooperation system through the participation of global shipping companies can also complement that capabilities that shipping companies do not have directly, such as the real-time monitoring of freight or multimodal transportation usage (Jung, Kim, and Shin, 2019).

Based on the above discussion, we verify the impact of transaction fare and global network construction as tangible service quality factors on customer satisfaction through the following hypotheses.

H1: A shipping company's cost competitiveness perceived by a shipper will have a positive impact on customer satisfaction.

H2: A shipping company's network competitiveness perceived by a shipper will have a positive impact on customer satisfaction.

2.5. Trust between Intangible Service Quality and Customer Satisfaction

Similar to tangible service quality, existing studies have already proved the existence of a relationship between service quality and customer satisfaction, and that it is of a direct causal nature (Cronin Jr and Taylor, 1992; Gunawan and Prasetyo, 2020; Hirata, 2019; Huang, Lee, and Chen, 2019; Yildiz, 2017; Zaibaf, Taherikia, and Fakharian, 2013; Zhong and Moon, 2020). However, this study aims to confirm that the process of trust formation plays an important mediating role between the direct causality of customer satisfaction creation, and

the specific characteristics of service quality.

Doney and Cannon (1997) suggested that information sharing, long-term transactions, and the willingness to provide services influences trust formation, thereby affecting overall corporate operational services. In the context of transport platforms, Mas-Machuca, Marimon, and Jaca (2021) found that platform participants positively build trust when transport service providers offer organized real-time sites, rapid responses to services, and a high level of interactions between business practitioners. Furthermore, Moorman, Deshpande, and Zaltman (1993) suggested that the strength of the interpersonal factor is the antecedent which can best predict trust when marketers are receiving services from a market research institute, representing the participants' expertise as a related variable. Swan and Nolan (1985) cognitively and behaviorally defined the trust between buyers and salespeople by applying the behavioral science of trust to commercial sale situations. The empirical results suggest that the degree of trust can vary greatly depending on the professionalism of the salespeople who are the ones providing close services to customers. For salespeople and customers in Peru, Arditto et al. (2020) found that salespeople's level of expertise causes their interactions with customers to be more energetic, thereby directly affecting and increasing the level of trust.

Although previous studies suggest that customer satisfaction precedes and then creates trust as a result (Dash, Bruning, and Guin, 2007; Fornell, 1992; Heri, 2017; Morgan and Hunt, 1994; Oliver, 1981; Tax and Brown, 1998), few studies pay attention to how the formation of trust itself has a direct and positive effect on customer satisfaction (Yildiz, 2017). When the trust built up during the process of customers receiving a service from a firm affects their satisfaction level, the customer becomes far more willing to engage in strengthening their relationship and have a stronger likelihood of repurchasing from the company (Anderson and Narus, 1990; Morgan and Hunt, 1994; Rita, Oliveira, and Farisa, 2019). The reinforcement of this trust through relationships may result from the increase in customer satisfaction after receiving the service, but the formation of trust can be sufficiently achieved even merely just through the experience of using the service. Shemwell, Cronin, and Bullard (1994) suggest that trust can improve the quality of a relationship because it places a high value on the relationship itself *per se*.

Therefore, we assumed that the intangible service quality (i.e., operation competitiveness and customer relationship) affects the formation of trust between shipping companies and shippers. In turn, it is assumed that this trust formation will positively affect customer satisfaction in the long-term end. Based on this assumption, the following hypothesis can be presented.

