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# Determinants of Sustainability Performance in Pharmaceutical Distribution Industry

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## Abstract

**Purpose:** The objective of this study is to deepen our understanding of the key factors that determine sustainability in terms of suppliers based on the transactions between suppliers (pharmaceutical companies) and buyers (medical institutions) in the pharmaceutical distribution industry. **Research design, data and methodology:** Transaction justice factors were derived from three main components: distributive, procedural and interpersonal, five hypotheses were set up. The respondents from the data collected through an online survey are sales staff of pharmaceutical companies. Total of 319 questionnaires are collected and used to verify the hypotheses through the SPSS 22.0 and AMOS 22.0 programs. **Results:** Justice of transactions perceived by the salesperson of pharmaceutical companies was found to have a significant effect on the relationship commitment. Among them, procedural justice was found to have greatest relative influences. In addition, relationship commitment was found to have a significant effect on sustainability performance. Thus, all hypotheses were adopted. **Conclusions:** The results of this study, can be used as basic data for the guidelines for fair trade between pharmaceutical companies and medical institutions. In addition, it is expected that the study will have significance in that it examined sustainability through transactions with buyers from the viewpoint of suppliers.

**Keywords :** Justice, Relationship Commitment, Sustainability Performance, Pharmaceutical Distribution

**JEL Classification Code :** L14, M11, M31

## 1. Introduction

The global pharmaceutical market is worth \$1.24 trillion as of 2018 and has an average annual growth rate of 5.2% since 2014. The size of the Korean pharmaceutical market is about \$196 million in 2018, showing an average annual

growth rate of 4.5% over the five years. It ranked 12th in the global market and accounts for 1.6% of the pharmaceutical market (KPBMA, 2019). Additionally, during the same period, the employment growth rate of the pharmaceutical market in Korea was 8.6%, showing a sharp increase, more than twice that of all industries and eight times the manufacturing industry, attracting a future flagship industry to be in the limelight (Jung, 2019).

As such, the growth of both global and Korean pharmaceutical markets has increased the awareness and interest of pharmaceutical decision makers on 'sustainability' (Park, 2020). Sustainability refers to business performance, including not only the economic performance of the company but also the non-financial performance such as environmental and social aspects (Carter & Rogers, 2008; Woo et al., 2014). This concept

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draws attention because the social sensitivity of the company's negative events promotes the awareness of SRI (Socially Responsible Investment) (Schneider & Meins, 2012). This is not an exception to the pharmaceutical industry, which has negative issues such as rebates (Park, 2020). In order to strengthen legal regulations for the eradication of illegal pharmaceutical sales, the Korean government introduced the "Rebate two-out system" in 2014 after implementing the "Dual Punishment System" in 2010. The "Improper Solicitation and Graft Act" was implemented in 2016 and the "Sunshine Act" was introduced in 2018 to further strengthen ethical aspects for sustainable management of the pharmaceutical distribution industry (Suh et al., 2018; KPMB, 2017).

Despite such government regulations, unfair trades between the pharmaceutical industry and the medical community has not been eradicated, raising awareness of fair trade. According to the 2019 Index of Public Integrity released by The Anti-Corruption & Civil Rights Commission, the rate of rebate experience, meaning the rate of corruption experience in the process of contracting the medical instruments or medicines, came out to be 11.85%. This means that improvements have stagnated to similar levels, although they have fallen slightly (-0.05%p) compared to 2018. More specifically, looking at the rebate types, the direct and indirect receipt of money and valuables rose 0.29%p from 2018, and the direct and indirect receipt of convenience also rose 0.22%p year-on-year, indicating that unfair trade is still being carried out. The point here is that only 46 public medical institutions are subject to data released by the Anti-Corruption and Civil Rights Commission. Given that 93,184 of Korean medical institutions registered in the health insurance statistics provided by the National Health Insurance Service, the issue of the relationship between medical institutions and pharmaceutical companies is crucial in terms of sustainable management. The fundamental cause of unfair trade is the imbalance of power in the relationship between medical and pharmaceutical industries. Moreover, a partner with a low dependence shows domination in the business relationship (Buchanan, 1992).

