Journal of Global Business and Trade
Vol. 19 No. 1 February 2023

1 Does Membership in Agricultural Cooperatives Improve Marketing Efficiency? Insights from Smallholder Coffee Farmers in Selected Provinces of the Philippines
Liezel S. Cruz, Agham C. Cuevas, Jan Danica S. Asma, JP Roma D. Duque, Beah M. Orlina

15 Do Rewards Build Importer Compliance and Commitment in Overseas Trade?
Sun-Ki Lee, Kyung-Jae Lee

39 Firm-Specific Investor Sentiment, Confirmation Bias, and Market Response to Earnings Information
Su-Young Choi, Heejeong Shin

57 Preparation for Digital Transformation: A Case and Empirical Findings of South Korean Multinational Corporations
Joonghak Lee, Youngwoo Kim, Jisang Kang

75 Establishing EU Norms as a Global Actor: Application of New Concepts in FTAs
Bong-Chul Kim, Eui-Chan Shin, Kyung-Eun Park

91 Environmental, Social, and Governance Performance and Corporate Sustainable Development in China
Xuan Wang, Shanyue Jin

109 A Review of Incomplete Agreements and the Formation of a Sales of Goods Contract
Sun-Ok Kim

125 Effect of Empowerment on Perceived Person-Environment Fit and Work Engagement: Focusing on Online Travel Platform Employees
Ji-Young Um, Hye-Yeon Park, Sun-Young Yoon

143 A Study on the Effect of FTA Preferential Rules of Origin (PRoO) on Implementation of Preferential Tariff and Export Performance: Focusing on Start-Up Companies
In-Seong Lee, Sok-Tae Kim

157 Does Commodity Trade Openness Beneficial to the Tourism Sector in Korea?
Soo-Eun Kim, Jun Ho Seok

173 The Spillover Effects of Privatization on Efficiency and Income Inequality in China
Xinyu Li, Sunghwan Kim, Yongshang Liu

193 Research on the Influencing Factors and Transformation Path of Logistics Enterprise Low-Carbon Performance
Jian Li, Seung-Lin Hong

International Academy of Global Business and Trade

Journal of Global Business & Trade Vol. 19 No. 1 February 2023 IAGBT

ISSN 1946-5130 (Print)
ISSN 2470-4733 (Online)

Journal of Global Business and Trade
Vol. 19 No. 1 February 2023

Published by
International Academy of Global Business and Trade

The Journal of Global Business and Trade
IAGBT
www.pfw.edu/jgbt

Journal of Global Business and Trade

indexed and abstracted in **SCOPUS**

ISSN 1946-5130 (Print)
ISSN 2470-4733 (Online)

About Journal

Journal of Global Business and Trade (JGBT) is the official publication of the International Academy of Global Business and Trade (IAGBT) and is published by IAGBT on a semiannual basis. JGBT is the leading peer-reviewed, scholarly journal that publishes research across the entire range of topics encompassing the domain of global business and trade.

JGBT aims to be a resource for the advancement of the theoretical foundations and the practical applications in the context of Asia-Pacific global business, trade and economy. The journal takes a broad perspective of the global economy by covering many vibrant sectors such as manufacturing, retailing, international trade, agricultural economy, tourism, and information technology, just to name a few. The journal will publish research papers, reports, and commentaries of significant interest to the community engaged in global business and trade. By being a conduit for sharing intellectual ideas and opinions among the academia and individual global industry sectors, the journal aims to bridge the gap between research and sound decision-making.

JGBT is the only business journal that highlights a diversity of perspectives through research papers, reports, and commentaries of significant interest to the international business and trade community.

JGBT enhances sound research through quick and constructive review of the manuscripts submitted.

JGBT aims to appeal to academics, government representatives, business major students, business and industry professionals, and trade organizations.

ISO abbreviation of journal title

The official title of the journal is 'Journal of Global Business and Trade' and the abbreviated title is 'J. Glob. Bus. Trade'

Year of launching (history)

Journal of Global Business and Trade was launched in 2005.

Availability of the full-text in the web

Full text is freely available from: https://www.pfw.edu/jgbt

Fund support

This journal was supported by the International Academy of Global Business and Trade.

Index in database

The articles published in this journal are indexed and/or abstracted in SCOPUS, EBSCO, ProQuest, Exribris, and GoogleScholar.

Subscription information

All correspondences regarding membership, subscriptions and changes of address should be sent to the society addressed as below:
International Academy of Global Business and Trade, 2101 E. Coliseum Boulevard, Fort Wayne, IN 46805, U.S.A. (Tel: 1.260.481.6794, Fax: 1.260.481.6879, E-mail: myeonghwan.kim@pfw.edu, Homepage: https://www.pfw.edu/jgbt). The annual subscription fees are free of charge.

Submission

The IAGBT operates an on-line submission system. Details of how to submit online and full author instructions can be found at: https://www.pfw.edu/jgbt. Manuscripts should be submitted to the on-line submission system at http://www.jgbt.us following all prompts on the screen. Other correspondences can be sent by e-mail to the editor Myeong Hwan Kim at myeonghwan.kim@pfw.edu.

Peer review under responsibility of International Academy of Global Business and Trade.

Journal of Global Business and Trade Volume 19, Number 1

Published 28 February 2023

Publisher (Editorial office)

International Academy of Global Business and Trade founded in 2005,
2101 E. Coliseum Boulevard, Fort Wayne, IN 46805, U.S.A. (Tel: 1.260.481.6794, Fax: 1.260.481.6879,
E-mail: myeonghwan.kim@pfw.edu, Homepage: https://www.pfw.edu/jgbt).

Editorial Staff

The Journal of Global Business and Trade (JGBT) editorial team is committed to providing subscribers with the best quality articles in a timely manner, ensuring a journal that subscribers will find stimulating and useful in their teaching and professional activities.

Journal of Global Business and Trade

Vol. 19 No. 1 February 2023

1 Does Membership in Agricultural Cooperatives Improve Marketing Efficiency?: Insights from Smallholder Coffee Farmers in Selected Provinces of the Philippines
Liezel S. Cruz, Agham C. Cuevas, Jan Danica S. Asma, JP Roma D. Duque, Beah M. Orlina

15 Do Rewards Build Importer Compliance and Commitment in Overseas Trade?
Sun-Ki Lee, Kyung-Jae Lee

39 Firm-Specific Investor Sentiment, Confirmation Bias, and Market Response to Earnings Information
Su-Young Choi, Heejeong Shin

57 Preparation for Digital Transformation: A Case and Empirical Findings of South Korean Multinational Corporations
Joonghak Lee, Youngwoo Kim, Jisang Kang

75 Establishing EU Norms as a Global Actor: Application of New Concepts in FTAs
Bong-Chul Kim, Eui-Chan Shin, Kyung-Eun Park

91 Environmental, Social, and Governance Performance and Corporate Sustainable Development in China
Xuan Wang, Shanyue Jin

The Journal of Global Business and Trade
IAGBT
www.pfw.edu/jgbt

Journal of Global Business and Trade

Vol. 19 No. 1 February 2023

109 A Review of Incomplete Agreements and the Formation of a Sales of Goods Contract
Sun-Ok Kim

125 Effect of Empowerment on Perceived Person-Environment Fit and Work Engagement: Focusing on Online Travel Platform Employees
Ji-Young Um, Hye-Yeon Park, Sun-Young Yoon

143 A Study on the Effect of FTA Preferential Rules of Origin (PRoO) on Implementation of Preferential Tariff and Export Performance: Focusing on Start-Up Companies
In-Seong Lee, Sok-Tae Kim

157 Does Commodity Trade Openness Beneficial to the Tourism Sector in Korea?
Soo-Eun Kim, Jun Ho Seok

173 The Spillover Effects of Privatization on Efficiency and Income Inequality in China
Xinyu Li, Sunghwan Kim, Yongshang Liu

193 Research on the Influencing Factors and Transformation Path of Logistics Enterprise Low-Carbon Performance
Jian Li, Seung-Lin Hong

The Journal of Global Business and Trade
IAGBT
www.pfw.edu/jgbt

ISSN 1946-5130 (Print), ISSN 2470-4733 (Online)
http://dx.doi.org/10.20294/jgbt.2023.19.1.1

The Journal of Global Business and Trade

Journal of Global Business and Trade

https://www.pfw.edu/jgbt

Does Membership in Agricultural Cooperatives Improve Marketing Efficiency?: Insights from Smallholder Coffee Farmers in Selected Provinces of the Philippines

Liezel S. Cruz[a]*, Agham C. Cuevas[b], Jan Danica S. Asma[a], JP Roma D. Duque[a], Beah M. Orlina[a]

[a]*Institute of Cooperatives and Bio-Enterprise Development, University of the Philippines Los Baños, Philippines*
[b]*Department of Economics, University of the Philippines Los Baños, Philippines*

Received 26 February 2022, Revised 15 January 2023, Accepted 5 February 2023

ABSTRACT

Purpose – Cooperatives are people-centric organizations that are organized to meet the common needs of their members. One key goal for the establishment of agricultural cooperatives is to help improve the marketing efficiency of their members. This study aimed to analyze the correlation between cooperative membership and marketing efficiency among coffee farmers in the provinces of Cavite, Benguet, and Mountain Province, Philippines.
Design/Methodology/Approach – Primary and secondary data were gathered in the study. Linear regression with endogenous treatment was used to analyze the data which examined both observable and unobservable factors affecting the treatment, cooperative membership, potential outcome, and the marketing efficiency.
Findings – The results of the study revealed that the average farmer generated USD0.85 more farm income for every peso spent on marketing activities if he/she was a member of an agricultural cooperative. This implied that membership positively improved the marketing efficiency of coffee farmers. Moreover, farmers who sold their processed coffee to cooperatives and who had price access were observed to have higher marketing efficiency. Farmers who were females, adopted more processing technologies, took longer to search for price information, sold to cooperatives, had more coffee experience, and whose farms were located away from technology sources were more likely to become cooperative members.
Research Implications – The study recommended the promotion of cooperative membership among farmers to improve their marketing efficiency and capacity-building activities related to the technology adoption and management of cooperatives.

Keywords: agricultural cooperatives, cooperative membership, linear regression with endogenous treatment, marketing efficiency
JEL Classifications: P13, Q13, Q16

* *Corresponding Author, E-mail: lscruz4@up.edu.ph*

I. Introduction

The impact of agriculture on the economic development of the Philippines cannot be overemphasized. According to Habito (2021), the country's agriculture grew by 1.6 percent and 1.2 percent, respectively during the 2nd and 3rd quarters of 2020 amidst the strictest lockdown or locally known as enhanced community quarantine (ECQ) enforced by the government to minimize the adverse effect of the COVID-19 pandemic. Agriculture's contribution to the country's GDP is also not just limited to crop production, livestock farming, forestry, and fishery as it also supports the growth of other key sectors of the economy such as manufacturing, trade & repair services, transport, storage, and communication, and other services (Habito, 2021). Agriculture also employs almost 10 million Filipinos, or 24.3 percent of the total employment generated in 2018 (PSA, 2019). These jobs mostly benefit those in the rural areas largely dependent on agriculture. Thus, agriculture plays a critical role in the development of rural areas.

To improve the performance of agriculture, one key goal is to have an efficient agricultural marketing system. This aims to promote a seamless flow of products along the value chain from production to consumption. According to Pabuayon et.al (2014), an efficient agricultural marketing system helps in making adequate food available, accessible, and affordable to consumers. An efficient marketing system also implies that every actor in the value chain benefits from the exchange. Quilloy and Sumalde (2015) reasoned that in an efficient marketing system, farmers receive handsome compensation for produce. Market intermediaries, on the other hand, can maintain profitable business operations for performing marketing functions and services for consumers at very reasonable and affordable prices.

Achieving marketing efficiency, however, is very challenging because of some inherent challenges faced by smallholder farmers. They have poor access to market information, reasonable credit, attractive business prospects, and agricultural production technologies (Fan & Rue, 2020; Zhang et al., 2020). These pose a problem because they need these inputs and information to make decisions on the type of crops to grow, the timing that will produce the most yield, the most suitable place to market the produce, and the most appropriate farm inputs and implements that are needed in the operation. They are also disorganized, scattered, and fragmented, thereby limiting their chances of meeting the volume and quality requirements set by buyers. Institutional buyers, for example, strictly require a stable supply from their input suppliers and demand quality-specific technical standards before they enter into long-term contracts with suppliers. Smallholder farmers also have poor access to price and market information, affecting their capability to make optimal decisions.

The establishment of community-based and rural institutions like cooperatives and associations has been strategically identified to address these agricultural challenges (Ahmed & Mesfin, 2017; Simmons & Birchall, 2008). These self-help groups have been tapped to level up the marketing performance of small-scale producers by improving market access, empowering farmers, enhancing livelihood, and increasing productivity (Quilloy & Sumalde, 2015). Collectively, these small-holder producers share information, pool resources, and distribute costs and risks among themselves to improve yield and productivity which would not be possible if the smallholder farmer is working alone (Abebaw, 2013; Cruz, 2016). Furthermore, the clustered farmers have stronger purchasing power and bargaining voice in the marketplace (Siebert, 2001). Simply put, organized farmers have inherent advantages in confronting the problems of agricultural inefficiency in marketing.

The Philippine coffee industry, like most commodities, is dominated by subsistent, disorganized, small-scale, scattered, and fragmented farmers with an average farm size of one to two hectares and a production yield of only

0.3 tons per hectare (Philippine Statistics Authority (PSA), 2016). In the 2017-2022 Philippine Coffee Industry Roadmap, the country has a long way to go before it can achieve its target yield of one ton per hectare, boost coffee production, and make the Philippines one of the top producers of premium-grade coffee in the world (Department of Agriculture (DA) & Department of Trade and Industry (DTI), 2018). In the same report, cooperatives and other coffee associations were highlighted to implement action programs and priority activities, such as providing access to information, infrastructure, assistance, credit, and training to improve the marketability, competitiveness, and sustainability of coffee farmers. From a policy standpoint, it is, therefore, worthwhile to investigate whether cooperative membership can enhance the marketing efficiency of coffee farmers.

In general, the study aimed to assess the role of cooperatives in improving the marketing efficiency of coffee farmers in selected provinces of the Philippines, namely: Cavite, Benguet, and Mountain Province. Specifically, it aimed to (1) determine whether membership in cooperatives and other rural/community-based organizations results in improved marketing efficiency; (2) identify factors affecting marketing efficiency and cooperative membership; and (3) provide specific recommendations on how cooperatives and other rural/community-based organizations can enhance marketing efficiency.

II. Research Methodology

1. Data Collection and Analysis

A farm household survey was conducted using a structured survey questionnaire. This covered, among others, demographic and household information, data on farmer socio-economic, farm characteristics, and marketing-related expenses and income, as well as information on the physical and institutional setting, and membership in cooperatives and farmers' associations. Key informant interviews (KII) and focus group discussions (FGD) with key executive officers of cooperatives, farmer-members, and non-members were also conducted to gather anecdotal information on the role of cooperatives in improving marketing efficiency among coffee respondents.

Multi-stage sampling was used for data collection. First, the three provinces of Cavite, Benguet, and Mountain Province were selected because these were the areas with the most mainstreamed coffee interventions from the funding agency, the Department of Science and Technology – Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (DOST-PCAARD). Second, chosen municipalities in these provinces must (1) have the highest coffee production, (2) be recipients of DOST-PCAARRD technologies, and (3) have cooperatives or other rural-based organizations in the area. The information for the first criterion was sourced from DOST-PCAARRD, while the list of cooperatives per municipality was collected from the Regional offices of the Cooperative Development Authority (CDA) and Municipal Agriculture Offices (MAOs).

The lists of farmers were obtained from the MAOs of selected survey sites. Information gathered from DOST-PCAARRD projects was used to counter-checked the farmer list. Farmers were randomly selected from the list provided by the sample municipalities. From the list of coffee farmers, simple random sampling was employed to determine the farmer respondents in the survey.

Given the above criteria, the sample size was determined based on the total population of the three provinces. The sample size per municipality and barangay was proportionally determined. The sample size formula used was based on the assumption that the observations from the farmers were normally distributed. Under the assumption that the proportion of the farmers in the market (P) is normally distributed, the appropriate sample size formula derived is given by:

$$n = \frac{\frac{z^2 \text{ x } p(1-p)}{e^2}}{1 + \frac{z^2 \text{ x } p(1-p)}{e^2 N}} \quad (1)$$

where:
p = hypothesized proportion of farmers that adopted the technology
z = standard normal deviate associated with a certain α
e = margin of error
N = population size

In this study, the hypothesized proportion was set to 0.5 for all the provinces. The confidence level was at 95%, thus α=0.05, and the margin of error was at 5%.

2. Empirical Framework

Cruz (2019) defined marketing efficiency as the ratio between the value-addition brought about by the marketing activities and the associated expenses of these processing or marketing activities. The value addition was measured by the difference between the amount paid by consumers for the processed products and the cost of producing the products. A higher ratio implied a higher marketing efficiency of the processed products and, thus, meant better marketing performance and bigger returns for every peso spent on marketing and processing.

$$Value\ Added = Revenue_{processed} - Cost_{processed} \quad (2)$$

$$Marketing\ efficiency = \frac{Value\ Added}{Cost\ of\ marketing\ or\ processing} \quad (3)$$

In analyzing the impact of cooperative membership on the marketing efficiency of farmers, linear regression with endogenous treatment (treatment effects or TE) was employed. This model data was used to determine if the treatment (i.e. cooperative membership) has a causal effect on the outcome (i.e. marketing efficiency). The model fits a nonlinear potential-outcome model that allows for a specific correlation structure between the unobservable items that affect the treatment (i.e. cooperative membership) and the unobservable items that affect the potential outcomes (i.e. marketing efficiency). This is used to address the sample selection bias that may result from observed and unobserved factors. This model also determined the significant factors that affect outcome (i.e. marketing efficiency) and treatment (i.e. cooperative membership).

The endogenous treatment-regression model is composed of an equation for the outcome ME_j , and an equation for the treatment z_j. The outcome equation is:

$$ME_j = x_j\beta + \delta z_j + \varepsilon_j \quad (4)$$

where x_j are the variables used to model the outcome. The treatment equation is modeled as:

$$z_j = w_j\gamma + u_j \quad (5)$$

and the observed decision is,

$$z_j = \begin{cases} 1, & w_j\gamma + \mu_j > 0 \\ 0, & otherwise \end{cases} \quad (6)$$

z_j is a binary variable with a value of 1 if a person opted to be a cooperative member, and 0 otherwise. w_j are the covariates used to model treatment which are observable characteristics affecting cooperative membership. The error terms ε_j and μ_j are bivariate normal with means of 0 and the covariance matrix

$$\begin{bmatrix} \sigma^2 & \sigma\rho \\ \sigma\rho & 1 \end{bmatrix} \quad (7)$$

The covariates x_j and w_j are unrelated to the error terms; in other words, they are exogenous.

III. Analysis and Findings

1. The Socio-Demographic Profile of Respondents

The three provinces were generally dominated by members (58 percent) that were males (53 percent), older than 41 (93 percent), married (78 percent), and had less than or equal to 10 years of formal education (66 percent), or about a high school level (Table 1). This study also showed that there were more members in Benguet and Mountain Province, while Cavite had more non-members. While there was an equal ratio of members and non-members among men, the result showed that there were more members among females (68 percent). Women member dominance in cooperatives was aligned to and even higher than the study findings of 55 percent female membership by Lamberte and Manlagnit (2003) among credit cooperatives in the Philippines.

In terms of average age, members seemed to be younger than non-members. This was in contrast with the findings of Shumeta and D'Haese (2016), which showed that members were relatively older than their counterparts. In the FGDs, some members attributed their decision to join cooperatives to their openness to accept new technologies and willingness to change their old farming practices compared to older coffee non-member farmers. The motivation of farmer-members to accept new farm practices could also be attributed to their having relatively more education compared to non-members (i.e. average of 10 versus 9 years of schooling of members and non-members, respectively). This was supported and observed by the same study of Shumeta and D'Haese, which showed more schooling years for members than non-members. In terms of coffee farming experience, non-members were more experienced (26 years) than members (21 years), supporting the anecdotal claim that non-members tended to stick to their usual farming practices due to their long experience in coffee farming.

2. The Philippine Coffee Species

Four species of coffee were commonly planted in the country, namely: Robusta, Arabica, Liberica, and Excelsa (Table 2). Robusta was more commonly produced in Cavite (95 percent) while Arabica was the dominant species planted in Benguet and Mt. Province. Members mainly produce Arabica coffee while a majority of the non-members plant Robusta coffee. However, the choice of coffee species planted was not based on preference, but was attributable to the topography where these coffee species thrived. Robusta was produced by most non-members as 73 percent of this group were from Cavite, and this was where this particular coffee species was commonly grown. Arabica, on the other hand, is suited to the climate and terrain of Benguet and Mountain Province.

Table 1. Socio-Demographic Profile of Coffee Farmers by Membership, Philippines, 2017-2018

Items	Member N= 222 (%)	Non-Members N=138 (%)	Total N=380 (%)
Provinces			
Cavite	41	59	52
Benguet	77	23	36
Mountain Province	77	23	12
% to Total	58	42	100
Sex			
Male	50	50	53
Female	68	32	47
Age			
21 – 40	69	31	7
41- 60	56	44	52
> 60	59	41	41
Average Age*	57	59	58
School Years			
Less than or equal to 10	57	43	66
11 to 15	61	39	32
Greater than 15	71	29	2
Ave. Schooling Years*	10	9	10
Farm Experience			
Less than or equal to 20	63	37	54
21 – 30	58	42	16
31 – 40	56	44	15
Greater than 40	46	54	15
Ave. farming years*	21	26	23

Note: * values are in units.

Table 2. Distribution of Coffee Species by Province and Membership, Philippines, 2017-2018.

Coffee Species	Province			Membership Status		Total
	Cavite %	Benguet %	MProv. %	Mem %	Non-mem %	%
Robusta	95	1	2	35	71	35
Arabica	5	99	100	67	44	67
Liberica	13			6	12	6
Excelsa	6			4	5	4
N=	196	136	48	222	158	380

Note: * multiple responses, MProv = Mountain Province, N = total respondents.

3. The Coffee Processing and Marketing

Almost all respondents conducted further processing of their coffee products across the 3 provinces (Table 3). Increasing their income was the main driver cited by respondents as the reason why they undertook further processing. FGD results showed that members could sell a kilo of their fresh cherry Robusta coffee for only USD 0.5 per kilo, which, if processed into dried beans, could fetch a price of 1 USD per kilo. Arabica cherries, on the other hand, could be sold at 1 USD per kilo but processed green beans ready for roasting could be sold at 5.2 USD per kilo. Aside from type of coffee, price also differed based on membership type. The FGD result showed that members got better prices for coffee products than non-members. Table 4 showed the price difference per kilo of coffee sold by these 2 groups.

Table 3. Distribution of Respondents Who Undertook Marketing and Processing Activities by Province and Membership, Philippines, 2017-2018.

Respondents who undertook Marketing	Province			Membership Status		Total
	Cavite %	Benguet %	MProv. %	Mem %	Non-mem %	%
Yes	96	97	98	97	96	97
No	4	3	2	3	4	3

Note: * multiple responses; MProv = Mountain Province.

Table 4. Average Price of Coffee Products by Coffee Species and Membership, Philippines, 2017-2018.

Coffee Products	Robusta (Price in USD/kilo)		Arabica (Price in USD/kilo)	
	Members	Non-Mem	Members	Non-Mem
Coffee Cherries	0.5	0.3 to 0.5	1.0	0.6 to 1.0
Dried Coffee Beans	1.0	0.6 to 1.0	2.0	1.6
Parchment Coffee	-	-	4.0	3.6
Green Beans	-	-	5.2	4.8

4. Type of Coffee Buyers

Coffee farmers sold the majority of processed coffee products to traders across the three provinces and membership types (Table 5). However, coffee farmers in Benguet and Mountain Province showed also a high preference for cooperatives as buyers of their coffee products. The general reason for choosing buyers across the three areas was the importance of being a regular buyer and choosing someone easy to deal with (Table 6).

Table 5. Types of Buyers of Coffee Per Province and Membership, Philippines, 2017-2018

Types of Buyers of Processed Coffee	Province			Membership Status		Total
	Cavite (%)	Benguet (%)	MProv. (%)	Mem (%)	Non-mem (%)	%
Direct Seller	14	10	13	16	8	13
Market Stall	2	10	13	7	4	6
Traders	96	47	35	67	76	71
Processors	3	1	2	1	4	2
Cooperatives	0	41	35	26	9	19

Note: * multiple responses, MProv = Mountain Province.

Table 6. Distribution of the Reasons for Buyer Preference Per Province and Membership, Philippines, 2017-2018

Reasons for Choosing a Buyer	Province			Membership Status		Total
	Cavite (%)	Benguet (%)	MProv. (%)	Mem (%)	Non-mem (%)	%
Easy to Deal with	16	14	25	18	15	17
Regular Buyer	34	24	13	32	27	30
Close to the Farm	1	11	4	5	4	5
Offer High Price	3	10	6	7	4	6
Provide Pick-up services	4	2	2	3	3	3
No choice	4	4	2	4	3	3

Note: * multiple responses, MProv = Mountain Province.

5. The Empirical Analysis of the Marketing Technical Efficiency Model

A linear regression with endogenous treatment effects was adopted in the study, which utilized the maximum likelihood approach for both the treatment and outcome models. The study aimed to examine if there was a difference in the marketing efficiency between members and non-members. Particularly, it tested the null hypothesis that there was no difference between the marketing efficiency of these two groups. As shown in Table 7, the potential outcome means of the marketing efficiency were higher for members. This implied that an average farmer generated PhP 42.60, or USD 0.852[1] more per PhP 1 spending in marketing activities if he/she was a cooperative member. This suggested that the marketing and processing-related services availed by the members translated into higher marketing efficiency than non-members. Results confirmed that a member tended to be 4.3 times more efficient than non-members. This result empirically reinforced the qualitative study of Quilloy and Sumalde (2015) that membership in cooperatives improved the marketing efficiency of two cooperatives in the Philippines.

Table 7. Impact of Cooperative Membership on the Marketing Efficiency of Coffee Farmers, Philippines, 2017-2018.

	Coef.	Robust S.E	P>|z|
Potential Outcome Means			
Non-Mem (0)	11.497	4.0020	***
Member (1)	54.122	15.6351	***
Average Treatment Effect (ATE)			
Mem (1 vs 0)	42.625	16.1391	***
Ave. Treatment Effect on Treated (ATET)			
Mem (1 vs 0)	42.625	0.0164	***

Notes: 1. Dependent variable: Marketing Efficiency = Value Added/marketing cost.
2. *** denote significance level at 1% probability.

As shown in Table 8, having access to price information positively and statistically affected marketing efficiency. This result was consistent with studies that showed farmers with access to price information were able to negotiate higher prices (Nakasone, 2013; Nyarko et. al., 2013). Farmers who sold coffee products to cooperatives were inclined to be more efficient than those who opted for other marketing channels. Results from the study also showed that farmers became more productive when dealing with cooperatives because some marketing-related activities were done by the cooperatives, leaving farmers more time to concentrate on improving farm operations

1. Foreign Exchange conversion used: PhP 50:USD 1.

and yields. Factors that negatively influenced marketing efficiency were the tendency of farmers to use their own vehicles to haul and transport coffee products during the rainy season. These extra functions entailed extra cost and effort on the side of the farmers with few extra benefits, translating to lower marketing efficiency for the farmers.

Table 8. Factors Influencing Marketing Efficiency and Cooperative Membership, Philippines, 2017-2018

	Marketing Efficiency		Cooperative Membership	
	Coef.	Robust S.E	Coef.	Robust S.E
No. of processing tech adopted (count)	0.718	0.523	0.139***	0.047
Distance of technology from farm (km)	0.013	0.016	0.043*	0.023
No. of years selling to buyers (years)	-0.029	0.043	-0.003	0.005
No. of days searching for a price (days)	0.003	0.009	0.008**	0.004
Served cooperatives as buyers (dummy)	7.301**	3.195	0.506***	0.105
Served Traders as buyers (dummy)	1.840	1.284	0.108	0.146
Access to Price (dummy)	3.218*	1.743	0.100	0.127
Access to Training (dummy)			-0.006	0.187
With own vehicle (dummy)	-2.367**	1.125	-0.226*	0.116
Looking for a buyer (dummy)	-0.993	0.946	0.002	0.111
Transport when raining (dummy)	-0.738**	0.992	0.077	0.114
Sex (dummy)			-0. 058**	0.072
No. of years of coffee farming			0.079*	0.002
No. of fruit-bearing trees			0.009	0.017
_cons	4.431	1.429	-0.482**	0.229
/athrho	1.656**	0.320		
/lnsigma	2.389***	0.295		
rho	0.930	0.043		
Sigma	10.900***	3.213		
lambda	10.134***	3.415		
Log pseudolikelihood	-1524.8***			
Wald test of Indep. Eqns.	26.72***			
Observations	380			

Notes: 1. Dependent variable: Marketing Efficiency = Value Added/marketing cost.
2. ***, **, and * denote significance level at the 1%, 5% and 10% probability levels, respectively.

One of the determinants that positively and statistically influenced membership was the number of processing technologies adopted by coffee farmers. This implied that access to processing technologies was a strong motivation for organizational membership among farmers. Insights collected from the FGDs revealed that cooperatives were targeted by government agencies as recipients of coffee processing equipment, such as dryers, dehullers, and roasters in which members were prioritized, if not given full exclusivity over non-members. Furthermore, some coffee farmers were also encouraged to join cooperatives to avail themselves to technical assistance and training offered by cooperatives that were commonly restricted to members only. This result was also observed by Zhang et al. (2020) in a study that showed a positive correlation between membership and technology adoption.

The farther the distance of accessing technology from a farmer's farm, the more likely the farmers were motivated to become members of cooperatives. Similarly, the longer they searched for price information, the more determined the farmers were in joining cooperatives. This indicated that farmers would rather let cooperatives shoulder transaction costs related to the sourcing of technologies. Furthermore, cooperatives were observed to provide fair prices to their members, and at the same time supply extra economic benefits through their practice of distributing patronage refunds and dividends to members.

Another factor affecting the decision of farmers to join cooperatives was having cooperatives as buyers of their coffee produce. Additionally, the more experienced the farmers were in coffee farming, the higher the tendencies were for these farmers to become members. As discovered from the FGDs, exposure to cooperatives as buyers enabled farmers to learn first-hand about the benefits of membership, such as access to technology, inputs, training, credit, and discounts. As a result, the longer the farmers were in the coffee industry, the more exposed they were to the benefits of organizational membership.

Those with their own vehicles for transporting coffee products were seen to be less likely to become members, which implied that membership in cooperatives was more attractive for farmers with lesser means. In addition, females were observed to have a higher propensity to become members than males. When asked what drove them to join cooperatives, they cited that they were influenced by their affinity to belong in groups and be accepted by peers, which were observed to be higher for females than males. This implied that socialization played a part in female decisions to join organizations. This result also confirmed the empirical findings of Balgah (2018) that showed the negative effect of gender (1=male; 0=female) on membership decisions.

The Wald chi2, which was statistically significant at 5%, showed a good model fit. This implied that there was a strong correlation between the error terms of the treatment model (membership) and the outcome model (marketing efficiency) denoting the presence of potential selectivity bias. This justified the use of the treatment-effect model in this study.

IV. Conclusions and Recommendations

Various studies showed the important role of cooperatives in improving small-scale production. However, very limited studies provided in-depth understandings using empirical analysis on the impact of organizational membership in enhancing marketing efficiency among coffee farmers in the Philippines. The model used in the study was a linear regression with endogenous treatment in which one of the regressors was an endogenous binary treatment. The model considered the correlation between the observable and unobservable items that affect treatment (i.e. cooperative membership) and those that affect the potential outcomes (i.e. marketing efficiency). The results obtained in this study showed that cooperatives and other community-based organizations played a significant role in improving the marketing efficiency of members, as

shown in the positive and significant relationship between membership and marketing efficiency. This suggests that policymakers should continue with policy incentives to support smallholder farmers to join and establish coffee organizations.

There must also be a focus on strengthening the agricultural cooperative sector to maximize its role: for instance, through programs with technical, financial, and management components that will complement the technical programs advocated by the government and other private institutions. Focusing on the operational and managerial improvement of cooperatives will address the low awareness of coffee farmers on the proper procedures and sustainable management of these coffee associations. Thus, extension services should not only focus on coffee technology and practices but also the internal management of cooperatives must be emphasized to ensure a higher success rate among these coffee groups. Close coordination and collaboration among cooperative stakeholders with the government, private, and academe would be needed to support this strategy.

References

Abebaw, D. H. (2013). The impact of cooperatives on agricultural technology adoption: Empirical evidence from Ethiopia. *Food Policy, 38*, 82-91.

Ahmed, M. H., & Mesfin, H. M. (2017). The impact of agricultural cooperatives membership on the wellbeing of smallholder farmers: Empirical evidence from eastern Ethiopia. *Agric Econ, 5*, 6. https://doi.org/10.1186/s40100-017-0075-z

Habito, C. (2021, February 11). *Virtual launch of agricultural cooperative development agenda*, Agriterra. https://www.agriterra.org/launching_ACDA/

Balgah, R. A. (2018). Factors influencing coffee farmers' decisions to join cooperatives. *Sustainable Agriculture Research, 8*(1), 42. https://doi.org/10.5539/sar.v8nlp42

Cruz, L. (2016). Empowering farmers through economies of scale. *Economics and Management Matters, CEM Technical Bulletin, 18*(4/July). University of the Philippines Los Baños.

Cruz, L. (2019). Role of cooperatives in improving production and marketing efficiency. *Economics and Management Matters, CEM Technical Bulletin, 42*(2/February). University of the Philippines Los Baños.

Department of Agriculture, & Department of Trade and Industry (2018). *2017-2022 Philippine coffee industry roadmap*. https://www.da.gov.ph/wp-content/uploads/2019/06/Philippine-Coffee-Industry-Roadmap-2017-2022.pdf

Fan, S., & Rue, C. (2020). The role of smallholder farms in changing world. In S. Gomez y Paloma, L. Riesgo, & K. Louhichi (Eds.), *The role of smallholder farms in food and nutrition security*. Springer. https://doi.org/10.1007/978-3-030-42148-9_2

Lamberte, M., & Manlagnit, M. C. (2003). *Integrating gender perspectives in evaluating the efficiency of COFI: The case of credit cooperatives in the Philippines* (Philippine Institute for Development Studies Discussion paper series No. 2003-06). Econstor. https://www.econstor.eu/bitstream/10419/127812/1/pids-dps2003-06.pdf

Nakasone, E. (2013). The role of price information in agricultural markets: Experimental evidence from rural Peru. *International Food Policy Research Institute.*

Nyarko, Y., Hildebrandt, N., Romagnoli, G., & Soldani, E. (2013). *Market information systems for rural farmers evaluation of Esoko MIS: Year 1 results.* New York University Abu Dhabi, Center for Technology and Economic Development.

Pabuayon, I. M., Cuevas, A. C., Quilloy, K. P., Delos Reyes, J. A., & Arrienda, F. G., Jr. (2014, October 1). Marketing, trade and distribution issues as they affect food security: Framework and empirical evidence. Paper presented at the Roundtable Discussion on Food Security: Marketing and Postharvest. Quezon City, Philippines.

Philippines Statistics Authority. (2016). *Selected statistics on agriculture 2016*. https://psa.gov.ph/sites/default/files/Selected%20Statistics%20on%20Agriculture%202016.pdf

Philippines Statistics Authority. (2019). *Population and labor force* (Agricultural indicators system (AIS) Report No. 2019-8). https://psa.gov.ph/sites/default/files/ais_population%26laborforce_2019.pdf

Quilloy, K., & Sumalde, Z. (2015, September 14-18). Improving marketing efficiency through agricultural cooperatives: Successful cases in the Philippines. Paper presented at International Seminar on Improving Food and Marketing Efficiency: The Role of Agricultural Cooperatives. Seoul, South Korea. https://www.researchgate.net/publication/325754981_Improving_Marketing_Efficiency_through_Agricultural_Cooperatives_Successful_Cases_in_the_Philippines

Siebert, J. (2001). *The role of bargaining cooperatives in a global market economy* (Working paper series No. 10). University of California Center for Cooperatives. http://sfp.ucdavis.edu/files/143770.pdf

Shumeta, Z., & D'Haese, M. (2016). Do coffee cooperatives benefit farmers? An exploration of the heterogeneous impact of coffee cooperative membership in Southwest Ethiopia. *International Foods and Agribusiness Management Review, 19*(4). https://doi.org/10.22434/IFAMR2015.0110

Simmons, R., & Birchall, J. (2008). The role of co-operatives in poverty reduction: Network perspectives. *Journal of Socio-Economics, 37*(6), 2131-2140. https://doi.org/ 10.1016/j.socec.2008.04.016.

Zhang, S., Zhanli, S., Wanglin, M., & Vladislav, V. (2020). The effect of cooperative membership on agricultural technology adoption in Sichuan, China. *China Economic Review*. https://doi.org/ 10.1016/j.chieco.2019.101334

ISSN 1946-5130 (Print), ISSN 2470-4733 (Online)
http://dx.doi.org/10.20294/jgbt.2023.19.1.15

The Journal of Global Business and Trade

Journal of Global Business and Trade

https://www.pfw.edu/jgbt

Do Rewards Build Importer Compliance and Commitment in Overseas Trade?*

Sun-Ki Lee[a], Kyung-Jae Lee[b]**

[a]*School of Business Administration, Hongik University, South Korea*
[b]*Department of Business Administration, Gachon University, South Korea*

Received 27 November 2022, Revised 3 January 2023, Accepted 5 February 2023

ABSTRACT

Purpose – Conflicts of interest can arise in interdependent relationships. For instance, importing agents may act opportunistically and not comply with the exporter's regulations. Thus, it is important that the principal seeks ways to encourage its agents to perform optimally on its behalf. It becomes necessary to establish a reliable reward system that positively influences agents' role performance. This study examines whether monetary and non-monetary rewards increase the role performance of overseas agents in international trade.

Design/Methodology/Approach – Analyzing the responses of 50 exporting representatives in South Korean small and medium-sized enterprises (SMEs), it revealed that while compliance and commitment positively influence agents' role performance, rewards encourage only commitment, not compliance, of agents.

Findings – The findings suggest that non-monetary rewards are as important as monetary incentives in improving the importers' role performance. In short, the importers' role performance is improved when non-monetary rewards are actively in place, and their levels of compliance and commitment play the mediating roles.

Research Implications – These findings were vital because exporters want their import agents to be compliant and committed. The results indicated that exporters value long-term commitment more than short-term compliance. Moreover, the role performance of importing agents improves when they are highly committed to their exporter's cause.

Keywords: commitment, compliance, conflict of interest, monetary rewards, non-monetary rewards, role performance

JEL Classifications: F23, M52

* *This work was supported by the Gachon University research fund of 2022 (GCU-20220585001).*
** *Corresponding Author, E-mail: kjlee@gachon.ac.kr*

I. Introduction

In international trade, exporters rely on their importers to represent them in the overseas market. They must ensure that the importer complies with regulations and is committed to the same objectives as theirs, so that their trade remains sustainable and mutually beneficial. However, the question that arises is whether importers will comply and not act on their self-interests. In this case, rewards may play an essential role in helping importers stay motivated. Thus, researchers have examined various forms of rewards and their motivational effects. Particularly, they have examined the characteristics of monetary and non-monetary rewards and their varied influence on agent role performance (Choi, 2018; Frant, 1996; Gilliland, 2003, 2004; Obadia et al., 2015).

Studies examining the relationship between the provision of rewards and agent role performance have presented the following findings. When exporters compensate foreign agents or importers solely monetarily based on sales performance in the local market, it indicates that the rewards depend solely on concrete and tangible outcomes. However, non-monetary rewards are useful when trading partners want to form lasting business relationships, because extra incentives can motivate agents to play their role more effectively (Frant, 1996; Kreps, 1997). In summary, providing monetary and non-monetary incentives is a sign of a mutual business relationship and a source of intrinsic motivation for importers (Ko, 2002; Obadia et al., 2015). Studies in international business and trade argue that rewards should be structured in a way that agents are inherently motivated. Non-monetary incentives would prove effective in this regard (Kreps, 1997; Obadia et al., 2015; Prendergast, 2008). Ultimately, these studies linked monetary rewards with external motivation, whereas non-monetary rewards have been associated with intrinsic motivation. Many aspects of the motivation theory support this phenomenon.

Studies also found that an agent's lack of motivation to comply and commit to the principal was detrimental to maintaining business relationships between exporters and importers (Morgan & Hunt, 1994; Zeriti et al., 2014), while others highlighted the importance of rapport between the two parties (Jeong & Kang, 2020). This study explores whether a major motivation source in business operations — the reward system — can actually contribute to increasing agents' compliance and commitment in the international business environment, helping them perform more efficiently on behalf of the exporter. Previous studies have examined how rewards and agent compliance and commitment influence agent performance. However, they have not investigated the direct link between incentives and agent behavior. Good behavior and attitude naturally generate positive results. Thus, this study argues that compliance and commitment directly improve agent role performance, but overseas importers must first be motivated using effective rewards. Numerous previous studies are reviewed in the following sections, along with the implications of this study's findings for international trade and management.

II. Literature Review

1. Studies on Exporters and Importers

Aykol and Leonidou (2018) reviewed the existing literature on exporter-importer business relationships published between 1975 and 2017. They showed that partner evaluation and selection was examined for relationship initiation and dissolution. Micro and macro factors were studied as environmental influences. To investigate internal influences, organizational factors, managerial characteristics, and internationalization aspects were explored. Furthermore, latent, manifest, and outcome variables were studied to examine behavioral dimensions, and relationship demographics, structure, and compatibility between partners were explored to determine relationship characteristics. Most studies focused on financial market and overall performance to gauge performance impact. As professional issues interpersonal problems, dark side factors, and network connectivity was considered. Analyzing

the existing literature, they suggested that future research topics will be relationship initiation/dissolution, environmental impacts, internal influences, behavioral dimensions, relationship characteristics, performance impacts, and professional issues.

In Ahmed et al. (2021) studied the mutual influence of importers and exporters on relationship performance in the context of Australian exporters and Southeast Asian import partners. To measure the reciprocity of the relationship structure, they used the PBD (perceptual bi-directionality) method. They set mutual cultural sensitivity, mutual partner likability, mutual communication, and mutual dependence as independent variables and tested whether they mediate the positive effect of mutual trust and mutual commitment on relationship performance. The results showed that reciprocity of relationship construction affects relationship performance. Mutual cultural sensitivity, mutual partner likability, and mutual communication positively affect mutual trust, mutual commitment and mutual performance.

