The Relations between Safety Matters, Corporate Image and Performance in Logistics Company

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Abstract

Purpose: The purpose of this study is to suggest strategic implications about empirical analysis with mediation effects of corporate image in terms of that relations between logistics culture safety, safety compliance and logistics performance of logistics companies. **Research design, data and methodology**: The structure and method of this research is organized with, first establishing hypothesis and research model based on previous study related to safety culture, safety compliance, corporate image, logistics safety and logistics performance, which has been carried out survey questionnaire to those who got involved in logistics businesses. **Results**: It is well justified that safety culture and safety compliance have significantly influenced to logistics performance as well as corporate images that is also revealed to have positive impact to logistics performance. With results verifying into mediation effects of corporate image, it is found that corporate image has partial mediation effects between logistics safety culture and logistics performance, and corporate image has full mediation effects between logistics safety compliance and logistics performance. **Conclusions**: In conclusion, it is strongly asked to make an aggressive efforts to safety compliance with necessity for spread of safety culture in level of enterprise. Planning the strategy and its implementation is required to secure safety in logistics process because both logistics performance and corporate image has positive influences by logistics safety.

Keywords : Logistics Safety, Logistics Safety Culture, Safety Compliance, Logistics Safety Performance, Corporate Image

JEL Classification Code : C12, J28, L81, L91, M14

1. Introduction

The importance of safety has been recognized well in all sectors of our society as well as in the field of distribution and logistics. Nevertheless, safety accidents are still occurring. If safety accidents occur in the logistics process, the supply of goods to the store is cut off, thus the retailers lose the opportunity to sell their product and customers secede. In addition, companies suffer human property damage due to product damage, worker injuries, and logistics equipment damage.

Logistics companies are facing more risks in all the logistics processes associated with shipping and returning to customers after production. Logistics companies are responsible for the accidents such as vehicle accidents, cargo dropping, storage and unloading during delivery, overturning of forklifts, cargo damage, fire, packing collision, vehicle accidents and product damage during delivery, thus logistics delivery processes are exposed to various risks. Since the distribution and logistics processes are closely related to each other, all participants in the whole process should have sufficient awareness for safety.

Safety management should be carried out at the whole company level before safety accidents occur in the distribution process. It is directly related to the corporate safety climate or safety culture, and also enables active safety behavior and safety compliance.

Researches on safety culture or safety compliance are being conducted in various industry fields. After Chernobyl

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nuclear accident, safety-related studies were first conducted in the nuclear-related industry. Since then, researches on safety have been spreading to the various fields such as the construction industry where many accidents occur and the medical industry dealing with human life and illness. Several studies have also confirmed that safety management and its activities directly affect safety level with reducing accidents.

However, safety studies on distribution and logistics sectors are still staying in the beginning. Despite the continuous occurrence of freight truck accidents and fires in the distribution center, companies and employees do not pay attention to logistics safety activities on their daily works. They only point to the neglect of safety management after an accident occurs.

In the field of logistics, safety studies are being conducted in the part of CSR perspective. In other words, researches are conducted on the relationship between CSR and corporate image, which includes safety in logistics activities, or the relationship between corporate image and logistics performance. However, an empirical analysis of the relationship between logistics safety culture, safety compliance, corporate image, and logistics performance has not been conducted. If safety accidents occur in the logistics process, there is a negative impact on the consumer's image, reputation and trust in the distributor involved in the incident. As a result, it affects negatively the corporate performance. Therefore, it is necessary to check the relationship between logistics safety culture and compliance and logistics performance that affect the corporate image.

In addition, it is necessary to analyze the mediating role of corporate image because corporate image of logistics safety activities may directly or indirectly affect logistics performance. Through these, distribution and logistics companies will be able to achieve their unique goals while effectively controlling the risks inherent in logistics processes.

Therefore, this study empirically analyzes the relationship between logistics safety culture, safety compliance and logistics performance and mediating effects of corporate image, and suggests strategic implications.

2. Theoretical Background

2.1. Previous Researches on Logistics Safety

The researches on logistics safety have mainly focused on transportation and unloading. Zohar, Huang, Lee, and Robertson (2015) studied the relationship between organization's safety climate and long distance drivers. This study suggests that the perception of the safety climate not only affects safety behavior but also ultimately reduces the accidents occurrence.