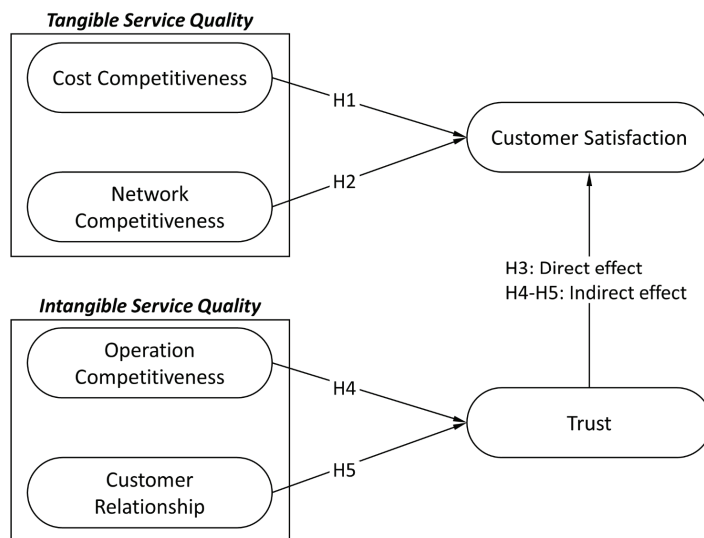
H3: Trust between a shipping company and a shipper will have a positive impact on customer satisfaction.

H4: Trust mediates the relationship between the operational competitiveness perceived by a shipper and customer satisfaction.

H5: Trust mediates the relationship between a shipping company's customer relationship as perceived by a shipper and customer satisfaction.

Fig. 1 shows the hypotheses of this study, which were discussed above as the research model.

Fig. 1. Research Model



3. Methodology

3.1. Samples

We sampled 200 domestic shipping companies and distributed a questionnaire to the global shipping and domestic logistics companies. The questionnaire was distributed over the course of a month by fax, e-mail, or in person communication. In order to find out the factors that shippers take into consideration when selecting a shipping company, we set up four factors as the independent variables: cost competitiveness, network competitiveness, operational competitiveness, and quality of customer relationship. Additionally, trust was also adopted as a mediating factor, and customer satisfaction was used as a dependent variable. Demographic questions gathered information on firm type, firm age, and the number of employees. Thus, 122 out of 200 questionnaires were collected in total, and the number of valid responses came out to be 114, with an additional exclusion of 8 of them. The ratio of survey return measured at 61%, and the available samples measured at 57%. To test the hypothesis, the PLS-SEM model was used.

3.2. Research Context: The Shipping Industry in South Korea

Although South Korea's shipping industry enjoyed a golden age during the 1980s and 1990s, it has been experiencing a gradual collapse recently. In recent years, due to both the sluggish circumstances of the global shipping industry and the aftereffects of Hanjin Shipping's restructuring, the sector recorded the largest maritime transport account deficit in 2018 (Ko, 2020). In addition, the liquidity crisis of many shipping companies has continued to worsen, as more than 27% of the top 100 shipping companies have a debt-to-equity ratio greater than 400%. Additionally, amid the ongoing issues that have continued to shake and destabilize the shipping industry, such as the environmental regulations of the International

Maritime Organization (IMO) and the reorganization of the global alliance, shipping companies in South Korea have been continuing to look for ways to recover their competitiveness and overcome the crisis (Lee and Pak, 2020). Furthermore, due to the nature of the shipping industry, the fierce competition for cost reduction has become inevitable, as the service differentiation among shipping companies operating worldwide continues to be low. Therefore, in order not to be pushed out of the oligopoly market-centered competition, it has become an absolute necessity to create a network which generates economies of scale, and various means to give customers the best satisfaction have begun to emerge over time.

3.3. Variables

In this study, a questionnaire was conducted on a Likert 5-point scale which ranged from 1 (not at all) to 5 (very much). From the existing literature, we partially extracted factors which are taken into consideration by shippers when selecting shipping companies. Cost competitiveness was derived from the two items used as measurement variables in Yoon (2009). The network competitiveness of shipping companies consisted of one measurement variable suggested by Seo (2016), in addition to one item used in Lu (2003). The items on operational competitiveness consisted of three items suggested by Park (2003), and one item from Choi and Shin (2006). According to Kim (2016), Lee, Shin, and Park (2010), the three items for customer relationships were extracted. Lastly, referring to the questionnaire on customer satisfaction and reliability used in Hwang (2016), it was composed of 4 and 3 items, respectively. The detailed analysis items for each item are presented in Table 2, along with their respective latent variable, factor loading, mean, and standard deviation.