The pharmaceutical company, the supplier, has a high dependency on selecting a drug at a medical institution in which a medical practitioner can interact with a specific company preferred by them without the decision of patient (Lee, 2011; Suh et al., 2018; Suh & Lee, 2017). In addition, the lack of new drug development which increased the number of suppliers and dependency on the distribution of generic drugs, highlighted the necessity to concentrate on forming relationships with buyers in order to gain competitive advantage (Arun, 2020). In this power imbalance, salesperson is more likely to engage in extra-role behavior (Ahmad, 2020) and unethical behavior to

improve sales performance (Wedatama & Sukaatmadja, 2019).

However, as the results of the study show that securing justice in the transaction relationship between pharmaceutical companies and medical institutions has a positive effect on the performance of pharmaceutical companies. In this respect, the importance of transaction justice is increasing in terms of improving performance even if unethical behavior such as rebate is not accompanied by sales activities (An et al., 2020; Suh et al., 2018; Suh & Lee, 2017). In the traditional manufacturing sector, studies have been actively conducted to improve the level of relationship between trading parties and the performance of companies (Wang et al., 2014; Liu et al., 2012; Kumar et al., 1995) but it showed relatively insufficient studies for a future leading industry. Particularly, there is a limit that a number of studies on sustainability cannot embrace the supplier's perspective from the buyer's perspective (Baliga et al., 2019; Ageron et al., 2012).

The objective of this study is to deepen our understanding of the key factors that determine sustainability in terms of suppliers based on the transactions between suppliers (pharmaceutical companies) and buyers (medical institutions) in the pharmaceutical distribution industry. First, the justice of the transaction perceived by the supplier in the relationship between the supplier pharmaceutical company and the buyer medical institution is identified. Second, this study examines how the supplier-perceived transaction justice affects the relationship with the buyer; third, it analyzes whether the relationship between the supplier and the buyer affects the sustainability of the supplier. The results of this study, which are derived from the above purpose, can be used as basic data for the guidelines for fair trade between pharmaceutical companies and medical institutions. In addition, it is expected that the study will have significance in that it examined sustainability through transactions with buyers from the viewpoint of suppliers.

## **2. Theoretical Framework**

### **2.1. Justice**

Adams (1963) presented the justice based on an exchange relationship between individuals and organizations which can be applied to all various environments where the exchange take place. The initial study on justice mainly focused on distributional justice related to equity as a ratio of input and outcome (Adams, 1963), but procedural justice emerged in the context of the opinion that justice of the procedures and processes were as important as distribution (Folger, 1977). In the following,

Bies & Moag (1986) suggested interpersonal justice by asserting that the interpersonal justice between individuals, which was recognized as part of procedural justice, is a different dimension. Therefore, the sub-factors of justice consist distributive, procedural, and interpersonal justice.

In this study, justice is based on the perception of the counterparty's behavior in the buyer-supplier relationship (Jokela & Söderman, 2017). In these relationship, distributive justice as a firm perception of the justice of the benefits received from relationships (Luo, 2007). Procedure justice is the justice of the procedure in which the transaction is made, including the consistency of the procedure, the accuracy of the procedure, the possibility of modification of the procedure, and the ethics of the procedure (Leventhal, 1980; Kumar et al., 1995). Finally, interpersonal justice means justice in terms of interpersonal relationships received from the other party in the whole process of transaction and includes buyer respect for the supplier and behavior of politeness (Liu et al., 2012).

The importance of transaction justice from the buyer-supplier perspective is due to the positive impact on the relationship (Liu et al., 2012). The lower the justice of a transaction, the more conflicts between parties can be induced (Kang & Jindal, 2015; Morgan & Hunt, 1994) and the quality of engagement can be reduced (Beugre & Acar, 2008). On the contrary, ensuring justice between buyers and suppliers facilitates the formation of long-term relationships and increases the possibility of investment by partners due to reduced uncertainty (Huo et al., 2016). Furthermore, it reduces unethical behavior (Kaynak et al., 2015), and can improve confidence levels in partners (Ziaullah et al., 2015).

## 2.2. Relationship Commitment

Relationship Commitment is defined as the degree to which a relationship is intended to maintain a valuable relationship with a partner by implicit or explicit agreement to relationship continuity between the parties in a transaction relationship (Dwyer et al., 1987; Morgan & Hunt, 1994). Since commitment affects the intention to continue or terminate the transaction relationship, it plays an important role in establishing an essential and continuous relationship of buyer-supplier and securing a competitive advantage in the market (Sohn et al., 2013). This is because the commitment affects the performance by expanding the mutual benefits through the partnership between trading partners (Archer et al., 2006). Therefore, relationship commitment is a factor that determines the sustainability of a company (Yang et al., 2010).