Kim (2017) confirmed the relationship for logistics safety activities such as safety transportation practice,

transportation safety management and safety transportation prevention management, and corporate image and logistics performance in transportation. Safety transportation practices and preventive management had a significant effect on corporate image. In addition, corporate image has a positive effect on logistics performance. Corporate image was analyzed to have a mediating effect on the relationship between safety transportation practice and prevention management and logistics performance. In addition, the study conducted a survey on the employees' awareness of logistics safety. According to the research results, it is important to practice safe transportation, and that driver management, safety transportation prevention, and transportation management are also necessary for safety transportation (Kim, 2014).

Wang and Liu(2012) focused on the four Taiwan rail transport companies. The study analyzed the relationship with safety accidents by evaluating 18 safety culture areas including safety commitment, education, communication, environment, regulations, systems, leadership, risk management, knowledge, awareness and attitude. The results showed clear differences in safety training, safety regulations, safety systems, safety participation encouragement, penalties, and performance measures. The study pointed out the need for continuous improvement in safety culture because the rail transport companies are not managed efficiently.

Shang, Yang, and Lu (2011) confirmed that concern for safety, safety motives, and supervisor's safety management have significant correlation to safety. The supervisor's safety management showed significant mediating effects in safety.

In addition, the studies on the safety performance include the shipping companies' profit(Bruning, 1989), safety transport regulations(Cantor, 2010, 2009, 1984; Douglas & Swartz, 2009), and the safety and differences in union and non-union transporters (Corsi, 2012), transport management policy for transport safety (Corsi, 2012), transporter potential assessment for safety process improvement (Mejza, 1999), and the effectiveness of safety management program (Olson & Austin, 2001).

2.2. Preceding Researches on Safety Culture and Safety Compliance

Safety culture is a kind of a reward for personal responsibility for safety, actions to maintain and elevate safety, communication for safety, active learning and compliance to safety, correcting behaviors based on mistakes. This safety culture is influenced not only by corporate management policies but also by the factors such as individual safety participation, safety responsibility, communication and safety learning (Weigman, Zhang, von Thaden, Sharma, & Gibbos, 2004). In addition, safety culture refers to employees' behavior for safety and their expressed attitude toward safety (Meams, Whitaker, & Flin, 2003; Cox & Flin, 1998), their social perception and

normative behavior about safety, and it can be recognized as employees' perception and structured system (Pidgeon, 1991).

First, as for the previous researches that analyzed the effect of safety culture, Jiang, Liang, and Han (2019) analyzed the relationship between safety culture, safety management system, safety knowledge, safety awareness and safety habits. Safety culture directly affects the safety management system, and the safety management system directly affects safety knowledge, safety awareness and safety habits. Safety culture was also found to have an indirect effect on safety knowledge, safety awareness and safety habits.

Molenaar, Park, and Washington (2009) studied a framework for measuring the effect of a company's safety culture on safety performance. They presented the elements and specific needs for safety culture to improve safety as the immersion to corporate safety, incentives for safety behavior, subcontractor involvement in corporate culture, safety responsibility and penalties for unsafe behavior.

Chen, Wang, Lu, and Pan (2018) examined the relationship between safety culture and safety in the construction industry. The results showed that the immersion to safety had no significant effect on safety participation. Also an organizational agreement had a negative effect on safety behavior, safety compliance and safety participation, and safety immersion had a significant effect on safety behavior and safety compliance. Safety communication was also shown to enhance the explanation of safety as well as to be closely related to safety. The safety culture is an indicator that can predict the safety performance and is necessary for safety and improvement.

Arghami and Taghizade (2017) analyzed the relationship between worker's safety behavior and safety culture. Their study showed that there is a significant correlation between safety culture and safety behavior, thus, as the level of safety culture increases, unsafe behavior decreases.

Chinda and Mohamed (2008) developed a structural equation model for the construction safety culture and they analyzed the relationship between safety leadership, safety policy and strategy, safety procedures, and safety objectives(performance). Safety leadership has a direct effect on the implementation of safety policies and strategies, but indirectly on partnerships and resources. Furthermore, partnerships and resources have been found to indirectly affect safety procedures through policies and strategies, which ultimately have a significant effect on safety objectives(performance).

As a research for the tools for measuring safety culture, Shirali, Shekari, and Angali (2018) evaluated the reliability and validity of safety culture measuring tools. Their study presented 13 evaluation factors such as safety climate, change of safety management, safety culture learning, risk management and evaluation, risk preparation, flexibility, reporting culture, management commitment, awareness, safety management system, and accident investigation.