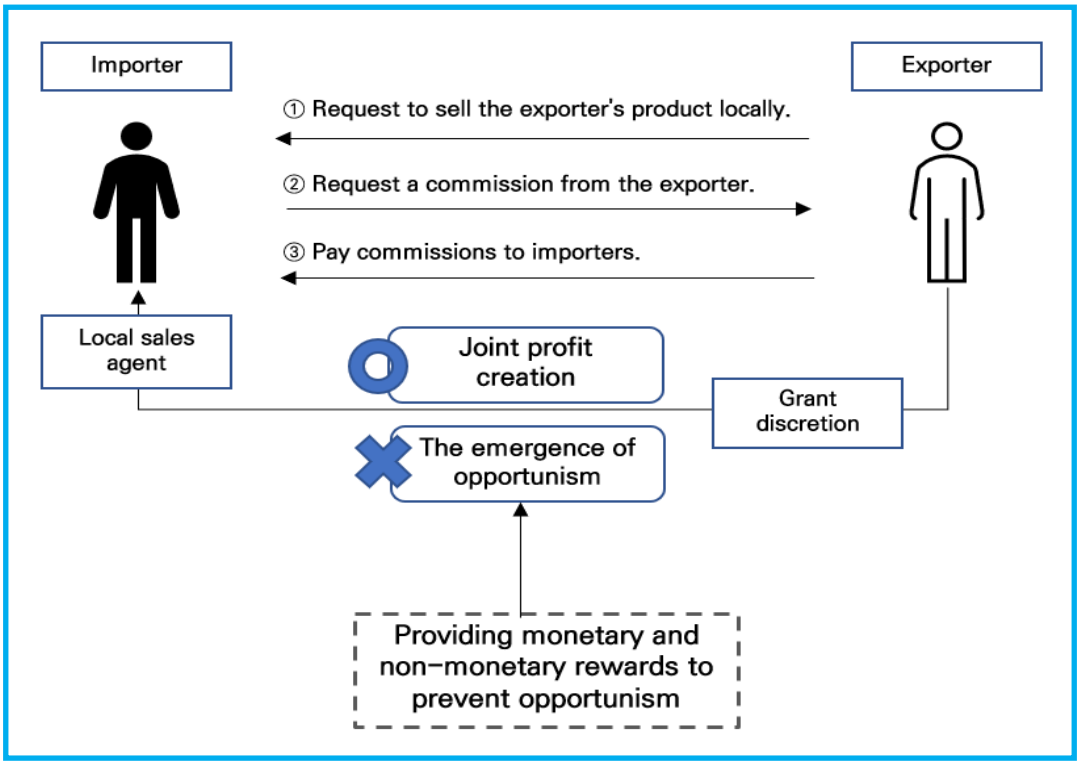
Obadia and Robson (2021) tested whether cooperation positively affects performance because studies examining the beneficial effect of importer–exporter cooperation were scant. For the primary data collection, they drew a random sample of 1,500 companies from a database of 32,500 French exporters using a systematic method. Then, they selected 1,036 industrial companies with 10 or more employees that exported at least 10% of their total sales to three or more countries and used independent international distributors (e.g., importers). The export manager responded based on their business relationship with the overseas distributors. They built on Morgan et al. (2004) to establish respondent competency in several ways, including administering a test that assessed respondents' competency to answer about central relationships. Hypothesis 1 posited that cooperation will positively affect exporter marketing performance. However, cooperation positively affected performance at low levels and had a negative impact at high levels. Hypothesis 2 tested whether cooperation positively affects exporter marketing performance through importers' special investments which was confirmed. Again, there was a positive effect on exporter marketing performance at low levels of cooperation but a negative effect at high levels. Hypothesis 3 tested whether interdependence moderated the relationship between cooperation and investors' special investments. The result was that the lesser the interdependence there was, the lower the effect, confirming the hypothesis. Hypothesis 4 tested whether psychic distance moderated the relationship between cooperation and investors' special investments. It was found that the greater the psychic distance, the more positive the effect, rejecting the hypothesis.

Overall, the existing studies identify the determinants of a positive relationship between exporters and importers. However, this study analyzes how tangible and intangible compensation, not just intangible determinants, play a role in building a good importer–exporter relationship. In order to clearly define the relationship between importers and exporters, it is illustrated as follows.

Table 1. Export-Importer Definition

Exporter	Importer
Transportation and transfer of goods (to the importer)	Payment (to export companies)
However, when export is done through an import agent (agent)	
In addition to monetary, additional support in the form of non-monetary (educational, territorial guarantee, etc.) compensation is also possible.	In this case, the import agent is responsible for promoting and selling the product in the local market on behalf of the exporting company.

Fig. 1. The Relationship Between Classifiers and Exporters and the Origin of Opportunism



2. Definition of Measurement Constructs in This Study

2.1. Defining the Roles of Exporters and Importers

Choi and Park (2020) define the role of exporters and importers and issues between them as follows.

- Importer: A "local sales agent" who sells the products of small and medium-sized exporters overseas and receives commissions based on performance.
- Importer discretion: An "opportunistic act" in which the importer exercises its discretion based on self-interests rather than the interests shared with the exporter. The problem of "importer discretion", which arises between traders is studied from the agency theory perspective.

In this study, "importer" refers to a "local sales agent" who sells products of small and medium-sized exporters overseas and receives commissions based on performance. Acting as an exporter's agent, an importer may exercise its "discretion" based on self-interests rather than the mutual objectives of the exporter and importer, thus exhibiting an "opportunistic act". This it considered an agency problem among importers.

Choi (2018) studied how non-monetary incentives enhance importers' role performance. Previous studies have reported that such incentives significantly affect role performance enhancement (Obadia et al., 2015; Palmatier et al., 2007). In this regard, Choi (2018) stated that "we postulate that trust mediates the relationship between non-monetary incentives and importers' role performance. In other words, we hypothesize that non-monetary incentives → trust → enhancement of importers' role performance. The trust formed

between exporters and importers through non-monetary incentives enhances importers' role performance by inhibiting opportunistic behaviors. Opportunistic behavior is when one party pursues self-interests rather than the common interest or pursues self-interest at the other party's expense." (Currall & Inkpen, 2002; Das & Teng, 1998)". In conclusion, exporters pursue their own interests at the expense of importers' and importers pursue their own interests at the expense of exporters'. In Choi and Jun (2019), trust makes exporters dependent on importers in bearing risks, and vice versa. Trust also deters the opportunistic behaviors of exporters and importers. Based on previous studies, this study defines exporter-importer relationship as follows.

2.2. Definition of Measured Variables

2.2.1. Monetary Rewards

Monetary rewards are widely known as financial rewards. Studies have shown that monetary rewards prove effective in motivating employees and maintaining their loyalty, especially in the short -term, which contributes to the firm's strength (Chi & Seo, 2006). Moreover, providing effective financial rewards may help increase work quality, decrease employee turnover, and boost productivity (Jang et al., 2017). Many jurisdictions have mandated the provision of minimum wage and insurance coverage as employee benefits. Based on Obadia et al. (2015), this study considers the following as monetary rewards in international business settings: sales commission, bulk purchase discount, sales credit, favorable terms and conditions, compensation match from competitors, and bonus.

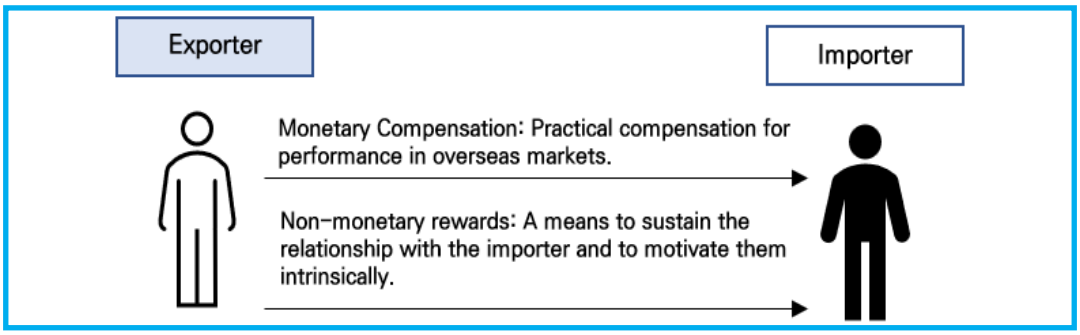
2.2.2. Non-monetary Rewards

Often, non-monetary rewards are considered supplementary to monetary incentives (Han, 2011). Non-monetary rewards may seem less tangible and physical than financial payments, such as sales commissions. However, they may be crucial in bolstering a sense of belonging and intrinsic motivation (Kreps, 1997; Prendergast, 2008). They also improve communication and agent loyalty in international business relationships. Obadia et al. (2015) recommend resolving conflicts, supporting growth, guaranteeing exclusive rights, training, supporting local business, and paying for local exhibitions as non-monetary rewards. Clearly, these incentives appear to be more relationship-driven than are monetary rewards. In specific, the definitions of monetary and non-monetary compensation are explained as follows.

Table 2. Monetary/Non-monetary Compensation from the Perspective of Exporters/Importers

Exporter		Importer	
Monetary reward	Non-monetary reward	Monetary reward	Non-monetary reward
Practical compensation for performance in overseas markets.	A means to maintain the relationship with the importers and to motivate them intrinsically.	Practical compensation for performance in the local market.	A symbolic reward that recognizes the import agent's desire to continue its relationship with the company, encourages compliance with export company regulations, and inherently deters opportunistic behavior.
		Exporting companies that only pay monetary compensation are easier to find and thus generate less switching costs.	Exporting companies that focus on continuation of the relationship and pay non-monetary compensation are relatively more difficult to find, resulting in huge switching costs.

Fig. 2. Concept of Monetary/Non-monetary Compensation from the Perspectives of Exporters



Monetary compensation is a short-term medium that corresponds to the obligations and rights that must be observed under the contract. However, it is intended to suggest that non-monetary compensation is a mean to reduce opportunistic behavior of importing agents. Non-monetary rewards are not intended for short-term results. In effort to form a lasting relationship between export and import agents, it is not necessary for exporting companies to compensate the import agent's performance non-monetarily. However, it may work very importantly to prevent opportunistic behavior from importing agents.

Fig. 3. Concept of Monetary/Non-monetary Compensation from the Point of View of Importers

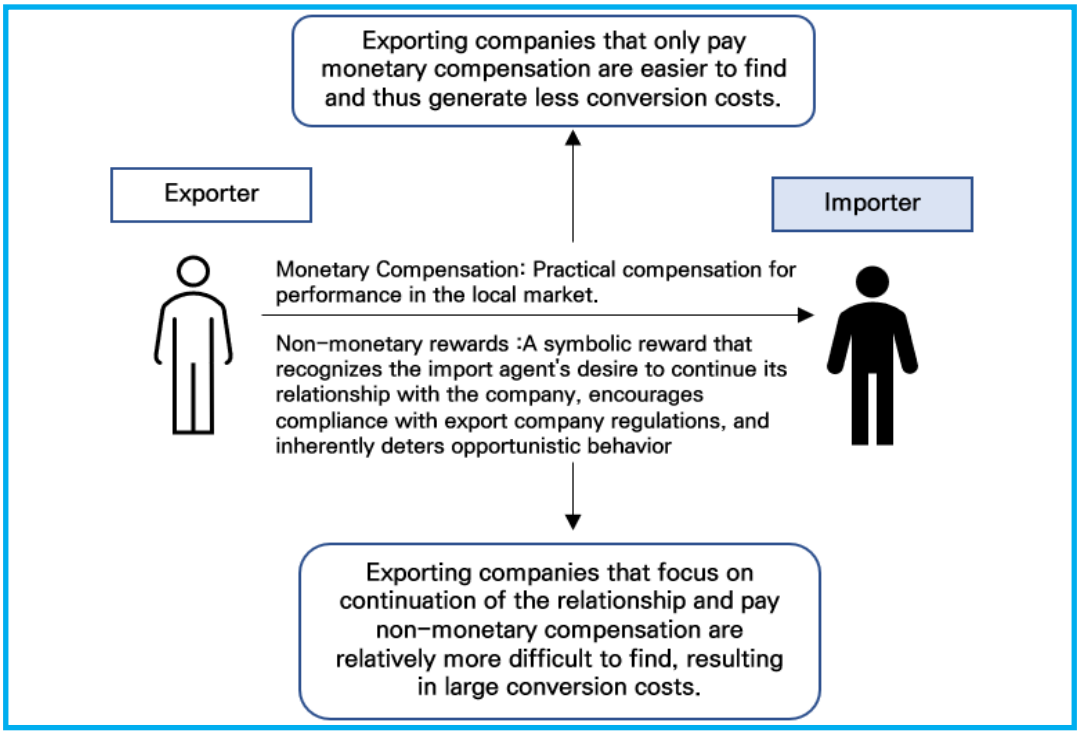
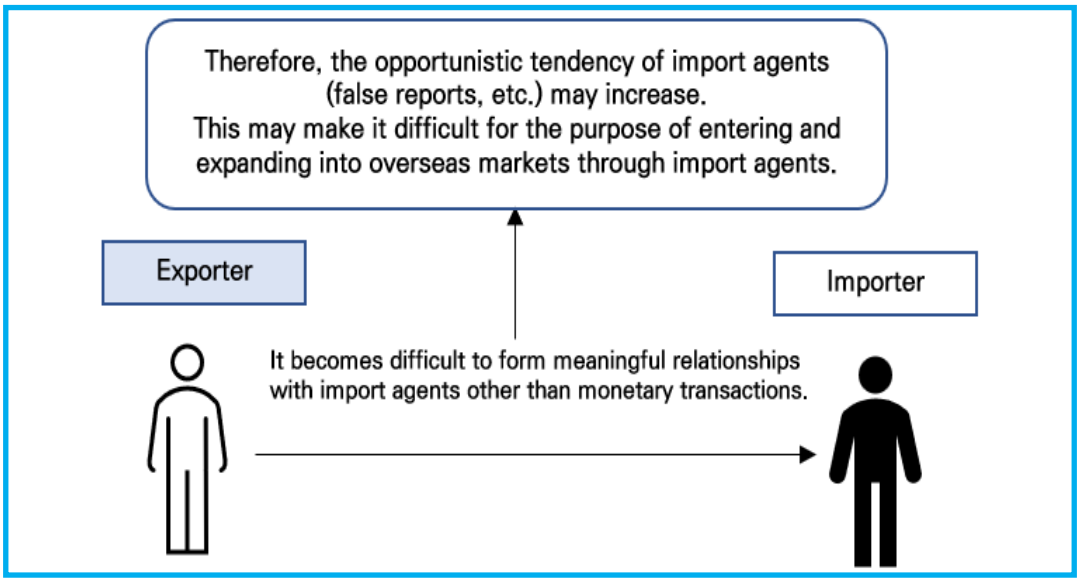


Table 3. Disadvantages to Exporters/Importers If Non-monetary Compensation Is Not Paid

Exporter	Importer
It becomes difficult to form meaningful relationships with import agents other than monetary transactions.	The will to continue doing business with exporting companies in the long term is relatively weak. (When only monetary compensation is paid.)
Therefore, the opportunistic tendency of import agents (false reports, etc.) may increase, which may make it difficult to enter and expand overseas markets through import agents.	Intrinsic motivation is relatively weak. Opportunistic tendencies may increase, which may lead to conversion costs when replacing a transaction target in the future. (False reports to exporting companies, etc.)

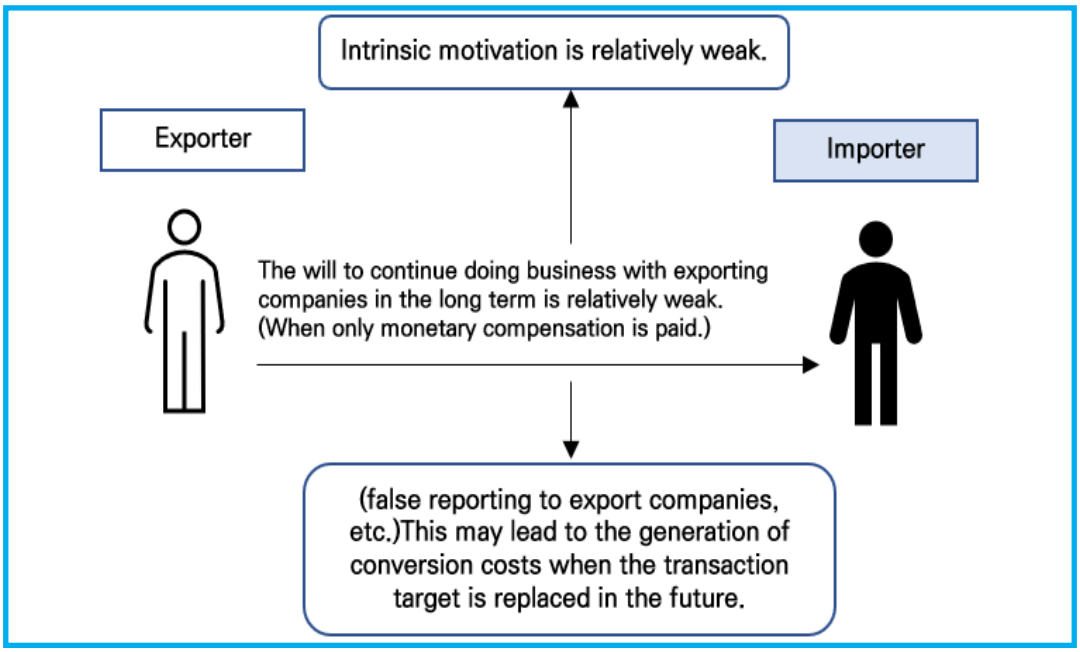
Fig. 4. Disadvantages of Not Paying Non-monetary Compensation for Exporting Companies



2.2.3. Compliance

Compliance is the key to successful overseas trade relationships, but the relationship between trading partners may weaken because exporters and importers are independent from one another. Essentially, the two parties cooperate within the scope of their contract, but they may seek self-interests, even though they are they are said to be working for mutual benefit (Choi & Jun, 2019). Exporters expect their importers to comply with the required regulations at all times. However, overseas agents can behave opportunistically for their benefit in the absence of monitoring (Gilliland & Manning, 2002; Kim & Lee, 2017). However, strict regulations and monitoring can also have negative effects as it would decrease the degree of discretion importers have, hampering their motivation (Gilliland & Manning, 2002). Previous studies focused on measuring the

Fig. 5. Disadvantages If Importers Do Not Receive Non-monetary Compensation



effectiveness of monitoring systems in agent role performance (Choi, 2018; Frant, 1996; Gilliland, 2003, 2004; Obadia et al., 2015). However, this study examines how agent compliance can be improved based on the reward provided and the agent's motivation level. Various aspects have been considered to measure exporters' perceptions of agent compliance, including accuracy in reporting and declaration and fulfilment of instructions.

2.2.4. Commitment

Previous studies define agent commitment as internal dedication to the principal (Ahamed & Noboa, 2022). Although difficult to quantify, overseas agent's commitment is often measured by the degree of attachment, understanding, and the willingness to contribute to achieving the exporter's goals. Thus, exporters often perceive agents' commitment based on the time and effort they devote to trading partners, In this study's survey, exporters were also interested in knowing whether their importers would commit to and invest in their business relationship in the long-run.

2.2.5. Role Performance

Agent role performance is measured based on the agent's ability to seek and achieve mutual benefits and goals. It is also quantified based on the profits generated in the local market due to the importers' efforts (Obadia et al., 2015). Overall, it was investigated whether the tasks presented by the head office were faithfully carried out, whether the requested role was fulfilled through compliance with regulations/instructions/policies to achieve the head office's goals, and whether the role was performed in accordance with the head office's mid- to long-term plan. In addition, it was measured whether role responsibilities for maximizing efficiency/effect were agreed upon and carried out, whether actual sales/sales performance and profits were created by performing the role in good faith, and finally, whether there was an effort to resolve dissatisfaction with role performance.

2.2.6. Agent Theory and Motivation in International Business

It is said that in international business, the macro-environment and the time factor at the micro-level can be mismatched. In his research, agricultural products are macro markets, and agricultural enterprises that depend on the timing and season of consumer demand can collide with religious and secular time and culture (Buckley, 2021). Here, the macroscopic time, the time at the company environment level, varies according to the long technology cycle, specifically, it is said that creation, improvement, commercialization, standardization, and product cycle are different. In addition, business cycles, fashion, secular trends, and demographics are variables in market cycles. In addition, in a study by Buckley et al. (2019), it is said that the company's main contract period and decision-making (team composition, recruitment (cycle), investment and inventory decision (including R&D) vary depending on these micro-time levels. In this study, it is assumed that there are many variables in the above international business relationship, rearrangement of time, and change of human resources organization. In addition, this study aims to investigate the factors that can positively affect the motivating rewards and roles, responsibilities, and commitment to work in such a diversified or rapidly changing environment. In particular, research that has been investigated during the recent COVID-19 period, adding the traditional changes and variables mentioned above, to positively affect export/import agents in global pandemic phenomena is indispensable.

In addition, in the existing studies, there are many distances in international business (including international trade) where companies cross borders and do business, and the following distances are suggested. The so-called "distance studies" of international business include institutional distance (Kostova, 1997; Paul & Sánchez-Morcilio, 2019; Roth & Kostova, 2003), linguistic distance (Dow & Karunaratna, 2006), economic distance (Ghemawat, 2001) and geographical distance exists (Eden & Miller, 2004), and the effect of these combinations was studied (Beugelsdijk et al., 2017). However, it is said that cultural distance is more institutionalized and internally distanced. This is said to influence strategic decision-making at the organizational level. In this study, in the above "distance study" for international business, from the perspective of institutional distance, we examine whether there is a distance for organizational compensation, commitment, compliance, and role and responsibility, and analyze which factors will act as positive factors. If this institutional distance is not narrowed, in fact, opportunism between export/import agents cannot be resolved in the field.

III. Research Method

A survey was conducted to study whether monetary and non-monetary rewards played role in having overseas importing agents comply and commit to their exporters. This survey was conducted online to obtain responses from a large number of overseas exporters in South Korea. More than 100 people were surveyed using a structured questionnaire. Of these, 5 people did not respond, 18 provided incomplete responses, 10 omitted too many questions, and 17 answered after the deadline. Therefore, these people were not included in the sample. Therefore, 50 people were finally analyzed in this study. In fact, in the early days, there were limitations in collecting data from exporters. In particular, describe the geographic or purpose of this study to find an agent, it took a considerable amount of time to explain the query. Nonetheless, information was initially collected on 167 people. However, 14 companies removed those with less than 3 years of experience. Twenty-two people with less than 1 to 3 years of work experience were also eliminated. They were removed because they were judged to be unrepresentative because they did not have rich experience in the compensation and dedication presented in this study. In addition, 14 companies were one-person companies that operated by

outsourcing external organizations. Among the 167 pieces of information collected in the first round, the trade name was judged to be a company related to import/export, but it was actually found to be a similar industry.

Here, the similar industry was not related to import/export belonging to trade transactions, but was a company that sold simple secondary or tertiary imported goods. These companies were also online sellers as one-person companies without stores. 17 companies are among them. In this way, a total of 100 people were first organized and an online/offline survey was conducted. However, as mentioned above, for the final 50 people, there are at least 5 years of experience, at least 10 employees, and 3 to 5 years of work experience, and the company's compliance, commitment, monetary compensation, and non-monetary compensation A representative subject who fully experienced the responsibility for compensation and role was selected. In addition, subjects with actual achievements in various countries were selected and investigated.

The causality analysis was performed to determine whether the paths in the research model statistically hold true. The t-values of this analysis are presented in the results section. If the absolute value of the t-value is 1.96 or more, the hypothesized path is considered confirmed. Moreover, the p-value should be less than 0.05 and confidence interval should be greater than 95%. To test multicollinearity in independent and dependent variables, the variance inflation factor (VIF) was measured. If the VIF was less than 10, multicollinearity was not considered an issue.

Multicollinearity is measured to determine whether a construct is distinct among the other measured variables. In other words, it measures whether there is discriminant validity between the measured variables. Using an equation, $1-R^2$, multicollinearity is calculated in regression analysis to test the correlation between independent variables. If the value of R^2 is large, correlation would be high, but the value of $1-R^2$ would decrease. This is also known as the tolerance limit. Here, the VIF stays less than 10 and the tolerance limit is higher than 0.1. Furthermore, standardized path coefficients were also tested to determine the degree of effect if the hypothesis was confirmed.

IV. Results

1. Attribute Analysis of Respondents

The results of analyzing respondents' characteristics show that most exporting firms have been established for 15~20 years or more than 30 years. Large companies with more than 100 employees were the largest group of respondents. For firms established for less than 20 years, the main form of compensation was monetary. The most common act of commitment was to perform the role assigned by the exporter, and the main target regions for Korean exporters were Southeast Asia, North America, and China. Finally, it was very common for exporters to handle multiple importers worldwide.

Table 4. Respondent Attributes

Respondent Attributes		Frequency	%
Years of establishment	Less than 5-10 years	4	8.0
	10 to 15 years	4	8.0
	15 to less than 20 years	15	30.0
	20 to less than 30 years	12	24.0
	Over 30 years	15	30.0
	Total	50	100.0

Number of employees	Less than 10	2	4.0
	20 to less than 40 people	4	8.0
	40-70 people	6	12.0
	70 to less than 100	16	32.0
	100 or more	22	44.0
	Total	50	100.0
Employee experiences	Less than 3-5 years	7	14.0
	Less than 5-10 years	20	40.0
	10-20 years or less	20	40.0
	Less than 20-30 years	1	2.0
	More than 30 years	2	4.0
	Total	50	100.0
Main form of compensation	Monetary rewards	47	94.0
	Non-monetary rewards	3	6.0
	Total	50	100.0
Exporters' importance ranking for compliance	1st	21	42.0
	2nd	20	40.0
	3rd	9	18.0
	Total	50	100.0
Exporters' importance ranking for commitment	1st	10	20.0
	2nd	11	22.0
	3rd	29	58.0
	Total	50	100.0
Exporters' importance ranking for role performance	1st	19	38.0
	2nd	19	38.0
	3rd	12	24.0
	Total	50	100.0
Main target area	Southeast Asia	14	28.0
	Europe	9	18.0
	China	11	22.0
	North America	13	26.0
	South America	2	4.0
	Africa	1	2.0
	Total	50	100.0
Number of overseas agents	More than 1 to less than 3	8	16.0
	3 or more to less than 5	23	46.0
	More than 5 to less than 10	13	26.0
	More than 10	6	12.0
	Total	50	100.0

2. Descriptive Statistics of Constructs

Each construct was measured using a 5-point scale, ranging from 1 (“not at all”) to 5 (“most definitely”). Table 2 summarizes the descriptive statistics of constructs. The degree of concentration of clusters cannot be measured using this analysis. Therefore, a multidimensional scale was used later.

Table 5. Descriptive Statistics of Constructs

Monetary rewards		**Non-monetary rewards**		**Compliance**	
Sales commission	4.22	Conflict resolution	3.86	Willingness to comply	4.06
Bulk purchase discount	4.20	Growth support	3.90	Management integrity	4.10
Sales on credit	3.82	Guarantee of exclusive rights	3.70	Reporting accuracy	4.04
Favorable terms and conditions	3.98	Training	4.04	Completion of customs declaration	4.30
Compensation match	4.20	Local business support	4.14	Fulfilment of instructions	4.24
Bonus compensation	3.84	Payment for local exhibitions	3.98	Compliance satisfaction	4.06
Total Average	4.04	Total Average	3.94	Total Average	4.13

Commitment		**Role performance**	
Time commitment	4.00	Fidelity in task performance	4.12
Investment intention	4.24	Goal achievement	4.26
Resource investment	4.02	Mid- to long-term plans for role performance	4.04
Additional work days	3.98	Role efficiency	3.98
Support for profit creation	3.76	Profit generation	4.22
Long-term commitment	4.10	Effort to resolve conflicts	4.00
Total Average	**4.02**	**Total Average**	**4.10**

3. Causality Analysis

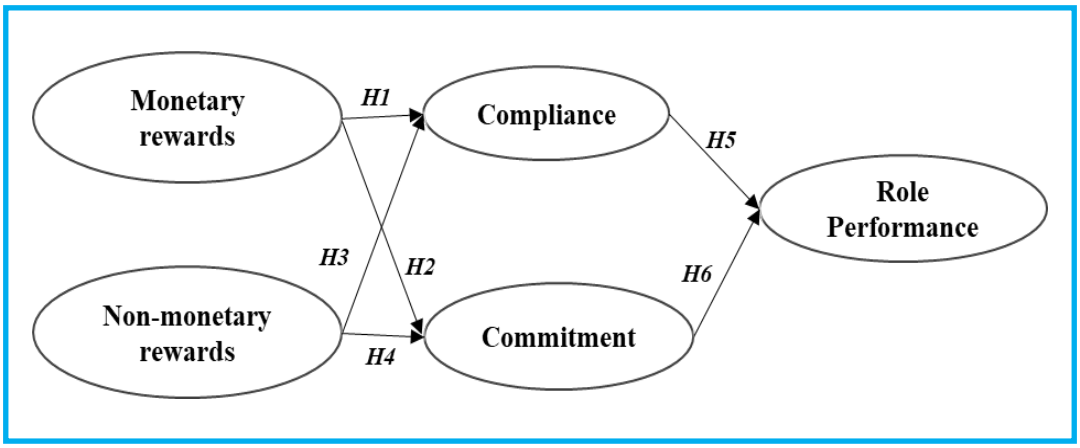
Monetary and non-monetary rewards are the exogenous variables, while agent compliance and commitment are the endogenous variables. Agent role performance was the sole dependent variable. The causality analysis measures how each construct affects endogenous variables and determines whether a hypothesis is accepted or rejected.

A hypothesis is confirmed if the absolute t-value exceed 1.96 and p-value is less than 0.05 with a confidence level of at least 95%.

3.1. Research Model

Fig. 6 shows the proposed research model with non-monetary and monetary compensation as antecedent variables affecting role performance through the medication of compliance and commitment.

Fig. 6. Research Model



3.2. Hypotheses

This study hypothesizes that providing monetary and non-monetary rewards increases compliance and commitment levels of importing agents, thus improving their role performance. The key difference between compliance and commitment is that, importers must comply with the exporter's requirements, but commitment is voluntary and stems from one's internal motivation. An increase in both compliance and commitment would positively affect importers' degree of role performance. In summary, the results would suggest how exporters should reward their importers to optimally increase agents' role performance.

H1: Monetary rewards will positively affect importer compliance.
H2: Monetary rewards will positively affect importer commitment.
H3: Non-monetary rewards will positively affect importer compliance.
H4: Non-monetary rewards will positively affect importer commitment.
H5: Compliance will positively affect importer role performance.
H6: Commitment will positively affect importer role performance.

Fig. 7 below presents the results of hypotheses testing. The first hypothesis was rejected. However, the effect of monetary rewards on

importer commitment was confirmed. The effect of non-monetary rewards on compliance was rejected, but their effect on commitment was confirmed. The effect of non-monetary rewards on commitment (H4: β = 0.439, accepted) was greater than that of monetary rewards (H2: β = 0.413, accepted). Furthermore, commitment (H6: β = 0.825, accepted) had a greater impact on role performance than compliance (H5: β = 0.814, accepted).

Fig. 7. Results of Causality Analysis

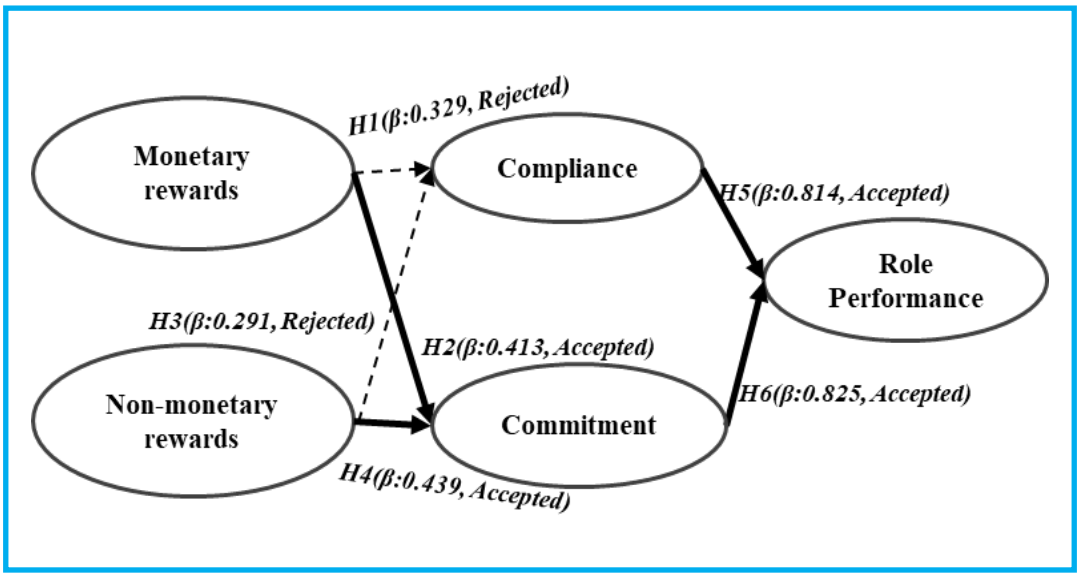


Table 6. Effects of Rewards on Agent Compliance

Model	Unstandardized coefficient		*β	t	P	CCollinear statistics	
	B	Std. Error				TL	VIF
Constant	1.786	.504	-	3.543	.001	-	-
Monetary rewards	.339	.176	.329	1.929	.060 R(H1)	.491	2.038
Non-monetary rewards	.248	.145	.291	1.707	.094 R (H3)	.491	2.038

Note: Dependent variable: Compliance, $p<0.05$ Significant, * β: standardized, R: rejected, TL: tolerance limit.

Table 7. Effects of Rewards on Agent Commitment

Model	Unstandardized coefficient		*β	t	P	CCollinear statistics	
	B	Std. Error				TL	VIF
Constant	.365	.433	-	.844	.403	-	-
Monetary rewards	.486	.151	.413	3.226	.002 A(H2)	.491	2.038
Non-monetary rewards	.428	.125	.439	3.431	.001 A(H4)	.491	2.038

Note: Dependent variable: Commitment, $p<0.05$ Significant, * β: standardized, A: accepted, TL: tolerance limit.

Table 8. Effects of Agent Compliance on Role Performance

Model	Unstandardized coefficient		*β	t	P	CCollinear statistics	
	B	Std. Error				TL	VIF
Constant	.561	.366		1.530	0.132	-	-
Compliance	.857	.088	.814	9.718	0.000 A(H5)	1.00	1.00

Note: Dependent variable: Role performance, $p<0.05$ Significant, * β: standardized, A: accepted, TL: tolerance limit.

As stated earlier, a hypothesis is accepted when the absolute t-value is 1.96 or higher and the p-value is less than 0.05. Tables 7 and 8 show that compliance (t-value= 9.718, p=0.000), and commitment (t-value= 10.115, p=0.000) significantly affect role performance.

Table 9. Effects of Agent Commitment on Role Performance

Model	Unstandardized coefficient		*β	t	P	Collinear statistics	
	B	Std. Error				TL	VIF
Constant	1.052	0.304	-	3.463	0.001	-	-
Commitment	0.759	0.075	0.825	10.12	0.000	1.000	1.000

Note: Dependent variable: Role performance, $p<0.05$ Significant, * β: standardized, TL: tolerance limit.

Overall, the results show that what exporters expect from their overseas importing agents is not compliance in the short term, but a long-term commitment. In other words, voluntary commitment, stemming from importers' internal motivation, can have a stronger positive effect on role performance than compliance. While exporters set rules for their importers to follow, the exporting parties feel that monitoring overseas agents is challenging due to physical distance and lack of knowledge about the local market.

4. Mediating Effect Analysis

Baron and Kenney (1986) explained mediation effect test procedure as below, so the same procedures were used for the analyses in this study.

(1) Independent variable → dependent variables (must significantly influence relationship)

(2) Independent variables, Mediator → dependent variables (must significantly influence relationship)

(3) Comparison of the beta (β) values of (1) and (2) [(1) > (2) for mediating effect]

4.1. Monetary Rewards → Compliance → Role Performance (Result: Accepted)

First, using Baron and Kenney (1986)'s procedures, the significant criteria were tested as shown in the findings in Table 10 below. This test result was accepted since t-value is greater than 1.96 and p-value is less than 0.05.

Table 10. Effect of Monetary Rewards on Compliance

Model	Unstandardized coefficient		*β	t	P	CCollinear Statistics	
	B	Std. Error				TL	VIF
Constant	1.898	.510		3.724	.001	-	-
Monetary Rewards	.553	.125	.537	4.406	.000	1.00	1.00

Note: Dependent Variable: Compliance, * β: standardized, TL: tolerance limit.

Then procedures 2 and 3 were implemented as shown in the findings in Table11 as below which showed that the β value was higher for ① (β = 0.668) than ② (β = 0.325). Therefore, this mediating effect was confirmed.

Table 11. Compliance Mediating Effect between Monetary Compensation and Role Performance

Model	Unstandardized coefficient		*β	t	P	CCollinear Statistics	
	B	Std. Error				TL	VIF
Constant	1.173	.473	-	2.480	.017	-	-
① Monetary Rewards	.725	.116	.668	6.227	.000	1.000	1.000
Constant	-.105	.373	-	-.282	.779	-	-
② Monetary Rewards	.353	.096	.325	3.676	.001	.712	1.404
Compliance	.673	.093	.640	7.234	.000	.712	1.404

Note: Dependent Variable: Role performance, * β: standardized, TL: tolerance limit.

4.2. Monetary Rewards → Commitment → Role Performance (Result: Rejected)

First, using Baron and Kenney (1986)'s procedures, the significant criteria were tested as shown in the findings in Table 12 below. This test result was accepted since t-value is greater than 1.96 and p-value is less than 0.05.

Table 12. Analysis of the Effect of Monetary Rewards on Commitment

Model	Unstandardized coefficient		*β	t	P	Collinear statistics	
	B	Std.Error				TL	VIF
Constant	.559	.475		1.177	.245	-	-
Monetary Rewards	.856	.117	.726	7.322	.000	1.000	1.000

Nore: Dependent Variable: Commitment, * β: standardized, TL: tolerance limit.

Then procedures 2 and 3 were implemented as shown in the findings in Table 13 as below which showed that the β value was higher for ① (β = 0.668) than ② (β = 0.146). However, the t-value was less than 1.96 at t =1.241. Thus, this mediating effect was rejected.

Table 13. Mediating Effect of Compliance between Monetary Reward and Role Performance

Model	Unstandardized coefficient		*β	t	P	Collinear statistics	
	B	Std.Error				TL	VIF
Constant	1.173	.473	-	2.480	.017	-	-
(1) Monetary Rewards	.725	.116	.668	6.227	.000	1.000	1.000
Constant	.803	.362	-	2.216	.032	-	-
(2) Monetary Rewards	.159	.128	.146	1.241	.221	.472	2.117
Commitment	.662	.109	.719	6.090	.000	.472	2.117

Note: Dependent Variable: Role performance, * β: standardized, TL: tolerance limit.

4.3. Non-monetary Rewards → Compliance → Role Performance (Result: Accepted)

First, using Baron and Kenney (1986)'s procedures, the significant criteria were tested as shown in the findings in Table 14 below. This test result was accepted since t-value is greater than 1.96 and p-value is less than 0.05.

Table 14. Effect of Non-monetary Rewards on Compliance

Model	Unstandardized coefficient		*β	t	P	Collinear statistics	
	B	Std. Error				TL	VIF
Constant	2.368	.415		5.701	.000	-	-
Non-Monetary Rewards	.449	.105	.526	4.283	.000	1.000	1.000

Note: Dependent Variable: Compliance, * β: standardized, TL: tolerance limit.

Then procedures 2 and 3 were implemented as shown in the findings in Table 15 as below which showed that the β value was higher for ① "Non-monetary rewards (β = 0.584) than ② "Monetary rewards (β = 0.215). Therefore, this mediating effect was confirmed.

Table 15. Mediating Effect of Compliance between Non-monetary Reward and Role Performance

Model	Unstandardized coefficient		*β	t	P	Collinear statistics	
	B	Std.Error				TL	VIF
Constant	2.039	.417	-	4.888	.000	-	-
(1) Non-Monetary Rewards	.524	.105	.584	4.984	.000	1.000	1.000
Constant	.292	.371	-	.789	.434	-	-
(2) Non-Monetary Rewards	.193	.085	.215	2.280	.027	.724	1.382
Compliance	.738	.099	.701	7.421	.000	.724	1.382

Note: Dependent Variable: Role performance, * β: standardized, TL: tolerance limit.

4.4. Non-monetary Rewards → Commitment → Role Performance (Result: Rejected)

First, using Baron and Kenney (1986)'s procedures, the significant criteria were tested as shown in the findings in Table 16 below. This test result was accepted since t-value is greater than 1.96 and p-value is less than 0.05.

Table 16. Effect of Non-monetary Rewards on Commitment

Model	Unstandardized coefficient		*β	t	P	Collinear statistics	
	B	Std.Error				TL	VIF
Constant	1.200	.379		3.165	.003	-	-
Non-Monetary Rewards	.716	.096	.734	7.485	.000	1.000	1.000

Note: Dependent Variable: Commitment, * β: standardized, TL: tolerance limit.

Then procedures 2 and 3 were implemented. However, as shown in the findings in Table 17 as below, it was apparent that mediating effect analysis is not possible for these variables.

Table 17. Mediating Effect of Commitment between Non-monetary Rewards and Role Performance

Model	Unstandardized coefficient		*β	t	P	Collinear statistics	
	B	Std.Error				TL	VIF
Constant	2.039	.417	-	4.888	.000	-	-
(1) Non-Monetary Rewards	.524	.105	.584	4.984	.000	1.000	1.000
Constant	1.090	.322	-	3.383	.001	-	-
(2) Non-Monetary Rewards	-.042	.109	-.047	-.385	.702	.461	2.167
Commitment	.791	.112	.859	7.092	.000	.461	2.167

Note: Dependent Variable: Role performance, * β: standardized, TL: tolerance limit.

V. Discussion

1. Respondent Characteristics Analysis

This study analyzed the responses of 50 overseas exporters in Korean small - to medium-sized enterprises (SME's). The company of more than 30% of the respondents had been established for over 30 years, and most companies had more than 100 employees. These companies were mostly SMEs. Furthermore, 20 years of work experience, making it the majority. Also, 94% of the time, monetary rewards were prioritized over non-monetary ones. Next, 42% of exporters regarded compliance as the most important attribute concerning importers, while 20% picked commitment as the most crucial attribute. The target region of most exporters was Southeast Asia (28%), North America (26%), China (22%), and Europe (18%). Most exporters deal with three or more but fewer than five importing agents worldwide.

Overall, respondents tend work at an SME and have over 10 years of work experience, mainly targeting the Southeast Asian, North American, and Chinese markets. They felt that it was absolutely necessary that their importer complies with the rules while admitting that earning long-term commitment and loyalty from their importing agents was not realistically easy.

2. Descriptive Statistics Analysis

Monetary and non-monetary rewards, agent compliance, agent commitment, and role performance were the constructs this study measured. The results of analyzing descriptive analysis showed that monetary reward, measured using a five-point scale, had an average value of 4.04, which was higher than the average value of non-monetary rewards (3.94). As the exporters emphasized agent compliance, they felt that the completion of customs declarations and the fulfilment of instructions were especially crucial. Simultaneously, they longed for investment intention and long-term commitment. Concerning agents' role, exporters stated that it was important to achieve goals and generate profits for mutual benefit.

Most respondents answered that their importers demanded sales commissions, bulk purchase discounts, favorable terms and conditions,

compensation matches, and bonuses as monetary rewards. As non-monetary compensation, most importers preferred conflict resolution, growth support, training, local business support, and payment for local exhibitions. However, guaranteed exclusive rights to importers were perceived less important compared to other non-monetary rewards. Next, exporters were satisfied with their importers' fulfilment of instructions, management integrity, willingness to comply, and completion of customs declaration. However, they expected a greater degree of transparency and improvement in report accuracy. While importers were willing to invest more time as a sign of their commitment, they were apprehensive toward additional workdays, investing resources and money, and long-term commitment. All variables of role performance were grouped together, but role efficiency and conflict resolution efforts were perceive more negatively.

3. Causal Analysis

Monetary and non-monetary rewards were set as exogenous variables and compliance and commitment as endogenous variables to analyze the hypothesized pathways. Resultantly, monetary rewards encouraged commitment, while non-monetary rewards did not. Moreover, both monetary and non-monetary rewards positively affected compliance, but not commitment, suggesting that monetary or non-monetary rewards do not necessarily motivate importers to comply with regulations. Importers voluntarily choose to commit to their exporter as long as proper compensation is provided. In this regard, additional workdays, willigness to invest, and long-term commitment were the indicators of agent commitment in the multidimensional scale analysis. Ultimately, this self-driven commitment contributes to improving agent role performance in achieving goals and generating profits.

4. Mediating Effect Analysis

Compliance did not have a mediating effect between rewards and role performance. It suggested that neither monetary nor non-monetary rewards can directly encourage importers to comply with regulations. However, previous studies and this one show that most non-monetary rewards motivate commitment. Past work (Obadia et al., 2015) also suggests that non-monetary rewards form trust and positively affect role performance. The authors argue that since it is questionable whether importers are willing to commit beyond the contractual relationship, it is necessary to form a non-monetary reward system that positively affects role performance. Realistically, importers often indulge in opportunistic behavior. This means that there is a limit to which one can expect monetary rewards to motivate importers to improve their role performance simply because they are paid and asked to follow the rules and do their jobs. Non-monetary rewards that importers may appreciate are delegation of authority, rationalization of supply unit price, discount rate, and providing on-site support. Although the findings in this study suggest that importers are committed regardless of which type of rewards they receive, past studies argue that non-monetary rewards may help importers become more highly motivated and likely to maintain relationship.