The relationship commitment has a characteristic that does not change easily once it is formed (Moorman et al., 1992). Therefore, many researchers have explored for the antecedents that affect long-term relationship commitment.

In particular, the perceived justice of transactions between buyers and suppliers is regarded as a strong preceding factor (Kaynak et al., 2015; Griffith et al., 2006). If the transaction is not fair, the relationship can be terminated without securing the stability (Duffy et al., 2013). However, the fair transaction process motivates the work performance and creates suitable work environments (Ellis et al., 2009). In such a way, justice is an essential element in ensuring the continuous relationship (Luo, 2007).

Luo et al. (2015) argued that distribution justice improves the quality of relationships by investing in long-term relationships and improving the level of trust in trading partners, while Kaynak et al. (2015) showed that distribution justice had a positive impact on the continuity of the relationship. Griffith et al. (2006) proved that the continuity of the relationship is improved by recognizing justice of the procedure from the trading partner, and Al-Ma'aitah (2018) argued that the recognizing procedural justice increases the opportunity to enhance the level of relationship commitment. In the same context, Yim (2017) proved that the higher the level of procedural justice forms relationship stronger. Next, the recognition of interpersonal justice in transactions reduces uncertainty about relationship, which makes them willing to invest more in buyer-supplier relationships (Luo et al., 2015). In the same context, Liu et al. (2012) showed that interpersonal justice had a significant effect on commitment.

The above results suggest that the transaction justice perceived by the supplier can have a positive effect on the relationship commitment even in the transaction between the salesperson of the pharmaceutical company and the doctor who is the supplier in the drug distribution process. Therefore, this leads to the following hypotheses:

- H1** : Distributive justice perceived by the salesperson of the pharmaceutical company will have a positive effect on the relationship commitment
- H2** : Procedural justice perceived by the salesperson of the pharmaceutical company will have a positive effect on the relationship commitment
- H3** : Interpersonal justice perceived by the salesperson of the pharmaceutical company will have a positive effect on the relationship commitment

## 2.3. Sustainability Performance

Sustainability includes the environment and social aspects, which are non-financial achievements, to overcome the limitations that financial performance alone cannot provide information about a company's overall performance (Kocmanova & Simberova, 2012). Carter & Rogers (2008) presented a conceptual framework for sustainability based on three pillars: economic, social and environmental

performance.

Economic sustainability is the most basic performance for a company to exist, which refers to the performance associated with increasing profits and reducing costs (Park et al., 2018). Environmental sustainability is associated with the choice of an eco-friendly supplier from the buyer's perspective of the manufacturing supply chain to minimize environmental pollution problems (Kaur & Singh, 2018). Social sustainability refers to achievements related to fulfilling the needs of society with key internal and external stakeholders (Awan et al., 2018). Crane & Matten (2004) argued that the three axes are interdependent with each other and should be maintained and managed together. In this study, we excluded environmental sustainability from the scope of research because the supplier's chain related to drug distribution does not mean that the doctor who is a buyer produces new medicines distributed by pharmaceutical companies. Therefore, sustainability in this study deals only with economic sustainability and social sustainability.

In order to create sustainability in the supply chain, it is necessary to pay attention to the cooperative relationship between buyers and suppliers (Seuring & Müller, 2008). In an uncertain business environment, as concerns about a company's sustainability increase, establishing a rapport within partners can produce greater performance than a relationship that is not (Touboulic et al., 2014; Noordewier et al., 1990). This is because the longer the members in the distribution path have a long-term perspective, the better the quality of the relationship, which reduces transaction costs and opportunistic behavior (Luo et al., 2015; Dyer & Singh, 1998; Lassar & Zinn, 1995). Therefore, relationship commitment, which means a long-term and valuable relationship, is a primary source for reaching a high sustainability (Whelan & Fink, 2016). In this context, Palmatier et al. (2007) and Park et al. (2018) mentioned that the relationship commitment with the trading partner has a strong effect on the overall economic performance including sales growth. Moreover, Lee (2016) showed that the relationship commitment has a positive effect on economic performance as well as social performance. Instead, Syed et al. (2020)'s study shows that relationship commitment has a positive effect on economic performance, but does not have a significant effect on social performance. This indicates that the results can vary depending on the object or environment of the study. Based on these results, we expect the following hypotheses to uncover a prominent relationship.