3.4. Analysis Method

The partial least squares-structural equation model (PLS-SEM) is a method used to factorize observed variables, which is useful for the verification of the process of latent variable formation, and the relationship between each construct via a linked path. PLS-SEM is a reliable methodology for finding optimized factors using factor analysis and maximizes the explanatory power of the effects of the potential factor on each of the dependent variables. Although multivariate analysis generally requires normality, PLS-SEM analysis does not have this condition; thus, a smaller number of samples can be estimated. Ten samples are required per connected path, and there are seven links between the latent variables in our proposed model. We endeavored to verify the hypothesized model using the 'plssem' package in the STATA 16. First, the suitability of the model was confirmed through CFA (confirmative factor analysis) and the hypothesis between the latent variables was analyzed. Second, CFA evaluated the reliability, convergence validity, and discriminant validity of the proposed model, and the hypothesis was verified after confirming no problems on all criteria measures. Third, the significance of the mediating effect was tested with bootstrap and Sobel tests through resampling.

3.5. Descriptive Statistics and Confirmatory Factor Analysis

This study was verified with 114 valid samples. The target of the questionnaire was a domestic shipping company which operates a global shipping and logistics agency. Among the firm types, 55 respondents working in a domestic small and medium-sized shipping company accounted for 48.25% of the sample, accounting for the largest number. When looking at the number of employees, those with less than 50 were the most common, at 36.84%. Firms under the age of 10-20 make up 40.35% of the sample.

Table 1. Sample Demographic

Variable	Classification	Total (N=114)	
		N	%
Firm type	Domestic SMEs	55	48.25
	Domestic large company	25	21.93
	Foreign company	34	29.82
Firm age	Less than 10	25	21.93
	Less than 10-20	46	40.35
	Less than 20-30	19	16.67
	More than 30	24	21.05
Number of employees	Less than 50	42	36.84
	Less than 50-100	22	19.30
	Less than 100-150	17	14.91
	Less than 150-200	4	3.51
	200 or more	29	25.44

Table 2. Confirmatory Factor Loading, Mean and Standard Deviation

Construct	Scale item	FL	Mean	SD
CC	Fare competitiveness	0.95	4.35	0.72
	Free time of DEM/DET	0.77	4.23	0.73
NC	Global network	0.85	3.42	0.92
	Ease of inland transportation	0.85	3.44	0.89
OC	Transit Time	0.80	4.23	0.69
	Roll Over or T/S	0.84	4.39	0.71
	Stability of fleet support during peak season	0.76	4.42	0.75
CR	Logistics knowledge of salesperson	0.86	3.40	0.84
	Communication skill of salesperson	0.79	3.75	0.89
	Convenient to use the homepage	0.77	3.44	1.02
CS	Overall transaction satisfaction	0.84	3.51	0.63
	Choosing the right partner	0.77	3.51	0.60
	Satisfaction with the service provided	0.87	3.44	0.63
	Willingness to the reuse of services	0.73	3.62	0.70
TR	Trust through business relations	0.79	3.20	0.71
	Sincerely fulfilling the promised service	0.78	3.32	0.70
	Ability to cope with the occurrence of problems	0.85	3.45	0.79

Notes: CC=cost competitiveness, NC=network competitiveness, OC=operation competitiveness, CR=customer relationship, TR=trust, CS=customer satisfaction, DEM/DET= demurrage and detention, FL=factor loading, SD=standard deviation, all FLs are significant at $p < 0.001$.