Zohar (1980) confirmed that the safety culture (safety climate) consists of 8 factors excluding the management's involvement in safety issues. In addition, it was confirmed that the safety culture appeared differently depending on where the CEO puts emphasis on the conflicting goals of safety and efficiency (Zohar, 2000).

Fernandez-Miniz, Montes-Peon, and Vazquez-Ordas (2007) describe the key elements of the safety culture as safety policies, incentives for safety activities, providing risk information, plans to avoid accidents, feedback on safety controls, safety immersion, continuing training and safety campaign participation. Their emphasis was placed on the importance of managers' roles in promoting safety behaviors, safety behaviors, and safety management systems, as well as promoting worker safety behaviors.

Olive, O'Conner, and Mannan (2006) analyzed the relationship between safety culture and safety process, saying that the key elements of safety culture are safety immersion, communication, resilience and flexibility, and awareness to risk. Furthermore, they emphasized the importance of a safety culture in preventable accidents.

Ball and Scotney (1998) found that the key elements of the safety culture include leadership, training, human resource management, self-assessment, communication, risk awareness, safety behavior, safety-related regulations and procedures, safety organization, stress management, and participation in safety activities.

Hale and Hovden (1998) stated that the establishment of a safety culture requires a commitment to safety, a safety training system, a communication channel, a stable working capacity, an education system, a leadership style, and openness to criticism.

Safety compliance is directly related to safety management. Safety compliance is therefore essential to maintaining safety. (Griffin & Neal, 2000). Safety knowledge and safety motivation had a significant effect on safety compliance behavior, and safety compliance had a significant effect on accident reduction.

Generally safety attitude influences safety compliance, and safety compliance significantly affects working environment safety. And the attitude of the supervisor had a positive effect on safety compliance, but the workload had a negative effect on safety compliance. Also safety compliance behavior had a significant effect on both intrinsic control and synchronous control safety motivation.

2.3. Previous researches on corporate image and performance

Corporate image is not only influenced by various factors but also affects the performance of the company. In particular, some researches have been carried out that corporate social responsibility and its ethical management influence corporate image (Kim, Eom, Kim, & Youn, 2015). Improving corporate image affects customer loyalty, and corporate social responsibility activities affect customer

value (Kim, Hwang, & Song, 2014). Recently, as website and social networks become more important, there is also a study that corporate brand image should be strengthened (Becker & Lee, 2019; Lee & Kwag, 2017).

Some studies have shown that corporate image directly affects corporate performance. Lee and Lee (2014) analyzed the relationship between corporate social responsibility, corporate image, and corporate performance. According to the results, corporate social responsibility activities have a partial effect on the corporate behavior image, social behavior image, and corporate contribution image, and also partially affect corporate performance such as brand attitude, corporate reputation, and corporate competitiveness.

According to the study by Su, Jeong, Choi, and Kim (2015), an ethical management such as public utilities, donation and support, and volunteer service have a significant effect on customers' purchase intention as well as a corporate image in relation to corporate image and purchase intention.

Arendt and Brettel (2010) analyzed the relationship between corporate social responsibility and corporate identity, corporate image and corporate performance. The management of corporate identity with the mediation of social responsibility not only affects corporate image but also has a significant effect on corporate performance.

Chang (2007) analyzed the relationship between corporate social responsibility, corporate image, and economic performance in Taiwan's high-tech industries as emphasizing that it is also related with the corporate performance.

Boonpattarakan (2012) revealed the relationship between competitive competence, corporate image and performance for Thai logistics companies. Competitive competences such as service reliability, service speed, prompt customer response, availability of service facilities, variety of services, reasonable prices, IT application, and employees have a significant impact on corporate image, and corporate image has a significant impact on profit and growth rate.

The study also found that the mediation of corporate image influences the performance of the company. Huang and Lien (2012) analyzed the effects of a corporate social responsibility on organizational performance and the mediating effect of corporate image. Corporate social responsibility was significantly correlated with a corporate image and organizational performance, and the mediating effect of corporate image was also significant. In order to improve corporate image, they insisted on investing in social responsibility activities to improve corporate performance.