**H4** : Relationship commitment between salespeople of pharmaceutical companies and medical institutions will have a positive effect on economic sustainability of pharmaceutical companies

**H5** : Relationship commitment between salespeople of pharmaceutical companies and medical institutions will have a positive effect on social sustainability of pharmaceutical companies

### 3. Methodology

#### 3.1. Research model

The research model was set as shown in <Figure 1> based on the previous research.

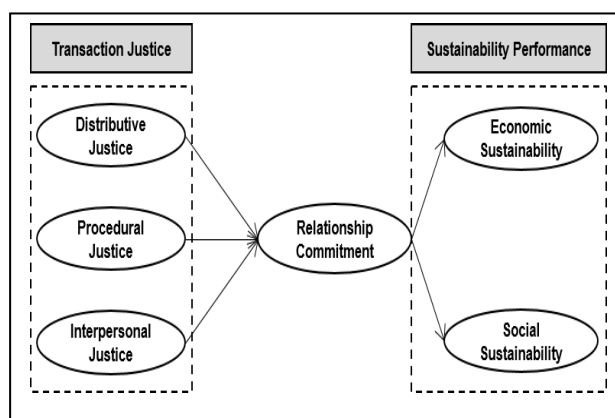


Figure 1: Research Model

#### 3.2. Measurement of variables

In order to measure the construct of this study, the questions that have proven reliability and validity from previous studies were adopted. In addition, some modifications were used in accordance with this study through a specialist who worked in the sales position of a pharmaceutical company for more than 10 years. First, distribution justice among transaction justice was composed of 4 questions by referring to the studies of Liu et al. (2012) and Kumar et al. (1995). It is the justification of the effort compared to the effort invested, the possibility of obtaining additional results through additional efforts, the satisfaction of the result, and the justification of the result. Procedural justice refers to the studies of Liu et al. (2012) and Kumar et al. (1995), and consists of 4 questions, including the possibility of presenting opinions, consistency of the procedure, fairness of the procedure, and the possibility of objection. Interpersonal justice refers to the studies of Liu et al. (2012) and Dwyer et al. (1995), and consists of 4 questions including polite attitude, listening, respectful attitude, and kindness. Next, the relationship commitment was borrowed from the research of Morgan & Hunt (1994) and consisted of 4 questions: willingness to continue trading,

intention to maintain close relationship, acceptance of losses due to continued trading, and conviction of long-term relationship. Lastly, for the questionnaire on the sustainability performance, the research of Lee (2016) and Lee (2015) was referenced. Economic sustainability consisted of 4 questions including an increase in sales, an increase in drug sales, an increase in intention to re-trade, and a decrease in all costs for sustainable transactions. Social sustainability was composed of 4 questions including reputation, improvement of trust in the company, practice of legal/ethical responsibility management, and formation of cooperative relationships with stakeholders.

### 3.3. Sample design and Analysis method

The subject of this study is a pharmaceutical company salesperson, and the non-probability sampling method was selected as the convenient sampling method. However, as for the type of pharmaceutical company to which the respondent belongs, a 4:1 ratio was selected considering that 180 domestic pharmaceutical companies registered with the Korea Pharmaceutical and Bio-Pharma Manufacturers Association (KPBMA) and 44 multinational pharmaceutical companies registered with the Korean Research-based Pharmaceutical Industry Association (KRPIA). To comply COVID-19 regulations, we performed online survey with Google Survey to minimize any chances of infection cause by face-to-face. The survey period was conducted for one month from July 24 to August 23, 2020. A total of 340 copies were collected, but 319 copies were used for empirical analysis, excluding 21 unscrupulous questionnaires, such as standardized estimate of  $\pm 3$  or more or responding identically to all questions. For the analysis, the SPSS v.22 and AMOS v.22 programs were used to perform frequency analysis, validity and reliability tests, and path analysis for hypothesis testing.