We analyzed the reliability, convergence validity, and discriminant validity of the items which converge on each latent variable, in order to thereby evaluate the overall fitness of the research model. Table 2 shows the results of confirmatory factor analysis during the pre-verification of PLS-SEM. In order to ensure high reliability and effectiveness in our analysis, this study excluded all items with a factor loading threshold lower than 0.7 (Hair et al., 2009). As a result of checking the factor loading value of each of the items, all 17 were found to be

suitable for our model. Furthermore, both the factor loading values were higher than the recommended level of 0.7 or more, and all items were found to be statistically significant at a significance level of 0.001.

3.6. Convergent and Discriminant Validity

Table 3 shows Cronbach's alpha, composite reliability, average variance extracted (AVE), the square-rooted AVE, and the correlation between the latent variables. Internal consistency is considered normal when Cronbach's alpha and composite reliability values are greater than 0.5, and are judged as excellent when greater than 0.7 (Hair et al., 2009; Hair et al., 2017). Within our model, the composite reliability values of all latent variables were at least 0.837 and therefore higher than 0.7, indicating high internal consistency. Convergent validity can be explained by the AVE of each latent variable. Our latents measured at an AVE value of 0.645 or higher, which than the recommended threshold value (0.5) (Hair et al., 2017). Finally, in order to achieve discriminant validity, the square-rooted AVE of each latent variable must be higher than that of the correlation coefficient. As a result of this verification, we verified that our model obtained discriminant validity.

Table 3. Inter-construct Correlations, Convergent and Discriminant Validity

Construct	CC	NC	OC	CR	CS	TR
CC	1					
NC	0.205	1				
OC	0.289	0.343	1			
CR	0.243	0.364	0.252	1		
CS	0.290	0.357	0.357	0.289	1	
TR	0.146	0.173	0.246	0.239	0.649	1
Cronbach's alpha	0.701	0.612	0.725	0.732	0.818	0.736
Composite reliability	0.857	0.837	0.845	0.846	0.880	0.850
rho_A	0.962	0.612	0.734	0.746	0.834	0.745
AVE	0.752	0.720	0.645	0.647	0.647	0.654
SQRT(AVE)	0.867	0.849	0.803	0.804	0.804	0.809

Notes: CC=cost competitiveness, NC=network competitiveness, OC=operation competitiveness, CR=customer relationship, TR=trust, CS=customer satisfaction, rho_A=Dijkstra and Henseler's composite reliability AVE=average variance extracted, SQRT=square rooted.

3.7. Common Method Bias Test

In PLS-SEM verification, a collinearity test is used to evaluate the risk of multicollinearity which may occur between latent variables. The diagnosis of multicollinearity between latent variables can be prevented in advance so that collinearity problems do not occur within the model. The common method bias (CMB) test is generally used within a covariance-based technique for validation and gives robustness to the variance-based PLS-SEM verification. First, in order to more closely verify the possibility of an issue of multicollinearity in the model, a method for verifying the VIF of variables and a single factor verification were performed. Kock (2015) explained that the process of verifying collinearity through the obtaining VIF, even if the discriminant validity is satisfied, is still a necessity in order to

prevent the occurrence of problems inherent within CMB. Since the VIF between our latent variables has a maximum value of 1.26, it is lower than the maximum threshold 3.3 recommended by Kock and Lynn (2012), confirming that there is no multicollinearity problem. Second, Harman's single-factor test was also performed. Podsakoff (2003) put forth the argument that, through principal factor analysis, if at least one factor with an eigenvalue of 1 or more occurs, a problem arises where the model can be explained with one factor, even if multiple factors are created. In the single-factor test, about 23% of the total variance was adequate for explanatory power, while it can be judged as no problem if it is less than 50%. As a result of the single-factor verification for our latent variables, it was confirmed that there was no CMB problem at a value of 29.56%.