Alrubaiee, Aladwan, Joma, Idris, and Khater (2016) examined the effects of corporate social responsibility and customer value on corporate image and marketing performance, and the mediating effect of corporate image. The results of their analysis showed that corporate image not only had a positive effect on marketing performance, but also had a mediating effect on corporate social responsibility and marketing performance.

3. Research Method

3.1. Research Model and Hypothesis

In order to confirm the correlation between safety culture, safety compliance, corporate image, and logistics performance in the logistics field, a research model was established based on previous studies related to the topics. First, this study aims to clarify the logistics safety culture, logistics safety compliance, corporate image and logistics performance based on previous studies that safety culture and safety compliance affect corporate performance. In addition, this study was conducted to investigate the effects of corporate social responsibility and ethical management on corporate image and corporate performance, and to study the mediating effect of corporate image (Alrubaiee et al., 2016; Lee & Lee, 2014; Huang & Lien, 2012; Boonpattarakan, 2012; Arendt & Brettel, 2010). Thus, this study analyzed the relationship between logistics safety culture, safety compliance and logistics performance through corporate image.
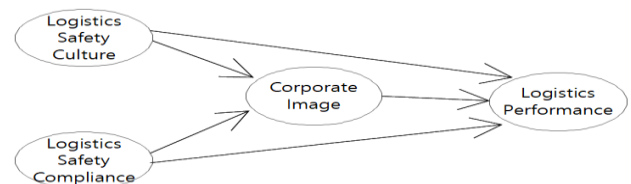

Figure 1: Research Model

Corporate image is influenced by logistics safety activities (Kim, 2017), corporate social responsibility (Alrubaiee et al., 2016; Huang & Lien, 2012; Chang, 2007), ethical management (Su et al., 2015), competitive competence (Boonpattarakan, 2012), and a corporate identity (Arendt & Brettel, 2010). This study proposes the hypothesis that logistics safety culture and safety compliance affect corporate image based on previous studies.

H1: Logistics safety culture will have a positive effect on corporate image.

H2: Logistics safety compliance will have a positive effect on corporate image.

Safety performance is influenced by safety culture (Chen et al., 2018; Wang & Liu, 2012; Molenaar et al., 2009), safety compliance and logistics safety (Kim, 2017), etc. Based on the preceding researches mentioned above, this study proposes the hypothesis that logistics safety culture and safety compliance affect logistics performance.

H3: Logistics safety culture will have a positive effect on logistics performance.

H4: Logistics safety compliance will have a positive effect on logistics performance.

H5: Corporate image will have a positive effect on logistics performance.

The medium of corporate image affects the performance of a company (Alrubaiee et al., 2016; Huang & Lien, 2012). Therefore, this study suggests that the mediation of corporate image influences safety culture and logistics safety based on the preceding researches mentioned above.

H6: Logistics safety culture will have a positive effect on logistics performance through corporate image.

H7: Logistics safety compliance will have a positive effect on logistics performance through corporate image.

3.2. Survey Questionnaire Configuration

This study developed a questionnaire based on the related prior researches to confirm the relationship between logistics safety culture, logistics safety compliance, logistics performance and the mediating effect of corporate image.

The questionnaire was organized as follows. Logistics safety culture consists of four questions including the company's emphasis on logistics safety regulations, logistics safety compliance consists of five questions including working in a safe way, and corporate image consists of four questions including the overall image and reputation of the company. Logistics performance was measured by four questions, each including an increase in satisfaction with logistics services.

Table 1: Questionnaire Configuration

Variables	Measurement Indicators	Related Study
Logistics Safety Culture	cul1. Emphasize the company's logistics safety regulations	Chen et al. (2018) Von Thaden et al. (2008) Von Thaden & Gibbons(2008)
	cul2. Consult with employees on the company's safety issues	
	cul3. Avoid the company's excessive work order	
	cul4. Emphasize on the company's safety practices	
Logistics Safety Compliance	com1. Work in a safe way	Griffin & Neal(2000)
	com2. Work according to correct safety procedures	
	com3. Use of required safety devices	
	com4. Work in the safest condition	
	com5. Attention to safety concerns	
Corporate Image	ima1. Improve the overall image and reputation of the enterprise	Kim(2017) Su et al. (2015) Huang & Lien (2012) Arendt & Brettel
	ima2. Improve trusted corporate image	
	ima3. Improve growth potential corporate image	(2010) Chang(2007)
	ima4. Improve the safe enterprise image	
Logistics Performance	per1. Increase logistics service satisfaction	Kim(2017)
	per2. Improve logistics service competitiveness	
	per3. Increase in profits from logistics operations	
	per4. Expand the logistics market(increase market share)	