## 4. Results

### 4.1. Sample characteristics

<Table 1> shows the demographic characteristics of respondents. First of all, in the case of gender, 94% were male and 6% were female, which can be said to be a result of reflecting the characteristics of pharmaceutical salesperson with a high proportion of men. Looking at the age of respondents, it was confirmed that the 40s accounted for the largest proportion with 43.3%. As for the types of pharmaceutical companies to which the respondents belong, 80.6% were domestic pharmaceutical companies and 19.4% were multinational pharmaceutical companies. The period of transactions with the main hospital was 6 to 10 years,

accounting for the largest share of 29.8%. Lastly, the types of major hospital were similar to Semi Hospital (43.6%) and Tertiary Hospital (40.1%).

**Table 1:** Demographic Characteristics (n = 319)

Division		n	%
Gender	Male	300	94.0
	Female	19	6.0
Age	20-29	23	7.2
	30-39	129	40.4
	40-49	138	43.3
	More than 50	29	9.1
Company type	Domestic	257	80.6
	Multinational	62	19.4
Transaction period of partner hospital (year)	Less than 3	74	23.2
	3-5	67	21.0
	5-10	95	29.8
	10-15	50	15.7
	More than 50	33	10.3
Hospital type	Semi hospital	139	43.6
	General Hospital	52	16.3
	Tertiary Hospital	128	40.1

### 4.2. Construct Validity and Reliability

Confirmatory factor analysis (CFA) and Cronbach's alpha analysis were conducted to verify the validity and reliability of the construct. First, the AVE value and CR value were calculated through CFA. If the AVE is 0.5 or more and the CR is 0.7 or more, it is considered that convergent validity is secured (Bagozzi & Yi, 1988). As shown in <Table 2>, AVE was 0.646~0.744 and CR was 0.885~0.920, which secured the convergent validity of the measurement items used in this study. Next, the discriminant validity was examined by comparing the AVE square root of each construct and the correlation coefficient between the constructs. If the square root of AVE is greater than the correlation coefficient with other concepts, discriminant validity is considered (Fornell & Larcker, 1981). As a result of the comparison, the square root of AVE of the 6 constructs was larger than the correlation coefficient with other concepts, thus ensuring discriminant validity <Table 3>. Finally, the reliability was confirmed through the calculation of Cronbach's alpha coefficient. As shown in <Table 2>, the Alpha coefficient was 0.903~0.938, which was higher than 0.7 suggested by Nunnally (1978), confirming that there was no problem in reliability.

**Table 2:** Results of CFA (Confirmatory Factor Analysis)

Variables	Measurement Items	Factor Loading	AVE (≥0.5)	C.R. (≥0.7)	Alpha (≥0.7)
Distributive Justice	justification of the effort compared to the effort invested	.887	.706	.906	.933
	possibility of obtaining additional results through additional efforts	.861			
	satisfaction of the result	.878			
	justification of the result	.901			
Procedural Justice	possibility of presenting opinions	.867	.688	.898	.927
	consistency of the procedure	.921			
	fairness of the procedure	.867			
	possibility of objection	.833			
Interpersonal Justice	polite attitude	.863	.742	.920	.938
	listening	.869			
	respectful attitude	.911			
	kindness	.920			
Relationship Commitment	willingness to continue trading	.930	.744	.920	.938
	intention to maintain close relationship	.938			
	acceptance of losses due to continued trading	.809			
	conviction of long-term relationship	.876			
Economic Sustainability	increase in sales	.908	.646	.878	.903
	increase in drug sales	.933			
	increase in intention to re-trade	.853			
	decrease in all costs for sustainable transactions	.683			
Social Sustainability	reputation, improvement of trust in the company	.857	.658	.885	.905
	improvement of trust in the company	.756			
	practice of legal/ethical responsibility management	.862			
	formation of cooperative relationships with stakeholders	.810			

CMIN/df = 1.488, RMR = 0.027, GFI = 0.906, NFI = 0.925, TLI = 0.967, CFI = 0.974, RMSEA = 0.046

**Table 3:** Discriminant Validity

Constructs	Mean	S.D	1	2	3	4	5	6
1. Distributive Justice	5.138	1.096	(0.840)					
2. Procedural Justice	4.768	1.136	0.610**	(0.829)				
3. Interpersonal Justice	5.118	1.067	0.501**	0.580**	(0.861)			
4. Relationship Commitment	5.373	1.063	0.602**	0.558**	0.627*	(0.862)		
5. Economic Sustainability	5.230	1.018	0.460**	0.454**	0.396**	0.567**	(0.804)	
6. Social Sustainability	5.485	0.913	0.468**	0.448**	0.503**	0.624**	0.566**	(0.811)

\*\* p<0.01

( ) square root of AVE

### 4.3. Path analysis - Model testing

Path analysis was performed to examine the causal relationship between transaction justice, relationship

commitment, and sustainability performance, which are the objectives of this study. Before examining the coefficients for the path, the fitness index for the study model was confirmed. The goodness-of-fit index was CMIN/df=1.386,

RMR=0.065, GFI=0.922, NFI=0.956, TLI=0.985, CFI=0.987, and RMSEA=0.035. Next, as a result of the hypothesis test, all hypotheses were adopted <Table 4>.