4. Empirical test

4.1. Results of PLS-SEM

Table 4 presents the PLS-SEM results to verify the influence of six variables with a linked path using a structural equation model. The hypothesis verification on the effect of the tangible service quality and intangible service-related service quality of shipping companies on customer satisfaction is as follows. H1, where cost competitiveness affects customer satisfaction, was partially supported through the data ($p < 0.1$). H2, the effect of a shipping company's global network competitiveness on customer satisfaction was supported at the 0.05 statistical significance level. H3, which assumed that the formation of trust between shipping companies and shippers would affect satisfaction, was strongly supported by the data ($p < 0.001$). Both operational competitiveness and customer relationship, which directly affect the level of trust, were significant at the 0.05 statistical significance level, whereas neither intangible-related services directly affected the level of customer satisfaction. Among the endogenous variables of this study, the explanatory power of TR was slightly lower (7.6%), but the explanatory power of our model is sufficiently acceptable, as CS has 49.5% explanatory power (R^2).

This study compared the effects of direct and indirect effects, which are shown in Table 5. As for the direct effects, the effect on TR→CS was the highest at 0.562, while CR→CS was found to have the lowest effect at 0.033. Looking at the path along with the indirect effects, OC and CR on TR were shown to have 0.113 and 0.104 effects, respectively.

Table 4. Results of PLS-SEM

Path	Standardized coefficient	<i>p</i> -value	R ²
CC→CS	0.130	0.071	(CS) 0.495
NC→CS	0.183	0.016	
OC→CS	0.113	0.134	
CR→CS	0.033	0.363	
TR→CS	0.562	0.000	
OC→TR	0.201	0.033	(TR) 0.076
CR→TR	0.185	0.050	

Notes: CC=cost competitiveness, NC=network competitiveness, OC=operation competitiveness, CR=customer relationship, TR=trust, CS=customer satisfaction.

We tested the significance of the mediating role of trust through bootstrap, by using Sobel's z-statistics (Baron and Kenny, 1986; Sobel, 1982; VanderWeele, 2015). To verify the significance of the mediating effect, 2000 re-samplings performed with bootstrap are judged to be statistically significant when the confidence interval does not contain zero (Hair et al., 2017). Table 6 shows that the mediating role of trust in the OC→TR→CS path and the CR→TR→CS path were 0.113 and 0.104, respectively. In the case of the statistical significance level, both OC→TR→CS and the CR→TR→CS are statistically significant at the 0.05 significance level, as each confidence interval does not contain zero; thus, it can be argued that there is a mediating effect. Besides the trust mediated effects of operational competitiveness and customer relationship on customer satisfaction; thus, both H4 and H5 were supported.

Table 1. Direct, Indirect, and Total Effect

Effect	Direct	Indirect	Total
CC→CS	0.130		0.130
NC→CS	0.183		0.183
OC→CS	0.113	0.113	0.226
OC→TR	0.201		0.201
CR→CS	0.033	0.104	0.137
CR→TR	0.185		0.185
TR→CS	0.562		0.562

Notes: CC=cost competitiveness, NC=network competitiveness, OC=operation competitiveness, CR=customer relationship, TR=trust, CS=customer satisfaction.

Table 6. Mediation effects with bootstrap (Sobel, 1982)

Statistics	OC→TR→CS	CR→TR→CS
Indirect effect	0.113	0.104
Standard error	0.057	0.052
z-statistic	1.974	1.993
p-value	0.048	0.046
95% Confidence Interval	[0.006, 0.233]	[0.005, 0.197]

Notes: (1) 2000 iterations for bootstrapping, (2) confidence level is 95%, (3) OC=operation competitiveness, CR=customer relationship, TR=trust, CS=customer satisfaction.

4.2. Supplementary Analysis: Multigroup Testing

A multi-group analysis was conducted to examine whether the moderation effect and differences between groups also appear in the structural model (Keil et al., 2000). In this study, paths with differences between domestic and global shipping companies were identified using multi-group analysis. Table 7 shows that only the NC→CS path was statistically significant at the 0.01 significance level. Through this result, it was found that there is a difference between the domestic and global shipping company groups within their impact of the shipping company network on customer satisfaction. Furthermore, it was found that the effect on the pathway of NC→CS had a greater effect on the domestic shipping company group (0.576), as opposed to on the global shipping company group (0.058).