VI. Conclusion

This study is based on previous research on agent theory and motivation in the context of international business. Causal analysis made it possible to determine overseas exporters' perceptions on their importing agents. First, exporters found that both monetary and non-monetary rewards motivate importers to commit to their exporters. Meanwhile, certain forms of non-monetary rewards, such as guaranteeing exclusive rights, were less effective than other rewards. Second, neither financial nor non-financial rewards positively affected agent compliance. In other words, agent compliance was mandatory, not something that could be improved

by providing rewards and improving motivation. Finally, agent commitment directly affected goal achievement profit generation, and both monetary and non-monetary rewards facilitated this effect. Some researchers including Obadia et al. (2015) argued that non-monetary compensations build agents' internal motivation and performance more effectively. However, this study's findings show that both financial and non-financial rewards positively affect agents' commitment and motivation.

To summarize, 50 exporters in Korean SMEs who mainly dealt with their Southeast Asian, North American, Chinese, and European partners emphasized agent compliance and commitment. To motivate their agents and achieve better outcomes, they intended to reward their importers appropriately. By providing effective rewards and increasing agents' motivation, an improvement in their commitment was evident. However, it was unclear whether the reward improved agent compliance. Nonetheless, the reward system mattered because it helped make importing agents commit and engage more proactively with their exporters to achieve growth and mutual benefit. However, building long-term trust and willingness to invest did not seem achievable solely using an effective reward system based on the findings in this study. This study presented interdependent relationships among overseas partners, an effective reward system and agent commitment. However, future research efforts should explore other factors affecting agent compliance and long-term business relationships. Through this study, it was confirmed that both monetary and non-monetary compensation create commitment and have a positive effect on job performance. Although this study does not target specific products or services, most of them are export/import relationships of everyday products. If you belong to an industry that handles expensive products, dangerous goods, or energy, the transaction amount will be very large and the relationship between agents will have a more complex structure. Therefore, in future studies, it will be necessary to examine whether special products have the same results as this study. Through this, it will be possible to present factors that can positively affect the relationship between an exporter and an import agent. In fact, without research that affects this positive (+), no one can guarantee that dishonest opportunism or excessive demands for compensation may be activated, causing disturbances and obstacles to the trade ecosystem.

In addition, Europe 18.0%, China 22.0%, North America 26.0%, South America 4.0%, Africa 2.0% by region mainly traded in this study, as well as products/services traded by country, will be different. However, it is necessary to investigate in the future taking into account culture, politics, economy, customs and environment. In this study, we looked at which fundamental monetary compensation or non-monetary compensation between export/import agents could have a more positive effect, but we identified it on the assumption that it would differ depending on the changing pattern of each country and the system we have, and put it into practice. It will be possible to present a so-called "To-do-list" for each country that can be specifically utilized.

References

Ahamed, A. J., & Noboa, F. (2022). Interconnectedness of trust-commitment-export performance dimensions: A model of the contingent effect of calculative commitment. *Cogent Business & Management, 9*(1), 2088461.

Ahmed, F., Evangelista, F., & Spanjaard, D. (2021). The effects of mutuality in exporter-importer relationships. *International Marketing Review, 38*(6), 1331-1369. https://doi.org/10.1108/IMR-12-2019-0293

Aykol, B., & Leonidou, L. C. (2018). Exporter-importer business relationships: Past empirical research and future directions. *International Business Review, 27*(5), 1007-1021. https://doi.org/10.1016/

j.ibusrev.2018.03.001

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173. https://doi.org/10.1037/0022-3514.51.6.1173

Beugelsdijk, S., Nell, P. C., & Ambos, B. (2017). When do distance effects become empirically observable? An investigation in the context of headquarters value creation for subsidiaries. *Journal of International Management, 23*(3), 255-267.

Buckley, P. J. (2021). The role of history in international business: Evidence, research practices, methods and theory. *British Journal of Management, 32*(3), 797-811.

Buckley, P. J., Craig, T. D., & Mudambi, R. (2019). Time to learn? Assignment duration in global value chain organization. *Journal of Business Research, 103*, 508-518.

Chi, S. K., & Seo, M. J. (2006). Non-financial performance measures in employees' compensation. *Korean Journal of Management Accounting Research, 6*(2), 1-31.

Choi, C. B. (2018). The effects of Korean exporter's incentives on the improvement in the Indian and ASEAN importers' role performance. *Korea Trade Review, 43*, 93-113. https://doi.org/10.22659/KTRA.2018.43.5.93

Choi, C. B., & Jun, J. Y. (2019). The incentives offered by exporters and the exporters' satisfaction with importer performance. *Korea International Commerce Review, 34*(4), 127-142. https://doi.org/10.18104/kaic.2019.34.4.127

Choi, C. B., & Park, C. K. (2020). A study on the motivation of foreign importers of Korean exporting companies. *Journal of the Korean Business Association, 33*(5), 841-857.

Currall, S. C., & Inkpen, A. C. (2002). A multilevel approach to trust in joint ventures. *Journal of International Business Studies, 33*, 475-495. https://doi.org/10.1057/palgrave.jibs.8491027

Das, T. K., & Teng, B. S. (1998). Between trust and control: Developing confidence in partner cooperation in alliances. *The Academy of Management Review, 23*(3), 491-512. https://doi.org/10.5465/amr.1998.926623

Dow, D., & Karunaratna, A. (2006). Developing a multidimensional instrument to measure psychic distance stimuli. *Journal of International Business Studies, 37*(5), 578-602.

Eden, L., & Miller, S. R. (2004). Distance matters: Liability of foreignness, institutional distance and ownership strategy. In M. A. Hitt & J. L. C. Cheng (Eds.), *Theories of the multinational enterprise: Diversity, complexity and relevance* (Advances in International Management, Vol. 16, pp. 187-221). Emerald Group Publishing Limited. https://doi.org/10.1016/S0747-7929(04)16010-1

Frant, H. (1996). High-powered and low-powered incentives in the public sector. *Journal of Public Administration Research and Theory, 6*(3), 365-381. https://doi.org/10.1093/oxfordjournals.jpart.a024317

Ghemawat, P. (2001). Distance still matters. *Harvard Business Review, 79*(8), 137-147.

Gilliland, D. I. (2003). Toward a business-to-business channel incentives classification scheme. *Industrial Marketing Management, 32*(1), 55-67. https://doi.org/10.1016/S0019-8501(01)00195-X

Gilliland, D. I. (2004). Designing channel incentives to overcome reseller rejection. *Industrial Marketing Management, 33*(2), 87-95. https://doi.org/10.1016/S0019-8501(03)00031-2

Gilliland, D. I., & Manning, K. C. (2002). When do firms conform to regulatory control? The effect of control processes on compliance and opportunism. *Journal of Public Policy and Marketing, 21*(2), 319-331. https://doi.org/10.1509/jppm.21.2.319.17578

Han, S. H. (2011). A study on the effects of non-financial incentives: Motivating consumers with an opportunity for charitable giving. *Journal of Consumer Studies, 22*(2), 139-152. https://www.adic.co.kr/data/sem/pdfdata/0110711_8.pdf

Jang, H. Y., Choi, J. W., & Park, H. Y. (2017). A study of the decoupling between goal achievement and rewards in the implementation of performance management system: Focus on the case of the local governments. *The Korean Journal of Local Government Studies, 21*(3), 453-473. http://doi.org/10.20484/klog.21.3.18

Jeong, G. Y., & Kang, H. W. (2020). The effect of the exporter's communication style on the rapport and relationship Bonding. *Korea International Commerce Review, 35*(2), 91-110. https://doi.org/10.18104/kaic.2020.35.2.91

Kim, S. K., & Lee, Y. (2017). Making channel incentives work: A discriminating match framework. *Industrial Marketing Management, 65*, 1-14. https://doi.org/10.1016/j.indmarman.2017.06.006

Ko, S. I. (2002). Effects of performance: Contingent rewards, competition, and feedback on intrinsic motivation. *Korean Management Review, 31*(2), 509-528.

Kostova, T. (1997, August). Country institutional profiles: Concept and measurement. *Academy of Management Proceedings,* 180-184.

Kreps, D. M. (1997). Intrinsic motivation and extrinsic incentives. *The American Economic Review, 87*(2), 359-364. https://www.jstor.org/stable/2950946

Morgan, N. A., Kaleka, A., & Katsikeas, C. S. (2004). Antecedents of export venture performance: A theoretical model and empirical assessment. *Journal of Marketing, 68*(1), 90-108.

Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *Journal of Marketing, 58*(3), 20-38. https://doi.org/10.1177/002224299405800302

Obadia, C., & Robson, M. J. (2021). The two sides of cooperation in export relationships: When more is not better. *Journal of International Business Studies, 52*(8), 1616-1627. https://doi.org/10.1057/s41267-021-00420-7

Obadia, C., Bello, D. C., & Gilliand, D. I. (2015). Effect of exporter's incentives on foreign distributor's role performance. *Journal of International Business Studies, 46*(8), 960-983. https://doi.org/10.1057/jibs.2015.17

Palmatier, R. W., Dant, R. P., & Grewal, D. (2007). A comparative longitudinal analysis of theoretical perspectives of inter-organizational relationship performance. *Journal of Marketing, 71*(4), 172-194. https://doi.org/10.1509/jmkg.71.4.172

Paul, J., & Sánchez-Morcilio, R. (2019). Toward a new model for firm internationalization: Conservative, predictable, and pacemaker companies and markets. *Canadian Journal of Administrative Sciences, Revue Canadienne des Sciences de l'Administration, 36*(3), 336-349.

Prendergast, C. (2008). Intrinsic motivation and incentives. *The American Economic Review, 98*(2), 201-205. https://doi.org/10.1257/aer.98.2.201

Roth, K., & Kostova, T. (2003). The use of the multinational corporation as a research context. *Journal of Management, 29*(6), 883-902.

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*(1), 54-67. https://doi.org/10.1006/ceps.1999.1020

Skarmeas, D., Katsikeas, C. S., Schlegelmilch, B. B. (2002). Drivers of commitment and its impact on performance in cross-cultural buyer-seller relationships: The importer's perspective. *Journal of International Studies, 33*(4), 757-783. https://doi.org/10.1057/palgrave.jibs.8491043

Su, H., Chen, Y., & Ro, Y. K. (2017). Perception differences between buyer and supplier: The effect of agent negotiation styles. *International Journal of Production Research, 55*(20), 6067-6083. https://doi.org/10.1080/00207543.2017.1324220

Zeriti, A., Robson, M. J., Spyropoulou, S., & Leonidou, C. N. (2014). Sustainable export marketing strategy fit and performance. *Journal of International Marketing, 22*(4), 44-66.

ISSN 1946-5130 (Print), ISSN 2470-4733 (Online)
http://dx.doi.org/10.20294/jgbt.2023.19.1.39

The Journal of Global Business and Trade

Journal of Global Business and Trade

https://www.pfw.edu/jgbt

Firm-Specific Investor Sentiment, Confirmation Bias, and Market Response to Earnings Information

Su-Young Choi[a], Heejeong Shin[b]*

[a]*Department of Business & Administration, Inha University, South Korea*
[b]*Department of Business & Administration, Dong-Eui University, South Korea*

Received 27 November 2022, Revised 8 January 2023, Accepted 5 February 2023

ABSTRACT

Purpose – This study investigates the effect of firm-specific investor sentiment on the asymmetry of the market's response to signed earnings of accounting information (i.e., positive/negative unexpected earnings). Applying cognitive attribution (i.e., confirmation bias), which arises due to the incongruency of prior and new information to market earning reactions, this paper aims to provide another insight into the market's efficiency of accounting information.

Design/Methodology/Approach – This study hypothesizes that firm-specific investor sentiment is associated with market reactions to earnings information. Using 4,802 firm-year observations of KSE listed firms from 2011 to 2018, this study conducts a series of multiple regression analyses that estimate the moderate/incremental effect of investor sentiment on market earnings responses.

Findings – The analysis results show that on average, firm-specific sentiment plays a role as a reference in interpreting subsequent earnings information. This leads investors to under-react to signed earnings at the announcement date, relying on the sentiment level.

Research Implications – This study is distinct from prior literature in using individual firm investor sentiment deemed to be relatively faithful for representing the external mood of firms. By linking the market's earnings response with investor cognitive attribution (i.e., confirmation bias), this study looks more closely into market informational efficiency.

Keywords: confirmation bias, earnings information, earnings response, firm-specific investor sentiment, investor behavior

JEL Classifications: M40, M41

* *Corresponding Author, E-mail: H.Maria.Shin@deu.ac.kr*

I. Introduction

This study investigates how firm-specific investor sentiment is involved in market responses to earnings information around the announcement date. Specifically, it examines whether the asymmetry of the market's response to signed earnings information (i.e., positive / negative unexpected earnings) is attributable to confirmation bias an investor cognitive attribution. While investor informational efficiency is critical for resource allocation in capital markets, investor cognitive bias can be an obstacle to information-based decision making. Confirmation bias refers to the psychological phenomenon in which people try to confirm current beliefs in judgement and decision making, whereby decision makers manifest a tendency to seek or interpret evidence that supports prior beliefs or expectations rather than current new information (Perera et al., 2020; Waller & Felix, 1984). Humans are susceptible to such cognitive bias (Fay & Montague, 2015), and are likely to be irrational in processing current information. That is, investor cognitive attributes can be determinants of the efficient market, but have not drawn attention in accounting information-based market study.

Hence, this study examines whether confirmation bias, which arises due to the incongruence of prior and new information, cause investors to respond inefficiently to accounting information. To the test the hypothesis, the research model sets firm-specific investor sentiment as a proxy for the market expectations based on prior information. Investor sentiment is known as a critical factor in forecasting future stock prices. Not only are investment strategies based on market sentiment pervasive in the stock market, but predicting stock returns employing investor sentiment has also been studied in academics (Baker & Wurgler, 2006; Brown & Cliff, 2005; De Long, 1990). Postulating investor sentiment reflects the prior expectations of market, and this paper provides insight into market efficiency regarding accounting information as new information in such a cognitive bias. However, since there are few studies concerning firm-specific investor sentiment, it is also an open question.

Using 4,802 firm-year observations of KSE listed firms from 2011 to 2018, findings show that, on average, sentiment plays a role in the reduction of the extent of the earnings response. However, the effect is differential by positive/negative unexpected earnings, showing that the sentiment amplifies the market's reaction for negative unexpected earnings. This result holds even after the sentiment measure is altered to one measured using temporary, but more timely, sentiment. These results indicate that the sentiment is involved in the asymmetry of the market earnings response by inducing investors to confirmation bias.

This study is distinct from prior literature in that it uses individual firm investor sentiment as a factor affecting investor's decision making. Firm-specific investor sentiment is deemed to be more faithful to represent the external mood of firms than market-wide investor sentiment. Therefore, research exploiting data about such investor sentiment could show results that take a step forward over existing research. This study is valuable to the literature on the relationship of investor cognitive bias to informational efficiency in the capital market. Particularly, while research on how investor sentiment affects market pricing on earnings is not varied in accounting academics, this study additionally provides insight into investor behaviors depending on the interaction of firm-specific investor sentiment with earnings level. By linking the market's earnings response with investor cognitive attributions (i.e., confirmation bias), this study looks more closely into market's reaction to earnings information.

The remainder of this paper is organized as follows. In Section II, a literature review is presented regarding investor sentiment and market earnings reaction, and then the relevant hypotheses are developed. Next, the research methodology is described in Section III. Then, the results of this study are provided in Section IV. Finally, the paper presents a discussion and concludes in Section V.

II. Research Background

1. Literature Review

Firm value depends on a variety of factors, which are not only financial but also non-financial. This study focuses on investor sentiment as a non-financial factor, which is reported to be substantially relevant in evaluating firm values (Baker & Wurgler, 2007; Hong & Stein, 2003). Investor sentiment is known as a critical factor in forecasting future stock prices. This is the case in the practical field where investors make decisions on stock investment by exploiting sentiment, which shows the market mood toward focal firms. Not only are investment strategies based on market sentiment pervasive in stock market indeed, but predicting stock returns employing investor sentiment has been studied in academics (Baker & Wurgler, 2006; Brown & Cliff, 2005; De Long, 1990).

Meanwhile, the most essential material is accounting information on financial statements, which is the main source needed in assessing firm value. Accounting based- valuation theory states that a firm's intrinsic value depends primarily on earnings information (Nissim & Penman, 2001; Ohlson, 1995). Hence, the market reacts to an earnings surprise/shock around the earnings announcement date, adjusting the expectation of the stock price (Ball & Brown, 1968; Beaver, 1968). Normally, positive unexpected earnings (earnings surprise) lead to an increase in stock returns. Contrarily, negative unexpected earnings (earnings shock) result in a decrease in stock returns, and a stock price crash in some cases. This means that accounting information is crucial to identify a firm's intrinsic value, even when predicting future stock returns in consideration of the investor sentiment information as mentioned above.

Although accounting earnings information is deemed to be value relevant, market reactions to an earnings announcement do not always correspond to the information content implied in unexpected earnings. Particularly, the market does less price a negative sign (i.e., earnings shock) of firm value in the practical field (Lee & Kim, 2006, Song et al., 2004). It is ironic that the literature studied in an aspect of accounting quality suggests various factors affecting such a phenomenon, which are mainly focused on earnings quality, audit quality, and so on. (Kim et al., 2013; Shim, 2004). That is, it is reported that lower disclosure quality causes market responses to be weak.

This study, on the other hand, emphasizes that firm-specific investor sentiment plays a critical role in unusual earnings responses since it could serve considerably as a mediator of investor cognitive bias only to affect the emarket reaction to earnings information (Baker & Wurgler, 2007; Banerjee & Green, 2015; Shleifer, 2000). Even though there exist various ex-ante factors affecting market pricing on earnings information such as macroeconomic condition, firm reputation formed by mass media, the 52-week high/low, and so on, such factors form investor sentiment, which is pervasive in the stock market. In this context, this study investigates how investor sentiment is involved in the market response to earnings information around the announcement date. While there are a few studies on the impact of investor sentiment on stock returns in Korea, most are focused on market-wide sentiment, which is close to the market mood dominant in the stock market (Kim & Byun, 2010; Park, 2016).

2. Hypothesis

Focusing on firm-specific investor sentiment that is more relevant to a firm's characteristics; this study examines more elaborately the effect of firm-specific investor sentiment on investor behaviors implied in the market reaction to earnings information. Investor sentiment could have a different effect on the market reaction to earnings in either the resultant information underlying a firm's value or the reference information merely referred to in assessing stock value. On one hand, investor sentiment could be seen as the

consequential indicator of firm value, which is the case since naïve individual investors tend to make decisions relying on a strategy based on the sentiment level at the time. In this case, earnings information is disregarded and not reflected in the stock price, resulting in a lower ERC (earnings response coefficient). Notably, this is not a kind of cognitive bias that distorts the information, but the under-reaction to an earnings announcement due to investor heuristic behaviors.

On the other hand, when investor sentiment acts as reference information for evaluating stocks, it could cause investors to be cognitively biased, affecting decision making. Investor sentiment drives investors to have confirmation bias in the evaluating process of a firm. Confirmation bias is referred to as the tendency to seek out only information that supports an existing belief (Perera et al., 2020). Investors tend to be so reliant on the existing information that the new information is interpreted differently according to existing information (Barberis et al., 1998; Veronesi, 1999). The high congruency of earnings news with sentiment (i.e., positive unexpected earnings/high sentiment or negative unexpected earnings/low sentiment) may lead investors to react more actively to the unexpected earnings, indicating high ERC.

Considering such, this study examines more closely the effect of firm-specific investor sentiment on the ERC in terms of positive unexpected earnings and those negative. If firm-specific investor sentiment is a kind of preceding price index known among market participants, and investors look over earnings information, investor sentiment would still contribute to the reduction of the ERC. This is similar with anchoring bias behavior, in which investors are fixed to certain reference information and under-react to new information (George et al., 2015; Kahnenman & Tversky, 1973; Shin & Park, 2018), leading to market anomalies including post-earnings announcement drift due to investor informational inefficiency.

In addition, when investor sentiment causes investors to misunderstand current information (i.e., confirmation bias), investors will not fully react to earnings information. Relying on informational congruence between investor sentiment and the earnings signal, investors react less to positive (negative) earnings under high (low) sentiment, leading to the lower ERC. On the contrary, investor reactions may be stronger with positive (negative) earnings inconsistent with low (high) sentiment, leading to higher ERC. As such, the effect of investor sentiment on market response to earnings information cannot be predicted only in a certain direction, and thus this study establishes a null hypothesis.

H1: Firm-specific investor sentiment does not affect the market reaction to earnings information.

III. Research Methodology

1. Sample Criteria

The analysis was conducted using Korea Stock Exchange listed firms over the period of 2011 to 2018. The analysis period started in 2011, when the mandatory adoption of IFRS was made. Particularly, consolidate financial statements being compulsory as a primary financial report makes a difference in the market's reaction to accounting information. These characteristics may make the data invalid in testing the hypothesis of the different reactions to earnings information by firm-specific investor sentiment, which is the main treatment variable. To control the differential informational environment (i.e., pre- and post-IFRS adoption) in testing the hypothesis, this study uses the financial data from consolidate financial statement after 2011 to be free from the heterogeneity of data during the sample period. The financial data used in analysis are retrieved from FnGuide database (https://www.fnguide.com/). From the available financial data of 7,020 firm-years, the final sample consists of 4,802 firm-year observations. A more detailed procedure on sample selection is as follows.

Table 1. Sample Selection Criteria

Criteria	Firm-Year Observations
KSE Listed Firms for the Period of 2011- 2018	7,020
Less: Financial and Insurance Industry	(151)
Less: Missing Data	(911)
Less: Data Not Available for Investor Sentiment Measurement*	(1,156)
Final Sample	4,802

Note: While the measurement for firm-specific investor sentiment requires daily stock returns and trading volume, some of the data do not show the continuity in stock transaction due to trading suspension or designation as a management item.

2. Test Variable Measurement: Firm-Specific Investor Sentiment

Seok et al. (2019) developed the sentiment indicator, which expands on those of Yang and Zhou (2015, 2016), Ryu et al. (2017), and Yang et al. (2017), to measure daily firm-level sentiment. They suggested a firm-specific investor sentiment index created using information such as the volume and price of individual shares so that the index can directly reflect investor transaction sentiments and transaction type. The measures representing the information used in creating the sentiment index are the daily Relative Strength Index (RSI), Psychological Line Index (PLI), Adjusted Turnover Rate (ATR), and the Logarithm of Trading Volume (LTV) for each firm.

The specific calculations for each component are presented in the following table.

Table 2. Components for Firm-Specific Investor Sentiment

Component	Measurement a)
(1) RSI	$RSI_{i,t} = \left[\frac{RS_{i,t}}{1+RS_{i,t}}\right] \times 100$, where $RS_{i,t} = \frac{\sum_{k=0}^{13} \max(P_{i,t-k} - P_{i,t-k-1},\ 0)}{\sum_{k=0}^{13} \max(P_{i,t-k-1} - P_{i,t-k},\ 0)}$
	: The degree of the stock relatively overbought or oversold (Chen et al., 2010)
(2) PLI	$PLI_{i,t} = \left[\sum_{k=0}^{11} \left\{\frac{\max(P_{i,t-k} - P_{i,t-k-1},\ 0)}{P_{i,t-k} - P_{i,t-k-1}}\right\} /12\right] \times 100$
	: Short-term price reversals and the psychological stability of investors (Yang & Gao, 2014)
(3) ATR	$ATR_{i,t} = \frac{V_{i,t}}{NOUTS_{i,t}} \times \frac{R_{i,t}}{\lvert R_{i,t}\rvert}$
	: Liquidity, distinguishing between optimistic and pessimistic sentiment (Yang & Zhang, 2014)
(4) LTV	$LTV_{i,t} = \ln(V_{i,t})$
	: Liquidity, reflecting the expectations and prospects of investors on the stock (Baker & Stein, 2004)

Note: a) $P_{i,t}$ denotes the closing price of stock i at time t; $V_{i,t}$ is the trading volume of stock t at time t and $R_{i,t}$ is the return of stock i at time t, calculated as $R_{i,t} = \left(\frac{P_{i,t}}{P_{i,t-1}}\right)$-1; $NOUTS_{i,t}$ indicates the number of outstanding shares.

Seok et al. (2019) constructed market-free versions of each component with the overall market variation removed by regressing each component on excess stock market returns. This procedure helps mitigate the common dependence of each component on the overall stock market.

$$Comp_{k,i,t} = \alpha_0 + \alpha_1 \times Market_t + \varepsilon_{k,i,t} \quad (1)$$

Where $Market_t$ denotes the market excess return (the market returns less the risk-free rate) at time t. The market return and risk-free rate are calculated using the KOSPI return and 91-day certificate of deposit rate, respectively. The dependent variable, $Comp_{k,i,t}$ is one of RSI, PLI, ATR, or LTV for stock i at time t. Then, the residuals $\varepsilon_{k,i,t}$ are considered market-free proxies for investor sentiment, which are presented by labelling the superscript $\perp$ in Eq. (2).

Using these four market-free components, Seok et al. (2019) performed principal component analysis on the firms to eliminate idiosyncratic, non-sentiment-related factors. Then, an investor sentiment index ($S_{i,t}$) based on the first principal component ($F_{i,t}$) of each firm i at time t is constructed.

$$S_{i,t} = F_{i,RSI} \times RSI_{i,t}^{\perp} + F_{i,PLI} \times PLI_{i,t}^{\perp} + F_{i,ATR} \times ATR_{i,t}^{\perp} + F_{i,LTV} \times LTV_{i,t}^{\perp} \quad (2)$$

This study uses the cumulative (abnormal) daily firm-specific investor sentiment for nine trading days (i.e., -10 ~ -2) by two days before the earnings announcement date (i.e., 0). However, to investigate the unbiased effect of sentiment on the sensitivity of returns to an earnings surprise, this study also uses the average sentiment over 2 trading days as a robustness check.

3. Model Specifications

The aim of this study is to investigate how firm-specific investor sentiment (SENT) influences the market response to an earnings announcement. Seeking to examine the consequence of investor sentiment confined to individual firm for the market reaction to earnings (i.e., ERC), this study regresses 3 trading day cumulative abnormal returns (CAR) on SENT multiplied by unexpected earnings (UE).

Investor sentiment is generally defined as the level of the market state representing the extent that investors are optimistic or pessimistic about future performance. It can represent the level of trading activity. High sentiment indicates investor optimism for future performance and an active trading state. When high sentiment is involved in market pricing, the market reaction to earnings is higher over than that under low or flat sentiment. In this context, firm-specific investor sentiment is also expected to increase ERC. However, the result is an empirical question since firm-specific sentiment has never been applied to the ERC test, which is different from the market-wide version that sets aside a firm's individual attributes.

Eq. (3) indicates the regression model for the test.

$$CAR(-1,1) = Const. + \beta_1 UE + \beta_2 SENT + \beta_3 UE \times SENT + Control\ Variables + \sum FE + \varepsilon \quad (3)$$

If the conjecture above is supported by the analysis, the coefficient of $UE \times SENT$, β_3 is expected to be positive.

IV. Empirical Results

1. Descriptive Statistics

Table 3 presents descriptive statistics for the test variables. SENT (investor sentiment), the main treatment variable, has the mean (median) value of -0.035 (-0.147), ranging from -19.336 to 20.790. Notably, it has rather large standard deviation of 7.602, Which is likely to be estimation biased due to the nonlinear distribution of data. To address this, the SENT variable engaged in the regression analysis is standardized, which has mean value of 0 and variance of 1.

Table 3. Descriptive Statistics (N=4,802)

Variables	Mean	Std. Dev.	Median	Min	Max
CAR (-1, 1)	0.004	0.049	0.001	-0.165	0.244
UE	0.001	0.040	0.000	-0.151	0.174
UE+	0.015	0.038	0.000	0.000	1.145
UE−	-0.014	0.029	0.000	-0.516	0.000
SENT	-0.035	7.602	-0.147	-19.336	20.790
SIZE	20.212	1.590	19.996	16.844	25.110
LEV	0.471	0.200	0.475	0.057	0.956
ACC	-0.014	0.075	-0.013	-0.364	0.331
GROW	0.059	0.184	0.034	-0.477	1.737
PBR	1.233	1.301	0.833	0.129	12.519
LOSS	0.160	0.366	0.000	0.000	1.000
FOR	0.101	0.128	0.046	0.000	0.643
DAF	0.236	0.425	0.000	0.000	1.000

Note: The definitions of variables are as follows: CAR is the cumulative market-adjusted (equally value-weighted) abnormal returns for three trading days around an earnings announcement date; UE denotes the unexpected earnings based on the change in operating income, which is scaled by total assets at previous year end; UE^+ consists of the positive number out of UE; UE^- is negative number out of UE; SENT, the main variable, is measured as the cumulative (abnormal) daily firm-specific investor sentiment for nine trading days (i.e., -10 ~ -2) by two days before the earnings announcement date (i.e., 0), where the daily firm-specific investor sentiment indicator is estimated employing Seok et al. (2019); SIZE is the firm size, measured as the natural logarithm of total assets; LEV indicates leverage, meaning debt ratio measured as the debt divided by total assets; ACC means the accruals measures, calculated as net income less the cash flows of operations scaled by total assets at previous year end; GROW indicates growth measured based on the change in total assets; PBR is the market price to book value ratio; LOSS is the indicator, meaning 1 for net loss and 0 for net income; and FOR indicates foreign investor ownership, which is 0 if foreign investor does not exist. DAF denotes the indicator of analyst coverage.

Table 4. Correlation Analysis

Variables		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
CAR (-1, 1)	(1)	0.068 (<.0001)	0.061 (<.0001)	-0.044 (0.002)	-0.004 (0.788)	-0.037 (0.010)	0.015 (0.303)	-0.007 (0.623)	0.007 (0.652)	0.005 (0.749)	-0.031 (0.032)	-0.032 (0.028)	-0.042 (0.004)
UE	(2)	1	0.684 (<.0001)	-0.708 (<.0001)	0.049 (0.001)	0.011 (0.450)	0.001 (0.938)	0.099 (<.0001)	0.143 (<.0001)	0.106 (<.0001)	-0.258 (<.0001)	0.033 (0.022)	0.019 (0.181)
UE^{+}	(3)		1	-0.186 (<.0001)	0.031 (0.033)	-0.081 (<.0001)	0.023 (0.112)	0.036 (0.013)	0.172 (<.0001)	0.190 (<.0001)	-0.025 (0.079)	-0.018 (0.217)	-0.004 (0.792)
$\lvert UE^{-} \rvert$	(4)			1	-0.031 (0.033)	-0.116 (<.0001)	0.035 (0.014)	-0.130 (<.0001)	-0.018 (0.212)	0.099 (<.0001)	0.377 (<.0001)	-0.062 (<.0001)	-0.028 (0.054)
SENT	(5)				1	-0.005 (0.709)	0.005 (0.706)	0.017 (0.241)	-0.007 (0.646)	0.005 (0.721)	-0.048 (0.001)	0.009 (0.537)	-0.009 (0.522)
SIZE	(6)					1	0.251 (<.0001)	0.015 (0.290)	0.067 (<.0001)	-0.109 (<.0001)	-0.217 (<.0001)	0.498 (<.0001)	0.245 (<.0001)
LEV	(7)						1	-0.200 (<.0001)	-0.008 (0.578)	0.030 (0.035)	0.150 (<.0001)	-0.123 (<.0001)	-0.019 (0.183)
ACC	(8)							1	0.219 (<.0001)	-0.017 (0.245)	-0.251 (<.0001)	0.047 (0.001)	0.076 (<.0001)
GROW	(9)								1	0.127 (<.0001)	-0.124 (<.0001)	0.060 (<.0001)	0.066 (<.0001)
PBR	(10)									1	0.066 (<.0001)	0.130 (<.0001)	0.091 (<.0001)
LOSS	(11)										1	-0.170 (<.0001)	-0.140 (<.0001)
FOR	(12)											1	0.189 (<.0001)
DAF	(13)												1

Note: The Pearson correlation coefficients (r) are indicated on the right of the empty diagonal. The figures in parentheses are p-values. Variables are defined in Table 3. The subscripts i (firm) are omitted from all variables.

2. Correlation Analysis

Table 4 provides correlation between test variables. As well documented, UE (unexpected earnings) is positively correlated with CAR (cumulative abnormal returns over three trading days), representing positive ERC (earnings response coefficient) (Ball & Brown, 1968; Beaver, 1968; Lipe, 1990). This is consistent with results that show a positive correlation coefficient on CAR for the positive UE (i.e., UE^{+}), and the negative sign of correlation with CAR for the absolute negative UE (i.e., UE^{-}).The primary variable SENT (firm-specific investor sentiment) is negatively correlated with CAR, showing a -0.004 coefficient that is insignificant (t-statistics=0.788). SENT has a different correlation with UE depending on the sign of UE, showing a positive sign for UE^{+}, but a negative sign for UE^{-}. It makes sense that the investor sentiment may imply coming earnings news in part.

3. Regression Analysis Results

Table 5 shows the analysis results. The Benchmark model in the left column shows the regression result with other variables excluded, while the Eq. (3) model on the right does with the other variables controlled. As documented in prior studies, unexpected earnings have a positive relation to CAR in both Eq. (3) and benchmark columns, meaning the positive ERC. The coefficient of SENT is not significant, indicating that investor sentiment (SENT) itself does not affect the CAR around earnings announcement date. Interestingly, the coefficient of $SENT \times UE$ has a negative sign and is statistically significant in both models. The values are -0.005 (t-statistics=-2.18) in the benchmark and -0.005 (t-statistics=-1.99) in Eq. (3), respectively. This is not consistent with the expectation on the effect of investor optimism on market pricing from earnings information. Rather, this indicates that investor sentiment contributes to less of a response of the market to earnings information, and this finding allows investor sentiment not to be interpreted merely as investor optimism.

The alternative perspectives are two fold in this study. Considering that firm-specific investor sentiment plays the role of a valuation factor in market pricing, the negative effect of SENT on ERC makes sense. This is because investors tend to discount the current price of stock under high market sentiment as seeing it as an over-valued stock, or do not fully respond to earnings information, relying on sentiment. Such a heuristic behavior of investors may lead to a reduction in earnings responses in market pricing (i.e., ERC). On the contrary, ERC could be excessive due to investor sentiment wherein investors do not react to earnings information appropriately.

It is assumed that investor sentiment plays a role in the informational environment, which affects investor cognitive behaviors in the stock pricing process. Particularly, acting as referential information for investors dedicated to heuristics to make decisions, investor sentiment may have investors over-react to earnings information, which is congruent with investor expectations based on sentiment. That is, investors overly weight earnings surprises (earnings shock) congruent with the implicit expectation of high (low) investor sentiment, which is referential information. This could be explained by the tendency of investors to accept information aligned with investor sentiment.

Confirmation bias is reported to affect investor biases to anticipated news in stock markets. This means that investors are likely to assess earnings information unevenly depending on the congruency with expectations. For example, a high congruency of earnings news with sentiment (i.e., positive unexpected earnings/high sentiment or negative unexpected earnings/low sentiment) may make investors react more actively to unexpected earnings, indicating high ERC. Considering such, this study examines more closely the effect of firm-specific investor sentiment on ERC in terms of positive unexpected earnings and those negative.

To summarize, if firm-specific investor sentiment serves as a kind of preceding price index known among market participants, and investors

Table 5. Firm-Specific Investor Sentiment and Earnings Response

$$CAR(-1,1) = Const. + \beta_1 UE^+ + \beta_2 |UE^-| + \beta_3 SENT + \beta_4 UE^+ \times SENT + \beta_5 |UE^-| \times SENT + Control\ Variables + \sum FE + \varepsilon$$

	Dep. Var. = *CAR* (-1, 1)			
Variable	Coef.	t-stat.	Coef.	t-stat.
	Benchmark		Eq. (3)	
Const.	0.005	2.82***	0.033	2.93***
UE	0.077	4.40***	0.067	3.65***
SENT	0.000	-0.67	0.000	-0.80
UE × *SENT*	-0.005	-2.18**	-0.005	-1.99**
SIZE			-0.002	-2.57**
LEV			0.009	2.15**
ACC			-0.006	-0.61
GROW			0.002	0.48
PBR			0.000	-0.31
LOSS			-0.005	-2.35**
FOR			-0.003	-0.49
DAF			-0.003	-1.47
Year Effect	Included		Included	
Adjusted R^2	0.02		0.02	
F-stat.	11.81***		7.79***	
# of obs.	4,802		4,802	

Note: The notations ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Statistical significance of estimated coefficient is based on firm clustered standard error. Please refer to Table 3 for the definitions of the variables. The subscripts *i* (firm) are omitted from all variables.

look over earnings information, investor sentiment would still contribute to the reduction of the ERC. On the other hand, if it plays a relevant role in investor cognitive behavior (i.e., confirmation bias), it will make investors over-react to earnings information congruent with investor sentiment, leading to heightening the ERC. The following equation is the regression model for the tests.

$$CAR(-1,1) = Const. + \beta_1 UE^+ + \beta_2 |UE^-| + \beta_3 SENT + \beta_4 UE^+ \times SENT + \beta_5 |UE^-| \times SENT + Control\ Variables + \sum FE + \varepsilon \quad (4)$$

As the baseline of the level of ERC, β_1, the coefficient of positive unexpected earnings is positive, and β_2, the coefficient of the negative unexpected earnings that is treated to the absolute value, is negative. If the finding supports the information hypothesis (i.e., resultantly ERC decrease), then the coefficient of $UE^+ \times SENT$, β_4 and the coefficient of $|UE^-| \times SENT$, β_5 have opposite signs to the baseline of the level of ERC (i.e., β_1 and β_2). Then, it is expected for β_4 to be negative and β_5 positive. However, if the findings are consistent with the reference hypothesis (i.e., resultantly magnified ERC), then the positive value for β_4 and the negative value for β_5 will be shown, indicating the amplified ERC due to the confirmation bias concerning investor sentiment.

The regression analysis results are provided in Table 6. As expected, the coefficients of UE^+ and $|UE^-|$ as the baseline of ERC reveal positive value and negative values, respectively, in both Benchmark and Eq. (4). The SENT per se do not have any relation to the market reaction around an earnings announcement date. The interesting variables in the analysis are the interaction terms of UE (unexpected earnings) and SENT (investor sentiment), i.e., $UE^+ \times SENT$ and $|UE^-| \times SENT$. Notably, their coefficients are a little different from the prediction mentioned above. Specifically, the coefficients of $UE^+ \times SENT$ are negative but not statistically significant in both Benchmark and Eq. (4).

The values are -0.001 (t-statistics= -0.52) and -0.001 (t-statistics=-0.32), respectively. However, those of $|UE^-| \times SENT$ are positive and significant at the 1% level, showing 0.009 (t-statistics=2.62) in Benchmark and 0.009 (t-statistics=2.61) in Eq. (3). These results support the reference theory in part. Even though SENT is not effective on ERC for positive unexpected earnings, it seems to play a role in amplifying the market reaction to negative unexpected earnings. This asymmetry might be attributable for the prospect theory documented by Kahneman and Tversky (1979), in which investors are more sensitive to a loss than profit, and this asymmetric reaction is due to a tendency for loss aversion. Accordingly, it seems that investors tend to react more to negative unexpected earnings where they are more trapped in investor sentiment with underlying confirmation bias. Eventually, investors with high sentiment (incongruent with earnings information) under-react to negative unexpected earnings, while those with low sentiment (congruent with earnings information) over-react.

4. Robustness Tests

4.1. Alternative Measures of Firm-Specific Investor Sentiment

In this section, the regression analysis on Eq. (4) is conducted employing the two alternative measures of firm-specific investor sentiment. One is the average of daily firm-specific investor sentiment over 10-trading days, and the other is the cumulative firm-specific investor sentiment for 2 trading days. All sentiment measurements are formed using daily firm-specific investor sentiment by the day ending two days before the earnings announcement date to not influence the market reaction (i.e., CAR). This ensures the unbiased effect of sentiment on the sensitivity of returns to an earnings surprise. Altering the method of investor sentiment measure using short period (i.e., 2 days) ensures the capturing of timely investor sentiment close to the event date (i.e., earnings announcement date).

The analysis results are presented in Table 7. The findings are similar with the original analysis, supporting the reference hypothesis in part, though showing less significance in the coefficients.

4.2. Regression Analysis by Sample of Positive and Negative Unexpected Earnings

In this section, a regression analysis on Eq. (4) was conducted via sample of signed unexpected earnings. Using the restricted sample limits the generalization of the findings, but ensures a more obvious examination focusing on each part of the signed UE, and facilitates the interpretation

Table 6. Firm-Specific Investor Sentiment and Earnings Response from Positive – and Negative Unexpected Earnings

$$CAR(-1,1) = Const. + \beta_1 UE^{+} + \beta_2 |UE^{-}| + \beta_3 SENT + \beta_4 UE^{+} \times SENT + \beta_5 |UE^{-}| \times SENT + Control\ Variables + \sum FE + \varepsilon$$

	Dep. Var = *CAR* (-1, 1)			
Variable	Coef.	t-stat.	Coef.	t-stat.
	Benchmark		Eq. (4)	
Const.	0.005	2.48**	0.033	2.88***
UE^{+}	0.073	3.86***	0.067	3.41***
$\|UE^{-}\|$	-0.044	-1.79*	-0.033	-1.22
SENT	0.000	-1.43	0.000	-1.62
$UE^{+} \times SENT$	-0.001	-0.52	-0.001	-0.32
$\|UE^{-}\| \times SENT$	0.009	2.62***	0.009	2.61***
SIZE			-0.002	-2.56**
LEV			0.009	2.15**
ACC			-0.006	-0.61
GROW			0.001	0.35
PBR			0.000	-0.44
LOSS			-0.006	-2.58***
FOR			-0.003	-0.46
DAF			-0.003	-1.47
Year Effect	Included		Included	
Adjusted R^2	0.02		0.02	
F-stat.	10.30***		7.32***	
# of obs.	4,802		4,802	

Note: The notations ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Statistical significance of the estimated coefficient is based on firm clustered standard error. Please refer to Table 3 for the definitions of the variables. The subscripts *i* (firm) are omitted from all variables.

Table 7. Firm-Specific Investor Sentiment and Earnings Response: Alternative Sentiment Measures

$$CAR(-1,1) = Const. + \beta_1 UE^+ + \beta_2 |UE^-| + \beta_3 SENT + \beta_4 UE^+ \times SENT + \beta_5 |UE^-| \times SENT + Control\ Variables + \sum FE + \varepsilon$$

	Dep. Var. = *CAR* (-1, 1)			
Variable	Coef.	t-stat.	Coef.	t-stat.
	Average over 10 days		Cumulative 2 days	
Const.	0.033	2.88***	0.033	2.89***
UE^+	0.068	3.43***	0.067	3.40***
$\|UE^-\|$	-0.033	-1.23	-0.032	-1.19
SENT	-0.002	-1.55	0.000	-0.58
$UE^+ \times SENT$	-0.011	-0.45	-0.003	-0.51
$\|UE^-\| \times SENT$	0.077	2.61***	0.013	1.80*
SIZE	-0.002	-2.55**	-0.002	-2.57**
LEV	0.009	2.14**	0.009	2.18**
ACC	-0.006	-0.62	-0.006	-0.58
GROW	0.001	0.32	0.002	0.38
PBR	0.000	-0.46	0.000	-0.44
LOSS	-0.006	-2.59***	-0.006	-2.55**
FOR	-0.003	-0.46	-0.003	-0.47
DAF	-0.003	-1.47	-0.003	-1.46
Year Effect	Included		Included	
Adjusted R^2	0.02		0.02	
F-stat.	7.33***		7.11***	
# of obs.	4,802		4,802	

Note: The notations ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Statistical significance of the estimated coefficient is based on firm clustered standard error. Please refer to Table 3 for the definitions of the variables. The subscripts *i* (firm) are omitted from all variables.

Table 8. Firm-Specific Investor Sentiment and Earnings Response: Analysis via Sample of Signed Unexpected Earnings

$$CAR(-1,1) = Const. + \beta_1 UE + \beta_2 SENT + \beta_3 UE \times SENT + Control\ Variables + \sum FE + \varepsilon$$

Variable	Dep. Var. = *CAR* (-1, 1)			
	Coef.	t-stat.	Coef.	t-stat.
	Sample of *UE+*		Sample of $\lvert UE^- \rvert$	
Const.	0.043	2.58**	0.020	1.25
UE	0.086	2.54**	-0.030	-0.98
SENT	0.000	-1.18	0.000	-1.38
UE × *SENT*	0.001	0.18	0.010	2.64***
SIZE	-0.002	-2.71***	-0.001	-0.76
LEV	0.020	3.53***	-0.003	-0.51
ACC	-0.003	-0.20	-0.006	-0.42
GROW	0.007	1.24	-0.003	-0.59
PBR	-0.001	-0.81	0.000	0.31
LOSS	-0.008	-2.24**	-0.004	-1.31
FOR	0.000	-0.04	-0.006	-0.68
DAF	-0.002	-0.77	-0.004	-1.37
Year Effect	Included		Included	
Adjusted R^2	0.03		0.01	
F-stat.	5.50***		3.16***	
# of obs.	4,802		4,802	

Note: The notations ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Statistical significance of the estimated coefficient is based on firm clustered standard error. Please refer to Table 3 for the definitions of the variables. The subscripts *i* (firm) are omitted from all variables.

of results. The results are presented in Table 8, consistent with main analysis. For the sample of the positive UE, SENT has no effect on the unexpected earnings, though it affects the negative signed UE, showing a negative coefficient of *UE* × *SENT*.