3.3. Survey and Analysis Method

This study conducted a survey to analyze the relationship between logistics safety culture, logistics safety compliance, corporate image and logistics performance, and the mediating effect of corporate image. The survey was conducted from February 21 to March 23, 2018. A total of 519 questionnaires were collected for this study, but 492 parts were used for the actual question analysis except 27 unfaithful ones. Some of the surveys were conducted directly at the training centers of incumbent logistics companies, and some were by email distribution and retrieval.

Collected questionnaires were analyzed using the SPSS 24.0 statistical package. In this study, exploratory factor analysis by principal component analysis, reliability analysis of Cronbach's Alpha Test, correlation analysis and regression analysis were performed. And Sobel-Test was conducted to verify the statistical significance of mediating effects.

4. Empirical Analysis Results

4.1. Respondents' Demographic Characteristics

Demographic characteristics of respondents are shown in <Table 2>. Respondents consisted of 316 males (64.2%) and 176 females (35.8%). By age, 259 respondents (52.6%) were the most in 31-40 years old, 121 respondents (24.6%) were below 30 years old, and 97 respondents (19.7%) were 41-50 years old. Respondents were also classified by rank, with 165 (33.5%) representatives, 139 general employees (28.3%), 109 managers (22.2%), 69 general managers (14.0%), and 10 executives. (2.0%). In terms of the size of employees, more than 1,001 employees were the most, with 174 (35.4%), with less than 300 employees were 204 (41.5%) and 301 to 1,000 employees were 114 (23.2%). In sales volume, the largest group was 137 respondents (27.8%) with more than KRW 1 trillion, 129 respondents (26.2%) were less than KRW100-500 billion, 91 respondents (18.5%) were less than 100-500 billion won, and 64 respondents (13.0%) were less than 10 billion won. 37 persons (7.5%)

were under 5,000 ~ 1 trillion won, and 34 persons (6.9%) were under 50 ~ 100 billion won. If they are classified by their work experience, 141 persons (28.7%) worked for 6-10 years, 131 persons (26.6%) were over 11 years old, 126 (25.6%) for 3 years or less, and 94 (19.1%) were for 4-5 years.

Table 2: Respondents' Demographic Characteristics

		Frequency	Rate (%)
Gender	Men	316	64.2
	Women	176	35.8
Age	30 and younger	121	24.6
	31~40 years	259	52.6
	41~50 years	97	19.7
	51 and older	15	3.0
Residence	Metropolitan Area	431	87.6
	Yeongnam Region	23	4.7
	Honam Region	7	1.4
	Chungcheong Region	26	5.3
	Others	5	1.0
Rank	General Employee	139	28.3
	Assistant Manager/Chief	165	33.5
	Manager/Team Leader	109	22.2
	General Manager	69	14.0
	Executives	10	2.0
Number of Employees	300 or fewer	204	41.5
	301~1,000	114	23.2
	1,001 More than	174	35.4
Sales Scale	Less than 10 Billion Won	64	13.0
	11~50 Billion Won	91	18.5
	51~100 Billion Won	34	6.9
	101~500 Billion Won	129	26.2
	501~1,000 Billion Won	37	7.5
	1,001 Billion Won More than	137	27.8
Career	3 years and less	126	25.6
	4~5 years	94	19.1
	6~10 years	141	28.7
	11 years and more	131	26.6
Total		492	100.0

4.2. Results of Reliability and Validity Analysis

In order to analyze empirically the relationship between safety culture, safety compliance, corporate image, logistics performance and the mediating effect of corporate image, this study analyzed the parameters of each variable based on previous researches on logistics and other industries. As for confirming the validity and reliability of the measurement items, this study conducted exploratory factor analysis and reliability analysis respectively. In the validity analysis, this study used principal component analysis, which is useful for extracting a small number of factors in the process of analysis and minimizing the loss of information. Varimax method was used for factor rotation. In general, eigen value was extracted based on 1.0 or more and the factor loading value was 0.5 or more. For exploratory factor analysis, 17

measurement items were used to derive four factors: logistics safety compliance, logistics performance, corporate image, and logistics safety culture. Since factor loadings were all calculated to be 0.5 or higher, this study confirmed that the validity was secured. KMO values are .865, and the other results showed as follows; X^2=3907.582, df=136, Sig=.000. The eigen values of each factor showed logistics safety compliance 5.767, logistics performance 2.582, corporate image 1.647, and logistics safety culture 1.156. The cumulative distributed explanatory power of four variables was found to be 65.597%. In addition, the reliability was verified through Cronbach's α analysis, which verifies the internal consistency between the measured items. In general, if the value of α is 0.7 or more, it is considerably good. As a result of the reliability analysis, the value of α was logistics safety compliance .827, logistics performance .850, corporate image .860, and logistics safety culture .771.