**Table 4:** Summary of Hypotheses Test Results

Variable		Standard Estimate	P-Value		Result
Independent	Dependent		t	F	
Distributive Justice	Relationship Commitment	0.219	4.044	***	accepted
Procedural Justice	Relationship Commitment	0.404	6.598	***	accepted
Interpersonal Justice	Relationship Commitment	0.322	6.126	***	accepted
Relationship Commitment	Economic Sustainability	0.582	10.655	***	accepted
Relationship Commitment	Social Sustainability	0.715	12.137	***	accepted

Note: \*\*\* p <0.001

Specifically, distribution justice ( $\beta=0.219$ ,  $t=4.044$ ), procedural justice ( $\beta=0.404$ ,  $t=6.598$ ), interpersonal justice ( $\beta=0.322$ ,  $t=6.126$ ) perceived by a pharmaceutical company salesperson in a transaction with a hospital Hypothesis 1, Hypothesis 2, and Hypothesis 3 were adopted as all of them had a statistically significant positive effect. From this, it can be seen that among the three types of transaction justice, procedural justice has a relatively greater influence on relationship commitment than distribution justice and interpersonal justice. Next, the effects of relational commitment on economic sustainability ( $\beta=0.582$ ,  $t=10.655$ ) and social sustainability ( $\beta=0.715$ ,  $t=12.137$ ) were statistically significant, and

hypothesis 4 and hypothesis 5 were also adopted. Through this, it can be interpreted that the more the relationship commitment is strengthened, the better the sustainability performance.

In addition, we examined the indirect effects of the relationship commitment between transaction justice and sustainability performance by doing the bootstrapping test using phantom variable. As a result, we found the relationship commitment in the path between transaction justice and sustainability performance has an indirect effect. Table 5 shows the indirect effect coefficient and significance level for each path.

**Table 5:** Results of indirect effect test

path	Indirect Effects		
	B	S.E	p
Distributive Justice → Relationship Commitment → Economic Sustainability	.122	.037	.004**
Procedural Justice → Relationship Commitment → Economic Sustainability	.240	.045	.002**
Interpersonal Justice → Relationship Commitment → Economic Sustainability	.179	.036	.005**
Distributive Justice → Relationship Commitment → Social Sustainability	.114	.031	.004**
Procedural Justice → Relationship Commitment → Social Sustainability	.224	.041	.004**
Interpersonal Justice → Relationship Commitment → Social Sustainability	.167	.034	.006**

Note: \*\*\* p <0.01

## 5. Conclusions

### 5.1. Summary and implications

This study aims to explore the factors that determine the sustainability of suppliers based on transactions between buyers and suppliers in the pharmaceutical distribution industry. To this end, the three dimensions of transaction

justice were proposed and demonstrated as a leading factor in the consolidation of relationships that could improve sustainability and the relationship between them was demonstrated. The results of this study are summarized as follows.

First, it was shown that the transactional justice perceived by the salesperson of the pharmaceutical company had a significant effect on the commitment of the relationship with a doctor who is a buyer. In particular, process justice was found to have the greatest effect among

the three factors (distributive, procedural and interactional) of transaction justice. Second, the association of relationships between suppliers and buyers has been shown to have a positive effect on both the economic sustainability and social sustainability of the pharmaceutical companies to which the supplier belongs. This can be interpreted as the higher the level of relationship cohesion, the higher the sustainability. thereby, we can interpret that the higher level of relationship commitment, the increase in sustainability.