V. Conclusions

This study investigates how firm-specific investor sentiment has an impact on market reaction to earnings information. Specifically, in postulating sentiment as market expectation based on prior information, or a preceding price indicator, this study examined market response asymmetry to earnings information. Moreover, it examined market response to earnings information depending on investor cognitive attribution (i.e., confirmation bias). This research was motivated by paying attention more to investor behavior-related factors (i.e., investor sentiment, cognitive bias) that determine the capital market, distinct from prior literature on accounting information-based market study.

Using 4,802 firm-year observations of KSE listed firms from 2011 to 2018, the findings show that on average, investor sentiment played a role in the reduction of the extent of earnings response, inconsistent with the hypothesis of no relationship between market response and investor sentiment. In addition, the results show that the effect of investor sentiment on market reactions to earnings information (the ERC) are different in signed unexpected earnings (i.e., positive UE and negative UE). Supporting the reference hypothesis in part, the findings reveal that investor sentiment played a role in amplifying the market reaction for negative unexpected earnings only. This result holds even after the sentiment is altered to the measurement corresponding to temporary but more timely sentiment.

These results indicate that sentiment induces confirmation bias. That is, when current information (i.e., accounting earnings information) is not consistent with prior expectations (i.e., the sentiment prior to earnings announcement), investor reactions to earnings information is significant, but not for earnings information consistent with prior expectations. In other words, investors tend to review and confirm new information based on prior information as a reference, which leads to asymmetric reactions to earnings information. These findings are distinct from prior literature in that firm-specific investor sentiment is considered a proxy for a market expectations based on prior information and cognitive attributions as a factor that determines investor behavior to mediate the effect of sentiment on market informational efficiency.

This study is valuable to the literature on the relationship of investor cognitive biases to informational efficiency in the capital market. Particularly, while research on how investor sentiment affects market pricing on earnings is not varied in accounting academics, this study provides additional insight into investor behavior depending on the interaction of firm-specific investor sentiment with earnings level. By linking the market's earnings response with investor cognitive attributions, this study looks more closely into market reactions to earning information. In addition, this study expands sentiment-related literature by using individual firm investor sentiment as a factor affecting investor decision making. Compared to market-wide sentiment, individual firm-specific investor sentiment is deemed to be more faithful in representing the external mood of firms. Therefore, research exploiting data about investor sentiment could show results that take a step forward over existing research.

By revealing the confirmation bias of investors in processing information, this study further provides market participants with the practical suggestion that investors should take ex-ante information in portfolio strategy based on both sentiment and earnings into account. This is ultimately concerned with corporate valuation using earnings information. Given that earnings information is reflected in stock price in the direction of earnings signs (Ball & Brown, 1968;

Beaver, 1968), investors need to incorporate positive signed-earnings information more actively with stock price, independent of the cognitive bias. From a company's point of view, disclosure management will be needed to reduce losses in corporate value, considering market sentiment and investor behavior on earnings information.

This study has several limitations in terms of analysis period and research methodology. Although it is reasonable to use financial statement data since the adoption of international financial reporting standard (i.e., IFRS) in 2011 and data up to the pre-pandemic period in 2020, it does not analyze the whole period in which financial accounting data is available in Korea. This can cause a problem of a generalization of findings, but it is appropriate in that it is analyzed by ensuring current accounting standards and consistency in market conditions that exclude the pandemic period. Next, this study conducted a market study in consideration of the human psychological and behavioral tendency of confirmation bias, but no reliability verification was attempted for proxy variables representing confirmation attribution. Thus, contextual analysis considering variables representing confirmation bias need to be examined for future research. In addition, this study focused on the earnings response coefficient to examine how confirmation bias represented by firm-specific investor sentiment affects investor information efficiency, but future research is needed through stock price drift (i.e., PEAD) due to investor underreactions to earnings information.

References

Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, *6*(2), 159-178.

Barberis, N., Shleifer, A., & Vishny, R. (1998). A model of investor sentiment. *Journal of Financial Economics*, *49*(3), 307-343.

Beaver, W. H. (1968). The information contents of annual earnings announcements. *Journal of Accounting Research*, *27*, 1-36.

De Long, J. B., Shleifer, A., Summers, L. H., & Waldmann, R. J. (1990). Noisier trade risk in financial markets. *Journal of Political Economy*, *98*(4), 703-738.

Fay, R. G., & Montague, N. R. (2014). Witnessing your own cognitive bias: A compendium of classroom exercises. *Accounting Education*, *30*(1), 13-34.

George, T. J., Hwang, C. Y., & Li, Y. (2015*). Anchoring, the 52-week high and post earnings announcement drift*. SSRN. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2391455

Hong, H., & Stein, J. C. (1999). A unified theory of underreaction, momentum trading and overreacting in asset markets. *The Journal of Finance*, *54*(6), 2143-2184.

Kahnenman, D., & Tversky, A. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, *5*(2), 207-232.

Kim, K., & Byun, J. (2010). Effect of investor sentiment on market response to stock split announcement. *Asia-Pacific Journal of Financial Studies*, *39*(6), 687-719.

Lee, H. J., & Kim, Y. B. (2006). Stock price responses of earnings and losses. *Korean Industrial Economic Research*, *19*(2), 811-828.

Lipe, R. (1990). The relation between stock returns and accounting earnings given alternative information. *The Accounting Review*, *65*(1), 49-71.

Nissim, D., & Penman, S. H. (2001). Ratio analysis and equity valuation: From research to practice. *Review of Accounting Studies*, *6*, 109-154.

Park, S. (2016). Investor sentiment and the market pricing of corporate earnings. *The Korean Accounting Journal*, *25*(1), 117-149.

Perera, D., Chand, P., & Mala, R. (2020). Confirmation bias in accounting judgments: The case for international financial reporting standards for small and medium-sized enterprises. *Accounting & Finance*, *60*(4), 4093-4119.

Seok, S., Cho, H., & Ryu, D. (2019). Firm-specific investor sentiment and the stock market response to earnings news. *North American Journal of Economics and Finance*, *48*, 221-240.

Shin, H., & Park, S. (2018). Do foreign investors mitigate anchoring bias in stock market? Evidence based on post-earnings announcement drift. *Pacific-Basin Finance Journal*, *48*(April), 224-240.

Song, I., Paek, W., & Park, H. S. (2004). Earnings management for the avoidance of losses. *Accounting Journal*, *13*(2), 29-59.

Veronesi, P. (1999). Stock market overreaction to bad news in good times: A rational expectations equilibrium model. *Review of Financial Studies*, *12*(5), 975-1007.

Waller, W. S., & Felix, W. I. (1984). The auditor and learning from experience: Some conjectures. *Accounting, Organizations and Society*, *9*(3-4), 383-406.

ISSN 1946-5130 (Print), ISSN 2470-4733 (Online)
http://dx.doi.org/10.20294/jgbt.2023.19.1.57

The Journal of Global Business and Trade

Journal of Global Business and Trade

https://www.pfw.edu/jgbt

Preparation for Digital Transformation: A Case and Empirical Findings of South Korean Multinational Corporations

Joonghak Lee[a], Youngwoo Kim[b]*, Jisang Kang[c]

[ab]College of Business, Gachon University, South Korea
[c]Department of Human Resource, Dong-A Socio Holdings, South Korea

Received 28 November 2022, Revised 7 January 2023, Accepted 5 February 2023

ABSTRACT

Purpose – Digital transformation is the key to success for recent multinational corporates. Ample studies have paid attention to the effectiveness of digital transformation and usage of advanced technology, but there is a lack of research related to how to prepare for digital transformation. The main purpose of this study is to organize specific case of preparation for digital transformation from a management perspective. In addition, the empirical results are presented to examine the impact of the preparation of the digital transformation.

Design/Methodology/Approach – The study first reviews previous literature about digital transformation to organize antecedents, theory, contingency, and outcomes. Second, based on the resource-based view, a case is explained the company's context, processes, and methodology. Lastly, empirical analysis is conducted to investigate how effective the digital transformation is prepared, and results are presented with data from 50 affiliations and 1,059 employees.

Findings – This study finds the key to successful digital transformation is well-prepared talent, and suggests how multinational corporates can be ready for talent selection and development. Furthermore, readiness in digital transformation in talent varies by industry, company, and employee characteristics. Then, the study implies successful digital transformation should consider a contingency.

Research Implications – The current study expands the knowledge on digital transformation by suggesting an actual case of South Korean multinational corporations, which allows researchers and practitioners to understand the process and methodology. Second, this research extended the discussion of digital transformation to talent selection preparation since previous literature has focused only on recent technology. Lastly, the study introduces the empirical results of preparation for digital transformation and helps practitioners initiate digital transformation in their organizations.

Keywords: digital transformation, reskilling, talent development, upskilling

JEL Classifications: M10, M12, O15

* *Corresponding Author, E-mail: kyw918@gachon.ac.kr*

I. Introduction

Digital transformation has been one of the most important challenges and concerns for corporations and CEOs around the world (Tabrizi et al., 2019). COVID-19 has motivated governments and businesses to put more effort and time into digital transformation (Chung, 2022), and the way employees and companies communicate has transformed digital-technology (Warner & Wager, 2019). However, the success rate of digital transformation is not high considering the efforts and resources behind digital transformation (Wade & Jialu, 2020). An estimated 70% of efforts for digital transformation result in failure (Forbes, 2018). For example, U.S. companies invest 1.3 trillion dollars in digital transformation a year, which means more than 1 trillion dollars has not led to success if calculated with a 70% failure rate (Ramesh & Delen, 2021).

Usage of advanced technology has received high attention from the CEOs and organizations for successful digital transformation (Tabrizi et al., 2019). Bloomberg (2018) defined digital transformation separately from digitalization, and emphasized that digital transformation is a continuous journey for a business model and organizational culture through advanced technologies. After all, the main purpose of digital transformation is to transform the way the corporations earn money and work using advanced technologies. Therefore, an important focus of digital transformation is on organizational transformation, not technology. For successful digital transformation, the ability to prepare and conduct organizational transformation is the key to success (Ashurst & Hodeges, 2010). At the core of successful organizational transformation, there should be prepared talent.

This study aims to investigate how corporations prepare and implement digital transformation through a case study, and examine the results of these preparations and implementations based on an empirical analysis of readiness for digital transformation in South Korean multinational companies. This study can contribute to the international management discipline by suggesting how digital transformation has been prepared and conducted through a case study of South Korean multinational corporations (MNCs). Scholars and professionals might be able to follow up the given specific process and methodology for their research and practice. Also, we provide the empirical results of the preparation and implementation of digital transformation via the measurement of the readiness of digital transformation focusing on people and core competency.

This paper reviews the literature and theoretical background in Section 2. The case study of South Korean MNCs is first described, including case setting, background, process of digital transformation, reskilling, and upskilling to introduce how the preparation of digital transformation through people selection and development can take place. Then, empirical analysis of readiness of digital transformation in people and the competency is presented in Section 3. Implications and conclusion are discussed in Section 4.

II. Literature Review and Theoretical Background

1. Digital Transformation

The success of digital transformation has huge impacts on organizational sustainability (Muthuraman, 2020). Adoption of advanced technology has changed business value chains and approaches to solve organizational problems (Tong et al., 2021). The introduction of the di gital transformation strategy for the role of h uman resource should be activated (Fenech et al., 2019), and recruitment is at the forefront of the organization's digital transformation (Gilch et al., 2021). Digital transformation shows a s harp increase in the number and diversity of digital tools used in business value chain activities (Morán et al., 2021). For example, employees are able to utilize artificial intelligence and big data, which leads to knowledge sharing and innovative

behavior (Colbert et al., 2016). Also, usage of artificial intelligence and big data can enhance the efficiency and effectiveness of decision-making, and improve organizational productivity (Castano et al., 2015).

Digital technologies afford more information, and they enable new forms of collaboration among distributed networks of diversified actors (Vial, 2021). For successful digital transformation, previous studies have paid attention to human resource management (HRM) and development (See table 1). Digital transformation strategies are best understood from a business-centric perspective. These strategies are focused on changing products, processes, and all aspects of the organization as a result of new technologies. The impact of digital transformation strategies has been across business models (Matt et al., 2015).

The effect of IT on organizational structure, procedures, information flow, and organizational capacities to accommodate and adapt to IT are highlighted by digital transformation (Orlikowski, 1996). In this way, the alignment between IT and companies and the technological foundation of IT are highlighted further by digital transformation (Venkatraman, 1994). Over the previous two decades, substantial research has been done on digital transformation (Besson & Rowe, 2012). The literature that has already been published has discussed digital transformation in terms of its enablers (Chatterjee et al., 2002), necessary resources and capabilities (Daniel & Wilson, 2003), transformation processes and modes (Tan & Pan, 2003), and benefits (Ash & Burn, 2003). Similarly, HRM is also business-centric and changes by adding value to the organization as a strategic partner, administrative expert, and employee champion (Ulrich, 1997). HRM focuses on the performance of organizations that emphasize its role as a solution to business problems (Becker & Huselid, 2006).

2. Resource-based View

The Resource-Based View (RBV) has been used to demonstrate how businesses can gain competitive advantage and improve performance. Performance is attributed to firm-specific resources and rare talents that are difficult for competitors to replicate (Barney, 1986). RBV also implies that organizational talents, competencies, and other resources differ, and that these resources are the most important determinants of success. Bharadwaj (2013) emphasized the application of advanced technology for the organization as an important success factor. For example, investment in the introduction of digital technology is highly related to e-business success (Chen et al., 2016). Specifically, the more actively digital technology is used, the more services can be provided through customer personalization, which also serves as an opportunity to increase customer satisfaction (Troisi et al., 2022). The role of IT capacity in leveraging the value of other resources and capacities within organizations can explain the relationship between IT capacity and firm performance (Radhakrishnan et al., 2008; Ravichandra et al., 2005).

Although organizations are constantly changing and evolving in response to new circumstances, digital transformation refers to changes made possible by digital technologies, which result in distinct changes to corporate operations, processes, and value creation (Libert et al., 2016). Organizations can incorporate digital technologies into many aspects of their operations and engage customers through digital innovations (Aral & Weill, 2007). Naturally, digital transformation enables businesses to reap the benefits of widespread digital connectivity, data, information, and expertise. Businesses that embrace digital transformation can provide better customer experiences through increased personalization, increased customer satisfaction, and lower costs (Mithas et al., 2005). For beneficial digital transformation, resources should be wisely utilized by corporations based on RBV. Bharadwaj (2013) categorized important organizational resources for digital transformation into IT infrastructure, human IT resources, and intangible IT-enabled resources. To achieve competitive advantage, the adaptation of advanced technology

Table 1. Previous Digital Transformation Literature

Article	Antecedent	Independent Variable	Dependent variable	Contingency (Moderator or Mediator)	Results
Martínez-Morán et al. (2021)	-Talent digital transformation -Talent attraction -Talent acquisition -Talent development -Talent retention -Digitalization -Social networks -E-HRM -Sustainability	Talent Management Process	-Digital Transformation	-Employee advocacy -Brand ambassadors	It shows a sharp increase in the number and diversity of digital tools used in the talent acquisition process.
Bannikov et al. (2021)	-Digital human resource management -Human resources -Human resource transformation -Remote management	Digital transformation	-Human resource management	-	Digital resources allow you to organize and improve efficient personnel management processes.
Gilch et al. (2021)	-Digital transformation -Qualitative study -Recruitment -Role of recruitment -Strategic human resource management -Strategic recruitment	Recruiting digital talent	-Digital transformation	-Strategic role	Recruitment plays an important role in embracing the technology needed for digital transformation.
Vial (2021)	-Digital transformation -IS strategy -Literature review -Digital technologies -Organizational transformation -Digital innovation.	Digital transformation	-Organizational performance -Operational efficiency	-Ethical performance	As digital technologies afford more information they enable new forms of collaboration among distributed networks of diversified actors.
Hanelt et al. (2021)	-Digital business ecosystems -Digital transformation -Organizational change -Organizational designs -Systematic literature review	Digital transformation	-Organizational Change -Organizational Strategy	-Technology impact -Systemic shift -Holistic co-evolution	Diagnose that DT can be best understood as continuous change that can be triggered and shaped by episodic bursts.
Fenech et al. (2019)	-Strategic Human Resource Management -Digital Transformation -Qualitative research -Resource-based View	Digital transformation	-Role of human resource	-Speed -Use of tele conferencing -Ease in collecting comparative -Human capital	The introduction of digital transformation strategy for the role of HR should be activated.

is important, but it is also critical how employees use technology. Therefore, how talent is prepared for digital transformation is an important factor for success. In next section, we introduce how a company prepare digital transformation through talent selection and development via case study easily understand the process and results.

III. Research Methodology and Results

1. Case Study

1.1. Case Setting

South Korean Go player Lee Se-dol and Google's AlphaGo competed from March 9 to 15, 2016. The prize money was $1 million, and Lee Se-dol predicted before the game that he would win four or all five games. It was broadcast worldwide via YouTube, and the number of people watching it instantaneously reached 100,000. In contrast with the expectations and hopes that artificial intelligence (AI) would not be able to defeat a skilled human in the game of Go, which requires high cognitive ability, Lee Se-dol won only one round before the game was called. The victory was the last achieved by humans.

Following the match against AlphaGo, many studies have reported that AI will eventually replace most human jobs worldwide, and it has been quickly introduced into the business. In the same year, Dr. Klaus Schwab introduced the concept of the "4th Industrial Revolution" at the World Economic Forum 2016. Since then, many changes have occurred in the industry globally under the banner of digital transformation (DT). However, DT, which refers to changes in working methods and business models, has occurred dramatically since 2020, when COVID-19 became prevalent. Consequently, AI, big data, and smart factories have now become familiar.

With the onset of COVID-19 from 2020, DT was quickly applied to the industry; companies that swiftly adapted to it gained new opportunities, whereas those that did not began to struggle. According to Bloomberg (2018), DT is a continuous journey that begins with digitization, converts analog work into digital, continues with digitalization that transforms a way of working through digital technologies, and ends with a DT that transforms both business operations and models through digital technologies.

For the all-round changes in the way of work and business model, human resource (HR) management that performs DT is essential. This case discusses how to plan and prepare HRs as critical components of DT. We will present two approaches: reskilling, which involves transforming existing internal employees to fill necessary DT positions, and upskilling, which involves allowing talent in DT jobs to develop their abilities. To transform the current business into new businesses driven by digital transformation, reskilling and upskilling are required to prepare talents to align with business transformation. This will have implications for how businesses can prepare for and respond to DT, and how HR can contribute to the business by examining the relationship with the organizational DT strategy.

1.2. Company Background

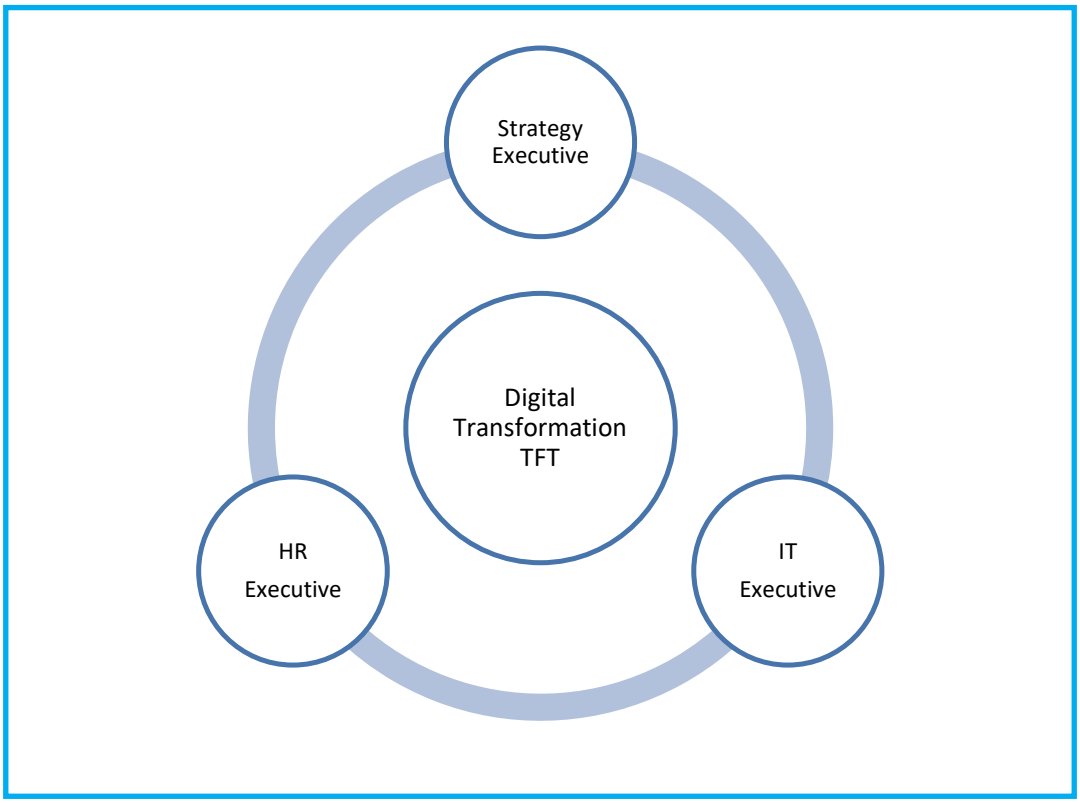
The company is a large business group in South Korea with more than 50 affiliations in retail, food, service, hotel, chemical, and other industries. It has expanded to 31 countries and employs more than 80,000 people both at home and abroad. Since the founder began the business in Japan and expanded it to South Korea, Japanese corporate culture and the way the company is run have influenced management philosophy and the incumbent chairman.

For example, the company values long-term employment, a family-like organizational culture, senior management with long tenure, and so on. During the 1997 International Monetary Fund crisis, the company made every effort to retain employees. To adapt to the rapidly changing environment, the company has shifted focus from retail and chemicals to new industries, such

as online retail, logistics, bio, and healthcare. To maintain the management's philosophy of talent, they must retain existing talent in business transformation while hiring from the external workforce to deal with rapidly changing technologies, such as AI, big data, and blockchain.

Group A established a DT headquarters in HQs with a strategic executive, an IT executive, and an HR executive. They formed a team that shared DT progress once every two weeks, and encouraged collaboration (See Fig. 1).

Fig. 1. DT Team Formation

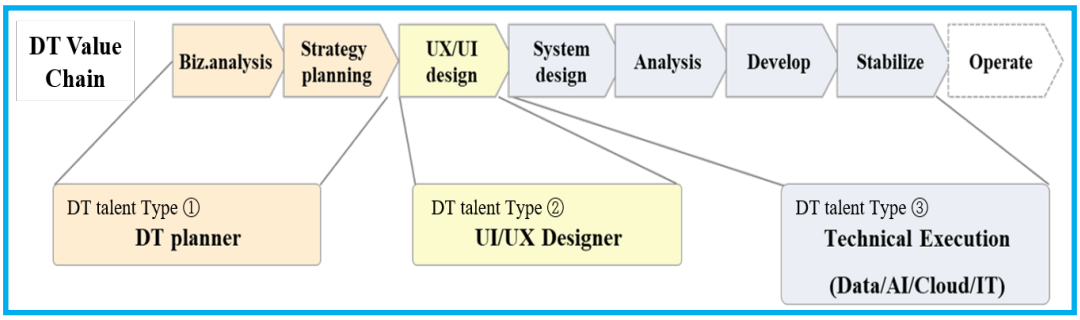


1.3. Process of Digital Transformation

1.3.1. First Step: Defining DT Talent

Talent performing DT tasks must be permitted to implement DT within the organization. DT talent was defined by the DT HR team as a single job. The team considered the value chain in which DT is executed, and "DT planning → User experience (UX)/interface (UI)→DT technical execution" as its value chain process. DT planning involves using digital technologies to improve current business processes or generate new business ideas. Those who work in DT planning job are known as DT planners, and the knowledge and skills the required include a broad understanding of the overall business, experience in industries (retail, service, foods, chemistry), and operating principles of technology (Fig. 2).

Fig. 2. DT Value Chain and DT Talent Type



Next, Group A converted offline stores, such as department stores and supermarkets, to online platform business, with retail and service businesses accounting for most sales and profits. Moreover, user experience and interface are important aspects of online platforms. UX/UI knowledge and skills deal with customer experiences online; therefore, not only understanding the system but also programming skills to handle design outcomes are required. Finally, for DT business to operate, each technology should be implemented in business activities. Representative technologies include AI, big data, cloud, and blockchain.

DT execution job was divided into four sub-categories: big data, AI, cloud, and IT. This job entails realizing ideas and UX/UI on an online platform and developing a business model. In this sense, DT execution jobs account for most DT jobs in Group A. When calculating the number of DT jobs working for Group A's 24 affiliates, this study found that the number of people numbered approximately 600. It was mostly in retail, service, and chemical companies.

1.3.2. Second Step: Aligning with Organizational Strategy

DT, by definition, is a business model transformation. Therefore, reconstruction and divestment of existing industries, and investment and preparation for DT new industries are critical. To establish a business model suitable for DT, Group A's strategic function was to devise a plan to reconstruct and lay off offline retail stores. Moreover, workforce planning for the new online retail was needed. The service and chemical industries used data and AI to improve productivity; therefore, the amount of new labor required in related industries must be forecasted.

As a result, close linkage with the strategy function is essential to predict the workforce required for DT. Group A distinguished itself by incorporating a strategic function in DT TFT to strengthen the link between future business directions and HR. In 2021, the HR DT team asked Group A's 24 affiliates to predict and share the total number of employees required for new DT business in three years. The HR DT team informed 24 HR managers that they would weigh the demand and supply of DT talent ahead of time, and develop strategies to quickly fill open positions through internal reskilling and external recruiting.

Simultaneously, each company's strategic function was directed to share talents whose job importance is decreasing due to future business transformation. Sales managers in department stores, marts, and supermarkets and merchandise (MD) employees are expected to be replaced by technology. Moreover, talents like operating managers and receptionists in hotels and food and beverage stores are expected to be obsolete. The HR DT team must also consider the Korean labor market. It has limited flexibility and necessitates that businesses provide new job opportunities for those that must transform their jobs due to

downsizing or other reasons. Furthermore, Group A has its own unique talent philosophy to sustain its employees even during a downturn. Given these together, the HR DT team seeks to find a way for those who are likely to be replaced by technologies and are at risk of being laid off.

1.3.3. Third Step: Workforce Planning for DT

As a result of sharing the required DT workforce in the next three years from 24 companies, data and AI jobs showed the highest demand. The DT job group in Group A as a whole had the most IT talent. More specifically, the number of jobs in data and artficial intelligence is expected to fall by 47% and 46%, respectively, over the next three years.

However, an estimated 1,000 employees were classified as being in danger of becoming obsolete in three years and are highly likely to be laid off due to business reconstruction and divestment. However, 30% plan to retire within the next five years. The remaining 700 were required to prepare for new jobs. As a result, Group A provided everyone with the opportunity to reskill and switch to a DT job, which could result in a stable supply of workforce for DT data and AI. It also planned an upskilling program for existing DT talent and newly hired personnel. DT jobs require employees to learn new skills quickly and on a continuous basis because of their nature. Moreover, new learning is important in DT jobs; hence, new technologies are updated once a month. Simultaneously, talents in DT seek jobs that will provide ample opportunities to develop cutting-edge technologies and skills.

Table 2. Example of DT Workforce Planning

Category	Total	DT planner	UX/UI planner	Technical Execution			
				Data	AI	Cloud	IT
Demand in three years (person)	1,407	120	102	420	230	85	450
Current (person)	950	95	81	220	124	58	372
Demand/current ratio (%)	68%	79%	79%	53%	54%	69%	83%

1.3.4. Reskilling

The HR DT team has begun designing the reskilling program around data and AI, which will be the most crucial job for the industry in the future. They initially recruited employees for the reskilling program through an online learning platform. If an employee wishes to participate in the data reskilling program, she or he must register through the platform, after which the HR manager in the affiliation will review the applicant and confirm the registration. The data and AI programs are divided into four steps. The content are an understanding of computation, requiring participants to take an online test about computational knowledge. Those who pass the quiz are eligible to register for Step II. In the second step, participants learn basic statistics concepts and the fundamentals of machine learning using Microsoft Excel. The second-stage evaluation provides statistical and analysis problems, and has a passing rate of about 30% on average.

In the third step, the data reskilling program conducts a business simulation exercise and requires participants to make decisions based on data analysis. There are 21 problem situations. For example, in a mart with 210 branches, decisions must be made to determine how to allocate resources using data and analysis. The passing rate tends to be 20%. The AI program provides

machine learning modeling through Python in the third stage, and it has a passing rate of about 10% in generating code and solving problems. In Step 4, data jobs learn machine learning modeling through Python in Step 3 of AI, and AI jobs learn visioning and text analysis through Python.

Those who successfully complete all four stages are invited to an interview with the expert group. Group A has assembled a panel of job experts, including directors and managers, to decide whether or not to permit a job switch. Approximately 3% to 4% of the employees pass the first to fourth stages, and if they pass the interview, they will be able to switch jobs. Group A prioritizes those who complete the final four reskilling stages before hiring new DT jobs outside Group A.

Table 3. Reskilling Programs for Data and Artificial Intelligence Jobs

Category	Level	Data	Artificial Intelligence
Reskilling Course		Reskilling-qualification Interview	
	Lv.4	Python programming-Machine learning (Coding test)	Visioning & Text analysis through Python (Coding test)
	Lv.3	Business Simulation Exercise-data driven decision making (Simulation quiz)	Python programming-Machine learning (Coding test)
	Lv.2	Statistical knowledge and data analysis through Excel (Quiz & analysis test)	
	Lv.1	Computational Knowledge (Knowledge-based OX quiz)	

1.3.5. Upskilling

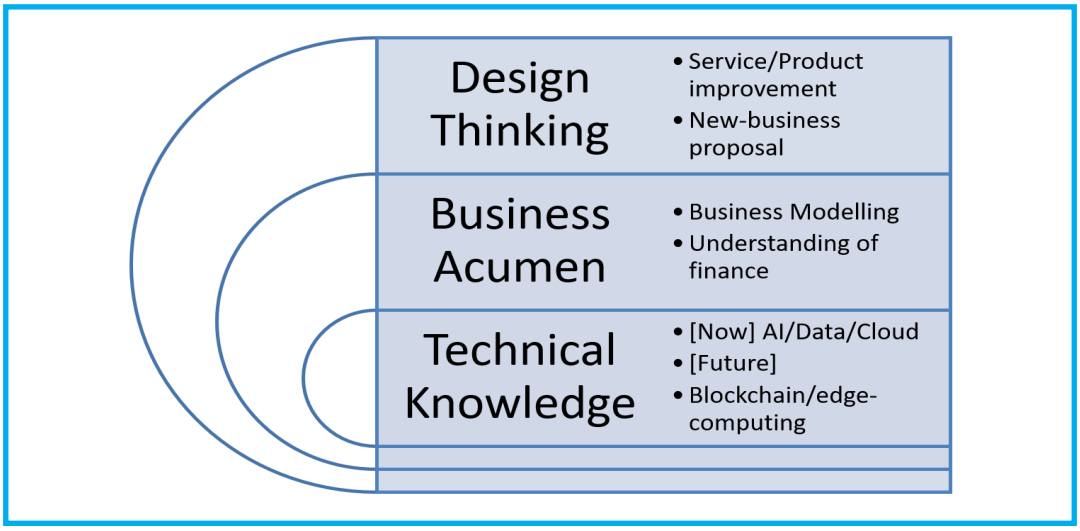
Upskilling, which is a part of the training for improving technological skills for existing DT talents, is a program that DT job employees should take. Group A created a diagnosis that can assess the job levels of each DT job holder for DT job employees to continuously develop skills. Based on the job description, a multifaceted evaluation method was used, and the results were evaluated in four stages through the supervisor, colleague, and self-evaluation of DT talents. It is divided into four stages: basic, intermediate, advanced, and master. If the results between oneself and others differ by at least two levels (e.g., the boss is basic, but the DT job holder is advanced), the results are calculated through personal interviews with the boss.

As of the beginning of 2021, 950 DT job workers in Group A had been evaluated, and personal result scores for eight jobs had been provided. The upskilling program was conducted in three ways: (1) listening to training on the online platform MOOC (e.g., Coursera and Edx.) and obtaining a certificate, (2) winning the LinkedIn badge in partnership with Microsoft by Group A, and (3) offline courses provided by the HR DT team. Coursera and Edx. have excellent training programs provided by prestigious universities in the United States; in particular, data and AI have high-quality content that is highly satisfying for DT talents. Microsoft's LinkedIn program was a platform where DT talents at the basic-intermediate level could learn by working in a 10-15 minute format and earn badges directly for their LinkedIn profiles. Moreover, offline training was conducted in a specific DT job that was more effective when conducted as a team rather than individually, such as DT planner.

Because DT planners must have two core competencies, namely business acumen and technological understanding, many employees with experience in planning, new business, or IT have applied to the DT planner upskilling program. It lasts 12 weeks and covers business models, new technologies (AI, data, etc.), and design thinking. Specifically, based on an understanding of the

business model, it is conducted in such a way that digital technology is used to improve existing business processes or to propose new business models. Moreover, the project is carried out in groups of four using design thinking methodology. Directors in charge of the strategy function and new business evaluated the project results over 12 weeks.

Fig. 3. Upskilling Program for DT Planners



2. Empirical Analysis

2.1. Readiness of Digital Transformation

To check how effective the process of digital transformation is in Group A, we assessed DT readiness through a survey. Previous studies found a relationship between DT readiness and other factors such as culture, innovation, performance, and resources (Jung et al., 2016; Schuh et al., 2020). Likewise, we examined DT readiness to see the impact of aforementioned DT efforts. A survey questionnaire was distributed into local employees that were working in Group A's affiliations and via the internal mail system of the company. Among 1,800 local employees, 1,059 completed the survey (58% response rate). Thus, our final sample size included 1,059 employees in 7 industries. The survey consisted of 5 parts: digital employee, foster innovation, digital vision & governance, data centric, and security & risk. It was developed by collaborating with IBM based on their DT assessment (IBM, 2021).

In the study, jobs were classified into five categories: (i) IT/technology, (ii) management support, (iii) production/production management, (iv) research and development, and (v) sales/sales management. The total number of samples was 1,059. The biggest mean was Production/Production management of Security & Risk (3.57), and the smallest was IT/Technical support of Forster Innovation (2.59). In terms of standard deviation, Management Support of Digital Employee had the highest score at 0.384, and R&D of Security & Risk had the lowest score at 0.130. By industry, it was divided into construction, finance, chemistry, service, food, retail, and service occupation accounted for the largest portion. The samples contained twice as many men as women, and 30 to 39 years of age was most common.

2.2. Results

Correlation analysis was performed as a procedure to validate the relationship between variables. As demonstrated in Table 1, there was a positive correlation between all variables. In particular, digital employee, foster innovation, and digital vision/governance variables were associated with each other, which meant those factors were strongly linked to one another.

Table 4. Correlation Matrix of Each Component in the Digital Transformation Readiness Survey

	Digital Employee	Foster Innovation	Digital Vision / Governance	Data Centric	Security & Risk
Digital Employee					
Foster Innovation	0.719***				
Digital Vision / Governance	0.703***	0.788***			
Data Centric	0.568***	0.724***	0.751***		
Security & Risk	0.422***	0.525***	0.418***	0.542***	

Note: *p<.05, **p<.01, ***p<.001.

As illustrated in Fig. 4, it should be reflected to the 2x2 matrix as practical advice by not only simply looking at the difference between the mean and standard deviation but identifying the location and meaning of each quadrant. In Fig. 5, respondents in the finance industry seemed relatively stronger in all components. In addition, in relation to the food industry, foster innovation and data centric components exhibited that it was necessary to encourage vulnerable organizations and individuals rather than the whole organization. Furthermore, in relation to the chemical industry, data centric and security & risk components represented relatively strong points, while the innovative digital culture components such as digital employee, foster innovation, and digital vision / governance appeared to be developed throughout the organization.

Fig. 4. 2x2 Matrix Based on Mean and Standard Deviation

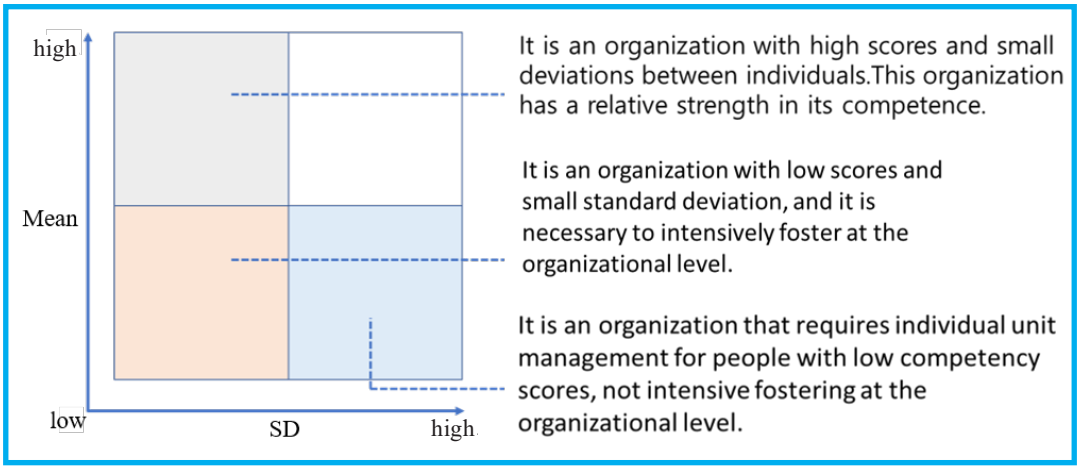
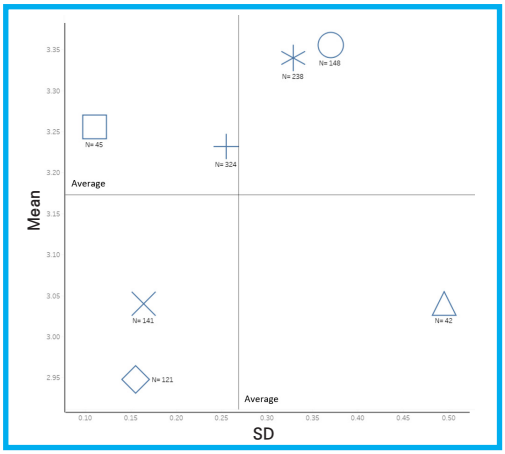
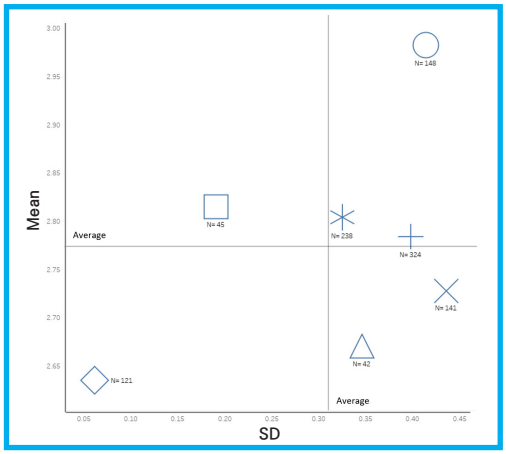


Fig. 5. Strengths and Weaknesses of the Components

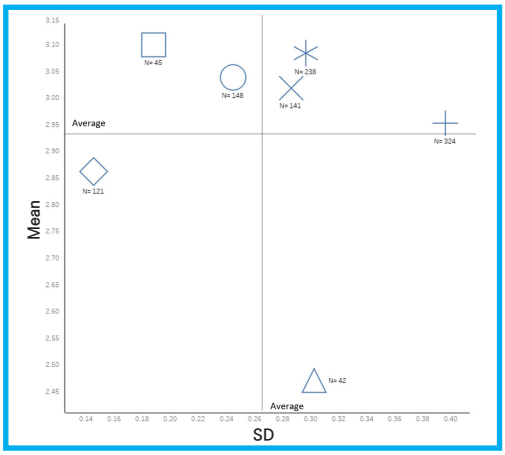
Digital Employee



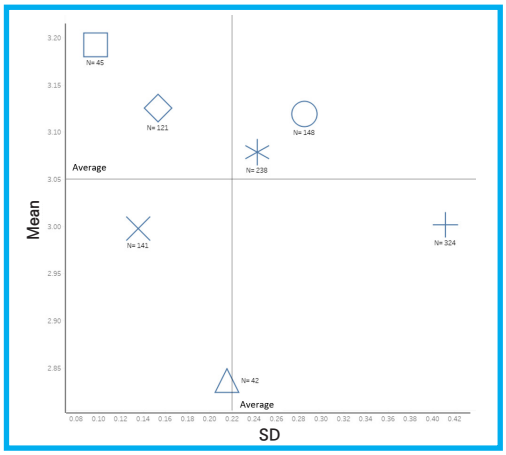
Foster Innovation



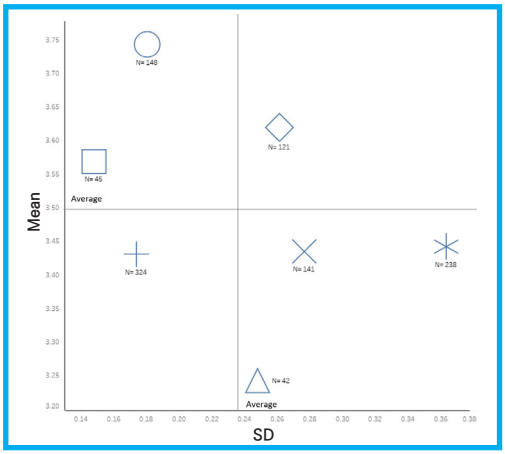
Digital Vision / Governance

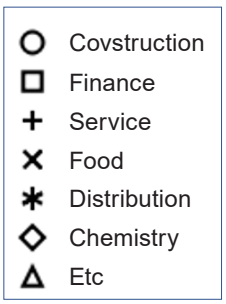


Data Centric



Security & Risk





In this study, two-dimensional clustering analysis was performed by the divided responses of the survey into culture including digital employee, foster innovation, and digital vision / governance, and competency including data centric, and security & risk. Clustering was conducted by the K-mean method, and clusters were composed of Cluster 1 (n=590), Cluster 2 (n=383) and Cluster 3 (n=86). As shown in Fig. 6 and Table 5, Clusters 1 and 2 showed a difference in competency, and the food industry belonged to Cluster 2. In addition, service and retail industries were different in terms of job classification. Therefore, it is necessary that the training and development for employees should be differentiated by job classification rather than the organization as a whole. Looking at the cluster data with a mean X standard deviation matrix, it could be beneficial to determine the subjects and topics for training in each job.