Table 3: Result of Factor Analysis and Reliability Analysis

	Logistics Safety Compliance	Logistics Performance	Corporate Image	Logistics Safety Culture
com2.	.815	.046	.184	.119
com1.	.803	.119	.112	.164
com3.	.714	-.030	.170	.229
com4.	.684	.165	.081	.321
com5.	.555	.044	.015	.309
per2.	.185	.828	.141	.023
per3.	-.042	.811	.142	.152
per1.	.236	.784	.177	.021
per4.	-.055	.781	.209	.176
ima2.	.155	.196	.867	.068
ima1.	.187	.227	.837	.105
ima4.	.180	.023	.804	.118
ima3.	-.010	.319	.704	.117
cul4.	.241	.133	.083	.773
cul2.	.194	.116	.074	.751
cul3.	.200	.001	.162	.709
cul1.	.353	.139	.075	.602
eigenvalue	5.767	2.582	1.647	1.156
% of variance	33.923	15.187	9.689	6.799
cumulative variance %	33.923	49.110	58.799	65.597
Cronbach's Alpha	.827	.850	.860	.771
KMO= .865, X^2=3907.582, df=136, p= .000				

4.3. Result of Correlation Analysis

In this study, Pearson correlation coefficient was used to analyze the correlation between logistics safety culture, logistics safety compliance, corporate image and logistics performance. As a result of the analysis, logistics safety culture, logistics safety compliance, corporate image and logistics performance showed statistically significant correlations. In particular, the correlation between logistics safety culture, logistics safety compliance, corporate image and logistics performance was relatively high. However, logistics performance was relatively low in the correlation

between logistics safety culture and logistics safety compliance.

Table 4: Result of Correlation Analysis

		Logistics Safety Culture	Logistics Safety Compliance	Corporate Image	Logistics Performance
Logistics Safety Culture	Pearson Correlation	1			
	Sig.				
Logistics Safety Compliance	Pearson Correlation	.579**	1		
	Sig.	.000			
Corporate Image	Pearson Correlation	.306**	.335**	1	
	Sig.	.000	.000		
Logistics Performance	Pearson Correlation	.279**	.237**	.439**	1
	Sig.	.000	.000	.000	

*<.05, **<.01, ***<.001

4.4. Result of Mediated Regression Analysis

This study conducted a three-step mediation regression analysis presented by Baron and Kenny (1986) to examine the relationship between logistics safety culture and logistics safety compliance, corporate image and logistics performance, and the mediating effect of corporate image.

The first stage of the analysis analyzed the effects of the independent variables such as logistics safety culture, and logistics safety compliance on the corporate image as a parameter. As a result of regression analysis, the explanatory power was 13.1% and the F-value was 36.826 (p <.001), indicating that this research model was statistically significant. Based on the regression coefficients, logistics safety culture (B = .172, p <.05) and logistics safety compliance (B = .277, p <.001) have a statistically significant positive effect on corporate image. Therefore, Hypothesis 1 and Hypothesis 2 were adopted that logistics safety culture and logistics safety compliance of logistics companies have a significant positive effect on corporate image. There is no existing research showing that safety culture and compliance in logistics have a significant effect on corporate image. However, compared with previous studies that the practice of safe transportation (Kim, 2017), ethical management (Su et al., 2015) and corporate social responsibility (Chang, 2007; Alrubaiee et al., 2016), this study can be interpreted as the same result. It is important to establish safety culture at the organizational level and to comply with safety at the individual level, which will allow companies to improve their image of the company.