Table 7. Multi-group Analysis between Domestic and Global Shipping Company

Structural effect	Domestic	Global	Statistic	p-value
CC → CS	-0.019	0.199	1.494	0.138
NC → CS	0.576	0.058	3.487	0.001
TR → CS	0.544	0.659	0.785	0.434
OC → TR	0.186	0.216	0.149	0.882
CR → TR	0.382	0.204	0.889	0.376

Notes: CC=cost competitiveness, NC=network competitiveness, OC=operation competitiveness, CR=customer relationship, TR=trust, CS=customer satisfaction.

5. Conclusions and Discussion

This study attempted to clarify that the tangible service-related service quality (i.e., cost competitiveness, network competitiveness) within traditional trading practices directly relates to the level of customer satisfaction when a customer shipper selects a shipping company. Additionally, the effects of the shipping company's service quality factors, such as intangible service quality (i.e., operational competitiveness, customer relations) on customer satisfaction and the mediating effect of trust formation between participants in the service exchange mechanism were also verified. Based on the results of the empirical analysis of this study, the following theoretical implications can thus be presented.

First, the traditional causal relationship between cost competitiveness and customer satisfaction, which is the tangible service quality provided by shipping companies within the shipping industry, has been reconfirmed and strengthened. Although existing studies, within which shipping services affect customer satisfaction, have been steadily conducted over time, attempts to determine the relationship between the network competitiveness of shipping companies and customer satisfaction have been limited in scope and number (Jung, Kim, and Shin, 2019). In other words, shipping companies' costs and multi-channel global network competitiveness remain crucial factors that directly affect the level of customer satisfaction in the shipping industry. Similarly, Suki (2014) found that the service that customers respond to most sensitively, when looking at airline passengers specifically, corresponds to tangible service-related services, such as level of cleanliness and the modern-looking feel exhibited by both the inside and outside of the airliner. As confirmed in this study, in order for shipping companies to be directly recognized as competitive to shippers, customers in the shipping industry can be categorized into costs that can be immediately reduced, which affects how diverse global shipping channels are possessed (Hirata, 2019). While the existing research on the relationship between shippers and shipping companies has focused on the strengths possessed by shipping companies, this study theoretically expanded and reinforced the strengths by focusing on the factors influencing the tangibility of shipping companies' capabilities. Therefore, this study's results were meaningful in reaffirming the traditional causal relationship in previous studies which verify that costs and networks in the shipping industry which are still important as continuous strategic assets. Although confirmed in the supplementary analysis, network capabilities are required from domestic shipping companies in comparison to overseas shipping companies, and more diverse channels will need to be established in order to compete more efficiently in the global market in both the near and far future.

Second, we expand the focus of the literature on shipping service quality by examining the

mediating effect of trust formation on customer satisfaction, mainly by dividing the level of trust, such as building and reinforcing, differently from existing studies where customer satisfaction leads to the formation of trust (Morgan and Hunt, 1994). It was thereby confirmed that customer satisfaction was affected by the formation of trust with customers through the stable operation service of shipping companies and active customer access, according to the gathered expertise of sales personnel (Moorman, Deshpande, and Zaltman, 1993). Although existing studies on shipping services have attempted to verify that the trust between the shipping company and the shipper is further established as the logistical performance is positively perceived over time, insufficient attention has been paid to the mechanisms by which the trust was formed due to the presence of intangible service-qualities (Heri, 2017). This study emphasized that during the process of intangible interaction between contract participants, a certain degree of sympathy occurs and trust is formed over time, which leads to an increase in satisfaction. For example, if the shipping company can receive accurate information about the service schedule in real-time or when requested, and is able to ensure that it could control the transport process stably even during the peak season, trust with the shipper will be formed during the agency process (Swan and Nolan, 1985). In this respect, this study presents a theoretical contribution in that satisfaction through trust-building can come about due to potentially intangible service-related service quality throughout a long-term relationship, although the shipping company cannot directly show this to the shipper (Yildiz, 2017).