Fig. 6. K-Mean Clustering

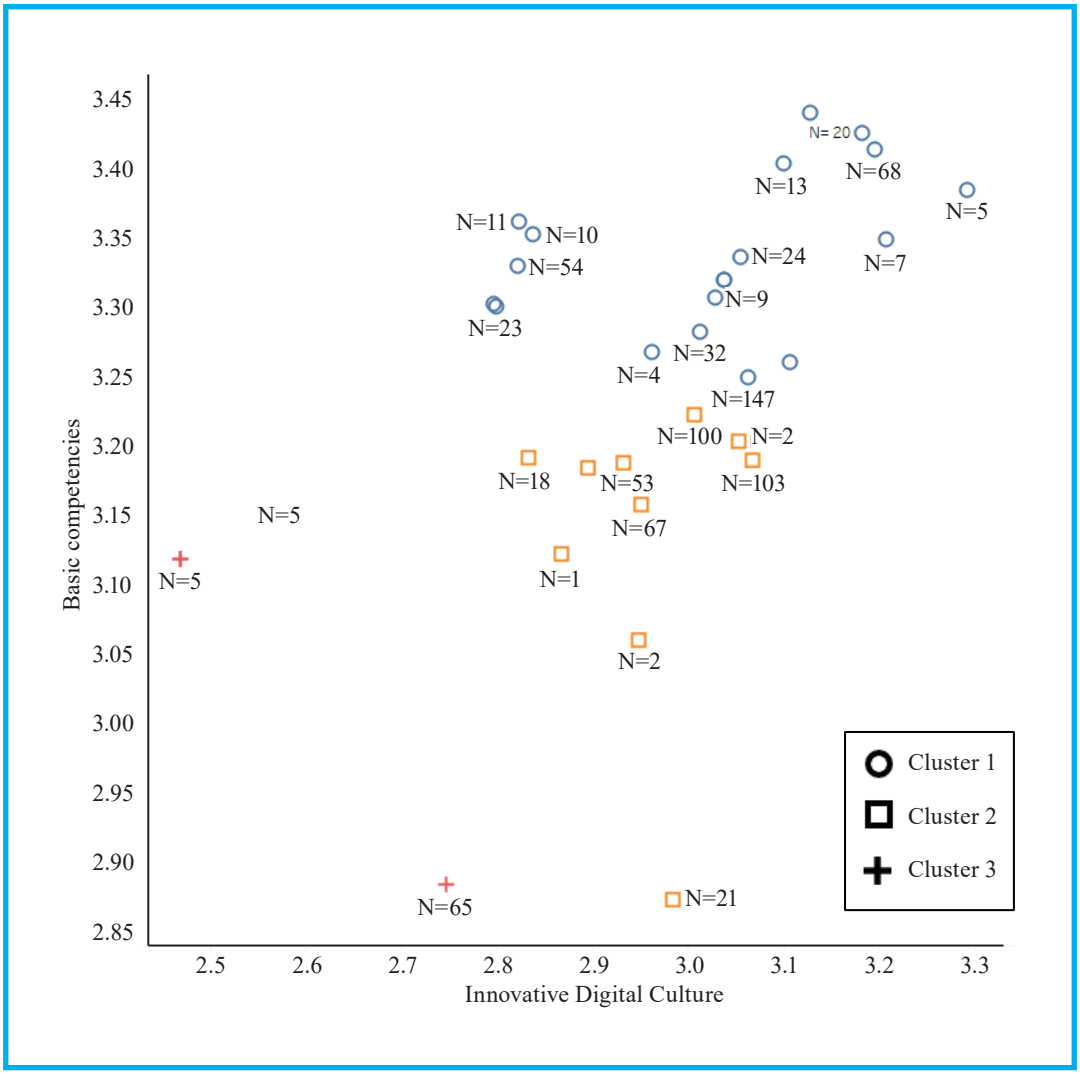


Table 5. Results from K-Mean Clustering Analysis

Cluster		Construction		Finance		Chemistry		Service		Food		Retail		Etc.	
		Cul.	Com.	Cul.	Com.	Cul.	Com.	Cul.	Com.	Cul.	Com.	Cul.	Com.	Cul.	Com.
1	Management support	3.20	3.41	3.04	3.32	3.04	3.32	3.06	3.25			3.11	3.26		
	IT/Technical support	3.18	3.42	3.03	3.31	3.03	3.31								
	Production/production management	3.06	3.33	3.13	3.44	3.13	3.44	3.21	3.35						
	Sales/Sales Management	3.01	3.28	3.10	3.40	3.10	3.40								
	R&D	2.96	3.27	3.04	3.32	3.04	3.32	3.29	3.38						
	# of participant	N = 148		N = 45		N = 121		N = 159				N = 117			
2	Management support									2.95	3.16			2.98	2.88
	IT/Technical support									2.95	3.06	2.90	3.18		
	Production/production management									2.83	3.19	3.05	3.20		
	Sales/Sales Management							3.01	3.22	2.93	3.19	3.07	3.19		
	R&D									2.87	3.12				
	# of participant							N = 100		N = 141		N = 121		N = 21	
3	IT/Technical support							2.75	2.89					2.47	3.12
	R&D													2.47	3.12
	# of participant							N = 65						N = 21	

Note: Cul. = culture; Com. = competency.

IV. Discussion

1. Conclusion

Group A is an example of a large investment in a workforce for DT. Group A invested heavily in reskilling and upskilling for DT talent, reflecting its unique talent philosophy and the characteristics of the Korean labor market. In these HR DT activities, however, several internal convictions exist. First, it was concerned about what would happen if DT talent left the company after the HR team had spent a large amount on reskilling and upskilling. From the HR team's perspective, it was assumed that they had invested expensively and did only beneficial things for other companies. However, the CEO of Group A believed that the members should focus on improving employability. Moving to another company as a member of Group A is good for the industry as a whole because it increases employability, and it also helped increase the reputation Group A. Thus, the turnover issue of those who did reskilling and upskilling from management was not a big issue. Second, a problem arises that those who switched jobs through reskilling have to work as if they were a newcomer in a newly joined company. Confucianism has had a strong influence on Korean businesses, and the system is still based on seniority. Therefore, individuals or new team members who have changed jobs may find themselves in an awkward situation. However, this was only a "trial and error" for the future job transformation era; thus, it was intended to solve this by providing adequate notice in advance to talent preparing for a job transition and providing guidance to new departments to not be awkward with them.

2. Implications, Limitations and Future Directions

Companies put every effort into adapting to a DT, which is no longer new. Given DT and the transition to a business model, it is a difficult journey. Furthermore, selecting and recruiting DT talent, which is critical to DT, are an important strategic goal, and reskilling existing talent is a major issue for businesses. To solve this problem, we looked at the case of Group A. Although this is a one-of-a-kind case reflecting the characteristics of the HR philosophy of Korea and Group A, it is also a representative case that many Asian companies can model. Not only Japanese companies but also large Korean corporations are attempting to reskill the existing workforce with zeal. Furthermore, the selection of the DT workforce as the most important retention factor is a continuous growth opportunity; therefore, upskilling will continue to be emphasized in the future.

This study can make several contributions to the international management discipline. First, this study defined the digital transformation as an organizational change (Deja et al., 2021), and identified the critical components of organizational change as strategy, human resource management, and development. By doing so, we suggested how those value chain activities can be implemented in a specific company with an example through a case study. In other words, this study contributes to the international management literature with a successful digital transformation process and the results. Second, DT readiness was assessed, and results were presented with actual data from 1,059 employees in 7 industries. In particular, we suggested which components of DT readiness should be developed in each industry, along with the results of the K-mean analysis, and found which job should focus on which components. These results can help practitioners determine best practices.

Despite the contributions discussed above, this article has limitations, mainly due to the case and data collection from a single South Korean conglomerate. Although this case and data were derived from 24 affiliates, those companies share a similar organizational culture and policy, which makes it hard to generalize our results to other companies. To generalize the findings, future studies need to replicate the results using different samples from different countries. Second, we examined efficiency and effectiveness of digital

transformation through empirical analysis from the survey of 1,059 employees. It should be better to evaluate the performance of digital transformation via financial outcome, such as return on investment and increase in revenue and profits. Further studies can investigate the outcome of digital transformation using different data sets. For future studies, how corporations prevent those who are reskilled and upskilled from moving to another company and from not being inducted into a newly joined company in terms of organizational culture should be investigated. Under the great resignation period, corporations and HR department should focus on retaining employees. In that sense, retaining talents is a top priority topic for corporations. Second, an organizational culture that can include those with different backgrounds, such as reskilled and upskilled employees, is a critical factor for successful digital transformation. Thus, future studies should examine the organizational culture needs for transformed corporations.

References

Aral, S., & Weill, P. (2007). IT assets, organizational capabilities, and firm performance: How resource allocations and organizational differences explain performance variation. *Organization Science, 18*(5), 763-780. https://doi.org/10.1287/orsc.1070.0306

Arora, R. (2021). *2021 Digital transformation assessment*. IBM. https://www.ibm.com/downloads/cas/MPQGMEN9

Ash, C. G., & Burn, J. M. (2003). A strategic framework for the management of ERP enabled e-business change. *European Journal of Operational Research, 146*(2), 374-387. https://doi.org/10.1016/s0377-2217(02)00556-8

Barney, J. B. (1986). Strategic factor markets: Expectations, luck, and business strategy. *Management Science, 32*(10), 1231-1241. https://doi.org/10.1287/mnsc.32.10.1231

Bannikov, S. A., & Abzeldinova, K. T. (2021, February 24). Digital transformation of HR management system. International Scientific and Practical Conference "Russia 2020-A New Reality: Economy and Society" (ISPCR 2020). Atlantis Press. 54-58. https://doi.org/10.2991/aebmr.k.210222.011

Becker, B. E., & Huselid, M. A. (2006). Strategic human resources management: Where do we go from here?. *Journal of Management, 32*(6), 898-925. https://doi.org/10.4135/9780857021496.n21

Besson, P., & Rowe, F. (2012). Strategizing information systems-enabled organizational transformation: A transdiciplinary review and new directions. *Journal of Strategic Information Systems, 21*, 103-124. https://doi.org/10.1016/j.jsis.2012.05.001

Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital business strategy: Toward a next generation of insights. *MIS Quarterly, 37*, 471- 482. https://doi.org/10.25300/misq/2013/37:2.3

Bloomberg, J. (2018, April 29). Digitization, digitalization and digital transformation: Confuse them at your peril. *Forbes.* https://www.forbes.com/sites/jasonbloomberg/2018/04/29/digitization-digitalization-and-digital-transformation-confuse-them-at-your-peril/?sh=6b8650852f2c

Castaño, M. S., Méndez, M. T., & Galindo, M. Á. (2015). The effect of social, cultural, and economic factors on entrepreneurship. *Journal of Business Research, 68*(7), 1496-1500. https://doi.org/10.1016/j.jbusres.2015.01.040

Chatterjee, D., Grewal, R., & Sambamurthy, V. (2002). Shaping up for e-commerce: Institutional enablers of the organizational assimilation of web technologies. *MIS Quarterly, 26*, 65-89. https://doi.org/10.2307/4132321

Chen, Y. Y. K., Jaw, Y. L., & Wu, B. L. (2016). Effect of digital transformation on organizational performance

of SMEs: Evidence from the Taiwanese textile industry's web portal. *Internet Research, 26*, 186-212. https://doi.org/10.1108/intr-12-2013-0265

Colbert, A., Yee, N., & George, G. (2016). The digital workforce and the workplace of the future. *Academy of Management Journal, 59*, 731-739. https://doi.org/10.5465/amj.2016.4003

Daniel, E., & Wilson, H. (2003). The role of dynamic capabilities in e-business transformation. *European Journal of Information Systems, 12*, 282-296. https://doi.org/10.1057/palgrave.ejis.3000478

Deja, M., Rak, D., & Bell, B. (2021). Digital transformation readiness: Perspectives on academia and library outcomes in information literacy. *The Journal of Academic Librarianship, 47*(5), 102403. https://doi.org/10.1016/j.acalib.2021.102403

Fenech, R., Baguant, R., & Ivanov, D. (2019). The changing role of human resource management in an era of digital transformation. *Journal of Management Information and Decision Sciences, 22*, 166-175.

Gilch, P. M., & Sieweke, J. (2021). Recruiting digital talent: The strategic role of recruitment in organizations' digital transformation. *German Journal of Human Resource Management, 35*(1), 53-82. https://doi.org/10.1177/2397002220952734

Hanelt, A., Bohnsack, R., Marz, D., & Antunes Marante, C. (2021). A systematic review of the literature on digital transformation: Insights and implications for strategy and organizational change. *Journal of Management Studies, 58*(5), 1159-1197. https://doi.org/10.1111/joms.12639

Jung, K., Kulvatunyou, B., Choi, S., & Brundage, M. P. (2016). An overview of a smart manufacturing system readiness assessment. In: I. Nääs, O. Vendrametto, J. M. Reis, R. F. Gonçalves, M. T. Silva, G. von Cieminski, & D. Kiritsis (Eds.), *Advances in production management systems: Initiatives for a sustainable world.* (pp. 705-712). Springer. https://doi.org/10.1007/978-3-319-51133-7_83

Libert, B., Beck, M., & Wind, Y. (2016, July 14). *7 Questions to ask before your next digital transformation.* Harvard Business Review. https://hbr.org/2016/07/7-questions-to-ask-before-your-next-digital-transformation

Matt, C., Hess, T., & Benlian, A. (2015). Digital transformation strategies. *Business & Information Systems Engineering, 57*(5), 339-343.

Martínez-Morán, P. C., Urgoiti, J. M. F. R., Díez, F., & Solabarrieta, J. (2021). The digital transformation of the talent management process: A spanish business case. *Sustainability, 13*(4), 2264. https://doi.org/10.3390/su13042264

Mithas, S., Krishnan, M. S., & Fornell, C. (2005). Why do customer relationship management applications affect customer satisfaction?. *Journal of Marketing, 69*(4), 201-209. https://doi.org/10.1509/jmkg.2005.69.4.201

Muthuraman, S. (2020). Digital business models for sustainability. *Gedrag Organisatie Review, 33*(2), 1095-1102.

Ravichandran, T., & Lertwongsatien, C. (2005). Effect of information systems resources and capabilities on firm performance: A resource-based perspective. *Journal of Management Information Systems, 21*(4), 237-276. https://doi.org/10.1080/07421222.2005.11045820

Radhakrishnan, A., Zu, X., & Grover, V. (2008). A process-oriented perspective on differential business value creation by information technology: An empirical investigation. *Omega, 36*(6), 1105-1125. https://doi.org/10.1016/j.omega.2006.06.003

Schuh, G., Anderl, R., Dumitrescu, R., Krüger, A., & Hompel, M. (2020). *Industrie 4.0 maturity index. Managing the digital transformation of companies*. National Academy of Science and Engineering. https://en.acatech.de/publication/industr ie-4-0-maturity-index-update-2020/

Tan, C. W., & Pan, S. L. (2003). Managing e-transformation in the public sector: An e-government study of the inland revenue authority of Singapore (IRAS). *European Journal of Information Systems, 12*(4), 269-281.

Tong, S., Jia, N., Luo, X., & Fang, Z. (2021). The Janus face of artificial intelligence feedback: Deployment versus disclosure effects on employee performance. *Strategic Management Journal, 42*(9), 1600-1631. https://doi.org/10.2139/ssrn.3873901

Ulrich, D. (1997). Measuring human resources: An overview of practice and a prescription for results. *Human Resource Management, 36*(3), 303-320. https://doi.org/10.1002/(SICI)1099-050X(199723)36:3<303::AID-HRM3>3.0.CO;2-%23

Venkatraman, N. (1994). IT-enabled business transformation: From automation to business scope redefinition. *Sloan Management Review, 35*, 73-87.

Vial, G. (2021). Understanding digital transformation: A review and a research agenda. *Journal of Strategic Information Systems, 28*(2), 118-144. https://doi.org/10.1016/j.jsis.2019.01.003

ISSN 1946-5130 (Print), ISSN 2470-4733 (Online)
http://dx.doi.org/10.20294/jgbt.2023.19.1.75

The Journal of Global Business and Trade

Journal of Global Business and Trade

https://www.pfw.edu/jgbt

Establishing EU Norms as a Global Actor: Application of New Concepts in FTAs*

Bong-Chul Kim[a], Eui-Chan Shin[b], Kyung-Eun Park[c]**

[a]*Division of International Studies, Hankuk University of Foreign Studies, South Korea*
[b]*Graduate School of International Area Studies, Hankuk University of Foreign Studies, South Korea*
[c]*Department of Thai, Hankuk University of Foreign Studies, South Korea*

Received 30 November 2022, Revised 10 January 2023, Accepted 5 February 2023

ABSTRACT

Purpose – This study conducts an analysis on the strengthening of the EU's capacity as a normative power, and the direction of global standardization of these norms. Specifically, this study examines how trade and sustainable development provisions are applied in FTAs with Asian countries.

Design/Methodology/Approach – To analyze the relationship between the EU as normative power and its expansion to global standardization as a new concept in the field of trade, this study first focuses on the concept of the EU's normative power. Based on the concept, the study conducts a comparative analysis of the Korea-EU FTA, EU-Singapore FTA, and EU-Vietnam FTA, which are known as representative FTAs of the EU with Asian countries.

Findings – The EU is trying to develop its norms into global standards as a normative power by applying the concept of trade and sustainable development when signing trade agreements with other countries amid changes in multilateral trade norms. This is evidently revealed in the FTAs of the EU with Korea, Singapore, and Vietnam.

Research Implications – When discussing the revision of the Korea-EU FTA in the future, it is necessary to recognize and respond to these changes, and Korea, as a middle power, also needs to consider the ripple effect of the EU's formation and spread of its norms as a normative power.

Keywords: free trade agreement (FTA), Korea-EU FTA, normative power, preferential trade agreement (PTA), trade and sustainable development

JEL Classifications: F10, F53, F60

* *This work was supported by Hankuk University of Foreign Studies Research Fund of 2022.*
** *Corresponding Author, E-mail: 081syc@naver.com*

I. Introduction

In a historical context, the development of the European Union (EU) started from a successful economic restoration after the end of the Second World War that brutally destroyed the European continent. After the Second World War, European countries actively cooperated to restore the European economy and accelerated European integration to develop better conditions in Europe in many fields. As a result, the EU plays a significant role in global society. Further, based on their values and norms, the EU is making efforts to spread norms to other countries and institutionalize these internationally as global standards. One of the areas where these characteristics are best exhibited is trade agreements with third countries. The EU, as a member of the World Trade Organization (WTO), supports multilateral trade and its norms, and has also tried to sign a Preferential Trade Agreement (PTA) with other regions beyond Europe based on the EU's global strategy. In the process, the EU has prepared to sign Free Trade Agreements with South Korea and other Asian countries as a major market for the future. In addition, the EU has pushed ahead with cooperation in security with some Asian countries, and has intended to strengthen its status as a global leader in global society based on such economic cooperation (Kim, 2017).

Currently, the EU is pursuing various forms of cooperation with countries belonging to both Northeast Asia and Southeast Asia in FTA negotiations. In particular, the EU's signing of PTAs for East Asian countries, which began with the Korea-EU FTA, continues to expand, and it has a unique aspect of linking rising global issues of the environment and labor to economic and trade issues. For example, the EU signed an FTA with Korea in Northeast Asia and an Economic Partnership Agreement (EPA) with Japan to establish an international legal basis for economic and trade cooperation, and to expand preferential treatment to other areas (Kim & Kim, 2018). Also, an FTA is underway between the EU and Southeast Asia to develop into a forward-looking economic cooperation model, away from cooperation based on traditional colonial relations in the past. In the long run, the EU plans to establish an EU-ASEAN FTA, which is a large-scale and inter-regional economic cooperation model.

Recently, the concept of "sustainability" has emerged as a major value in the world, and related policies or regulations are also specified in trade agreements such as PTAs and FTAs. The EU is the main global actor that stresses the importance of sustainability, and related regulations mainly include labor and environmental issues that are difficult to recognize directly related to trade as a discipline of preferential trade agreements, and serve to establish them as elements of the trade environment. The EU appears to be utilizing trade-linked sustainability regulations established in their trade agreements leading to recent changes in the value system of the economic sector.

In this respect, the EU has expanded its influence in the international community through foreign policy based on non-compulsory methods of political, economic, and cultural values in accordance with the concept of soft power advocated by international political scientists represented by Joseph Nye. Applying this as an aspect of international trade relations, the EU continues to exert its leading influence in trade agreements with other countries, and strives to develop international norms, and this is well shown in PTAs and FTAs.

Despite the recent international conflict centered on U.S.-China competition, it is undeniable that opportunities for regional and global cooperation are expanding along with increased cooperation among existing global actors based on international interdependence. Against this background, the method of cooperation on sustainability formed in the international community based on the UN's sustainable development agenda serves as a major mechanism for building economic growth, recovery, and stability in countries around the world. Such international cooperation on sustainability is becoming a universal norm, along with the environment, human rights, the rule of law, and others, and it is also worth noting that this sustainability is rapidly being applied in trade

relations from the perspective of international economic relations. In particular, FTAs signed by the EU include trade and sustainable development, which are provisions that emphasize sustainability, and details related to universal norms about labor, the environment, and others are specified.

As such, studies on this have been conducted at a time when various discussions are underway on the exercise of the EU's influence as a normative power in the international community, and the EU's FTA strategy and sustainable development. First, research on the EU as a global actor based on the concept of soft power similar to normative power also has been conducted in the past, but research on EU normative power has been conducted in earnest since Manners (2002). Since then, many studies dealing with European normative power have suggested normative power as a concept that can understand the EU's external representation and related policies and better explain the EU's status as a global actor in the international community. Second, as interest in sustainability began to appear continuously in the trade field, various studies on sustainable development and trade were conducted. For example, Harrison and Paulini (2020) focused on trade and sustainable development between the EU and Mercosur Association Agreement, and Poletti et al. (2021) analyzed EU trade agreements and global value chains by promoting sustainable development.

However, despite the progress of many studies on EU trade relations and sustainable development, other studies have limitations in that they focused only on the EU's sustainable development strategy and direction or trade relations with specific countries.

In this respect, this study is significant in that it analyzes the importance of FTAs in trade relations with the EU in Asia, and compares and analyzes them by applying them to EU influence as a normative power and trade and sustainable development (Douma, 2017). Considering the above comprehensively, to see the process of the EU's normative spreading power as a global actor, this study will first look at the concept of normative power and the EU's direction for establishing its position as a normative power. The next chapter analyzes how EU normative power is linked to matters related to trade by looking at FTAs signed by the EU with countries in Asia. In particular, the provisions for trade and sustainable development are representative provisions indicating the direction of the EU as a normative power pursued by the EU, and the EU is striving to develop them into international norms. In this respect, this study aims to compare and analyze the trade and sustainable development regulations stipulated in the Korea-EU FTA with other representative FTA examples, the EU-Singapore and EU-Vietnam FTAs.

II. Direction of EU Normative Power as a Global Actor

1. The EU as a Normative Power

As competition for the global power structure, called the U.S.-China competition, intensifies, common global values such as human rights, democracy, the rule of law, and the market economy that the international community has pursued are facing serious challenges. Against this backdrop, the global COVID-19 pandemic is intensifying competition and conflict centered on the U.S. and China, and the so-called new Cold War international political environment is expanding through Russia's invasion of Ukraine in early 2022. On the other hand, it is also undeniable that, contrary to international politics in this conflict, based on the interdependence of the international community, cooperation between existing global actors is increasing, and opportunities for regional and global cooperation are also expanding.

Under these circumstances, the EU, a global actor that has traditionally prioritized common global values, is pursuing strategies to cope with geopolitical issues around Europe, and is attempting to strengthen its role as a major actor in the international community by announcing its willingness and plans to actively engage in Asia and the Indo-Pacific region, which have emerged

as a new chapter in international politics.

In the process of European integration, the EU emphasized and carried out external representation in the international community through treaties through the Maastricht Treaty signed in 1991 (European Parliament, 2022). Through the Maastricht Treaty, the EU set the Common Foreign and Security Policy (CFSP) as an axis of the so-called three-state system with the European Communities (EC) and Justice and Home Affairs (JHA), and later strengthened this representation through the Amsterdam Treaty and the Nice Treaty.

Following the Treaty of Lisbon signing in 2007, the EU has legally organized foreign policy in an integrated system with Title 5 'General Provisions on the Union's External Action and Specific Provisions on the Common Foreign and Security Policy' from the Treaty on the European Union (TEU). In addition, the EU's external representation was strengthened through reforms such as the permanent chairmanship of the EU Summit, the establishment of a European External Action Service (EEAS), and granting the EU a legal personality as the subject of international negotiations and international agreements.

As such, the EU has continuously tried to strengthen external representation through the process of European integration and exert its influence as a major global actor in the international community (Centre for European Studies, n.d.). Also, the EU's external influence in the process of European integration is represented by soft power, which exerts influence on the other party in ways other than physical coercion (including military and economic power), rather than hard power based on diplomacy, defense, and economics.

Under the concept of soft power advocated by international political scientists represented by Joseph Nye, the EU has expanded its influence in the international community through foreign policy methods based on non-compulsiveness and cultural and political values. Of course, it cannot be denied that leader consensus and policy cooperation plays an important role based on the universal values and trust of peace and cooperation that the EU has traditionally pursued, but there is also a limitation in that it cannot infringe on the sovereignty of each member country in the process of European integration and EU policy implementation (Collard-Wexler, 2006).

Table 1. Types of Power and Forms of Diffusion

	Diffusion Mechanisms	Type of EU Diffusion	Means/Channels of Diffusion
Military Power	Coercion	Material, active	Military imposition, threats (negative conditionality)
Civilian Power	Rewards	Material, active	Trade and cooperation agreements, technical and financial assistance (positive conditionality)
	Competition	Material, passive	Large, well-integrated domestic market
Normative Power	Socialization	Ideational, active	Cooperation agreements, political dialogue, technical assistance
	Emulation	Ideational, passive	'Successful' integration; discourse/ narrative, symbolic representations

Source: Lenz (2013).

Furthermore, normative power is a power concept that can represent the EU's external representation and related policies, and better explain the EU's status as a global actor in the international community (Chung, 2016). Manners (2009) argued for normative power, focusing on concepts of ideas/ideologies and normative power rather than the exercise of physical power, and said that the international community should implement sustainable relations and policies in terms of power with normative justification. Also, Manners (2002) presented five core norms and four minor norms as sub-elements in relation to normative power.[1] Based on this concept of normative power, it is possible to better understand the EU's special status in terms of the EU's external representation and related policies, as well as the international community's role as an actor in the traditional framework.

Table 2. Core and Minor Norms

Type of Norm	Content
Core	Peace, Liberty, Democracy, Rule of Law, Human Right
Minor	Social Solidarity, Anti-Discrimination, Sustainable Development, Good Governance

Source: Manners (2002).

2. EU Normative Power and Its Application to International Society

The EU carries out various foreign policies under the concept of normative power, and plays a leading role in related fields as it spreads its values and norms to the international community. The international spread of these norms takes place in the following way (Manners, 2002).

Norms are spread through:

- The unintended spread of ideas to other political actors;
- Spreading information as a result of strategic communication scope;
- Procedural diffusion due to the institutionalization of relations with third countries;
- Spreading through goods, trade, aid, or technical support;
- Spreading through physical presence in third countries; and
- Creating a socio-political identity through knowledge and norms, and spreading through interaction.

By focusing on these diffusion methods, the EU is expanding its influence in various fields in the international community (Gerrits, 2009) . Representatively, the EU is one of the most important global actors in presenting various agendas and forming related norms in the field of human rights. In the environmental sector, the Emission Trading System (ETS) was first introduced and implemented in 2005, played a leading role in the spread of the system as an international norm, and led the 2015 Paris Climate Agreement to promote the internationalization of climate change policies centered on the European Green Deal. This proliferation of EU normative power is also emphasized in the economic and trade sectors, expanding their influence in trade agreements with other countries through trade and sustainable development regulations represented by the concept of sustainability in trade agreements and cooperation (Savorskaya, 2015).

1. Here, sub-elements do not mean subordinate elements to core norms, but can be understood to mean norms that are less important in addition to core norms, or that can reflect relative values according to a standard. Currently, the EU is pursuing various forms of cooperation with countries belonging to both Northeast Asia and Southeast Asia in FTA negotiations (Kim & Lim, 2020).

III. The Status of PTAs between the EU and Countries in Asia

1. PTAs between the EU and Northeast Asian Countries

With the goal of developing relations with China via various methods in Northeast Asia, the EU has tried to expand trade with China while maintaining traditional economic cooperation with Japan. In fact, investment agreements signed by both sides could be used as a legal basis for investment-related issues between the EU and China, which had steadily expanded before COVID-19. Also, the EU and Japan are very important targets in investment and trade with each other, and to further expand economic relations, the two signed an EPA, which is a comprehensive version of an FTA (European Commission, 2017).

However, the legal stability of cooperation between Korea and the EU is clearer than that of China and Japan. Since 2010, Korea has signed a bilateral FTA with the EU to strengthen cooperation in the economic sector (Kim, 2016). The Korea-EU FTA, which went into effect in 2011, includes provisions on investment, labor, intellectual property rights, and cultural cooperation, including the removal of trade barriers and the expansion of economic cooperation (Kim, 2013). In addition, Korea and the EU revised the Framework Agreement signed in 1996, along with the FTA in 2010, and used it as a norm for cooperation in various fields.[2]

Considering the EU's global strategy, the EU will continue to cooperate in other areas beyond economic cooperation with Northeast Asian countries. As an example, to explain this aspect, there is the Framework Participation Agreement aimed at facilitating Korea's future participation in EU Common Security and Defence Policy (CSDP) operations, which engages Korea to participate in EU crisis management operations. Based on this agreement, Korea and the EU laid the foundation for international law to actively cooperate on sensitive issues such as security and military operations (Kim et al., 2019).

Like this, Korea and the EU have expanded the scope of cooperation, continuing joint discussions on international politics and security issues. The issue of terrorism and indiscriminate nuclear proliferation, which has recently emerged as a serious issue in the international community, is drawing much attention from EU member states, and Korea is also a must for stability and the denuclearization of the Korean Peninsula. Among Northeast Asian countries, Korea is the only country in the world that has established cooperative relations based on various international legal bases such as political affairs, economy, and security with the EU (Pacheco et al., 2018). As such, Korea and the EU have established a 'strategic partnership' that is not common in the international community while expanding the field of cooperation based on various treaties.

In addition to treaties signed between Northeast Asian countries and the EU, bilateral treaties signed with Northeast Asian countries individually by EU member states serve as the basis for the international law of cooperation (Yoon, 2008). Bilateral treaties signed individually by members of Northeast Asia and the EU still have value, even after collective treaties such as FTAs are signed. These bilateral treaties have the advantage of being able to include sensitive and complex issues in the field of cooperation that treaties concluded at the EU level do not govern, and proceed with negotiations reflecting the individuality of each EU member state.

Meanwhile, relations between Northeast Asia and the EU are affected by diverse variables, and a representative example is COVID-19. COVID-19

2. Currently, much of the trade issues between Korea and the EU are regulated by bilateral FTAs, but in other areas, except for the FTA's application, basic agreements provide an important standard for cooperation between the two. Under these circumstances, the EU, a global actor that has traditionally prioritized common global values, is pursuing strategies to cope with geopolitical issues around Europe, and is attempting to strengthen its role as a major actor in the international community by announcing its willingness and plans to actively engage in Asia and the Indo-Pacific region, which have emerged as a new chapter in international politics (Kim, 2018).

has also negatively affected trade activities between the EU and Northeast Asian countries as an obstacle to intra-European exchanges. Situations related to the UK's exit from the EU (Brexit) can demonstrate such cases (Kang, 2017). For example, Korean-British relations need a new foundation for international law to replace the Korea-EU FTA, and thus the two countries quickly signed the Korea-Britain FTA.

2. PTAs between the EU and Southeast Asian Countries

Southeast Asia is also an important target of cooperation for the EU, and the EU links relationships with the Association of Southeast Asian Nations (ASEAN) countries from past colonial history to economic benefits (Arjuman, 2014). According to the European Commission, the EU and ASEAN have been dialogue partners since 1977, with the shared values and principles of a rules-based international order, effective and sustainable multilateralism, and free and fair trade. ASEAN is forming a huge market worth 2.6 trillion dollars. The amount of trade between the EU and ASEAN was about 246.5 billion euros in 2015, and for the EU, ASEAN became the third-largest trading partner, excluding Europe, after the United States and China (Pozzi, 2021).

In addition to trade negotiations with individual ASEAN member states, the EU is working closely with the entire ASEAN region (Robles, 2008). Cooperation between the two regions is organized by the ASEAN-EU Trade and Investment Affairs Programme, which is clearly illustrated by the following activities.

- An EU-ASEAN dialogue including discussions on trade and investment issues at ministerial and senior official levels;
- bi-regional expert dialogue groups;
- cooperation activities;
- and the regular organization of business at ASEAN-EU Business Summits.

To expand this relationship, the EU and ASEAN promoted the conclusion of an FTA for active trade and investment. In April 2007, the EU Council, along with many countries, also approved FTA negotiations with ASEAN (Cuyvers, 2007). However, in the case of Myanmar, negotiations were suspended in December 2009 due to human rights and political issues, and the EU has since promoted FTA negotiations with individual ASEAN countries such as Vietnam, Singapore, and Indonesia (Cuyvers, 2013).

The EU and Singapore concluded FTA negotiations, which began in March 2010, with a brief statement in September of 2013. Singapore boasts the most open trade environment and advanced economic levels in Southeast Asia. This characteristic of Singapore contributed to the EU being the first to sign an FTA with Singapore among all ASEAN members (European Parilament, 2020). Compared to the EU's difficulties in FTA negotiations with Vietnam, FTA negotiations with Singapore, which already has an open trade/economic environment, were relatively easy (Byun, 2017).

Meanwhile, Vietnam is promoting aggressive FTA policies by signing FTAs with various countries, including the Korea-Vietnam FTA and the Russia-Vietnam FTA, as an open economic system. EU-Vietnam FTA negotiations, which began in 2012, were finally concluded in December of 2015 after 12 rounds of negotiations (Yoon, 2017).

IV. Application of a New Concept in EU-Asia FTAs: Trade and Sustainable Development Provisions

1. Chapter 13 of the Korea-EU FTA: Trade and Sustainable Development

The Korea-EU FTA agreement consists of 15 chapters, and this system is also reflected in the Korea-UK FTA agreement, which took effect in 2021, and the order and name are similar. In PTAs with East Asian countries resulting from the signing of the Korea-EU FTA, the EU can be found trying to carry out its so-called "European normative values" when signing PTAs with these countries. Unlike existing FTAs concluded in

the international community, there are original normative structures or provisions of the FTA when the EU becomes a party to the conclusion.

The representative content of the FTA's unique normative structure or provisions reflecting such "the value of the EU" are regulations that link trade and sustainable development (IEEP, 2022). . The concept of "Sustainable Development" can be found in the United Nation's (UN) Sustainable Development Goals (SDGs), which have been applied since 2015, replacing the Millennium Development Goals (MDGs) of 2000. The SDG is an overall goal to pursue eco-friendly economic and development activities while meeting social needs in the UN and the international community.

Agendas related to trade and sustainability have been linked to various goals to ensure economic sustainability in the recent global economic background, including environment, labor, human rights, fair trade, and development cooperation. The WTO, which already regulates the multilateral trade system, is also striving to reflect the concept of sustainability, reducing the gap between developed and developing countries and overhauling trade norms to expand trade activities that respect humans and the environment (Park, 2008). Specifically, efforts to prevent an impersonal working environment from being encouraged or neglected for economic reasons in the manufacturing process and to limit the distribution of manufactured products in such circumstances are representative. Trade, which reduces economic activities that emit pollutants and induces manufacturing and processing processes that are highly renewable, can also be said to be an activity that considers sustainability.

The concept of sustainability is also applied to PTAs, and it is worth noting the FTA's "Trade and Sustainable Development" provisions signed by the EU. The Korea-EU FTA separately highlighted the sustainability issue, which previous FTAs did not generally address, in the agreement, and provided Chapter 13 (Durán, 2013). Chapter 13 of the Korea-EU FTA consists of a total of 16 provisions, and the order is generally as follows.

Table 3. Chapter 13 of the Korea-EU FTA: Trade and Sustainable Development

Article	Content
13.1	Context and Objectives
13.2	Scope
13.3	Right to Regulate and Levels of Protection
13.4	Multilateral Labour Standards and Agreements
13.5	Multilateral Environmental Agreements
13.6	Trade Favouring Sustainable Development
13.7	Upholding Levels of Protection in the Application and Enforcement of Laws, Regulations, or Standards
13.8	Scientific Information
13.9	Transparency
13.10	Review of Sustainability Impacts
13.11	Cooperation
13.12	Institutional Mechanism
13.13	Civil Society Dialogue Mechanism
13.14	Government Consultations
13.15	Panel of Experts
13.16	Dispute Settlement

Source: EUR-Lex (2011).

These trade and sustainable development provisions, which first appeared in Chapter 13 of the Korea-EU FTA, have been applied to most FTAs signed by the EU since then, and in this respect, the implications of the Korea-EU FTA are significant. The details of the specific provisions differ somewhat, but the general content is similar in that the EU and the other country have promised to implement sustainability in the discipline of preferential trade. The EU-Singapore and EU-Vietnam FTAs also have similar chapters on trade and sustainability, and so does the EU-Japan EPA.

In this way, trade agreements and cooperation centered on sustainable development regulations are also expanding amid the spread of EU norms, and are very prominent in the EU's FTA strategy for Asia, which is considered a new growth engine for the international community, including ASEAN countries (Park, 2011). In particular, after the Korea-EU FTA, the EU emphasizes linking the concepts of trade and sustainability to economic and trade issues, and the importance of sustainability provisions in international trade in the future is expected to increase.

2. Comparison of Trade and Sustainable Development Provisions between the Korea-EU and EU-Singapore FTAs

The provisions related to the trade and sustainable development of the EU-Singapore FTA generally have a similar system to the aforementioned regulations of Chapter 13 of the Korea-EU FTA. However, the detailed regulations of individual provisions differ slightly depending on the size of the country or the political and economic situation of the country. Hereinafter, the differences between the provisions of the two FTAs will be examined.

Table 4. Chapter 12 of the EU-Singapore FTA: Trade and Sustainable Development

Article	Content
12.1	Context and Objectives
12.2	Right to Regulate and Levels of Protection
12.3	Multilateral labor Standards and Agreements
12.4	Labor Cooperation in the Context of Trade and Sustainable Development
12.5	Scientific Information
12.6	Multilateral Environmental Standards and Agreements
12.7	Trade in Timber and Timber Products
12.8	Trade in Fish Products
12.9	Scientific Information
12.10	Cooperation on Environmental Aspects in the Context of Trade and Sustainable Development
12.11	Trade and Investment Promoting Sustainable Development
12.12	Upholding Levels of Protection
12.13	Transparency
12.14	Review of Impact on Sustainable Development
12.15	Institutional Set up and Monitoring Mechanism
12.16	Government Consultations
12.17	Panel of Experts

Source: EUR-Lex (2019).

To be specific, there is no mention of domestic labor law, environmental law, and protectionism in trade in the Korea-EU FTA, but these appear in the EU-Singapore FTA 12.1.3. This can be compared to Article 13.1 of the Korea-EU FTA, which refers to protectionism in trade in Article 13.2.2 of the Korea-EU FTA. Regarding the ratification of the International Labor Organization (ILO) Convention, the term of 'Comparative Advantage' is clearly stated in Articles 12.3.4 and 12.3.5 of the EU-Singapore FTA, and this can only be found in the EU-Singapore FTA, which can be compared to Article 13.4 of the Korea-EU FTA, which has a similar purpose.

Article 12.1.3. of the EU-Singapore FTA

The Parties recognise that it is inappropriate to encourage trade or investment by weakening or reducing the protections afforded by their domestic labour and environment law. At the same time, the Parties stress that environmental and labour standards should not be used for protectionist trade purposes.

Article 12.3.4. of the EU-Singapore FTA

The Parties will make continued and sustained efforts towards ratifying and effectively implementing the fundamental ILO conventions, and they will exchange information in this regard. The Parties will also consider the ratification and effective implementation of other ILO conventions, taking into account domestic circumstances. The Parties will exchange information in this regard.

Regarding the Labor Cooperation in the Context of Trade and Sustainable Development, Article 12.4 of the EU-Singapore FTA has unique content. A relatively comparable regulation in the Korea-EU FTA is Article 13.6, "Trade Favouring Sustainable Development", but this emphasizes aspects of tariffs and fair trade, and Article 12.4 of the EU-Singapore FTA emphasizes cooperation in the labor sector.

Article 12.4 of the EU-Singapore FTA

The Parties recognise the importance of working together on trade-related aspects of labour policies in order to achieve the objectives of this Agreement.

Next, Article 12.6.4 of the EU-Singapore FTA is a clause related to interference between the FTA and the Multilateral Environmental Agreement (MEA), and this can be compared to Article 13.5 of the Korea-EU FTA, despite some differences in wording. In the case of the EU-Singapore FTA 12.7, "Trade in Timber and Timber Products", the content exists only in the EU-Singapore FTA, and is only briefly mentioned in Annex 13-(i) regarding logging. Meanwhile, Articles 12.5 and 12.9 of the EU-Singapore FTA have "Scientific Information" provisions related to labor and the environment, respectively, while Article 13.8 of the Korea-EU FTA has provisions on scientific information.

Article 12.6.4. of the EU-Singapore FTA

Nothing in this Agreement shall prevent a Party from adopting or maintaining measures to implement the multilateral environmental agreements to which they are party, provided that such measures are not applied in a manner that would constitute a means of arbitrary or unjustifiable discrimination between the Parties or a disguised restriction on trade.

Article 12.5. of the EU-Singapore FTA

Each Party, when preparing and implementing measures aimed at health and safety at work which may affect trade or investment between the Parties, shall take account of relevant scientific and technical information and related international standards, guidelines or recommendations, if available, including the precautionary principle as enshrined in such international standards, guidelines or recommendations.

Article 12.9 of the EU-Singapore FTA

Each Party, when preparing and implementing measures aimed at environmental protection which may affect trade or investment between the Parties, shall take account of scientific evidence and relevant international standards, guidelines or recommendations, where available, and of the precautionary principle.

Next, Article 12.10 of the EU-Singapore FTA emphasizes cooperation related to environmental issues under the title "Cooperation on Environmental Aspects in the Context of Trade and Sustainable Development". On the other hand, the Korea-EU FTA mentions similar content in Article 13.11 and Annex 13. Comparing the content of the Annex related to this, it is similar overall, but in the Korea-EU FTA, Annex 13-(g) states cooperation on trade-related aspects of biodiversity, including in relation to biofuels.

Article 12.11 of the EU-Singapore FTA has a provision called "Trade and Investment Promoting Sustainable Development". Article 12.11.3 describes the items in more detail, and is characterized by emphasizing cooperation in fossil fuels, carbon fuels, and greenhouse gas emissions. In this regard, Article 13.6 of the Korea-EU FTA mentions the promotion of trade and investment in the labor sector, environmental, renewable energy, and services.

Finally, Article 12.14.2 of the EU-Singapore FTA stipulates special matters concerning the review of the sustainability impact. This provision embodies the purpose of sharing indicators and methodologies for impact assessment in each field, which exists only in this FTA. In addition, the Korea-EU FTA briefly mentions the operation of the expert panel through Article 13.15, while Article 12.17 of the EU-Singapore FTA details the composition, operation, replacement of panel members, source, authority, scope, final report, and implementation of panel recommendations.

3. Comparison of the Trade and Sustainable Development Provisions between the Korea-EU and EU-Vietnam FTAs

Provisions related to the trade and sustainable development of the EU-Vietnam FTA have also a similar system to those of Chapter 13 of the Korea-EU FTA, just like the EU-Singapore FTA. The detailed regulations of the individual provisions are slightly different from the Korea-EU and EU-Singapore FTAs because of the business environment of Vietnam. However, they are generally more similar to the Korea-EU FTA as compared to the EU-Singapore FTA, and the content also affected the effective implementation of the Korea-Vietnam FTA. In the following, the differences in each FTA-related regulation will be examined, focusing on the regulations of the EU-Vietnam FTA.

First, Article 13.6 of the EU-Vietnam FTA explicitly mentions "Climate Change". Article 13.5 of the Korea-EU FTA and Article 13.5 of the EU-Vietnam FTA related to multilateral environmental agreements are similar, but the EU-Vietnam FTA is characterized by a special emphasis on cooperation in the climate change sector through Article 13.6. Furthermore, Article 13.7 of the EU-Vietnam FTA provides explicit regulations on "Biological Diversity", and describes matters that require cooperation in detail. On the other hand, the Korea-EU FTA briefly mentions similar content in Annex 13-(g), as mentioned above.

Article.13.6.1. of the EU-Vietnam FTA

The Parties shall cooperate on the implementation of the UNFCCC, the Kyoto Protocol and the Paris Agreement. The Parties shall, as appropriate, cooperate and promote the positive contribution of this Chapter to enhance the capacities of the Parties in the transition to low greenhouse gas emissions and climate-resilient economies, in accordance with the Paris Agreement.

Article.13.7.1. of the EU-Vietnam FTA

The Parties recognise the importance of ensuring the conservation and sustainable use of biological diversity in accordance with the Convention on Biological Diversity of 1992 (hereinafter referred to as "CBD") and the Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets, adopted at the tenth meeting of the Conference of the Parties in Nagoya on 18 to 29 October 2010, Convention on International Trade in Endangered Species of Wild Fauna and Flora, as last amended in Gaborone in 1983 (hereinafter referred to as "CITES"), and other relevant international instruments to which they are party, as well as the decisions adopted thereunder.