In the second stage, the effects of the independent variable, logistics safety culture and logistics safety compliance on the dependent variable, logistics performance were analyzed. As a result of regression analysis, the explanatory power was 8.6% and the F value was 23.134 (p <.001). According to the regression coefficient analysis, logistics safety culture (B = .246, p <.001) and logistics safety compliance (B = .149, p <.05) have a statistically

significant positive effect on logistics performance. Therefore, Hypothesis 3 and Hypothesis 4 were adopted that logistics safety culture and logistics safety compliance of logistics companies have a positive effect on corporate image. There are not many existing studies analyzing the relationship between safety culture and safety compliance and logistics performance. However, this study is concerned with the relationship between logistics safety activities and logistics performance (Kim, 2017), the relationship between safety climate and accident reduction in freight transport (Zohar et al., 2015), and the relationship between safety culture and accident reduction in cargo handling operations (Shang. et al., 2011), comparing the relationship between safety culture and accidents in railway transportation (Wang & Liu, 2012), and confirming that the results of this study are identical to the existing studies that have a significant effect on each outcome. In addition, studies by Molenaar et al. (2009) and Chen et al. (2018) also show that safety culture has a significant impact on safety performance. A corporate should prioritize the value of safety in the logistics process because the establishment of a safety culture at the enterprise level and a worker safety compliance reduce safety accidents in logistics activities and have a positive effect on the performance of logistics companies.

In the third stage, the mediating effect of corporate image was analyzed in the relationship between logistics safety culture, logistics safety compliance and logistics. The explanatory power of the model was 21.6% and the F value was 44.795 (p <.001), which was statistically significant. In order for Model 3 to be significant in Step 3, Model 1 and Model 2 must be significant, and Model 3's regression coefficient must be smaller than Model 2's regression coefficient. As a result of analysis, both Model 1 and Model 2 are significant, and the regression coefficient of Model 3 (Logistics Safety Culture .171, Logistics Safety Compliance .029) is higher than that of Model 2 (Logistics Safety Culture .246, Logistics Safety Compliance .070). As a result of investigating the impact on logistics performance by inputting the independent safety culture and safety compliance as parameters and the corporate image as a parameter, it was found that corporate image had a significant positive effect on logistics performance (b = .436, p <.001), therefore Hypothesis 5 was adopted. Kim (2017), Lee and Lee (2014), Boonpattarakan (2012), Arendt and Brettel (2010), and Chang (2007) have shown the same results as previous studies that corporate image has a significant effect on performance. Improving corporate image has a positive impact on performance because it increases customer trust. It is true that customers of logistics companies are more shippers than ordinary consumers, and interest in improving corporate image may be less than other industries. However, based on the result that corporate image directly affects the logistics performance, it is necessary to prevent the negative impact on corporate image due to safety accidents occurring in the logistics process. Companies also need to improve their social awareness and image of logistics companies by actively implementing safety activities in the logistics process.

Table 5: Result of Mediated Regression Analysis

	Model1(Dependent: : Corporate Image)				Model2(Dependent: : Logistics Performance)				Model3(Dependent : Logistics Performance)			
	B	**S.E**	**β**	**p**	**B**	**S.E**	**β**	**p**	**B**	**S.E**	**β**	**p**
(Constant)	2.331	.225		.000***	1.830	.261		.000***	.815	.267		.002**
Logistics Safety Culture	.172	.053	.169	.001**	.246	.061	.214	.000***	.171	.057	.149	.003**
Logistics Safety Compliance	.277	.060	.237	.000***	.149	.070	.113	.033*	.029	.066	.022	.666
Corporate Image									.436	.049	.386	.000***
R²	.131				.086				.216			
F-Value	36.826				23.134				44.795			
p	.000***				.000***				.000***			

*<.05, **<.01, ***<.001

In addition, logistics safety culture had a significant effect on logistics performance, which was found to have a positive influence on logistics performance (B = .171, p = .01). However, logistics safety compliance did not have a significant effect on logistics performance, so it was found to have a positive effect on logistics performance with the complete corporate image (B = .029, p = .666). Therefore, both hypothesis 6 and hypothesis 7 were adopted. In the relationship between corporate image and performance, Lee and Lee (2014) confirmed that there was a partial mediating effect, and as for the studies by Alrubaiee et al. (2016) and Huang and Lien (2012), the mediating effect on performance through corporate image The same result of this study was obtained as confirmed. If safety culture and safety compliance are established in the logistics system, it directly affects corporate image enhancement and logistics performance improvement, but it also affects logistics performance ultimately pursued by logistics companies through corporate image. Therefore, in order for a logistics company to improve its performance, the safety of logistics activities must be secured, and it has a significant effect on performance as well as corporate image. In particular, logistics companies tend to neglect for safety activities because they have to invest additional costs for them. A corporate need to recognize that the cost of safety is not an extension cost anymore but investment in improving the corporate image and logistics performance.