As part of academic implications, first, the study on sustainability in the supply chain where suppliers and buyers exist has been mainly done from the perspective of buyers (Baliga et al., 2019; Ageron et al., 2012) but this study is different from the previous study in that it was done from the perspective of suppliers. Second, this study is significant in that the research on the relationship between the supplier and the buyer was added by conducting a study on the pharmaceutical distribution industry, which had a difference in perception between the buyer and the supplier, but the research was insufficient. Although the pharmaceutical distribution industry is interested in the national level and has established and managed a system to eradicate unfair trade, it still has negative issues such as rebates. Negative issues affect performance due to increased social sensitivity and increased importance of socially responsible investment. Therefore, it can be said that it is a significant matter to examine the trade fairness of the pharmaceutical distribution industry where unfair trade exists.

Likewise, the practical implications are as follows: First, the importance of fair trade can be presented in eradicating illegal pharmaceutical business. The results of this study show that the justice of distributive, procedural, and interpersonal perceived by salesperson of pharmaceutical companies strengthens the level of relationship commitment for buyers and improves sustainability. This means that the more the transaction process with the buyer, the human interaction, and the outcomes are perceived to be fair, the level of maintaining a valuable relationship with the buyer increases which has a positive impact on sustainability in the long term. Therefore, it is necessary to recognize the importance of fair trade in preparing guidelines for eradicating illegal pharmaceutical sales. In South Korea, doctors who have a relatively low dependence on transactions due to the large number of generic drugs have an advantage over pharmaceutical salespeople. Thus, doctors are likely to change contracts to other pharmaceutical companies, and pharmaceutical salesperson can act negatively due to anxiety about termination of transactions. These extra-role behaviors may have a positive effect on short-term performance but can cause a negative effect on its performance in the long term. Accordingly, securing transactional justice for reduce

unnecessary behavior and improve the level of trust between partners can be suggested as an important factor for eradicating illegal pharmaceutical sales (Kaynak et al., 2015; Ziaullah et al., 2015).

Second, it was confirmed that commitment with buyers was essential for the sustainability and improvement of pharmaceutical companies. In other words, pharmaceutical companies should strive to form a relationship with buyers to improve their economic sustainability and social sustainability. Studies have shown that commitment has a particularly strong impact on social sustainability, which can be expected to reduce the need for unethical behavior by expanding mutual benefits through partnerships between trading parties (Archer et al, 2006). Therefore, it is necessary to explore ways to strengthen the relationship with the buyer on the premise of a fair transaction situation. For example, conflict management (Sahin & Robinson, 2002), communication (Turn & Urban, 2001), and sharing activities (Kim et al., 2016) can be suggested.

Third, it can be seen that interpersonal justice has become an important variable for the relationship commitment in transactions between pharmaceutical companies and medical institutions over time. In the study by Suh & Lee (2017), interpersonal justice did not affect relationship commitment. However, this study has shown that it has a greater impact than distribution justice. In the case of procedures and distribution, it is possible to manage with a set of minimum regulation or system. However, since the interpersonal justice depends on the attitude of the parties, there is a large variation according to the tendency of the doctor. Moreover, in the past, signing contracts for pharmaceuticals became a more fundamental purpose, so it is likely that they were less interested in human attitudes. Furthermore, it is believed that the awareness of the interaction between the parties to the transaction has improved due to following conditions: the state-level restrictions, the social atmosphere of fair trade, and the ethical management of pharmaceutical companies. Therefore, discussions between pharmaceutical companies and medical institutions are needed on ways to have positive interactions to ensure fairness in drug transactions.

## **5.2. Limitation and future research**

The limitations of this study were, first, internal facilitation factors were not considered because the focus was on the justice of the supplier-buyer relationship in the distribution of medicines and the consideration of the association with the buyer to see if they would improve sustainability. Cucchiella et al. (2012) presented strategies, functions and human factors as internal facilitators for sustainability, while Lee (2015) showed significant effects on all three of the lower factors of sustainability. Therefore,



in subsequent studies, external factors such as fair trade need to be considered as well as internal factors. Second, this study is meaningful in that it conducted the study from the perspective of a relatively dependent supplier, but it may differ from the perception level of the buyer. Thus, if we develop a research by bilateral analysis in pairs of suppliers and buyers, the difference in recognition level between trading partners can be considered. Finally, this study has a limitation that it did not include the transaction relationship with the buyer who belongs to the clinic by limiting the size of the medical institution to the hospital level. Therefore, further studies including the level of members are needed to generalize the results of the study.

Conclusions, the main conclusions of the study may be presented in a short Conclusions section, which may stand alone.

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