Table 5. Chapter 13 of the EU-Vietnam FTA: Trade and Sustainable Development

Article	Content
13.1	Objectives
13.2	Right to Regulate and Levels of Protection
13.3	Upholding Levels of Protection
13.4	Multilateral Labour Standards and Agreements
13.5	Multilateral Environmental Agreements
13.6	Climate Change
13.7	Biological Diversity
13.8	Sustainable Forest Management and Trade in Forest Products
13.9	Trade and Sustainable Management of Living Marine Resources and Aquaculture Products
13.10	Trade and Investment Favouring Sustainable Development
13.11	Scientific Information
13.12	Transparency
13.13	Review of Sustainability Impact
13.14	Working Together on Trade and Sustainable Development
13.15	Institutional Provisions
13.16	Government Consultations
13.17	Panel of Experts

Source: EUR-Lex (2020).

This same pattern is also found in several other regulations. Article 13.8 of the EU-Vietnam FTA provides detailed cooperation in the provisions of "Sustainable Forest Management and Trade in Forest Products". However, the Korea-EU FTA briefly mentions related matters in the Annex 13-(i). Next, Article 13.9 of EU-Vietnam FTA, on the "Trade and Sustainable Management of Living Marine Resources and Aquaculture Products", stipulates matters concerning cooperation between the two sides in relative detail. However, it can be found that the Korea-EU FTA clause in this regard is simply mentioned in Annex 13-(h).

Article 13.9.1. of the EU-Vietnam FTA

The Parties recognise the importance of ensuring the conservation and sustainable management of living marine resources and marine ecosystems as well as the promotion of responsible and sustainable aquaculture.

Finally, Article 13.17 of the EU-Vietnam FTA has relatively detailed regulations on the operation of expert panels. This is similar to the EU-Singapore FTA, which specifically describes the composition, operation, replacement of panel members, source of information, authority, scope, final report, and implementation of panel recommendations. On the other hand, the Korea-EU FTA has a brief reference to this in Article 13.15.

The EU has signed selective FTAs with ASEAN countries such as Singapore and Vietnam, which are similar to the process of Japan signing FTAs with ASEAN, and are distinct from the fact that Korea signed a separate Korea-Vietnam FTA after Korea signed the Korea-ASEAN FTA. In addition, although the detailed provisions of trade and sustainable development provisions in the Korea-EU FTA are largely reflected in the EU-Singapore and EU-Vietnam FTAs, there are different reasons for coordination with the domestic laws of each country.

V. Conclusion

As a global actor, the expansion of values and norms pursued by the EU is taking place in many areas, including both in hard power and soft power issues. In addition to the EU's influence on the international spread of democracy, the rule of law, and human security around human rights, ETS and the European Green Deal, which are important pillars of EU climate change policy, are becoming major standards and norms in the international community. Furthermore, in the spread of these EU norms, trade agreements and cooperation centered on the Sustainable Development provisions are also expanding, which is very prominent in the EU's FTA strategy for Asia.

First, the EU's PTA with East Asian countries, which began with the Korea-EU FTA, will continue to expand, and China and Japan in Northeast Asia are also in the process of expanding various types of preferential trade relations. The EU also promoted FTA negotiations with ASEAN in Southeast Asia, but failed to advance due to human rights issues and international relations in Southeast Asian countries. However, the EU has signed selective FTAs with ASEAN countries such as Singapore and Vietnam. This method is similar to the process of Japan signing an FTA with ASEAN, which is distinct from the fact that Korea signed a Korea-Vietnam FTA separately after Korea signed the Korea-ASEAN FTA.

In addition, the EU's PTAs have some unique features that link trade and sustainability with environmental and labor issues to economic and trade issues. These provisions, which first appeared in Chapter 13 of the Korea-EU FTA, aim to attempt strong discipline by covering those traditionally considered non-economic issues in the scope of economic cooperation and commerce. At the same time, it is also characterized by EU-led trade law regulations that reflect European values and norms in the international community.

The trade and sustainable development provisions of the FTAs signed by the EU with Singapore and Vietnam have similar systems because they are based on the relevant regulations of the Korea-EU FTA. However, considering that the relevant regulations of the Singapore-Vietnam FTA are similar but slightly different, the fact that these Southeast Asian countries are in different economic and trade situations can be said to have some impact on the details of the agreement.

On the other hand, the fact that the Korea-EU FTA has been long signed and that discussions in the international community have recently changed may be the reason for the difference in the agreement. In addition, it can be evaluated that the EU has learned to establish "EU-led global standards" for this field while steadily promoting trade agreements with East Asian countries after the conclusion of the Korea-EU FTA. Since the EU is trying to reflect these standards in changes in multilateral trade norms such as the WTO, it is necessary to recognize and respond to these issues along with discussions on the revision of the Korea-EU FTA and to apply it to future global trade norms.

References

Arjuman, L. (2014). EU-ASEAN proposed FTA: Implications for Bangladesh. *Journal of South Asian Studies, 20*(1), 87-106.

Byun, J. H. (2017, March 10). EU-ASEAN FTA negotiations resume after 8 years. *Sedaily*. http://www.sedaily.com/NewsView/1ODBFN3XUO

Center for European Studies. (n.d.). *The EU and soft power.* https://europe.unc.edu/iron-curtain/power-and-politics-the-prisoners-dilemma/the-eu-and-soft-power

Chung, S. W. (2016). Examining the EU's normative roles on the Korean peninsula: The EU's non-proliferation policy towards North Korea. *Korean Journal of European Integration*, *7*(1), 97-125.

Collard-Wexler, A. (2006). Integration under anarchy: Neorealism and the European Union. *European Journal of International Relations*, *12*(3), 397-432.

Cuyvers, L. (2007). *An EU-ASEAN free trade agreement: Reflections on issues, priorities, strategies* (CAS Discussion paper No. 53). Centre for ASEAN Studies, 1-15. https://medialibrary.uantwerpen.be/oldcontent/container2626/files/CAS%20en%20ASEAN/CAS53.pdf

Cuyvers, L. (2013). *The sustainable development clauses in free trade agreements: An EU perspective for ASEAN?* (UNU-CRIS Working papers, W-2013/10). UNU Institute on Comparative Regional Integration Studies, 1-32. https://cris.unu.edu/sustainable-development-clauses-free-trade-agreements-eu-perspective-asean

Douma, W. (2017). The promotion of sustainable development through EU trade instruments. *European Business Law Review*, *28*(2), 197-216.

EUR-Lex (2011). *EU-Korea FTA.* https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri= ELEX:22011A0514(01)

EUR-Lex (2019). *EU-Singapore FTA.* https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:22019A1114(01)&from=EN#page=96

EUR-Lex (2020). *EU-Vietnam FTA.* https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:2020:186:FULL&from=EN#page=132

European Commission (2015). *Trade for all: Towards a more responsible trade and investment policy.* https://trade.ec.europa.eu/doclib/docs/2015/october/tradoc_153846.pdf

European Commission (2017). *EU and Japan finalise economic partnership agreement*. https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/japan/eu-japan-agreement_en

European Commission (2021). *The European Union and ASEAN.* https://www.eeas.europa.eu/asean/european-union-and-asean_en?s=47

European Parilament (2020, November 11). *Trade negotiations between the EU and ASEAN member states.* https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2020)659337

European Parilament (2022). *The Maastricht and Amsterdam treaties.* https://www.europarl.europa.eu/factsheets/en/sheet/3/the-maastricht-and-amsterdam-treaties

Durán, G. M. (2013). Innovations and implications of the trade and sustainable development chapter in the EU-Korea free trade agreement. In J. Harrison (Ed.), *The European Union and South Korea: The legal framework for strengthening trade, economic and political relations* (pp. 124-146). Edinburgh University Press.

Gerrits, A. (2009). *Normative power Europe in a changing world: A discussion.* Netherlands Institute of International Realtions Clingendael. https://www.clingendael.org/sites/default/files/pdfs/20091200_cesp_paper_gerrits.pdf

Harrison, J., & Paulini, S. (2020). *The trade and sustainable development chapter in the EUMercosur association Agreement*. ClientEarch. https://www.clientearth.org/media/rs5enobx/the-trade-and-sustainable-development-chapter-in-the-eu-mercosur-association-agreement-ext-en.pdf

IEEP (2022). *Enhancing sustainability in EU free trade agreements: The case for a holistic approach* (IEEP Policy Report). http://wrap.warwick.ac.uk/164913/1/WRAP-Enhancing-sustainability-EU-Free-Trade-Agreements-holistic-IEEP-2022.pdf

Kang, Y. D. (2017). UK's trade policy for global Britain: What should be done after the Brexit?. *The Journal of Contemporary European Studies*, *35*(2), 51-88.

Kim, B. C. (2013). The effectuation of Korea-EU FTA and legal issue. *The Journal of Contemporary European Studies*, *31*(3), 1-28.

Kim, B. C. (2016). The international laws on the cooperation of the Korea-vesegrád group. *Advanced Science*

Letters, 23(10), 9870-9874.

Kim, B. C., & Kim, H. (2018). *Lectures on Korean FTA and law.* HUINE, 1-223.

Kim, C. W. (2018). A view on EU's future and its lessons for Asia-Pacific region in promoting economic Integration. *Asia-Pacific Journal of EU Studies. 16*(2), 1-10.

Kim, H., & Lim, S. R. (2020). The EU-East Asian cooperation for the development of the regional international law. *Journal of European Union Studies. 54*, 107-132.

Kim, S. H. (2017). EU global strategy and Korea-EU relations. *The Journal of Contemporary European Studies. 35*(3), 29-53.

Kim, S. H., Choi, J. W., Kim, B. C., Lee, M. S., Kang, M. D., & Song, B. J. et al. (2019). *Korea-European Union relations*. HUINE, 1-440.

Lenz, T. (2013). EU normative power and regionalism: Ideational diffusion and its limits. *Cooperation and Conflict*, *48*(2), 211-228.

Manners, I. (2002). Normative power Europe: A contradiction in terms?. *Journal of Common Market Studies*, *40*(2), 235-258.

Manners, I. (2009). The concept of normative power in world politics (DIIS Brief). *Danish Institute for International Studies*, 1-5. https://pure.diis.dk/ws/files/68745/B09_maj_Concept_Normative_Power_World_Politics.pdf

Pacheco, R., Desmaele, L., & Ernst, M. (2018, October 18). *Putting the EU-South Korea partnership to work.* Euractiv. https://www.euractiv.com/section/economy-jobs/opinion/putting-the-eu-south-korea-partnership-to-work/

Park, S. U. (2008). Legal framework and institutionalization of the ASIAN FTA. *Yonsei Law Journal*, *18*(4), 171-198.

Park, Y. S. (2011, May 19). EU to push for FTAs with ASEAN individual countries. *KOTRA News*. https://dream.kotra.or.kr/kotranews/cms/news/actionKotraBoardDetail.do?SITE_NO=3&MENU_ID=90&CONTENTS_NO=1&bbsSn=244&pNttSn=106737

Poletti, A., Sicurelli, D., & Yildrim, A. B. (2021). Promoting sustainable development through trade? EU trade agreements and global value chains. *Italian Political Science Review*, *51*, 339-354.

Pozzi, R. (2021, March 18). *ASEAN-EU strategic partnership: A new path of upgraded relations.* Euractiv. https://www.euractiv.com/section/global-europe/opinion/asean-eu-strategic-partnership-a-new-path-of-upgraded-relations/

Robles, A. C. (2008). The EU and ASEAN: Learning from the failed EU-Mercosur FTA negotiation. *ASEAN Economic Bulletin, 25*(3), 334-344.

Savorskaya, E. (2015). The concept of the European union's normative power. *Baltic Region*, *4*(26), 66-76.

Yoon, B. N. (2017, September 18). *EU-Vietnam FTA takes effect, Will it be possible within 2018?.* Kotra. https://dream.kotra.or.kr/kotranews/cms/news/actionKotraBoardDetail.do?SITE_NO=3&MENU_ID=90&CONTENTS_NO=1&bbsGbn=244&bbsSn=244&pNttSn=160940

Yoon, S. W. (2008). Political economic analysis of free trade agreements in case of Korea-EU FTA: Strategic importance of Korea. *The Journal of Eurasian Studies*, *5*(1), 51-65.

ISSN 1946-5130 (Print), ISSN 2470-4733 (Online)
http://dx.doi.org/10.20294/jgbt.2023.19.1.91

The Journal of Global Business and Trade

Journal of Global Business and Trade

https://www.pfw.edu/jgbt

Environmental, Social, and Governance Performance and Corporate Sustainable Development in China*

Xuan Wang[a], Shanyue Jin[b]**

[a]*School of Accounting, Shandong Women's University, China*
[b]*College of Business, Gachon University, South Korea*

Received 4 December 2022, Revised 12 January 2023, Accepted 5 February 2023

ABSTRACT

Purpose – With the acceleration of global integration and the deepening of the market economy, sustainable development is receiving unprecedented attention worldwide. Corporate environmental, social, and governance (ESG) performance is one of the most important ways of promoting sustainable development. Companies with good ESG performance excel both operationally and financially, maintaining their competitive advantage and achieving sustainable corporate growth. This study examines the impact of ESG performance on corporate sustainability and identifies factors that influence this relationship from the perspective of external governance structures.

Design/Methodology/Approach – This study investigates the impact of corporate ESG performance on corporate sustainability using a fixed-effects model with Chinese A-share listed companies from 2011 to 2020. It also explores the moderating roles of external audit quality, the shareholding ratio of institutional investors, and analyst attention on the impact of ESG performance on corporate sustainability.

Findings – The findings show that corporate ESG performance can contribute to sustainable development. External audit quality, the shareholding ratio of institutional investors, and analyst attention have positive moderating effects on ESG performance, which can contribute to sustainable development.

Research Implications – This study enriches theoretical research in ESG performance and sustainability, and identifies external governance factors that contribute to the relationship between the two. Consequently, it provides suggestions for listed company growth and sustainability practices

Keywords: analyst attention, ESG performance, external audit quality, shareholding ratio of institutional investors, sustainable development

JEL Classifications: G30, G38, M48

** This work was supported by the Gachon University Research Fund of 2022 (GCU-202206240001).*
*** Corresponding Author, E-mail: jsyrena0923@gachon.ac.kr*

I. Introduction

Global climate extremes have become more frequent in recent years, which has caused the world community to focus more on environmental issues. Since the United Nations Global Compact formally introduced the concept of environmental, social, and governance (ESG) in 2004, the concept of ESG has gradually become known to the general public (Ge et al., 2022). ESG is a non-financial system for assessing business performance that focuses on environmental, social, and governance aspects. It increases environmental investment, actively engages in social responsibility, and enhances corporate governance to increase competitive advantage (Feng & Wu, 2021; Santamaria et al., 2021). In the fight against climate change in various countries, the ways in which companies can achieve sustainable development have received widespread attention. The study *Our Common Future* gave rise to the idea of sustainable development, defined as "development that meets the needs of the present without sacrificing the ability of future generations to fulfill their needs". Sustainable development is based on the interdependence of the economic, social, and environmental pillars (Lazar & Chithra, 2022). In China, the government has set goals for achieving "carbon peaking" by 2030, and "carbon neutrality" by 2060. The creation of a green, low-carbon, and circular economic system must be accelerated to achieve sustainable development and support the ESG concept to accomplish these two objectives (Cui & Zhang, 2022). The promotion of high-quality development should also be a priority, and the use of green development symbolizes China's transition from a speedy economy to high-quality growth. As microeconomic subjects, enterprises should have more responsibility for environmental protection, the fulfillment of social responsibility, and improvement of internal governance (Gong et al., 2021; Lu, 2021). Therefore, good ESG performance facilitates corporate sustainability. If so, how does ESG influence sustainability?

Good ESG performance can contribute to enhancing a firm's corporate value. Investor trust in a company and its value is influenced by how well it performs in terms of environmental protection, social responsibility, and corporate governance effectiveness (Bruna et al., 2022; Wong et al., 2021). In terms of individual dimensions, firm environmental performance is positively related to firm value, and the effect of environmental management in the current period is more significant in enhancing financial value in the following year (Choi et al., 2020; Wahidahwati & Ardini, 2021). To avoid being driven out of the competitive market environment, enterprises must adopt a global green development trend, create a quality certification system that complies with international standards, standardize and adapt their industrial structure, optimize human resources, reduce environmental pollution and utilization, and enhance brand awareness (Li, et al., 2021). Good environmental performance helps companies improve the utilization of corporate resources, win more market and social resources, build a good social image, enhance investor confidence in higher expectations of the company, and achieve sustainable development (Wamba, 2022). Being socially responsible enhances corporate value. To fulfill stakeholder social responsibility, companies should continuously improve production processes, innovate to produce low-cost, high-profit, safe, and environmentally friendly products, improve internal operational efficiency, gain a good social reputation, and increase corporate value (Asogwa et al., 2020; Lu et al., 2022; Xu et al., 2020). A high level of internal corporate governance is conducive to firm value and contributes to firm growth. Wahianhwati and Aridini (2021) argued that the value of a company increases with increased corporate governance. Good corporate governance performance reduces firm transaction costs, addresses information asymmetries, and reinforces long-term orientation, thus improving firm performance (Poursoleyman et al., 2021; Raithatha & Haldar, 2021).

The quality of external audits, institutional investors, and analysts play an important role in external oversight. First, a high-quality external audit can monitor corporate accounting

disclosures by implementing effective audit procedures to prompt high-quality financial reports and improve the transparency and quality of corporate accounting information (Shiue et al., 2022). Simultaneously, high-quality external audits play a regulatory function based on their high professionalism and independence, which helps companies strengthen internal governance and reduce the cost of agency by agreement (Chae et al., 2020). Second, institutional investors, with their professional and informational advantages, play a supervisory role in company management. They generally have strong professional analytical skills and can objectively interpret the relevant accounting information disclosed by a company to enhance its risk-taking ability by improving corporate information transparency and alleviating financing constraints (Wei et al., 2021). Institutional investors have more information about their unit holdings at the information superiority level. This information can facilitate firm performance improvement, alleviate agency problems by agreement, and reduce the degree of information asymmetry (Li et al., 2022). Finally, analysts play an important role as external supervisors in capital markets. Naqvi et al. (2021) argued that analyst attention plays a moderating role between social responsibility performance and information asymmetry, and that analyst attention plays an important role in reducing the level of information asymmetry in companies. Simultaneously, analysts can increase investor attention to the company by tracking listed companies, further forming supervision pressure, resulting in enterprises disclosing high quality accounting information , conveying a good social image, and promoting development (Jiao & Qi, 2022).

The innovation of this study lies in the following points. First, research on the ESG of Chinese companies mainly focuses on the impact of ESG performance on corporate value, and less on sustainable development. This study can enrich the literature on the impact of the relationship between ESG and sustainable development. Second, based on the perspective of external monitoring, this paper examines the moderating effects of external audit quality, institutional investor shareholding ratio, and analyst concerns about the relationship between ESG performance and sustainable development. The study proposes policy recommendations from different perspectives to enrich the literature on ESG-related fields and provides practical insights for enterprises and governments.

II. Theoretical Background and Assumptions

1. ESG Performance and Sustainable Development

According to the stakeholder theory, an enterprise's environmental and social responsibility can demonstrate its reliability to stakeholders, lower the cost of transactions between an organization and its stakeholders, and improve the effectiveness of stakeholder involvement in creating enterprise value (Freeman & Evan, 1990). As the impact of an enterprise in ESG on its business performance and sustainable development ability continues to be highlighted, the government, employees, investors, creditors, and other market players, as well as the public, are increasingly concerned about the ESG performance of enterprises. ESG performance has gradually become a window for communication between enterprises and stakeholders, as well as a way for enterprises to enhance corporate value (Arvidsson & Dumay, 2022). Positive ESG performance for the government facilitates the development of positive ties with the government and a comfortable environment for its growth (El Khoury et al., 2022). Meanwhile, good ESG performance may result in more financial support and tax benefits, leading to better financial performance and sustainable corporate development (Jonwall et al., 2022). For internal personnel, strong ESG performance is a sign of a strong corporate culture that can improve the working environment for staff, boost their sense of

belonging, lower staff turnover, and preserve the stability of business operations (Gu et al., 2020). Additionally, enterprises that perform well in ESG areas have strong governance, which can improve employee enthusiasm and efficiency through reasonable performance evaluations and incentive mechanisms. Therefore, financial performance can be improved (Piao et al., 2022). For investors, companies active in taking on ESG responsibilities are less prone to environmental events and can reduce investor losses (Cornell, 2021). Moreover, firms with good ESG performance can send favorable signals to investors, reduce investment risks, improve investor confidence, and increase share prices to achieve long-term corporate growth (Xu et al., 2022). For creditors, good ESG performance can reduce debt financing costs and improve corporate performance through financial leverage (Maaloul et al., 2021). For consumers, good ESG performance leads to improved corporate governance, improved product quality, and enhanced consumer willingness to buy (Kim et al., 2021). Companies with good ESG performance that achieve environmental and social responsibility will be favored by environmentalists, increasing product sales and enhancing their competitive market positions and reputations for long-term growth (Muhmad et al., 2021).

According to resource-based theory, enterprises are a collection of resources. Enterprises vary for different reasons, and this heterogeneity influences variations in their competitiveness (Wernerfelt, 1984). A company's rational use and allocation of resources to solve environmental problems enable it to develop a lasting competitive advantage, thus creating value (Conca et al., 2021). Companies can benefit from having a positive social reputation, and good ESG performance makes it easier for companies to gain a competitive advantage, enhance core competencies, and improve long-term performance (Murè et al., 2021). Of course, negative reports on a company's ESG can negatively affect corporate value by affecting its social reputation (Wong & Zhang, 2022). However, companies seeking to improve ESG performance are more motivated to investigate new technologies and approaches to taking up environmental and social responsibility. This will further enhance resource utilization, reduce costs, develop green products, and improve financial performance for sustainable corporate development (Khalil et al., 2022). Li and Li. (2022) concluded that by imposing an environmental tax is beneficial to improve the ESG performance of firms, promote green technological innovation, and achieve the sustainable development of firms. Wang et al. (2022) argued that a high level of ESG disclosure by firms can promote sustainable growth. Good ESG performance can promote high quality corporate development, alleviate financing constraints, and better describe sustainable development goals, the impact of which is also reflected in ASEAN countries (Ge et al., 2022; Sadiq et al., 2022; Zhang et al., 2022). Therefore, Hypothesis 1 is proposed below.

H1: Better ESG performance promotes sustainable corporate development.

2. Moderating Role of External Supervision

According to agency theory, because of the existence of problems such as information asymmetry, manager behavior is not effectively supervised, and managers may act to maximize personal interests, to the detriment of the principal's interests, which gives rise to the so-called moral hazard (Jensen & Meckling, 1976). To mitigate information asymmetry and agency problems, external auditors, institutional investors, and analysts play an effective role as part of the external governance mechanism.

2.1. The Moderating Role of External Audit Quality

An external audit is an external governance mechanism that monitors, deters, and restrains the behavior of corporate executives. It is an important tool that influences corporate behavior (Habib et

al., 2021). The quality of a firm's external audit is directly related to its operations, performance, and stakeholder interests (Al-ahdal & Hashim, 2021). Auditing can improve the transparency and quality of corporate accounting information by implementing effective audit procedures to understand the actual situation of a company's internal controls, strategic objectives, operational risks, and to identify problems in the preparation and disclosure of financial statements (Jannopat & Phornlaphatrachakorn , 2022). Among these, ESG disclosure by listed companies is an important way for auditors to understand companies (Knechel, 2021). High-quality audits can encourage companies to actively fulfill social responsibility, take on environmental responsibility, and improve corporate governance (Nasution & Kalanjati, 2022). External audits serve as explicit signals to measure firm financial positions and performance capabilities, and indirectly observe manager efforts (Chy & Hope, 2021). The higher the audit quality, the more it stimulates the organization's willingness to learn proactively, and this encourages firms to engage in ESG activities. Simultaneously, it effectively monitors firm ESG performance to ensure sustainable development. Therefore, Hypothesis 2 is proposed below.

H2: External audit quality positively moderates the ESG performance process for sustainable development.

2.2. Moderating Role of Institutional Investor Shareholding Ratio

By participating in corporate governance based on knowledge and capital advantages, institutional investors, a significant force in the capital market, play a significant role in the market (Chung et al., 2020). To meet client demand for sustainable investments, more institutional investors are considering environmental and social impacts in addition to financial returns when making investment decisions and incorporating ESG and corporate sustainability goals into the capital allocation process (García-Sánchez et al., 2022a; Pan, 2020). The management strategy of institutional investors has evolved in recent years from the passive screening of eligible companies to active participation in the ESG governance of companies, improving corporate environmental and social performance, and becoming long-term investors (Amin & Tauseef, 2022; Liu et al., 2022a). The shareholding ratio of institutional investors can significantly enhance corporate social responsibility and influence ESG performance to achieve sustainability goals (García-Sánchez et al., 2020; Xiong et al., 2022). Based on this, we propose Hypothesis 3 below.

H3: Institutional investor shareholding ratio positively modifies ESG performance for sustainable development.

2.3. Moderating Role of Analyst Attention

Analysts are the information intermediaries in the capital market and an important regulatory force for mining and analyzing relevant information on companies to forecast growth prospects, and thus advise investors on whether to buy or hold securities. Higher analyst attention helps firms provide high-quality information and reduce information asymmetry about the firm (Yang et al., 2021). Analyst coverage can significantly enhance company engagement in ESG and have an economically significant incremental impact on company value (Hu et al., 2021). Companies with better ESG performance are often recognized as having greater growth potential and investment value, and therefore attract more analyst attention (Senadheera et al., 2021). Analysts generally have profound expertise and information regarding the industries they focus on. Their years of experience in the field enable them to identify misstatements and fraud when faced with corporate disclosures, which can affect investor decisions and corporate reputation (Liu et al., 2021). The reports issued by analysts guide the attention of investors and other external monitoring mechanisms to the firm, thus reducing agency costs. The greater the analyst attention,

the more effective it is in curbing opportunistic management behaviors, and the higher the quality of the ESG performance and disclosure. As a result, it promotes sustainable corporate development (García-Sánchez et al., 2022b). Therefore, Hypothesis 4 is proposed below.

H4: Analyst attention plays a positive moderating role in ESG performance in sustainable development.

III. Research Design

1. Data and Sample

We selected Chinese A-share listed companies in Shanghai and Shenzhen from 2011 to 2020 as the research sample. To ensure the reliability of the data, the samples were screened and processed based on the initial sample as follows: (1) companies in ST (Special Treatment), ST*, and PT (Particular Transfer) were excluded; (2) companies in the financial sector were excluded; (3) samples with incomplete data were excluded, and (4) continuous variables were winsorized at 1% and 99%. A total of 23,519 observations were obtained. ESG data were obtained from the WIND database of the China Securities Index ESG evaluation system, and the other data were obtained from the CSMAR database. This study used the STATA software for empirical analysis (Liao et al., 2022).

2. Definitions of Variables

2.1. Dependent Variable

In this study, sustainable development capability was selected as the dependent variable. The capacity of an organization to meet its objectives while pursuing long-term preservation and sustainable development is known as corporate sustainability. Additionally, it enables the business to maintain a competitive edge, maintain ongoing profitability, and experience steady growth over an extended period. Based on that, the static model of James C. Van Horne was used to measure the sustainability of a company in terms of profitability and competitiveness, considering the interests of shareholders and creditors when measuring the sustainability of the company (Liao et al., 2022; Wu et al., 2022).

2.2. Independent Variables

In this study, corporate ESG performance was selected as the independent variable. The WIND financial database's SSI ESG rating information was used as the independent variable. (Wang et al., 2022). A three-tier indicator system was built from top to bottom as part of this evaluation system, based on the basic connotation and development experience of ESG. It has a high reference value in terms of the number of covered firms and indicator design because it was created with careful study of the applicability of each indication while considering the features of Chinese listed companies. The rating results were ranked from high to low according to the AAA-C scale. The highest AAA grade was 9. One had the lowest C rating. The company's overall environmental performance, social responsibility, and corporate governance were subpar, as indicated by the C rating.

2.3. Moderating Variables

This study chose the external audit quality, shareholding ratio of institutional investors, and analyst focus as moderating variables to further analyze the moderating influence of external corporate monitoring on the relationship between ESG performance and sustainability.

2.3.1. External Audit Quality

This study referred to the approach of Hrazdil et al. (2021) and evaluated whether audits were conducted by the Big Four audit firms. The dummy variables were set to measure the audit study by taking a value of 1 if the audit firms were "Big Four audit firms", and 0 if they were not.

2.3.2. Shareholding Ratio of Institutional Investors

As a measure of the percentage of shares owned by institutional investors, determined by the percentage of shares held at the end of each year, this study chose the percentage of shares held by these investors in listed companies. Institutional investors include securities, insurance, and financial companies. The shareholding ratio is the total number of shares divided by the number of shares held by institutional investors (Zhang & Ye, 2021).

2.3.3. Analyst Attention

As a bridge to information communication between companies and investors, the attention of securities analysts and the issuance of research reports have an important influence on reasonable investment decisions. As a member of external supervision, analyst attention can effectively regulate the relationship between ESG performance and sustainable development. Therefore, this study used analyst attention as a moderating variable. By learning from Hong (2020), this study used the natural logarithm of the amount of analyst attention as a measure of analyst attention.

2.4. Control Variables

This study drew on a related study by Liu et al. (2022b) to select firm size (SIZE), debt-to-asset ratio (LEV), equity concentration (TOP1), total asset turnover (ATO), firm age (AGE), and firm growth (GROW) as control variables while controlling for year (Year) and industry (Ind). In addition, the variable year (Year) and industry (Ind) were controlled. The definitions of the variables in this study are shown in Table 1.

Table 1. Variable Definitions

Variable Type	Variable Name	Variable Symbol	Variable Definition
Dependent Variable	Sustainable Development	SGR	Net sales interest rate × total asset turnover × income retention rate × equity multiplier/(1-net sales interest rate × total asset turnover × income retention rate × equity multiplier)
Independent Variable	ESG Performance	ESG	SSI ESG Indicator System: Nine ratings are assigned from 1 to 9
Moderating Variables	External Audit Quality	AUD	If the enterprise was audited by the Big Four for the year, the value is 1; otherwise, it is 0
	Shareholding Ratio of Institutional Investors	INS	Shareholding ratio of external institutional investors
	Analyst Attention	COV	Natural logarithm of annual company analysts
Control Variables	Enterprise Size	SIZE	Natural logarithm of total year-end assets
	Debt-to-asset Ratio	LEV	Total Liabilities/Total Assets
	Shareholding Concentration	TOP1	Percentage of shareholding of the largest shareholder
	Total Assets Turnover Ratio	ATO	Operating Income/Average Total Assets
	Enterprise Age	AGE	Ln (Study year-Established year+ 1)
	Corporate Growth	GROW	Operating income growth rate
	Year	Year	Annual dummy variable
	Industry	Ind	Industry dummy variable

3. Model Design

To test the relationship between ESG performance and corporate sustainability to test Hypothesis 1, Model (1) was developed.

$$SGR = \beta_0 + \beta_1 ESG + \beta_2 SIZE + \beta_3 LEV + \beta_4 TOP1 + \beta_5 ATO + \beta_6 AGE + \beta_7 GROW + \Sigma Year + \Sigma Ind + \varepsilon \quad (1)$$

The positive and significant β_1 in Model (1) indicates that the better the ESG performance, the more sustainable the company's development capability.

To test Hypotheses 2-4 to test the moderating effects of external audit quality, the shareholding ratio of institutional investors and analyst attention in the external monitoring of firms on the relationship between ESG performance and corporate sustainability, regression analyses were conducted by adding the main explanatory and interaction terms to develop Models (2)-(4).

$$SGR = \beta_0 + \beta_1 ESG + \beta_2 AUD + \beta_3 ESG*AUD + \beta_4 SIZE + \beta_5 LEV + \beta_6 TOP1 + \beta_7 ATO + \beta_8 AGE + \beta_9 GROW + \Sigma Year + \Sigma Ind + \varepsilon \quad (2)$$

$$SGR = \beta_0 + \beta_1 ESG + \beta_2 INS + \beta_3 ESG*INS + \beta_4 SIZE + \beta_5 LEV + \beta_6 TOP1 + \beta_7 ATO + \beta_8 AGE + \beta_9 GROW + \Sigma Year + \Sigma Ind + \varepsilon \quad (3)$$

$$SGR = \beta_0 + \beta_1 ESG + \beta_2 COV + \beta_3 ESG*COV + \beta_4 SIZE + \beta_5 LEV + \beta_6 TOP1 + \beta_7 ATO + \beta_8 AGE + \beta_9 GROW + \Sigma Year + \Sigma Ind + \varepsilon \quad (4)$$

A positive and significant $\boldsymbol{\beta_3}$ in Model (2) indicates that external audit quality positively moderates ESG performance for sustainable development. The positive and significant $\boldsymbol{\beta_3}$ in Model (3) indicates that institutional investor ownership positively moderates ESG performance for sustainable development. The positive and significant $\boldsymbol{\beta_3}$ in Model (4) indicates that analyst attention positively moderates ESG performance for sustainable development. In the above model, ∑Year is the year dummy variable, ∑Ind is the industry dummy variable, $\boldsymbol{\beta_0}$ is a constant term, andεis the residual term. The p-values of the Hausman test results for Models (1)-(4) in this study were <0.05. Therefore, a fixed-effects regression model was chosen for this study.

IV. Empirical Results

1. Descriptive Statistics

Table 2 presents descriptive statistics for each variable. The table shows that the maximum value of enterprise sustainability capability (SGR) is 0.367, the minimum value is -0.434, and the mean value is 0.054. They indicate that the sustainability capability of each enterprise varies, and that the overall sustainability capability of enterprises is generally low. The mean value of corporate ESG performance is 6.547, with a standard deviation of 1.054, indicating that the average corporate ESG rating was between BBB and A, with wide variation. The mean value of external audit quality (AUD) is 0.054, indicating that most companies were not audited by Big Four audit firms. The mean value of the shareholding ratio of institutional investors (INS) is 0.389, with a standard deviation of 0.236, indicating a large difference in the shareholding ratio of institutional investors among individual companies. The mean value of analyst concerns (COV) is 1.621, with a standard deviation of 1.132, indicating that analyst attention was generally low and varied greatly between firms.

2. Correlation Analysis

This study used Pearson correlation analysis to test the degree of correlation between variables, and the results are shown in Table 3.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
SGR	23519	0.054	0.076	-0.434	0.367
ESG	23519	6.547	1.054	1	9
AUD	23519	0.054	0.227	0	1
INS	23519	0.389	0.236	0	0.889
COV	23519	1.621	1.132	0	5.416
SIZE	23519	22.218	1.276	19.774	26.430
LEV	23519	0.411	0.203	0.029	0.876
TOP1	23519	0.348	0.148	0.083	0.758
ATO	23519	0.647	0.430	0.062	2.719
AGE	23519	2.856	0.342	1.386	3.555
GROW	23519	0.170	0.384	-0.642	3.541

Table 3. Correlation Analysis

	SGR	ESG	AUD	INS	COV	SIZE	LEV	TOP1	ATO	AGE	GROW
SGR	1.000										
ESG	0.151***	1.000									
AUD	0.057***	0.192***	1.000								
INS	0.101***	0.269***	0.209***	1.000							
COV	0.292***	0.157***	0.118***	0.197***	1.000						
SIZE	0.103***	0.361***	0.332***	0.470***	0.259***	1.000					
LEV	-0.051***	0.140***	0.116***	0.270***	-0.021***	0.568***	1.000				
TOP1	0.086***	0.115***	0.135***	0.338***	0.035***	0.182***	0.070***	1.000			
ATO	0.214***	0.023***	0.025***	0.077***	0.106***	0.032***	0.146***	0.074***	1.000		
AGE	-0.028***	0.092***	0.027***	0.156***	-0.196***	0.223***	0.199***	-0.097***	-0.026***	1.000	
GROW	0.272***	-0.028***	-0.027***	-0.022***	0.095***	0.022***	0.036***	-0.015**	0.102***	-0.062***	1.000

Table 3 shows that the correlation between the ESG performance of enterprises and sustainable development is significantly positive at the 1% level, which supports Hypothesis 1 to some extent. Similarly, external audit quality, the shareholding ratio of institutional investors along with analyst attention are significantly and positively associated with sustainability at the 1% level. In addition, the variance inflation factor test for each variable showed that the VIF coefficient between the variables was less than 2, indicating that there was no multicollinearity between the variables.

3. Analysis of Regression Results

After the descriptive statistics and correlation analysis of each variable, the model was regressed in this study, and the regression analysis results are shown in Table 4.

Table 4. Regression Results

Variable	(1) SGR	(2) SGR	(3) SGR	(4) SGR
ESG	0.0041*** (6.3018)	0.0039*** (5.8761)	0.0021* (1.7730)	0.0019** (2.0458)
AUD		-0.0258 (-1.2861)		
ESG*AUD		0.0049* (1.7378)		
INS			-0.0114 (-0.7252)	
ESG*INS			0.0046* (1.9477)	
COV				0.0040 (1.4229)
ESG*COV				0.0011** (2.4967)
SIZE	0.0189*** (14.8481)	0.0188*** (14.7406)	0.0186*** (14.5597)	0.0152*** (11.9044)
LEV	-0.1056*** (-21.7615)	-0.1058*** (-21.7922)	-0.1064*** (-21.9359)	-0.0973*** (-20.1680)
TOP1	0.0464*** (5.9445)	0.0461*** (5.9141)	0.0453*** (5.8117)	0.0448*** (5.8042)
ATO	0.0790*** (32.0107)	0.0790*** (32.0017)	0.0792*** (32.1008)	0.0744*** (30.3085)
AGE	0.0317*** (4.1393)	0.0316*** (4.1295)	0.0303*** (3.9571)	0.0348*** (4.5878)
GROW	0.0365*** (30.4347)	0.0366*** (30.4627)	0.0364*** (30.3152)	0.0359*** (30.1635)
_cons	-0.4804*** (-11.6156)	-0.4770*** (-11.5254)	-0.4626*** (-11.0613)	-0.4153*** (-10.0112)
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
N	23519	23519	23519	23519
adj. R2	0.028	0.028	0.030	0.048

Note: *t* statistics in parentheses , $^{*}p<0.1$, $^{**}p<0.05$, $^{***}p<0.01$.

As shown in Column (1) of Table 4, company ESG performance is significantly and positively correlated with sustainability at the 1% level, indicating that company ESG performance has a significant positive impact on sustainability. Therefore, Hypothesis 1 is verified. In Column (2), Hypothesis 2 is tested, as the interaction term coefficient between the ESG performance of companies and sustainability is significantly and positively correlated at the 1% level, and the interaction term coefficient between ESG performance and external audit quality is positive,

and significantly and positively correlated at the 10% level. Thus, Hypothesis 2 is verified. Empirical results indicate that external audit quality positively moderates the effect of ESG on corporate sustainability. In Column (3), company ESG performance is significantly and positively correlated with sustainability at the 10% level. The coefficient of the interaction term between ESG performance and the shareholding ratio of institutional investors is positive, significant, and positively correlated at the 10% level. Thus, Hypothesis 3 is verified. This shows that when companies have better ESG performance, those with a higher percentage of institutional investor shareholding ratios are more likely to be more sustainable. In Column (4), company ESG performance is significantly and positively related to sustainability at the 5% level, and the coefficient of the interaction term between ESG performance and analyst attention is positive, and significantly and positively related at the 5% level. Thus, Hypothesis 4 is verified. These empirical results indicate that analyst attention positively moderates the effect of ESG on company sustainability.

Table 5. Robustness Test

Variable	(1) First Stage ESG	(2) Second Stage SGR
LESG	0.759*** (133.77)	
ESG		0.007*** (10.62)
SIZE	0.106*** (19.87)	0.011*** (18.00)
LEV	-0.291*** (-9.27)	-0.091*** (-20.46)
TOP1	0.217*** (6.39)	0.021*** (6.10)
ATO	0.069*** (5.18)	0.049*** (27.70)
AGE	0.041** (2.45)	0.001 (0.51)
GROW	-0.002 (-0.13)	0.047*** (24.93)
Constant	-0.905*** (-6.77)	-0.268*** (-16.78)
Industry FE	YES	YES
Year FE	YES	YES
Observations	19,627	19,627
R-squared		0.202
Kleibergen-Paap rk LM statistic	4389.20(Chi-sq(1) *p*-value = 0.0000)	
Cragg-Donald Wald F statistic	22374.79	
Kleibergen-Paap rk Wald F statistic	17895.28	
10% maximal IV size	16.380	

Note: *t* statistics in parentheses, $^{*}p<0.1$, $^{**}p<0.05$, $^{***}p<0.01$.

4. Robustness Test

Considering the possible endogeneity problems associated with two-way causality, this study referred to Zhang and Jin (2022), selected the lagged one-period value of ESG performance (LESG) as an instrumental variable, and used two-stage least squares (2SLS) to test robustness.

The results of the two-stage least squares regression are presented in Table 5. The findings demonstrate a significant positive correlation between the regression coefficients of LESG and ESG at the 1% level in the first stage (Column 1). In the second stage (Column 2), corporate ESG performance is significantly and positively correlated with sustainability at the 1% level. The above results showed that after considering endogeneity and including instrumental variables, there was a significant positive correlation between company ESG performance and sustainability. This supported the reliability of the study's findings, and was often compatible with the findings of the baseline regression. Additionally, the Kleibergen-Paap rk LM statistic for the instrumental variables examined in Table 5 is 4389.20, equating to a p-value of 0, demonstrating that the instrumental variables are identifiable. The Cragg-Donald Wald F statistic is 22374.79, much larger than StockYogo's weak identification test threshold at the 10% level (the 10% level threshold is 16.380). As a result, no issues with weak instrumental variables exist.

V. Conclusion and Implications

1. Conclusion

As the scale of global ESG investments increases, stakeholders, especially external regulators, pay more attention to corporate ESG performance. This study empirically examines the impact of corporate ESG performance on sustainability, using Chinese A-share listed companies from 2011 to 2020 as the research object. Based on the perspective of external monitoring, it further explores the moderating role of external audit quality, the shareholding ratio of institutional investors, and analyst attention in the impact of ESG performance on corporate sustainability. The following findings are obtained.

First, good ESG performance promotes sustainable corporate development. By expanding their environmental investment, exercising active social responsibility, and enhancing corporate governance, organizations maintain competitive advantage, increase long-term value, and support sustainable development.

Second, external audit quality positively moderates the impact of company ESG performance on sustainability. In other words, *ceteris paribus*, an improvement in external audit quality positively contributes to the impact of ESG performance on corporate sustainability.

Third, institutional investor shareholding ratio of institutional investors has a positive moderating effect on the impact of company ESG performance on sustainable development. In other words, an increase in institutional investor shareholding ratio can positively contribute to the impact of ESG performance on corporate sustainability.

Fourth, analyst attention has a positive moderating effect on the impact of company ESG performance on sustainability. *Ceteris paribus*, an increase in analyst attention positively contributes to the impact of ESG performance on corporate sustainability.

This study enriches theoretical research in ESG performance and sustainability, and identifies external governance factors that contribute to the relationship between the two. Consequently, it provides suggestions for listed company growth and sustainability practices.

2. Implications

Internally, companies should first focus on ESG investments, improve ESG performance, and actively disclose relevant information to stakeholders. Although some costs are incurred in enhancing corporate ESG performance, in the long run, enhancing corporate ESG performance

through capital investment can enhance non-financial advantages, gain the attention needed for corporate development, and build a good social reputation for sustainable growth. Second, companies should hire high-quality external auditors to improve the quality of audits as well as the quality of financial information. Finally, companies should seek out elevated institutional investors interested in the long-term growth of their corporate shares, and appropriately raise the institutional investor shareholding ratio to improve governance effects and convey the company's strong development potential.

Externally, the government should first improve relevant ESG information disclosure mechanisms and guide enterprises in making ESG information disclosure more comprehensive. A complete ESG indicator system should be built to regulate and guide enterprises, and appropriate laws and regulations should be developed to compel enterprises to disclose ESG information. Listed companies should be encouraged to disclose ESG-related information, and the oversight of ESG information disclosure quality should be strengthened. Second, external auditors should further improve audit quality, monitor internal control effectiveness, and manage behavior to guide companies to actively improve ESG performance. Third, the government should encourage institutional investors to join corporate governance through legislative incentives and impose restrictions on businesses to force them to concentrate on ESG performance in operational procedures, which would support effective advancement. Fourth, we should develop and optimize policies to strengthen the regulation of the analyst industry so that it can better mitigate agency problems and guide investors and other external monitoring mechanisms to pay attention to companies.