Moreover, this study confirmed that corporate image has a partial mediation effect and a complete mediation effect in the relationship between logistics safety culture and logistics safety compliance. Two-sided verification of the Sobel Test was conducted to determine whether these effects were statistically significant. As a result, the test statistics (.075, p <.05) on indirect effects of logistics safety culture, corporate image, and logistics performance were statistically significant. Indirect effects of logistics safety compliance, corporate image, and logistics performance were .121 (p <.001), and mediating effects of corporate image were statistically significant.

Table 6: Result of Sobel-Test

	Indirect Effect	t-value	p
Logistics Safety Culture→ Corporate Image→Logistics Performance	.075	3.049	.002**
Logistics Safety Compliance→ Corporate Image→Logistics Performance	.121	4.098	.000***

5. Conclusions

As safety concerns spread after the Chernobyl nuclear accident, most industries are implementing various safety policies to prevent risks. Safety-related studies are continuously conducted in the construction and medical fields, but the researches in the distribution and logistics fields are quite lacking. Distribution and logistics processes have many potential risks in transportation or storage. A safety accident negatively affects not only human and material damages but also corporate image and corporate performance. Eventually, safety needs to be established and implemented at the company-wide level, which requires analyzing the relationship between safety and performance. This study empirically analyzes the relationship between logistics safety culture, logistics safety compliance and logistics performance of logistics companies and the mediating effects of corporate image, and suggests strategic implications. Based on previous studies related to logistics safety, safety culture, safety compliance, corporate image, and logistics performance, this study established a research model and hypothesis, and surveyed the employees of logistics companies. For the hypothesis test, this study carried out validity analysis, reliability analysis, correlation analysis, and mediation regression analysis, and verified the statistical significance of mediating effect of corporate image through Sobel's Test.

As a result of the empirical analysis, logistics safety culture and logistics safety compliance had a significant influence on corporate image and logistics performance, and corporate image also had a significant influence on logistics performance. In addition, as a result of verifying the mediating effect of corporate image, it was found that corporate image has a partial mediating effect between

logistics safety culture and logistics performance, and corporate image has a full mediating effect between logistics safety compliance and logistics performance. As a result of Sobel's Test, the mediating effect of corporate image was statistically significant.

Based on the research results, this study suggests the following implications. First, it is necessary to establish an interest, support and implementation strategy so that safety culture can be established at the overall level of the enterprise. Safety issues are generally not of great concern before an accident occurs. However, since accidents can result in significant losses, safety culture must be internalized throughout the logistics process before a safety accident occurs. In particular, companies need to have a top management concern and support for safety, safety regulations and manuals, safety communication, safety education and training, evaluation and compensation systems.

Second, safety compliance should be made at the individual worker level. Companies should work in accordance with safety procedures, such as safety regulations, manuals and work instructions for logistics processes, and make appropriate use of facilities and equipment for safety. Most logistics operations need to be completed quickly within a given time, and similar tasks are performed repeatedly, often neglecting safety regulations. At the logistics site, supervisors or safety managers should provide ongoing training and guidance, and ensure that workers' logistics practice is routine.

Third, in order to enhance the image of logistics companies, it must be fully recognized that the safety of logistics processes is important. In order to improve the reputation, recognition, and credibility of the company, the company should be a logistics company that is always secured. As a single accident can deteriorate corporate image, it is necessary to raise awareness and awareness about logistics safety.

Fourth, because logistics safety also contributes to the performance of logistics companies, companies should invest in training for safety and the expansion of safety facilities and equipment. This will not only improve logistics services but also improve the company's financial performance.

This study empirically analyzed the effect of logistics safety culture and logistics safety compliance on corporate image and performance that can occur in the business process of distributors and logistics companies. Therefore, this study suggests implications for the safety of logistics processes and has the significance of contributing to the spread of logistics safety. However, this study has the limitations of the study of the impact on perceived safety, such as accident reduction, or the relationship between safety and logistics, except for the relationship between logistics safety culture and logistics safety compliance and logistics performance. This needs to be clarified.

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