Currently, shipping companies are struggling with the negative impact and uncertainty of the COVID-19 pandemic. Therefore, it will be central to understand the causal relationship between service provision and satisfaction factors while also remaining aware of the specific challenges of the COVID-19 situation. Eliminating uncertainty so that a confirmed causal relationship can be applied can also serve as an option. The causal relationship of the underlying factors is identified somewhat more clearly, and after that, it responds in connection with the removal of unexpected situations. Therefore, the following practical implications can be presented based on the results of this study.

First, it was possible to confirm the importance of the shipping company's ability in controlling freight rates. Considering that import and export transactions are recovering from the current COVID-19 mitigation tax and vaccine developments, shipping trade is essential for personal, national, and global welfare enhancement. However, shippers are still experiencing difficulties due to rising freight rates due to failures in adjusting the fleet volume. However, since the demand for sea transportation is inelastic to price level, there is a limit to the direct controlling of demurrage and detention (DEM/DET) by shipping companies. Therefore, the observer role played by the Ministry of Trade, Industry and Energy (MOTIE) or the Ministry of Oceans and Fisheries (MOF) is ultimately required. Suppose that the supervisory authority monitors the unfair trade of shipping companies in order to prevent excessive freight rates and adjusts freight rates through providing support for the expansion of fleet volumes. In that case, it will be possible to improve the satisfaction of both the shippers and shipping companies participating in the global transport industry.

Second, shipping companies must endeavor to discover and connect with new global networks. According to the results of this study, a shipping company's global network competitiveness has a higher direct effect on customer satisfaction than just cost competitiveness. Shipping service has limitations in its growth and survival due to its demand for door-to-door delivery, or its international nature due to certain given industrial characteristics. Therefore, it is necessary to recognize the mutual necessity of transport service providers, and strive to enhance joint strategic cooperation. Additionally, as a result of multi-

group analysis, there was a significant difference in satisfaction with the network competitiveness recognized by shippers according to the specific type of shipping company.

Third, the mediating effect of trust was greater due to the operational service competitiveness than the customer relationship. In order to build further trust between contractors, it is essential to stably operate the planned transportation time and transportation process specified by the shipping company, rather than merely the logistics knowledge and communication ability of the salesperson. Unlike a contract for the sale of goods, the transport contract holds the characteristics of a contract of adhesion, so the shipper accepts the service quality presented by the shipping company or carrier as it is, without any modification. Therefore, as the stable operation of the service accepted by the customer is recognized where the fulfillment of mutual agreements is appropriately realized, trust is formed and can lead to greater customer satisfaction.

Although we presented meaningful theoretical and practical implications, there are still limitations, which are presented as follows. First, our study investigated the causal relationship between shipping company selection factors and the satisfaction in general situations. Reflecting uncertain situations, such as those caused by the COVID-19 pandemic, is expected to increase understanding of the more recent trade situation, but no unprecedented variables regarding intangible service quality were detected during a review of related prior studies. In addition to the COVID-19 pandemic, the inevitable recent situation related to the aftermath of the bankruptcy of Hanjin Shipping and greater protectionism may have already settled in the perception of respondents. Future studies will also need to consider how these trade-related uncertainties affect respondents' perceptions. Second, since this study was conducted without calling attention to the COVID-19 pandemic, future studies can present more meaningful implications for the shipping market by comparing the assumed and unassumed situations for the COVID-19 pandemic. Third, to further strengthen the model's robustness, it is recommended that future studies incorporate simulation analysis techniques, such as system dynamic methods.

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