3. Limitations

This study selected data related to Chinese A-share listed companies, and the findings may not apply to non-listed companies. In this study, whether Big Four audit firms conducted an audit was selected as a measure of external audit quality; however, there is no uniform standard for its measurement. In the future, indicators such as audit fees could be selected to study the moderating effect and investigate the impact of ESG performance on the sustainability of non-listed companies.

References

Al-ahdal, W. M., & Hashim, H. A. (2021). Impact of audit committee characteristics and external audit quality on firm performance: Evidence from India. *Corporate Governance*, *22*(2), 424-445. https://doi.org/10.1108/CG-09-2020-0420

Amin, N., & Tauseef, S. (2022). Does an optimal ESG score exist? Evidence from China. *Macroeconomics and Finance in Emerging Market Economies*, 1-19. https://doi.org/10.1080/17520843.2022.2034280

Arvidsson, S., & Dumay, J. (2022). Corporate ESG reporting quantity, quality and performance: Where to now for environmental policy and practice?. *Business Strategy and the Environment, 31*(3), 1091-1110. https://doi.org/10.1002/bse.2937

Asogwa, C. I., Ugwu, O. C., Okereke, G. K. O., Samuel, A., Igbinedion, A., & Uzuagu, A. U. et al. (2020). Corporate social responsibility intensity: Shareholders' value adding or destroying?. *Cogent Business & Management, 7*(1), 1826089. https://doi.org/10.1080/23311975.2020.1826089

Bruna, M. G., Loprevite, S., Raucci, D., Ricca, B., & Rupo, D. (2022). Investigating the marginal impact of ESG results on corporate financial performance. *Finance Research Letters*, *47*, 102828. https://doi.org/10.1016/j.frl.2022.102828

Chae, S. J., Nakano, M., & Fujitani, R. (2020). Financial reporting opacity, audit quality and crash risk:

Evidence from Japan. *The Journal of Asian Finance*, *Economics and Business, 7*(1), 9-17. https://doi.org/10.13106/jafeb.2020.vol7.no1.9

Choi, H., Han, I., & Lee, J. (2020). Value relevance of corporate environmental performance: A comprehensive analysis of performance indicators using Korean data. *Sustainability, 12*(17), 7209. https://doi.org/10.3390/su12177209

Chung, C. Y., Kim, D., & Lee, J. (2020). Do institutional investors improve corporate governance quality? Evidence from the blockholdings of the Korean national pension service. *Global Economic Review, 49*(4), 422-437. https://doi.org/10.1080/1226508X.2020.1798268

Chy, M., & Hope, O. K. (2021). Real effects of auditor conservatism. *Review of Accounting Studies, 26*(2), 730-771. https://doi.org/10.1007/s11142-020-09568-3

Conca, L., Manta, F., Morrone, D., & Toma, P. (2021). The impact of direct environmental, social, and governance reporting: Empirical evidence in European-listed companies in the agri-food sector. *Business Strategy and the Environment, 30*(2), 1080-1093. https://doi.org/10.1002/bse.2672

Cornell, B. (2021). ESG preferences, risk and return. *European Financial Management, 27*(1), 12-19. https://doi.org/10.1111/eufm.12295

Cui, T., & Zhang, Y. (2022). Research on the impact of circular economy on total factor carbon productivity in China. *Environmental Science and Pollution Research*, 1-15. https://doi.org/10.1007/s11356-022-21314-7

El Khoury, R., Nasrallah, N., Harb, E., & Hussainey, K. (2022). Exploring the performance of responsible companies in G20 during the COVID-19 outbreak. *Journal of Cleaner Production, 354*, 131693. https://doi.org/10.1016/j.jclepro.2022.131693

Feng, Z., & Wu, Z. (2021). ESG disclosure, REIT debt financing and firm value. *The Journal of Real Estate Finance and Economics*, 1-35. https://doi.org/10.1007/s11146-021-09857-x

Freeman, R. E., & Evan, W. M. (1990). Corporate governance: A stakeholder interpretation. *Journal of Behavioral Economics, 19*(4), 337-359. https://doi.org/10.1016/0090-5720(90)90022-Y

García-Sánchez, I. M., Rodríguez-Ariza, L., Aibar-Guzmán, B., & Aibar-Guzmán, C. (2020). Do institutional investors drive corporate transparency regarding business contribution to the sustainable development goals?. *Business Strategy and the Environment, 29*(5), 2019-2036. https://doi.org/10.1002/bse.2485

García-Sánchez, I. M., Aibar-Guzmán, B., Aibar-Guzmán, C., & Somohano-Rodríguez, F. M. (2022). The drivers of the integration of the sustainable development goals into the non-financial information system: Individual and joint analysis of their influence. *Sustainable Development*, *30*(4), 513-524. https://doi.org/10.1002/sd.2246

García-Sánchez, I. M., Aibar-Guzmán, C., Núñez-Torrado, M., & Aibar-Guzmán, B. (2022). Are institutional investors "in love" with the sustainable development goals? Understanding the idyll in the case of governments and pension funds. *Sustainable Development*, *30*(5),1099-1116. https://doi.org/10.1002/sd.2305

Ge, G., Xiao, X., Li, Z., & Dai, Q. (2022). Does ESG performance promote high-quality development of enterprises in China? The mediating role of innovation input. *Sustainability, 14*(7), 3843. https://doi.org/10.3390/su14073843

Gong, Z., Guo, K., & He, X. (2021). Corporate social responsibility based on radial basis function neural network evaluation model of low-carbon circular economy coupled development. *Complexity*, *2021.* https://doi.org/10.1155/2021/5592569

Gu, Y., Yang, Y., & Wang, J. (2020). Research on employee sense of gain: The development of scale and influence mechanism. *Frontiers in Psychology, 11*, 568609. https://doi.org/10.3389/fpsyg.2020.568609

Habib, A., Bhuiyan, M. B. U., & Wu, J. (2021). Corporate governance determinants of financial restatements: A meta-analysis. *The International Journal of Accounting, 56*(1), 2150002. https://doi.org/10.1142/

S1094406021500025

Hong, Y., Huseynov, F., Sardarli, S., & Zhang, W. (2020). Bank earnings management and analyst coverage: Evidence from loan loss provisions. *Review of Quantitative Finance and Accounting, 55*(1), 29-54. https://doi.org/10.1007/s11156-019-00835-2

Hrazdil, K., Simunic, D. A., & Suwanyangyuan, N. (2021). Auditor choice and the informativeness of 10-k reports. *Journal of Accounting, Auditing & Finance.* https://doi.org/10.1177/0148558X211062430

Hu, M., Xiong, W., & Xu, C. (2021). Analyst coverage, corporate social responsibility, and firm value: Evidence from China. *Global Finance Journal, 50*, 100671. https://doi.org/10.1016/j.gfj.2021.100671

Jannopat, S., & Phornlaphatrachakorn, K. (2022). Fraud investigation, internal audit quality and organizational performance: Empirical Evidence from Thai listed companies. *The Journal of Asian Finance, Economics and Business, 9*(1), 311-324. https://doi.org/10.13106/jafeb.2022.vol9.no1.0311

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305-360. https://doi.org/10.1016/0304-405X(76)90026-X

Jiao, R., & Qi, R. (2022). Whether analyst tracking can improve the information disclosure quality of listed companies?. *Transformations in Business & Economics, 21*(2) , 255-274.

Jonwall, R., Gupta, S., & Pahuja, S. (2022). Socially responsible investment behavior: A study of individual investors from India. *Review of Behavioral Finance.* https://doi.org/10.1108/RBF-05-2021-0099

Khalil, M. A., Khalil, R., & Khalil, M. K. (2022). Environmental, social and governance (ESG)-augmented investments in innovation and firms' value: A fixed-effects panel regression of Asian economies. *China Finance Review International.* https://doi.org/10.1108/CFRI-05-2022-0067

Kim, J., Kim, M., Im, S., & Choi, D. (2021). Competitiveness of E commerce firms through ESG Logistics. *Sustainability, 13*(20), 11548. https://doi.org/10.3390/su132011548

Knechel, W. R. (2021). The future of assurance in capital markets: Reclaiming the economic imperative of the auditing profession. *Accounting Horizons, 35*(1), 133-151. https://doi.org/10.2308/HORIZONS-19-182

Lazar, N., & Chithra, K. (2022). Role of culture in sustainable development and sustainable built environment: Aa review. *Environment, Development and Sustainability, 24*(5), 5991-6031. https://doi.org/10.1007/s10668-021-01691-8

Li, J., & Li, S. (2022). Environmental protection tax, corporate ESG performance, and green technological innovation. *Frontiers in Environmental Science*, *10*. https://doi.org/10.3389/fenvs.2022.982132

Li, M., Du, W., & Tang, S. (2021). Assessing the impact of environmental regulation and environmental co-governance on pollution transfer: Micro-evidence from China. *Environmental Impact Assessment Review*, *86*, 106467. https://doi.org/10.1016/j.eiar.2020.106467

Li, Z., Zhang, T., Zhao, X., & Zhu, Y. (2022). Monitoring or colluding? Institutional investors' heterogeneity and environmental information disclosure behavior. *Frontiers in Psychology, 13*. https://doi.org/10.3389/fpsyg.2022.911901

Liao, Y., Qiu, X., Wu, A., Sun, Q., Shen, H., and Li, P. (2022). Assessing the impact of green innovation on corporate sustainable development. *Frontiers in Energy Research, 2022*(2), 800848. https://doi.org/10.3389/fenrg.2021.800848

Liu, H., Yang, B., & Zhang, J. (2021). Do financial analysts discourage or encourage corporate fraud? Empirical evidence from China. *Pacific Accounting Review, 33*(1), 81-113. https://doi.org/10.1108/PAR-03-2020-0036

Liu, J., Xiong, X., Gao, Y., & Zhang, J. (2022). The impact of institutional investors on ESG: Evidence from China. Accounting & Finance. https://doi.org/10.1111/acfi.13011

Liu, L., Liu, X., Guo, Z., & Fan, S. (2022). An examination of impact of the board of directors' capital on enterprises' low-carbon sustainable development. *Journal of Sensors*, 2022. https://doi.

org/10.1155/2022/7740946

Lu, H., Liu, X., & Osiyevskyy, O. (2022). Doing safe while doing good: Slack, risk management capabilities, and the reliability of value creation through CSR. *Strategic Organization.* https://doi.org/10.1177/14761270221122428

Lu, L. W. (2021). The moderating effect of corporate governance on the relationship between corporate sustainability performance and corporate financial performance. *International Journal of Disclosure and Governance, 18*(3), 193-206. https://doi.org/10.1057/s41310-020-00099-6

Maaloul, A., Zéghal, D., Ben Amar, W., & Mansour, S. (2021). The effect of environmental, social, and governance (ESG) performance and disclosure on cost of debt: The mediating effect of corporate reputation. *Corporate Reputation Review,* 1-18. https://doi.org/10.1057/s41299-021-00130-8

Muhmad, S. N., Ariff, A. M., Majid, N. A., & Kamarudin, K. A. (2021). Product market competition, corporate governance and ESG. *Asian Academy of Management Journal of Accounting & Finance, 17*(1), 63-91. https://doi.org/10.21315/aamjaf2021.17.1.3

Murè, P., Spallone, M., Mango, F., Marzioni, S., & Bittucci, L. (2021). ESG and reputation: The case of sanctioned Italian banks. *Corporate Social Responsibility and Environmental Management, 28*(1), 265-277. https://doi.org/10.1002/csr.2047

Naqvi, S. K., Shahzad, F., Rehman, I. U., Qureshi, F., & Laique, U. (2021). Corporate social responsibility performance and information asymmetry: The moderating role of analyst coverage. *Corporate Social Responsibility and Environmental Management, 28*(6), 1549-1563. https://doi.org/10.1002/csr.2114

Nasution, D., & Kalanjati, D. S. (2022). The complementary nature of audited financial reporting and corporate social responsibility disclosure. *Journal of Sustainable Finance & Investment*, 1-25. https://doi.org/10.1080/20430795.2022.2077288

Pan, L. (2020). Demystifying ESG investing considerations for institutional cash investors. *The Journal of Portfolio Management, 46*(3), 153-156. https://doi.org/10.3905/jpm.2020.46.3.153

Piao, X., Xie, J., & Managi, S. (2022). Environmental, social, and corporate governance activities with employee psychological well-being improvement. *BMC Public Health, 22*(1), 1-12. https://doi.org/10.1186/s12889-021-12350-y

Poursoleyman, E., Joudi, S., Mansourfar, G., & Homayoun, S. (2021). The impact of corporate governance performance on the association between information asymmetry and opportunities' optimal levels: Evidence from developed markets. *Journal of Economic and Administrative Sciences.* https://doi.org/10.1108/JEAS-02-2021-0036

Raithatha, M., & Haldar, A. (2021). Are internal governance mechanisms efficient? The case of a developing economy. *IIMB Management Review, 33*(3), 191-204. https://doi.org/10.1016/j.iimb.2021.08.004

Sadiq, M., Ngo, T. Q., Pantamee, A. A., Khudoykulov, K., Thi Ngan, T., & Tan, L. P. (2022). The role of environmental social and governance in achieving sustainable development goals: Evidence from ASEAN countries. *Economic Research-Ekonomska Istraživanja*, 1-21. https://doi.org/10.1080/1331677X.2022.2072357

Santamaria, R., Paolone, F., Cucari, N., & Dezi, L. (2021). Non-financial strategy disclosure and environmental, social and governance score: Insight from a configurational approach. *Business Strategy and the Environment, 30*(4), 1993-2007. https://doi.org/10.1002/bse.2728

Senadheera, S. S., Withana, P. A., Dissanayake, P. D., Sarkar, B., Chopra, S. S., & Rhee, J. H. et al. (2021). Scoring environment pillar in environmental, social, and governance (ESG) assessment. *Sustainable Environment, 7*(1), 1960097. https://doi.org/10.1080/27658511.2021.1960097

Shiue, M. J., Chiu, P. C., Kuo, L. C., & Yeh, S. L. (2022). Signing networks of audit partners and accruals quality: Evidence from Taiwan. *Managerial Auditing Journal. 37*(4), 464-485. https://doi.org/10.1108/MAJ-12-2020-2962

Wahidahwati, W., & Ardini, L. (2021). Corporate governance and environmental performance: How they affect firm value. *The Journal of Asian Finance, Economics and Business, 8*(2), 953-962. https://doi.org/10.13106/jafeb.2021.vol8.no2.0953

Wamba, L. D. (2022). The determinants of environmental performance and its effect on the financial performance of European-listed companies. *Journal of General Manag. 47*(2), 97-110. https://doi.org/10.1177/03063070211021050

Wang, L. L., Lian, Y. H., Dong, J. (2022). Research on the influence mechanism of ESG performance on enterprise value. *Securities Market Herald, 2022*(5), 2-13.

Wang, N., Li, D., Cui, D., & Ma, X. (2022). Environmental, social, governance disclosure and corporate sustainable growth: Evidence from China. *Frontiers in Environmental Science*, 1883. https://doi.org/10.3389/fenvs.2022.1015764

Wei, L., Dou, Z., Li, J., & Zhu, B. (2021). Impact of institutional investors on enterprise risk-taking. *Transformations in Business & Economics, 20*(2B), 886-904.

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal, 5*(2), 171-180. https://doi.org/10.1002/smj.4250050207

Wong, J. B., & Zhang, Q. (2022). Stock market reactions to adverse ESG disclosure via media channels. *The British Accounting Review, 54*(1), 101045. https://doi.org/10.1016/j.bar.2021.101045

Wong, W. C., Batten, J. A., Mohamed-Arshad, S. B., Nordin, S., & Adzis, A. A. (2021). Does ESG certification add firm value?. *Finance Research Letters*, *39*, 101593. https://doi.org/10.1016/j.frl.2020.101593

Wu, L., Qing, C., & Jin, S. (2022). Environmental protection and sustainable development of enterprises in China: The moderating role of media attention. *Frontiers in Environmental Science*, 1781. https://doi.org/10.3389/fenvs.2022.966479

Xiong, W., Dong, M., & Xu, C. (2022). Institutional investors and corporate social responsibility: Evidence from China. *Emerging Markets Finance and Trade*, 1-12. https://doi.org/10.1080/1540496X.2022.2088351

Xu, F., Ma, L., Liunata, L., Najaf, I., & Streimikiene, D. (2020). Does social responsibility increase corporate value of China's coal enterprises? The mediating effect of capital enrichment based on the generalized moment estimation. *Acta Montanistica Slovaca, 25(*3), 274-288.

Xu, N., Liu, J., & Dou, H. (2022). ESG information disclosure and stock price crash risk: Evidence from Chinese listed companies. *Frontiers in Psychology*, 5598. https://doi.org/10.3389/fpsyg.2022.977369

Yang, J., Wang, R., & Xue, Y. (2021). Analyst coverage and corporate misconduct. *Australian Economic Papers*, *60*(2), 261-288. https://doi.org/10.1111/1467-8454.12203

Zhang, C., & Jin, S. (2022). What drives sustainable development of enterprises? Focusing on ESG management and green technology innovation. *Sustainability, 14*(18), 11695. https://doi.org/10.3390/su141811695

Zhang, D., Wang, C., & Dong, Y. (2022). How does firm ESG performance impact financial constraints? An experimental exploration of the COVID-19 pandemic. *The European Journal of Development Research*, 1-21. https://doi.org/10.1057/s41287-021-00499-6

Zhang, J., & Ye, Y. (2021). Does the research meeting affect the shareholding ratio of institutional investors in listed companies? Empirical evidence from China. *China Finance Review International*. https://doi.org/10.1108/CFRI-08-2020-0112

ISSN 1946-5130 (Print), ISSN 2470-4733 (Online)
http://dx.doi.org/10.20294/jgbt.2023.19.1.109

The Journal of Global Business and Trade

Journal of Global Business and Trade

https://www.pfw.edu/jgbt

A Review of Incomplete Agreements and the Formation of a Sales of Goods Contract

Sun-Ok Kim*

Department of International Trade, Changwon National University, South Korea

Received 18 December 2022, Revised 11 January 2023, Accepted 5 February 2023

ABSTRACT

Purpose – This paper focuses on two issues that may arise from incomplete agreements in relation to the formation of contracts in international sales transactions, and explores national attitudes toward these issues. The first issue is whether a contract can be formed for an incomplete agreement. The second issue is the question of what criteria can be used to determine terms not agreed upon between the parties.

Design/Methodology/Approach – This paper analyzes each country's attitude toward incomplete agreement through case analysis. It explores the international trend towards incomplete agreements through analysis of the case of the UK and the cases of CISG member countries.

Findings – Our findings may be summarized as follows. Even if an incomplete agreement is achieved, the courts tend to interpret it to allow the formation of a contract if the parties' intentions to be bound by the agreement are clear. Whether or not a contract is formed depends on what terms the parties need to agree to in order to make the contract binding. If there is no agreement between the parties regarding the open terms, these are determined by applying objective criteria that consider the transaction process, trade usage, and purpose of the contract.

Research Implications – This research is significant in that it analyzes the trends in the interpretation of incomplete agreements. This thesis found where it was clear that the parties intended to be bound, and to establish a legal relationship, it is permissible to imply terms that give business validity.

Keywords: CISG article 8, incomplete agreement, open terms, party's intention
JEL Classifications: F19, F53, F59

* *E-mail: ksok@cwnu.ac.kr*

I. Introduction

An international sales contract is formed by a binding agreement between parties, and is not subject to any restrictions on the form of the contract. This contract formation mechanism has been recognized for a long time in contract theory, as well as in precedent.

In addition, no contract may be formed without an agreement by both parties to be bound by it (South Korea (Civil Code Article 532), CISG (Articles 11, 23), PICC (2:101), France (Civil Code Article 1108), United States (U.C.C. section 2-204), UK (Sale of Goods Act Article 4), and so on). However, in order to reach a binding agreement, they must enter a certain negotiation stage or agreement process. In such a process, the parties express a statement of intention to establish a sales contract, and the statement is usually made orally or in writing.

However, if the binding intentions are not clearly expressed, there may be a difference in interpretation as to whether the statements made by the parties during the negotiation process fall under the binding agreement. CISG Article 8 provides rules of interpretation for interpreting statements and actions relating to the process of concluding a sales contract. It would therefore be worthwhile to review how the provisions of CISG Article 8 are interpreted and applied in determining party intentions.

A binding contract may also be formed even though only a few terms have been orally agreed upon, as long as the parties intend to be bound by the agreement. Further, it is not a requirement that they agree to all terms of the relevant contract in order for it to be a binding contract. However, if both parties orally agree to certain terms only, and do not specify them in writing, one party may subsequently claim that such agreement does not constitute a binding contract. Generally, in international trade practices, it is common that traders do not agree to all the terms of a contract when they enter into it, but rather agree on some essential terms, and then agree on the remaining terms in detail later. Based on such trade practices, international sales contracts may be concluded with an incomplete agreement.

If there is a problem in interpreting party intentions because intentions are not clear, it is possible to reasonably infer the true intentions by applying Article 8 of the CISG. Since the interpretation of intentions is a central issue in disputes relating to the formation of contract, it is necessary to analyze cases in which the interpretation criteria set forth in Article 8 were applied to the interpretation of party intentions.

However, when a contract is formed with incomplete agreement, the following two problems arise. First, it is necessary to judge whether the intentions of the parties to be bound may be found in the incomplete agreement. Second, if a binding contract is found to have been formed despite incomplete agreement, by what criteria are the open terms to be filled?

Focusing on these two problems, this article addresses issues arising from incomplete contracts, and their treatment in various countries and in the United Nations Convention on Contracts for the International Sale of Goods (hereinafter cited as CISG). In addition, in reviewing the positions of each country on the incomplete agreement, this research separately considers the positions of CISG members and non-members. Most countries have joined CISG, but the UK has not yet. However, as it has expanded its influence as a trading nation internationally, it considers the position of the British Courts as a nation, not a member of the CISG. In addition, the cases used in this research are those judged by the application of CISG. Since 1988, when CISG entered into force, until now, 35 years have passed, precedents applying CISG have accumulated significantly, which has certainly increased predictability, and it could be evaluated that its role as a uniform law for international sales contracts is also increasing.

Given the large number of judicial precedents that have accumulated, it is of some significance to examine the positions of each country regarding the formation of contracts through the analysis of judicial precedents applying CISG.

The wide application of CISG worldwide would

be significant in terms of ensuring legal stability in international transactions.

II. Incomplete Agreements and Party Intentions

1. Some Aspects of Incomplete Agreement and Contract Formation

A contract of sale is a promise made by the agreement of the intentions of both parties to be bound by certain terms. If there is no agreement, a contract cannot be established, although there are no restrictions on the form of the agreement. For example, in response to a seller's intention to sell a bag at US$100, a buyer agrees to purchase the bag at US$100, whereby a sales contract is established by the agreement of the two parties.

The intentions of both parties can be divided into "an offer", "a counter-offer", and "an acceptance", depending on which party expresses the intention and the content of the intention. However, a sales contract is formed by a combination of two factors, namely "an offer" and "an acceptance". Intent of the party to be bound is one criterion of an offer in South Korea, under the USA's Uniform Commercial Code (cited U.C.C.), the UK courts, and CISG (Moss, 2005). According to CISG Article 14, a proposal to conclude a contract is an offer if it indicates an intention by the offeror to be bound upon acceptance. U.C.C. emphasizes the element of intent (U.C.C. Section 2-204(1)). For a contract to be binding, both parties must indicate intention.

However, if there is an incomplete agreement, is there nevertheless a contract? In other words, what declarations of intent are required for the contract to be concluded? Should a contract be considered formed if there is an agreement on the basic terms of the contract? Alternatively, must there be an agreement on all terms of the contract? This issue relates to determining the matter of whether an incomplete agreement may be found to be a binding contract. This decision is never easy in reality. For example, consider the circumstances in which both parties have reached agreement by telephone to be bound, although they have reserved some terms to be agreed upon in the future, and the goods are delivered by the seller, but the price is not paid on the reasoning that the buyer did not sign a contract. Should the contract be deemed to have been concluded in such a case?

2. The Construction of the Modern Judicial Mindset

2.1. Incomplete Agreements and Intentions of Both Parties

Even if there is an incomplete agreement, if the agreement between the parties to be bound is clear, the court may not attempt to deny the formation of the contract on the grounds of the incomplete agreement (Nicholas, 2017; *Bear Stearns Bank Plc v Forum Global Equity Ltd*, 2007; *Barbudev v Eurocom Cable Management Bulgaria Eood*, 2012). Accordingly, even if the parties deferred the agreement on material terms, if the parties' intentions to bind were indicated in the initial agreement, the court may find that there is a binding contract.

In general, the intention of the parties is expressed in the process of negotiation, and the subject of negotiation is the terms of the transaction to be performed. However, it is not required to reach agreement on all terms of the proposed contract. In international sales contracts, negotiation is sometimes concluded in the form of an open contract.

However, if one party denies the conclusion of the contract on the grounds that there are terms that were not agreed upon during the negotiation, would the conclusion of the sales contract not be recognized? A review of the judgments of English courts dealing with these matters reveals some issues raised by incomplete agreements in relation to contract formation.

The English courts[1] tend broadly to allow an incomplete agreement to be valid if an intent to be bound is apparently established.

In the case of *Devani v. Wells* (2019), the

English court dealt with the issue of determining whether an incomplete agreement between the parties was a binding agreement. The core issue in this case was whether a contract was formed despite an incomplete agreement in which some terms were not agreed upon.

There were two main questions in this case: first, whether there was a binding contract even though there was no agreement on material terms in the transaction, and second, by what criteria the future agreement between the parties would be fulfilled.

Negotiations in the Devani case were preceded by phone conversation. In the process of negotiating between the customer that wanted to sell land and the real estate agent who would introduce a buyer, the amount of the agent's commission was agreed upon, but the time of payment was not mentioned. The land was sold to a person introduced by the agent, but the customer refused to pay the commission, arguing that the agreement reached did not constitute a sufficient and binding agreement because the parties failed to specify when the fees should be paid. However, the British Supreme Court noted that the intention of the parties to be bound could be found in this agreement, and that the imperfections alleged by the landowner could be corrected by the implied terms that the commission would be paid upon completion of the sale. The court also suggested that terms not specified at the time of establishment of the contract could be reasonably inferred from the statements or actions of the parties. The Supreme Court further held that the commission was intended to be paid upon completion of the sale, taking into account business efficacy and what was necessary for the agreement to be reached *(Devani v. Wells.* 2019). The court passed judgement based on the statements made during the negotiation process between the landowner and the agent, the agent's actions after the negotiation, and the standards of understanding of a reasonable person.

Conversely, in the second trial of this case, some judges expressed opinions denying the conclusion of the contract. Failure to specify important conditions, they claimed, meant that incomplete negotiations had been made. Furthermore, it was argued that it would be unreasonable and inconsistent with principle to convert an imperfect bargain into a reasonably binding contract by additionally applying an implied condition to an explicit condition in order to remedy such imperfection. Nevertheless, the Supreme Court unanimously admitted the landowner's obligation to pay the commission, stating that a reasonable person would have understood that the parties intended the commission to be paid at the completion of the sale to a purchaser introduced by the agent, although the contract did not explicitly specify the timing of the payment.

The Court furthermore stated that an agreement to agree to certain terms in the future under a binding agreement between the parties indicates understanding that those terms may be agreed upon in the future. Such an understanding also indicates the intent of the parties to establish a legal relationship.

Where there is a clear intent to be mutually binding notwithstanding the failure to specify the terms of payment, English courts have taken a position to prevent the denial of contract formation on the grounds of an incomplete agreement (*Bear Stearns Bank Plc v. Forum Global Equity ltd*., 2008; *Barbudev v. Eurocom Cable Management Bulgaria Eood*, 2012; *Pagnan Spa v. Feed Products Ltd*., 1987). It has also long applied the logic that open terms to be agreed upon in the future can be covered by implied terms (David, 2020).

Likewise, the Court of New Zealand (*Fletcher Challenge Energy Ltd v. Electricity Corp of New Zealand Ltd*., 2002) held that where mutual intention to be bound to a contract is found to exist, the gaps in incomplete contracts could be determined by applying an implied term.

1. The UK has not signed CISG

The U.C.C., which governs the domestic sales of goods, allows contract formation even where there are some variances between the terms of an offer and the terms of acceptance (U.C.C. Section 2-207).[2]

In determining whether a proposal to conclude a contract is an offer, the U.C.C. focuses on intention (U.C.C. Section 2-204 (1)) (*Kleinschmidt Division of SCM Corp. v. Futronics Corp.,* 1977). Intention to be bound is a critical element of an offer. The Code provides that open terms will not cause a contract to fail for incompleteness (U.C.C. Section 2-204 (3)). Moreover, it is recognized that such open contracts and vague contractual terms may be satisfied by the course of trade and the usage of trade (U.C.C. Section 2-208 (1), (2); 1-205 (3), (5)).

The Seoul High Court of the Republic of Korea[3] has also decided such cases by focusing on the agreement of the parties' intentions where a contract was incomplete. The Court ruled that if the seller sent a pro forma invoice in response to an order from the buyer, the parties' agreement was established at the time the invoice was sent; hence, the contract was concluded at the time the invoice was sent. The Court also judged that a modification of the factors listed in Article 19(3) CISG does not necessarily constitute a material modification of the contract terms, and therefore whether a modification of the terms is material depends on the overall circumstances of each case (Singh, 2006).[4]

Generally, however, a proposal having no intention of a party to be bound may be considered a quote (Patrick, 2008). It is not intended to create a legal relationship, but merely specifies the price at which goods can be bought, rather than expressing or implying a commitment actually to provide the goods. In practice, it may be difficult to find the intention to be bound when formation takes place in the course of negotiating a contract. In determining whether a party's intention to be bound exists, the critical point is to find whether the objective test of intention is satisfied. In other words, a binding agreement can be reasonably inferred by taking into account the following factors: purpose of the agreement, commercial background, course of conduct, trade usage, understanding of reasonable persons, and business effectiveness.

2.2. Treatment of Open Terms in Contract Practice

In the process of contract negotiation, trade terms are subject to discussion, and unless these terms are determined, the sales contract cannot be completed.

With respect to incomplete contracts, there are court decisions to support the idea that open terms may be met by the implication of terms to give the contract business validity or practical effect as intended by the parties (*Devani v. Wells*, 2019).

Generally, sale price is an important factor that has significant influence in determining whether a contract is established. However, in some circumstances, even price may not be a necessary factor in determining whether a contract is established.

In urgent situations involving the need to secure raw materials, a price may not be essential to the contract. In such situations, securing raw materials immediately is of utmost importance. If both parties are at one on that essential matter, the agreement becomes a legally binding contract. In these circumstances, what is important to both parties is a firm commitment to enable the necessary business planning to take place. If in default of agreement between the parties, say, as to price, a reasonable price will finally be paid

2. The United States signed CISG on August 31, 1981.
3. Since South Korea is a member of CISG, the decision was made by applying CISG. Korea Seoul High Court Decision (2012).
4. In this case, the buyer sent an order with "FOB factory", but the seller sent a pro forma invoice altering the term into "FOB Taiwan Airport".

(Mooney, 1995). In sum, although price is usually an essential term that parties must agree on, it may not be an essential term in every case. To insist that price must be settled is to frustrate the intentions of both parties, and may deprive the arrangement of practical effectiveness.

The United States allows the pricing terms to remain open during contract formation (U.C.C. Section 2-204 (3) comment). If the terms remain open and the parties still intend to be bound, a reasonable price will be inserted at the time of delivery (U.C.C. Section 2-305). Although the price cannot currently be determined, if there is a dominant intention of the parties to be bound, the problem is usually resolved on a certain reasonable basis (U.C.C. Section 2-305 (4) comment 1).

In the English courts (*Neilson v. Stewart,* 1991; *Proton Energy Group SA v. Lietuva*, 2013; *R and J Dempster Ltd v. Motherwell Bridge and Engineering Co.*, 1964), it has been decided that "open order" means that jobs are begun on the understanding that the price will be worked out at a later date. In a special market, price may be a secondary element. One might argue that the fact that the parties did not agree on material terms may be a meaningful allusion indicating that the parties did not intend to enter into a binding contract. Against this opinion, it is said that in the claim that the parties must agree upon essential terms: the word "essential" is ambiguous or contextual. The most important thing is to decide by which terms the parties intended to be bound.

The Swiss court ruled based on past practices between parties that a contract had been entered into orally without a detailed discussion of price (*CLOUT case 1772*, 2016). In this case, the buyer claimed that a valid contract had not been concluded due to a lack of sufficiently clear prices. However, the court concluded that the price of the goods delivered was sufficiently determinable taking into account the negotiations, practices, and subsequent actions of the parties. In addition, the court noted that the parties had developed a practice of verbally agreeing to orders in the past, leaving it up to the seller to specify the price after the goods were manufactured. On this background, the court ruled that the price of the goods were determinable and corresponded to the price stated on the seller's invoice.

CISG also recognizes that a contract may be concluded even if the proposal is completely silent on price. Like quantity, the Convention allows prices to be set explicitly, implicitly, or by formula. In the absence of any express or implied provision for determining prices, Article 55 of CISG provides for an implied reference to market prices at the time the contract enters into force.

Modern courts try to make contracts valid even with terms that have not yet been agreed upon, such as price, so long as there is an intent to be bound. It has been interpreted that open terms shall be filled by applying objective criteria in such circumstances, taking into account reasonableness, fairness, the course of dealing, trade usage, or the purpose of the contract. (*BJ Aviation Ltd v. Pool Aviation Ltd.,* 2002; *MRI Trading AG v. Erdenet Mining Corp LLC*, 2013; *Teekay Tankers Ltd v. STX Offshore & Shipbuilding Co Ltd.*, (No.2), 2017)

III. Incomplete Agreements and Contract Formation under CISG

1. Contract Formation and CISG Article 8

CISG also adopts a mechanism in which an international sales contract is concluded through an agreement of intent between parties: that is, an offer (Articles 14-17) and an acceptance (Articles 18-22).

Articles 14-23 of CISG set out the requirements for qualifying as an offer and the requirements for qualifying as an acceptance. The mechanism of contract formation by an offer and an acceptance presents a typical example of how a contract is established.

The parties' intentions to be bound may be expressed by statements or conduct. If the statements or actions of the parties do not meet the offer and acceptance requirements set forth in

CISG, no contract will be formed. According to Article 14, in order to be an offer, three elements are required, namely ① the intention of the offeror to be bound by acceptance must be indicated in the proposal, ② an intention must be made to specific persons regardless of the number of persons, and ③ the intent to conclude a contract must be sufficiently definite. Further, CISG provides criteria for definitive intention judging. For example, if goods are specified in the offeror's intention and a method for determining the quantity and price is explicitly or implicitly indicated, such intentions can be considered sufficiently definitive. Article 18 of CISG sets out the requirements for acceptance indicating assent to an offer.

Whether a statement or act indicates consent is subject to interpretation in accordance with the rules of Articles 8 (1) and 8 (2) of CISG (*CLOUT Case 429*, 2000). If no statement or conduct indicating acceptance of the offer is found, there is no contract under CISG (*CLOUT Case 173*, 1997). Article 19 determines whether a response that indicates consent to an offer, but modifies that offer, is an acceptance or a counter-offer (*CLOUT Case 227*, 1992; *CLOUT Case 232*, 1998).

1.1. Intent of the Party to be Bound

To be deemed an offer, the offeror's intention to be bound by acceptance must be indicated in the proposal. Conversely, if a party making a proposal merely offers a transaction without the intent to be bound, it will be considered an "invitation letter to make offers". In addition, any statement or act of rejecting an offer constitutes a "counter-offer" (CISG Article 19, *CLOUT Case 121*, 1994; *CLOUT Case 189*, 1997; *CLOUT Case 1642*, 2013). The distinction between an "offer" and an "invitation letter" is often problematic in practice. Although the criteria for their distinction are stipulated in Article 14, Paragraph 1 (offer) and Paragraph 2 (invitation letter), it nevertheless is not easy to make a clear judgment by applying these regulations in practice.

CISG does not employ a mechanism that requires confirmation of all terms of the contract as a requirement for the offer to be effective.

Within CISG, then, even if any terms cannot be confirmed by the offer, the terms of the contract can be supplemented by acceptance, and it is possible to recognize the effect of acceptance with modifications in a broad sense if the offeror does not raise any objection. The intentions can be ascertained by interpreting statements and actions in accordance with Article 8 (*CLOUT Case 215*, 1997). According to Article 8, intentions may be found by considering all relevant circumstances of the case, including statements and conduct during the negotiation process, any practices that the parties have established between themselves, usage, and conduct after the conclusion of the contract (*CLOUT Case 215*, 1997). For example, in a case in which the buyer refused to pay for the delivered raw material on the grounds that the purchase price was not fixed, the Swiss court held that the buyer had to pay for all material delivered. The court relied on the buyer's subsequent conduct by application of CISG Article 8(3) (*CLOUT Case 215*, 1997).

Furthermore, in Switzerland, the matter was raised as to whether a contract was formed between the parties in a case in which the buyer sent by fax an unsigned order stating "we order" or "immediate delivery" without indicating all the terms and conditions of the contract. The Swiss court found that the unsigned buyer's fax indicated his intention to be bound to enter into a contract with the seller, and this was judged sufficiently definite (*CLOUT Case 330*, 1995). Although it did not contain all the terms of a contract, it clearly expressed the buyer's binding intention to purchase equipment. In this case, the buyer denied actually being a party because he did not sign the fax. However, the court noted that a contract of sale is not subject to formal requirements, and therefore does not require a signature. (CISG Article 11).[5]

5. CISG Article 11: "A contract of sale need not be concluded in or evidenced by writing and is not subject to any other requirement as to form. It may be proved by any means, including witnesses."

In addition, considering all relevant circumstances related to the conclusion of the contract, the court held that the buyer was responsible for paying the purchase price (*CLOUT Case 330*, 1995).

In Germany, the Hamburg court interpreted that when the seller communicated to the buyer in English with "we can only propose you" or "First truck could be delivered", this communication indicated the seller's intention to be bound (UNCITRAL, 2016). Both parties had signed an order indicating a computer program and its price. The program was delivered and installed. The parties also intended to conclude a second contract concerning the use of the program, but negotiations on that contract failed. The buyer then refused to pay the price of the program, which was delivered and installed, and claimed that the order did not indicate an intention to conclude a contract, but merely indicated a specification of the contract to be concluded at a later date. The German court, however, found that the parties had agreed on all particulars of the sale of the program, and therefore had agreed to a contract of sale (*CLOUT Case 131*, 1995).

1.2. Intention to Unspecified Persons

If a seller proposes a product or price to an unspecified person on a website, could this be considered as an offer as stipulated in CISG?

In the case of a proposal presenting the intention of a transaction on a website, it may be argued that it should be regarded as an invitation letter as there are cases where the order is concentrated, and there is a shortage of inventory. In some cases, however, it may be argued that this should be interpreted as an offer.

If the act of displaying a price tag on a product on a website is recognized as an offer to unspecified people, the intention to purchase the goods may be interpreted as an acceptance, such that the intention of the two parties thereby coincides, and at that moment a contract is formed and becomes binding. Therefore, the party exhibiting the goods cannot refuse to deliver the goods in exchange for the price.

However, if the act of exhibiting the product is recognized as induction of an offer rather than an offer, the intention to purchase becomes the offer, and therefore, the contract is not concluded, as the seller may now freely choose whether to sell the product. It may be difficult to establish clear rules regarding what acts of the parties constitute an offer, and what acts constitute an acceptance in various transactions with unspecified persons. In the United States, proposals that are not sent to one or more specific recipients are called "general" or "public" offers. The announcement to the public and the display of the products for sale are identified as a general offer (Joseph, 1984). The same act may thus be recognized as an offer or conversely interpreted as an inducement for an offer. However, under Article 14(2) of CISG, a proposal to an unspecified person shall be treated as an invitation to make offers, unless there is an objection.

1.3. Practical Application of Sufficiently Definite Intent

To be recognized as an offer, a proposal for the conclusion of a contract must not only indicate an intention to be bound by an acceptance, but also must be sufficiently definite (*CLOUT Case 417*, 1999). Under CISG, proposals that represent the goods and that expressly or implicitly determine the quantity and price, or the manner in which these are to be determined, are assessed as sufficiently definite (CISG Article 14(1)).

However, if a proposal for concluding a contract does not specify the quality, quantity, and price according to the practices established between parties, can it be considered as sufficiently definite?

The Hungarian court interpreted a proposal to order by phone without setting a price as sufficiently definite. The court provided the following considerations. Since the transaction was the same as a previous transaction type and could be confirmed by the course of dealings even if the price was not determined, unclear transaction conditions could be supplemented

by past transaction conditions (*CLOUT Case 52*, 1992; *CLOUT Case 777*, 2006). In such cases, the courts have inferred the definitive intent of the ambiguous agreement from the past business practices between parties.

In Swiss court rulings, although the term of the price is not specified, a proposal is sufficiently definite if the intention to be bound by acceptance is expressed (*CLOUT Case 330*, 1995). The German court, meanwhile, ruled that the proposal to express the quantity as "700 to 800 tons" of natural gas is sufficiently definitive when usage in natural gas trade treated the quantity as adequate (*CLOUT Case 176*, 1995).

Where a statement or act is unclear, the courts have applied the rules of construction of Article 8 CISG to determine whether the statement or act was sufficiently definite (*CLOUT Case 1034*, 2010).

1.4. Practical Application of Article 8 CISG to Interpretation of Statements and Conduct

CISG Article 8 provides guidelines for the interpretation of the statements and actions of parties relating to matters covered by the Convention (*CLOUT Case 605*, 2001; *CLOUT Case 932*, 2006).[6]

As explained earlier, a sales contract is concluded by the mutual consent of the parties to be bound. Whenever a party's intent becomes ambiguous, some courts have applied the standard of construction of Article 8 CISG to interpret statements and conduct relating to the formation of a contract (*CLOUT Case 106*, 1994; *CLOUT Case 176*, 1995; *CLOUT Case 189*, 1997; *CLOUT Case 330*, 1995; *CLOUT Case 334*, 1995; *CLOUT Case 424*, 2000; *CLOUT Case 429*, 2000; *CLOUT Case 605*, 2001). The interpretative criteria of CISG Article 8 consist of a hierarchy of rules: 'subjective intentions of the parties' (Article 8(1)) and 'objective/reasonable interpretation' (Article 8(2)) (*CLOUT Case 273*, 1997).

Additionally, Article 8 (3) sets out relevant factors to be considered in determining the intent of the parties and the understanding that a reasonable person would have. The Seoul High Court treated these factors referred to in Article 8 (3) as not exclusive features (UN, 1980), but as having to be taken into account when interpreting the statements or acts of the parties (*CLOUT Case 1644*, 2012). The elements listed in Article 8 (3) include the negotiations, any practices established between the parties (*CLOUT Case 750*, 2005), usage, and any subsequent conduct of the parties (*CLOUT Case 106*, 1994; *CLOUT Case 215*, 1997; *CLOUT Case 576*, 2003; *CLOUT Case 702*, 2000; *CLOUT Case 802*, 2008; *CLOUT Case 828*, 2007; *CLOUT Case 890*, 2003; *CLOUT Case 932,* 2006; *CLOUT Case 1257*, 2002; *CLOUT Case 1452*, 2006). In determining the intention of both parties, Article 8 requires an examination of all relevant facts and circumstances (Murry, 1988; Viscasillas, 2001).

The Court interpreted the intent of both parties by applying the standard of understanding of a reasonable person (*CLOUT Case 1644*, 2012), and ruled that although the sales contract (i.e., invoice) originally signed by both parties indicated the product name as "6N" grade, this was not the product the defendant (the buyer) intended to purchase.

In the judgment above, the court found that "99.99%" was stated in the purity column, and that the defendant consistently requested a supply of "4N" grade products. The court also stated that the standard of understanding of a reasonable person in the plaintiff's position in the same situation suggested that the defendant's intention was to purchase a "4N" grade product. For these reasons, the court held that it was clear that the intention was to enter into a sales contract for a "4N" grade product.

In a case filed in the Busan District Court of

6. Where Article 8 applies, it precludes the application of national rules of interpretation as it deals exclusively with matters of interpretation.

the Republic of Korea, the buyer refused to pay the purchase price in a contract concluded with the help of an intermediary, claiming that he was not an actual party to the contract with the seller. The court applied CISG Article 8 to determine who was party to the contract. (*CLOUT Case 1567*, 2011). Under Article 8 (1), (2), and (3), the court found it appropriate to regard the defendant as a party to the contract of sale because the plaintiff (the seller) maintained a continuing business relationship with the defendant (the buyer) as a counterpart. In making such a judgment, the following facts were considered. The defendant was named as the buyer in all sales contracts, the defendant received the goods from the plaintiff and paid the price for the goods directly to the plaintiff in his own name, and before the plaintiff brought the lawsuit, the defendant had never objected to the payment of the sale price of the goods.

Similarly, the Swiss court stated that "any previous negotiations and subsequent conduct of the parties may indicate how they have actually understanding their respective declarations of intent" (*CLOUT Case 932*, 2006). In another case, the Swiss court pointed out in relation to a party's conduct that the buyer's request to the seller to issue a textile invoice to a third party was sufficient evidence that the buyer was willing to be bound (*CLOUT Case 215*, 1997).

Expression of intention by conduct is applicable when there is an established practice or custom between the parties, but there are various forms of action. According to cases governed by CISG, efficacy of conduct depends on the content and form of the act. For example, one court held that the act of the buyer issuing the letter of credit itself might be construed as an expression of acceptance (*CLOUT Case 417*, 1999). Also, some courts have stated that a party's subsequent conduct may be grounds for inferring what a statement was intended to mean when it was made (*CLOUT Case 5*, 1990; *CLOUT Case 215*, 1997).

According to the cases determined by the application of Article 8 CISG, examples of conduct that indicate the intent of the party to be bound include acceptance of the goods without objection, payment of the purchase price, and delivery of the invoice/goods by the seller (UNCITRAL, 2016).

2. Interplay between Article 14 and 55 of CISG

According to CISG Article 14, a proposal that fixes the price or determines the method of fixing the price shall be deemed as sufficiently definite. In some cases, even where the validity of the contract is questioned because the price is not specified, it has been interpreted as valid by applying the subsidiary method of determination of the price provided for in Article 55 CISG (*CLOUT Case 934*, 2007; *CLOUT Case 215*, 1997; CLOUT *Case 106*, 1994). Even if the price within the meaning of Article 14 has not been determined, a contract can be formed if it can be found that the parties intend to be bound by the contract. It is presumed that the fact that the price can be determined in accordance with Article 55 was taken into account in the background of recognizing the conclusion of the contract, even when the price was not specified. However, there is one case where Article 14 is applied in preference to Article 55, and if the price was not specified, the contract is not concluded. Determining the price by applying Article 55 is determined by applying the market price at the seller's place of business (Fogt, 2014) (*CLOUT Case 934*, 2007). In a case in which Article 14 took precedence over Article 55, the court decided that since there was no market price for aircraft engines, it was not possible to determine the price by applying Article 55, so the requirements of Article 14 were not met (*CLOUT Case 53*, 1992).

Where Article 55 applies, it is necessary in determining the price if a valid contract was entered into (*CLOUT Case 1451*, 2008; *CLOUT Case 98*, 1991), and does not apply if it was not a sales contract within the meaning of CISG (*CLOUT Case 695*, 2004) In other words, Article 55 is a provision for determining a price where a contract has been entered into validly, but no price has been determined, and does not apply where no

contract has been entered into.

Arbitration case law is also intended to give effect to contracts in which parties do not specify a price, particularly because of the necessity of international trade.

IV. Conclusion

This paper explores two problems that can be caused by incomplete contracts. First, whether an incomplete agreement can be recognized as a binding agreement. This issue is closely related to contract formation. The second is what criteria can be applied to determine open terms. International sales of goods are generally carried out under an incomplete agreement. However, there are cases in which the conclusion of a contract is denied due to various circumstances, such as changes in the environment after an agreement between parties. In that case, the situation is exposed to the problem of determining whether the formation of the contract ought to be recognized under the conditions of incomplete agreement.

CISG provisions and the attitude of national courts dealing with this issue indicate a tendency not to deny the formation of a contract on the grounds of an incomplete agreement, as long as the intention to be bound by the agreement is clear. An agreement need not be reached on all terms of a contract for the contract to be formed, but at a minimum the parties must agree upon the terms on which the contract is intended to be concluded. However, the issue of whether or not a contract is established should be judged based on the intention of the parties above all else. This issue will have to be resolved by finding what terms must be agreed upon in order for the parties to make the contract binding. The establishment of a contract is not only recognized in cases where agreement on all terms and conditions is reached to the extent that there is no more to be negotiated. As long as the parties express the intention to be bound, the formation of a contract may be recognized. Where a party's actions or statements are unclear, Article 8 is applied to determine intent. In cases determined by the application of Article 8, courts have relied on the criteria set forth in Article 8 to interpret statements and acts related to the process of forming contracts. Where it is clear that the parties intended to be bound and establish a legal relationship, it is permissible to imply terms that give the contract business validity as intended by the parties. For example, an agreement can be enforceable even if it requires further agreement between the parties, such as price. It may be appropriate to imply a condition that a reasonable price must be paid in the case of disagreement. Moreover, as Article 55 applies to the determination of prices, it provides a price formula that applies when a contract has been entered into validly but no price has been determined, and does not apply where no contract has been entered into. Even when the validity of a price-unspecified contract is disputed, there are many cases where the validity of the contract has been found through the application of Article 55 CISG, which provides for a subsidiary pricing method.

It is presumed that the fact that the price can be determined in accordance with Article 55 was taken into account in the background of recognizing the conclusion of the contract when the price was not specified. Since CISG does not mention the place where the price is determined, when price is determined according to the application of Article 55, the question arises as to which location's price should be applied. The court applying Article 55 applied the market price that in the seller's place of business. However, in cases where there was no market price, such as an aircraft engine price, the court ruled that the contract was not established because the price was not specified between the parties, and therefore did not meet the requirements of Article 14 of CISG.

In addition, when an incomplete agreement is reached, open terms are determined by the application of objective criteria based on rationality and fairness. The objective criteria are derived by considering the course of transaction, trade usage, the purpose of the contract, implied terms, and so on.

References

David, M. (2020). Contract formation, incompleteness and implied terms. *Lloyd's Maritime and Commercial Law Quarterly*, 38-43.

Fogt, M. M. (2014). Contract formation under the CISG: The need for a reform. *International Sales Law: A Global Challenge*, 189. https://doi.org/10.1017/CBO9781139103923.017

Joseph, J. E. (1984). Contract formation under the United Nations convention on contracts for the international sale of goods and the Uniform Commercial Code. *Penn State International Law Review, 3*(1). http://elibrary.law.psu.edu/psilr/vol3/iss1/5

Murray, J. (1988). An essay on the formation of contracts and related matters under the United Nations convention on contracts for the international sale of goods. *Journal of Law and Commerce*, *8*, 11-51. http://www.cisg.law.pace.edu/cisg/biblio/murray.html

Mooney, R. J. (1995). The new conceptualism in contract law. *Oregan Law Review,* 1131, 1136.

Moss, S. (2005). Why the United Kingdom has not ratified the CISG, 25. *Journal of law and Commerce*, 483.

Nicholas, S. (2017). The scope of the principle in Scancarriers v Aotearoa and Estate agent's commission. *Lloyd's Maritime and Commercial Law Quarterly*, 473.

Patrick, B. (2008). Offer and acceptance in international contract negotiation: A comparative study. *International Business Law Journal*, *6*.

Singh, L. (2006). Caveat emptor: Are decisions more favorable to the seller on matters relating to letters of credit?. 2 *Nordic Journal of Commercial Law*, 8.

UNCITRAL (2016). *UNCITRAL digest of case law on the United Nations convention on contracts for the international sale of goods*. 54-57, 86. https://uncitral.un.org/en/case_law/digests

Viscasillas, M. (2001). The formation of contracts and the principles of European contract law. *Pace International Law Review*, *13*, 371-397. http://www.cisg.law.pace.edu/cisg/biblio/perales3.html

United Nations (1980, March 10 - April 11). Official records (United Nations publication, Sales No. E. 81. IV. 3). The United Nations Conference on Contracts for the International Sale of Goods, Vienna. https://digitallibrary.un.org/record/160585

Law

CISG (United Nations Convention on Contracts for the International Sale of Goods) of 1980. §8, §11, §13-22, §55. https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/19-09951_e_ebook.pdf

Uniform Commercial Code (U.C.C.). §1-205(3), 1-205(5), §2-204, §2-204(1), §2-204(3), §2-207, §2-208, §2-305, §2-305(4). https://www.law.cornell.edu/ucc/2

Case

CLOUT (Case Law On UNCITRAL Texts) Case 5. Gernamy: Landgericht Hamburg (5 0 543/88. 26 September 1990. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V97/274/84/PDF/V9727484.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 52. Hungary: Municipal Court Budapest (AZ 12.G.41.471/1991/21). 24 March 1992. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V94/257/97/IMG/V9425797.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 53. Hungary: Supreme Court (Gf.I. 31.349/1992/9). 25 September 1992. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V94/257/97/IMG/V9425797.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 106. Austria: Supreme Court (2 Ob 547/93). 10

November 1994. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V95/604/92/IMG/V9560492.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 98. Netherlands: Rechtbank Roermond (900336). 19 December 1991. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V95/559/66/IMG/V9555966.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 121. Germany: Oberlandesgericht Franjfurt (10 U 80/93). 4 March 1994. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V96/842/23/IMG/V9684223.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 131. Germany: Landgericht Munchen (8 HKO 24667/93). 8 February 1995. https://www.uncitral.org/clout/clout/data/deu/clout_case_131_leg-1334.html

CLOUT (Case Law On UNCITRAL Texts) Case 135. Germany: Oberlandesgericht Franjfurt am Main (25 U 185/94). 31 March 1995. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V96/853/30/IMG/V9685330.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 215. Switzerland: Bezirksgericht St. Gallen (3PZ97/18). 3 July 1997. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V98/553/61/PDF/V9855361.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 227. Germany: Oberlandesgericht Hamm (19U 97/91). 22 September 1992. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V99/811/74/PDF/V9981174.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 273. Germany: Oberlandesgericht Munchen (7U 2070/97). 9 July 1997. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V99/903/75/PDF/V9990375.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 232. Germany: Oberlandesgericht Munchen (7U 4427/97). 11 March 1998. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V99/811/74/PDF/V9981174.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 268. Germany: Bundesgerichtshof (VIII ZR 154/95). 11 December 1996. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V99/903/75/PDF/V9990375.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 189. Austria: Oberster Gerichtshof (2 Ob 58/97m). 20 March 1997. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V98/506/26/PDF/V9850626.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 173. Hungary: Metropolitan Court (No. 12.G.76.237/1996/14). 17 June 1997. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V97/274/84/PDF/V9727484.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 176. Austria: Supreme Court (10 Ob 518/95). 2 February 1995. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V97/274/84/PDF/V9727484.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 334. Switzerland: : Obergericht des Kantons Thurgau (ZB 95 22). 19 December 1995. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V00/550/47/PDF/V0055047.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 330. Switzerland: Handelsgericht des Kantons St. Gallen (HG 45/1994). 5 December 1995. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V00/550/47/PDF/V0055047.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 417. United States of America: U.S. [Federal] District Court for the Northern District of Illinois (99 C 5153). 7 December 1999. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V01/869/91/PDF/V0186991.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 424. Austria: Oberster Gerichtshof (6 Ob 311/99z). 9 March 2000. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V03/846/28/PDF/V0384628.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 429. Germany: Oberlandesgericht Franjfurt am Main (9 U 13/00). 30 August 2000. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V03/846/28/PDF/V0384628.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 576. United States of America: U.S. [Federal] Court of Appeals, Ninth Circuit (02 15727). 5 May 2003. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V06/507/48/PDF/V0650748.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 605. Austria: Oberster Gerichtshof (1 Ob 49/01i). 22 October 2001. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V06/539/52/PDF/V0653952.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 695. United States of America: U.S. [Federal] District Court for the Eastern District of Pennsylvania (Civ. A. 00-2638). 29 March 2004. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V07/818/40/PDF/V0781840.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 702. New Zealand: New Zealand (2000 NZCA 350). 27 November 2000. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V07/818/40/PDF/V0781840.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 750. Austria: Oberster Gerichtshof (7 Ob 175/05v). 31 August 2005. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V07/890/92/PDF/V0789092.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 777 . United States of America: U.S. [Federal] Court of Appeals, Eleventh Circuit (05-13005). 12 September 2006. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V08/530/94/PDF/V0853094.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 802. Spain: Tribunal Supremo, sección 1ª (18/2008). 17 Jenuary 2008. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V08/561/08/PDF/V0856108.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 828. Netherlands: Court of Appeals of 's-Hertogenbosch (C0500427). 2 Jenuary 2007. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V08/585/98/PDF/V0858598.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 890. Switzerland: Tribunale d'appello del Cantone Ticino (12.2002.181). 29 October 2003. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V09/867/37/PDF/V0986737.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 932. Switzerland: Obergericht des Kantons Thurgau (ZBR.2006.26). 12 December 2006). https://documents-dds-ny.un.org/doc/UNDOC/GEN/V10/527/60/PDF/V1052760.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 934. Switzerland: Cantonal Court of the Canton of Valais (C1 06 95). 27 April 2007. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V10/527/60/PDF/V1052760.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 1034. Spain: Audiencia Provincial de Cáceres (00296/2010). 14 July 2010. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V11/808/49/PDF/V1180849.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 1257. New Zealand: The High Court of New Zealand, Auckland Registry (AP117/SW99). 27 March 2002. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V13/846/00/PDF/V1384600.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 1451. Czech Republic: Supreme Court (32 Cdo 824/2007).

25 May 2008. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V15/020/98/PDF/V1502098.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 1452. Czech Republic: Supreme Court (32 Odo 725/2004). 29 March 2006. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V15/020/98/PDF/V1502098.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 1567. Republic of Korea: Busan District Court (2009gahap26384). 27 July 2011. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V16/025/94/PDF/V1602594.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 1642. Republic of Korea: Seoul High Court (Decision 2012Na59871) 19 July 2013. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V17/003/37/PDF/V1700337.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 1644. Republic of Korea: Seoul High Court (Decision 2011Na62108 (Goods price), non-continuation dismissal, Supreme Court Decision 2012Da115861). 15 November 2012. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V17/003/37/PDF/V1700337.pdf?OpenElement

CLOUT (Case Law On UNCITRAL Texts) Case 1772. Switzerland: Cour d'appel civile du Tribunal Cantonal de Vaud (Court of Appeal of the Canton Vaud) (No. JI11.036221-151531). 29 February 2016. https://documents-dds-ny.un.org/doc/UNDOC/GEN/V18/052/82/PDF/V1805282.pdf?OpenElement

Barbudev v Eurocom Cable Management Bulgaria Eood [2012] EWCA Civ 548.

Bear Stearns Bank Plc v Forum Global Equity Ltd [2007] EWHC 1576.

BJ Aviation Ltd v. Pool Aviation Ltd [2002] EWCA Civ 163; [2002] 2 P& CR 25;

Devani v. Wells [2019] UKSC 4 Para. 29; 33; 35; [2019] 2 WLR 617.

Fletcher Challenge Energy Ltd v. Electricity Corp of New Zealand Ltd [2002] 2 NZLR 433.

Kleinschmidt Division of SCM Corp. v. Futronics Corp., 41 N.Y.2d 972, 363 N.E.2d 701, 395 N.Y.S.2d 151 (1977).

Korea Seoul High Court. Decision: 2012Na 59871; 2013.7.17.

MRI Trading AG v. Erdenet Mining Corp LLC [2013] EWCA Civ 156; [2013] 1 Lloyd's Rep. 638;

Neilson v. Stewart [1991] UKHL 13.

Pagnan Spa v. Feed Products Ltd. [1987] 2 Lloyd's Rep. 601, 619.

Proton Energy Group SA v. Lietuva [2013] EWHC 2872 [2014] 1 Lloyd's Rep. 100.

R and J Dempster Ltd v. Motherwell Bridge and Engineering Co., (1964) SC 308.

Teekay Tankers Ltd v. STX Offshore & Shipbuilding Co Ltd., (No.2) [2017] EWHC 253; [2017] 1 Lloyd's Rep. 387.

ISSN 1946-5130 (Print), ISSN 2470-4733 (Online)
http://dx.doi.org/10.20294/jgbt.2023.19.1.125

The Journal of Global Business and Trade

Journal of Global Business and Trade

https://www.pfw.edu/jgbt

Effect of Empowerment on Perceived Person-Environment Fit and Work Engagement: Focusing on Online Travel Platform Employees

Ji-Young Um[a], Hye-Yeon Park[b], Sun-Young Yoon[c]*

[a]*Department of Business Administration, Sahmyook University, South Korea*
[b]*Department of Event & Convention, Graduate School, Kyonggi University, South Korea*
[c]*Department of Tourism and Culture Contents Management, Kyonggi University, South Korea*

Received 8 December 2022, Revised 7 January 2023, Accepted 5 February 2023

ABSTRACT

Purpose – COVID-19 has dramatically changed the business landscape, and the travel industry is no exception. The industry is undergoing a paradigm shift to the platform business, and traditional travel agencies are moving their businesses to online platforms. However, in this irreversible global paradigm shift, it is not easy for travel companies to hire and retain employees, especially companies in the IT sector. Studies typically study consumers, such as selection attributes and satisfaction with travel platforms. However, to the best of our knowledge, there have been almost no studies on employees. This study explored how the empowerment of online travel platform employees influences their perceived person-environment (P-E) fit and work engagement.

Design/Methodology/Approach – We analyzed data from 352 employees of 26 domestic online travel platforms who were surveyed in January and February 2021. After coding the collected data, we analyzed it using frequency, exploratory factor, reliability, correlation, and multiple regression analyses using IBM SPSS Statistics, ver. 20.0.

Findings – First, enhancing the meaningfulness of work and organizational autonomy influences person-job (P-J) fit and person-organization (P-O) fit. Second, enhancing the meaningfulness of work significantly influences vigor, dedication, and absorption in terms of work engagement, while organizational autonomy significantly influences work engagement vigor. Third, P-J fit and P-O fit influence the vigor of work engagement, and P-O fit influences dedication and absorption.

Research Implications – This study demonstrated that the empowerment of travel platform employees can improve perceived P-E fit and work engagement. Thus, if organizations guarantee some degree of empowerment, employees will be energized and engaged more in their workplace. Finally, this helps expand the scope of online travel platform research from the perspective of personnel organization.

Keywords: COVID-19, empowerment, online travel platforms, perceived person-environment fit, work engagement

JEL Classifications: J50, J53, L81, M15, Z30

* *Corresponding Author, E-mail: Yoon, ysy222@kyonggi.ac.kr*

I. Introduction

COVID-19 has dramatically changed the business landscape across and within all industries. While some industries, such as tourism, were hit hard, others thrived. Some of South Korea's top ten travel companies suspended operations, while many others were trying to optimize operations by downsizing employees, restructuring subsidiaries, and selling office space (Lee, 2021). However, the situation is quite different for online travel platforms.

Online platforms are Internet-based environments or systems that provide a range of services and content, enabling online production, distribution, and consumption (Lee & Lee, 2020). Meanwhile, online travel platforms are web-based marketplaces where consumers can research, plan, and book travel services, including flights, hotels, and transportation (Kourtesopoulou et al., 2019). In contrast to the online presence of traditional travel agencies, online travel platforms provide travel services through a price comparison metasearch using advanced online systems (Shin, 2019). While studies have used the terms "online travel agency" and "online travel platform" interchangeably, this study adopted the latter, as the term "platform" is widely used by the general population in relation to smartphone applications.

Online travel platforms have enjoyed steady growth due to reduced distribution costs, flexible rate policies, easy accessibility, lower costs than traditional travel agencies, and ease of acquiring information (Lee & Park, 2013). Even during the pandemic, when profits were slightly reduced, online travel platforms diversified and attracted investments based on their future value. For instance, in 2021, Yanolja, South Korea's fastest-growing online travel platform, was listed as 8th "unicorn" (privately held startup companies valued at over $1 billion) in South Korea (Lee, 2020). Yanolja's success is attributed to its aggressive mergers and acquisitions, actively attracting investments, and superior Internet capabilities.

Indeed, the tourism industry expects a paradigm shift because of the pandemic, with online travel platforms at its core. South Korea, which is well equipped with information and communication technology infrastructure and has one of the highest smartphone penetration rates, is witnessing a rapid growth in mobile travel services along with the sharing economy and online to offline platforms (Korea Tourism Organization, 2019). Inspired by these changes, H Tour, a South Korean tourism giant, developed an ambitious plan to liquidate 90% of its existing businesses to transform itself into an online travel platform (S. M. Kim, 2021).

The current online travel platform environment is characterized by a wide range of jobs and a changing work environment. First, unlike traditional travel agencies, online travel platforms have several types of jobs, including IT jobs. For instance, at Yanolja, research and development (R&D) personnel account for more than 50% of employees (Cho, 2020; Jung, 2019). R&D jobs cover a wide range of fields, including user experience research, front-end development, back-end development, engineering, and performance marketing (Yanolja, n.d.). This job diversity requires recognizing others' expertise to create cooperation among various job groups. In South Korea alone, approximately 30 online travel platforms are competing for talent and aggressively hiring IT staff. In particular, competition for hiring IT staff has intensified during the COVID-19 pandemic (D. W. Kim, 2021). Importantly, to hire and retain talented workers, organizations must understand the values that are attractive to employees.

Second, South Korean companies are currently faced with a new work environment comprising a team system, a 52-hour maximum workweek, and the "MZ" generation (i.e., Millennials and Gen-Z members in their 20s and 30s) entering the core workforce. While the vertical organizational structure has been the commonly used management approach for a long time, a shift is now occurring to the team system. However, the older generation's view of efficiency, characterized by vertical communication and one-way instructions, substantially differs from that of the organizations' younger members (H. S. Song, 2018) as they tend to be self-assertive

and more likely to prioritize themselves over a group. Moreover, South Korea implemented a 52-hour maximum workweek in 2018, which requires increased efficiency to produce outcomes in fewer hours. Prior to that, employees, especially IT professionals, worked for more than 52 hours per week due to the nature of their job. Thus, it is important to devise methods to help employees engage in their work efficiently within limited working hours and adapt to the new environment.

II. Theoretical Background

1. Empowerment

The notion of empowerment can be traced back to the civil rights movement of the 1970s, during which the rights of social minorities, including black people and women, were promoted in the United States (Hong, 2019). In South Korea, businesses were controlled centrally, hierarchically, and vertically during the 70s and 80s. However, changes over time required companies to maximize their employees' knowledge and creativity in order to survive as value-creating organizations. This created a need for empowerment studies. The shift from control to commitment has emerged as the new conventional wisdom, with many believing that empowering employees with more responsibility and supporting them, rather than controlling them, elicits more creative responses (Park, 1997).

Literally, "empowerment" involves granting power, authority, or freedom to do something. However, opinions vary regarding exactly what "power" means. Burke (1986) believed that empowerment had two meanings, "empower" and "enable." The author asserted that empowerment involves leaders sharing power with subordinates and allowing them to do something, thereby increasing employees' self-motivation through a sense of self-efficacy.

Thomas and Velthouse (1990) assigned three meanings to empowerment: First, in a legal sense, power refers to authority, such as an individual's or organization's control over other individuals or organizations. Second, power refers to capacity, as in the self-efficacy or individuals' belief in their capacity to do something and produce specific outcomes. Third, power refers to energy; thus, empowering can also energize an organization.

Kanter (1993) stated that power, or having access to opportunity, information, and support, highly influences employee behavior by encouraging a positive perception of the organization and increasing work engagement (Quinn & Spreitzer, 1997). Conger and Kanungo (1988) had a more comprehensive perspective, defining empowerment as a motivational relationship accompanied by psychological changes rather than simply satisfying organizational members' needs and maintaining equality. Instead, it can be used to develop self-efficacy by preventing feelings of powerlessness among employees.

Park (1997) suggested methods for granting authority and defined empowerment as nurturing, utilizing, vitalizing, activating, and expanding employees' capabilities to seek autonomous and creative management. The author emphasized that empowerment involves power devolution, where power is rooted out and granted, rather than simple delegation where power is given and taken back. Finally, the author asserted that those with power must actively assume it rather than fear the loss of power through delegation because empowerment is not about losing or giving power but releasing and nurturing the existing power.

Based on a literature review, we define empowerment as motivating employees by granting appropriate authority over their jobs. The components of empowerment include authorization and responsibility, enhancing the meaningfulness of work, organizational autonomy, and self-determination.

Research on online travel platforms has typically focused on platform users, including comparisons between user groups (e.g., initial and mature trust groups), user benefits and perceived value, and brand trust (Chen, 2018; Kwak, 2020; G. S. Lee, 2020; Lee & Kim, 2019; Min & Lee, 2020; Min et al., 2020; Niu & Lee, 2018; C. Y.

Yang, 2018). Employee empowerment, person-environment (P-E) fit, and job engagement have been examined in other industries. However, to our knowledge, little attention has been paid to online travel platform employees. Empowerment has been studied as an antecedent variable for negative job attitudes, and as a predictor of employee behavioral change and individual and organizational performance. Recent studies on employee behavior change provide evidence on the influence of empowerment and organizational citizenship behavior (Yoon, 2019), employee engagement (Hur et al., 2019; Kim et al., 2018; Te et al., 2019), and job satisfaction (Goh & Shin, 2019). A few studies have exam ined empowerment and P-E fit (Hong & Jo, 2017; S. T. Song, 2018). Perceived P-E fit is an important concept and appears in some studies as an antecedent of organizational citizenship behavior, engagement, self-efficacy, job satisfaction, and job performance. Recent studies provide further evidence on the relationship between P-E fit and job engagement, and the mediating influence of perceived P-E fit on job engagement (Chung & Kang, 2016; Moulik & Giri, 2021; So, 2019). Given this background, this study aimed to analyze the influence of empowering online travel platform employees on perceived P-E fit and work engagement.

2. Perceived Person-Environment Fit

Chatman (1989) noted that “fit” is how a job or environmental condition fits into a specific object in a balanced and harmonious way. Fit is an important concept for research on behavioral change in business administration and psychology.

The P-E fit concept was introduced in The Republic, where Plato emphasized assigning people jobs that correspond to their attributes and abilities (Dumont & Carson, 1995; Ryu, 2014). Muchinsky and Monahan (1987) stated that fit involves compatibility that allows individuals and the environment to coexist in a specific situation, where P-E is the degree of fit or agreement between mutual variables that produce positive or negative results for individual choices. The authors identified three categories of fit: person-organization fit, person-job (P-J) fit, and person-supervisor fit. Holland’s (1997) definition of P-E fit—the degree of compatibility or congruence between job characteristics and employees—is frequently used.

Employee-perceived P-E fit is important because it reflects employee attitudes toward the work environment (Kristof-Brown & Billsberry, 2013), which develops as individuals assess the compatibility between themselves and their environment (Englert et al., 2020; Kristof-Brown et al., 2005).

Two pairs of fit types are most frequently discussed. First, there are supplementary and complementary fits. Supplementary fit occurs when a person and an organization have similar or compatible characteristics. Meanwhile, complementary fit occurs when the characteristics of a person or an organization are different, but they complement and meet the other's needs (Muchinsky & Monahan, 1987; Kristof, 1996). Second, there are demands-abilities and needs-supplies fits. The demands-abilities perspective suggests that an appropriate fit occurs when an individual has the skills, abilities, and knowledge required to meet environmental demands. From the need-supplies perspective, an appropriate fit occurs when an environment satisfies an individual's needs, desires, or preferences (Kristof, 1996).

P-E fit is the degree of congruence between employees’ abilities and company-required abilities. This study examined P-J and person-organization fit, following Muchinsky and Monahan (1987). P-J fit is the compatibility between individuals and the job they perform (Kristof-Brown et al., 2005), while person-organization fit is the compatibility between an employee and an organization—the congruence of an individual’s beliefs, values, goals, and personality with the organization’s orientation (Kristof, 1996).

3. Work Engagement

Over the past 30 years, the concept of work engagement has gained importance in human resource development. Numerous studies have

confirmed that high work engagement is positively correlated with job satisfaction, organizational commitment, and work performance, and negatively correlated with low turnover intention (Park et al., 2018).

Kahn (1990) introduced the concept of engagement in a study of personal engagement behavior. The author described it as people employing and expressing themselves physically, cognitively, emotionally, and mentally in performing their roles (Schaufeli et al., 2002). Maslach et al. (1997) shifted the focus from personal to work areas, characterizing work engagement (i.e., the opposite of burnout) as energy, involvement, and efficacy. Engaged workers are energetic, have a sense of self-efficacy, and are confident about their ability to handle all tasks. Work engagement is the inverse of exhaustion, cynicism, and a lack of professional efficacy (Schaufeli et al., 2002).

Rothbard (2001) defined work engagement as psychological presence in and focused on a role linked to two components: attention and absorption. Attention involves cognitive availability and the time spent focused on a role. Absorption is the intensity of the focus and degree to which a person is engrossed in a role. Schaufeli et al. (2002) defined work engagement as a positive, fulfilling, and work-related state of mind characterized by vigor, dedication, and absorption, which has been supported by several studies. The authors emphasized that work engagement is not a momentary state but a broad state that is maintained over time, and that it should be measured with an independent scale specific to work engagement studies.

Bakker (2011) argued that work engagement and job satisfaction are different concepts: engagement combines a high level of pleasure at work (dedication) with high activation (vigor and absorption), while job satisfaction is a more passive form of well-being. Moreover, job satisfaction effects tend to last longer than work engagement effects, which last only a few hours. Work engagement and job satisfaction also differ from motivation because they include cognition and affection in addition to motivation.

Seppälä et al. (2012) found that work engagement is positively related to employees' healthy cardiac autonomic activity. According to Schaufeli and Bakker (2001), engaged workers tend to be in better shape, mentally and physically, and experience more positive emotions than their unengaged coworkers. This suggests that work engagement is crucial for both organizational success and individual's health (Singh & Chopra, 2018).

This study defines work engagement as the state in which individuals are happy and satisfied because they do their best at work and experience a sense of self-efficacy and passion. Based on Schaufeli et al. (2002), we identified three work engagement components: vigor, dedication, and absorption.

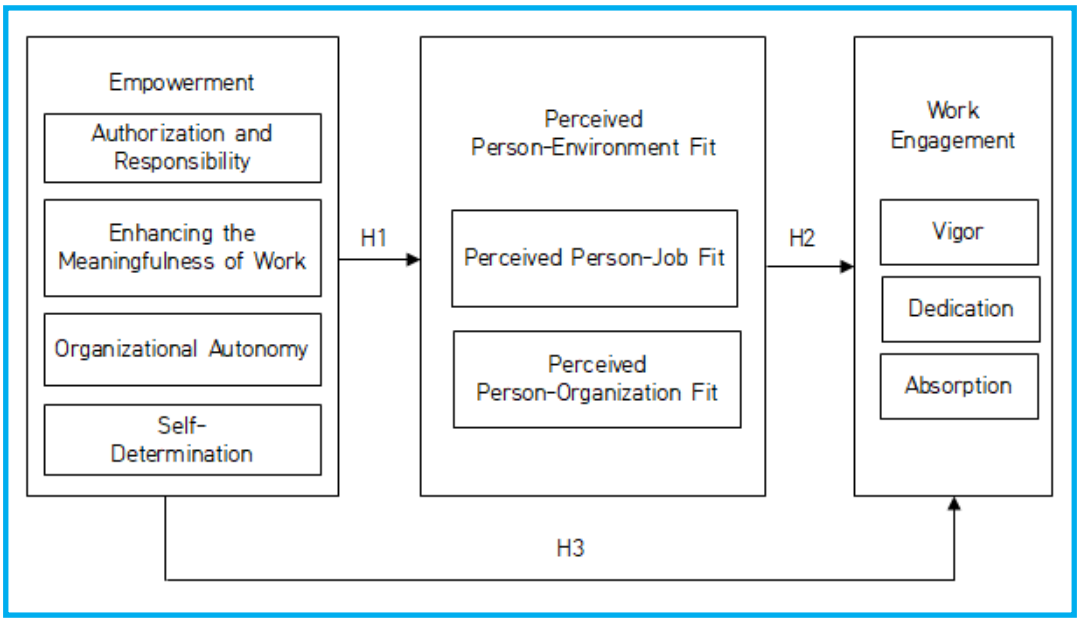
III. Methodology

1. Research Design and Hypothesis

The research model (Fig. 1) was developed based on previous studies on empowerment, including Konczak et al. (2000), H. R. Yang (2018), and Sung and Lee (2019); on perceived P-E fit, including Rynes and Gerhart (1990), Y. B. Choi (2020), and Y. S. Choi (2020); and on work engagement, including Schaufeli et al. (2002), Seo (2020), and Im (2020).

For organizations to survive and adapt to a rapidly changing environment, such as that produced by COVID-19, a new empowerment and organizational culture is needed. Empowerment also stimulates the motivation of organizational members within the organization and enables them to demonstrate their abilities by demonstrating their work engagement. According to Hong and Jo (2017) and S. T. Song (2018), empowerment influences P-E fit. Many studies have verified that empowerment affects work engagement (Hur et al., 2019; Kim et al., 2018; Te et al., 2019). Others have shown that P-E fit is an antecedent variable for work engagement, and mediates the relationship between empowerment and work engagement (Chung & Kang, 2016; Moulik & Giri, 2021; So, 2019).

Fig. 1. Research Model



Based on these studies, we propose the following hypotheses:

H1: Empowerment significantly affects perceived P-E fit.
H2: Perceived P-E fit significantly affects work engagement.
H3: Empowerment significantly affects work engagement.

2. Analysis

We surveyed 26 online travel platforms in South Korea during January and February 2021: Hotels.com, Agoda, Yanolja, Trip.com, Airbnb, How about here, Web Tour, WeMakePrice, Hotel & Joy, Tourbis, Jeju.com, Hyundai Card Previa Travel, Mode Tour, Kite, Next Tour, My Real Trip, Hotel Pass, 11st, Oneulbamn, Timon, WeHome, Funnbiz, Interpark, Daily Hotel, Gmarket, and TB.

Given that the COVID-19 pandemic situation during this period, potential participants were contacted via phone. The researchers explained the study purpose to online travel platform employees and assured potential participants that their responses would be used only for the study. Only 380 respondents who provided informed consent received the questionnaire via email. Responses were collected via email, of which 352 valid responses were used for the analysis; 16 respondents did not answer, while 12 responses were incomplete. Ethical review was not required for this survey study; however, we explained that the study aims to all respondents and assured them that the data would only be used for this study.

The details of the questionnaire are discussed in the Results section. After coding the collected data, we conducted frequency, exploratory factor, reliability, correlation, and multiple regression analyses using IBM SPSS Statistics, ver. 20.0.

IV. Results

1. Respondents' Demographic Characteristics

The participant characteristics are illustrated in Table 1.

Table 1. Respondents' Demographic Characteristics

Division		Frequency (Persons)	Ratio (%)	Division		Frequency (Persons)	Ratio (%)
Gender	Male	219	62.2	Major	Tourism and service	99	28.1
	Female	133	37.8		Humanities and society	22	6.3
Education	High school graduate	14	4.0		Business and economics	14	4.0
	College graduate	49	13.9		IT	177	50.3
	University graduate	238	67.6		Other	40	11.4
	Graduate students	36	10.2	Jobs	App development and management	33	9.4
	Graduate school graduates	15	4.3		Engineer	87	24.7
Age	20s	64	18.2		UX researcher	33	9.4
	30s	156	44.3		Performance marketer	29	8.2
	40s	87	24.7		Brand design	48	13.6
	50s	27	7.7		Product development and planning	55	15.6
	Over 60	18	5.1		Front-end development	29	8.2
Job title	Employee	82	23.3		Personnel and general affairs	33	9.4
	Deputy Section Chief	158	44.9		Finance/accounting	5	1.4
	Section Head	61	17.3	Annual Income	20–29 million won	121	34.4
	Deputy Manager	32	9.1		30–39 million won	114	32.4
	Department Head	17	4.8		40–49 million won	75	21.3
	Executives	2	0.6		50–59 million won	37	10.5
Period of service	1–3 years	95	27.0		60–69 million won	3	0.9
	4–6 years	187	53.1		70 million won or more	2	0.6
	7–9 years	68	19.3	Employment Status	Regular employees	152	43.2
	10–15 years	2	0.6		Irregular employees	200	56.8
	Sum	352	100.0		Sum	352	100.0

2. Exploratory Factor and Reliability Analysis

The exploratory factor analysis returned a Kaiser-Meyer-Olkin (KMO) value of 0.798, and the sphericity test result was 1426.758 ($p < 0.001$), which was adequate for factor analysis. Four common factors had eigenvalues of one or more: authorization and responsibility (2.396), enhancing the meaningfulness of work (2.304), organizational autonomy (2.089), and self-determination (1.515). The total variance explained was sufficient at 69.207%. The Cronbach's alpha value was 0.847 for authorization and responsibility, 0.748 for enhancing the meaningfulness of work, 0.715 for organizational autonomy, and 0.608 for self-determination, showing high reliability.

The exploratory factor and reliability analyses for perceived P-E fit yielded a KMO value of 0.890 and the sphericity test result was 1190.916 ($p < 0.001$). Two factors were derived from the factor analysis: P-J fit (2.681) and P-O fit (2.477); the total variance explained was sufficient at 64.473%. The Cronbach's alpha was 0.764 for P-J fit and 0.852 for P-O fit, confirming the items' suitability.

The exploratory factor and reliability analyses for work engagement yielded a KMO value of 0.759 and the sphericity test results was 922.822 ($p < 0.001$). Three factors were identified: vigor (2.262), dedication (1.957), and absorption (1.786). The total variance explained was 66.714%, and the Cronbach's alpha was 0.793 for vigor, 0.641 for dedication, and 0.693 for absorption.

The results are summarized in Table 2.

Table 2. Exploratory Factor Analysis

	Measurement item	Communality	Factor loading		e-value/ variance (%)	α	Cronbach's alpha	
EMPOWERMENT	Authorization and responsibility	My organization grants me responsibility and authority.	0.802	0.863	2.396 / 19.969	0.755	0.847	0.730
		My organization gives me a high degree of autonomy in decision-making.	0.783	0.853		0.765		
		My organization accepts quick, unauthorized decisions I make to satisfy customer needs.	0.722	0.844		0.837		
	Enhancing the meaningfulness of work	My organization describes my job roles and expectations.	0.747	0.845	2.304 / 19.197	0.638	0.748	
		My organization explains the company's decisions.	0.690	0.811		0.613		
		My organization helps me understand how I relate to the organization's goals.	0.632	0.678		0.745		
	Organizational autonomy	My organization guarantees independence and freedom in how I perform tasks.	0.689	0.815	2.089 / 17.412	0.688	0.715	
		My organization helps me work more effectively by simplifying principles or regulations.	0.637	0.758		0.585		
		My organization gives me the power to decide when and how to perform my duties.	0.653	0.737		0.574		

	Self-determination	My organization respects and shares my opinions, even if they do not agree with me.	0.757	0.863	1.515 / 12.628	0.469	0.608	0.730
		My organization encourages me to propose ideas.	0.565	0.579		0.553		
		My organization gives everyone a chance to voice their opinions.	0.627	0.560		0.489		
PERCEIVED P-E FIT	Perceived P-J fit	My current job is suitable for utilizing my skills, knowledge, and abilities.	0.650	0.785	2.681 / 33.513	0.706	0.764	0.808
		I have a clear understanding of the contents and responsibilities of my job.	0.643	0.752		0.687		
		I believe that I can achieve my goals through my current job.	0.578	0.669		0.696		
		My current job suits me well.	0.483	0.630		0.742		
	Perceived P-O fit	My personality is suitable for the current organization, and the values and goals pursued by the organization are a good fit for me.	0.802	0.858	2.477 / 30.96	0.774	0.852	
		I have a strong attachment and a sense of belonging to the current organization.	0.711	0.816		0.827		
		I perceive the current organization's problems as my own.	0.653	0.710		0.820		
		I can make full use of my abilities in the current organization.	0.638	0.669		0.823		
WORK ENGAGEMENT	Vigor	I feel happy when I concentrate on my work.	0.788	0.887	2.262 / 25.128	0.740	0.793	0.709
		My work inspires me.	0.809	0.882		0.601		
		I am full of energy at work.	0.638	0.688		0.813		
	Dedication	I feel that my current job is very meaningful and valuable.	0.704	0.832	1.957 / 21.743	0.479	0.641	
		I prioritize my job over my personal affairs.	0.577	0.750		0.577		
		I find it difficult to separate myself from my work.	0.547	0.622		0.573		
	Absorption	When I perform my current job, I forget everything around me other than my job.	0.681	0.798	1.786 / 19.842	0.608	0.693	
		I feel very engaged in my job.	0.689	0.784		0.504		
		I am very engrossed in performing my current job.	0.571	0.719		0.688		

	KMO	x^2	Total Variance
Empowerment	0.798	1426.758 ($p < 0.001$)	69.207
Perceived P-E fit	0.890	1190.916 ($p < 0.001$)	64.473
Work engagement	0.759	922.822 ($p < 0.001$)	66.714

3. Correlation Analysis

The results of the correlation analysis are presented in Table 3. Correlation coefficients were significant at 0.05 for all variables, indicating that they were suitable for the research model.

Table 3. Correlation Analysis

Variable	Authorization	Meaningfulness	Autonomy	Self-determination	Perceived P-J fit	Perceived P-O fit	Vigor	Dedication	Absorption
Authorization	1								
Meaningfulness	0.286**	1							
Autonomy	0.327**	0.314**	1						
Self determination	0.241**	0.453**	0.355**	1					
Perceived P-J fit	0.212**	0.273**	0.301**	0.289**	1				
Perceived P-O fit	0.372**	0.187**	0.277**	0.448**	0.683**	1			
Vigor	0.272**	0.418**	0.423**	0.308**	0.302**	0.261**	1		
Dedication	0.11**	0.421**	0.197**	0.268**	0.142**	0.256**	0.314**	1	
Absorption	0.194	0.521**	0.194**	0.224**	0.095	0.154**	0.374**	0.332**	1

Note: *p<0.05, **p<0.01.

4. Multiple Regression Analysis

4.1. Empowerment Influence on Perceived P-E Fit

Multiple regression analysis was performed to test the research model. The relationship between empowerment and perceived P-J fit was significant ($F = 149.852$, $p < 0.001$), indicating sufficient explanatory power. Organizational autonomy ($t = 6.862$, $p < 0.001$) and enhancing the meaningfulness of work ($t = 3.176$, $p = 0.002$) were significant factors influencing empowerment's effect on P-J fit, while authorization and responsibility ($t = 1.533$, $p < 0.001$) and self-determination ($t = 1.348$, $p = 0.001$) were not.

The influence of empowerment on perceived P-O fit was statistically significant ($F = 114.142$, $p < 0.001$). Again, organizational autonomy ($t = 5.128$, $p < 0.001$) and enhancing the meaningfulness of work ($t = 2.766$, $p = 0.006$) were significant factors influencing empowerment's effect on P-O fit, while authorization and responsibility ($t = 0.603$, $p < 0.001$) and self-determination ($t = 0.838$, $p < 0.001$) were not. The results are reported in Table 4.

Table 4. Empowerment Influence on Perceived P-E Fit

Dependent variable	Independent variable	Unstandardized coefficient		Standardized coefficient	t	p	Collinearity statistics	
		B	Standard error	B			Tolerance	VIF
P-J fit	(Constant)	0.041	0.150		0.276	0.783		
	Authorization and responsibility	0.240	0.047	0.223	1.533	0.129	0.496	2.016
	Enhancing the meaningfulness of work	0.181	0.058	0.144	3.176	0.002**	0.459	2.180
	Organizational autonomy	0.374	0.054	0.349	6.862	0.000***	0.365	2.738
	Self determination	0.152	0.046	0.153	1.348	0.151	0.442	2.260
	Modified R^2 = 0.318, F = 149.852, p = 0.000, Durbin-Watson = 1.952							
P-O fit	(Constant)	0.008	0.173		0.049	0.961		
	Authorization and responsibility	0.256	0.054	0.223	0.603	0.498	0.496	2.016
	Enhancing the meaningfulness of work	0.181	0.064	0.135	2.766	0.006**	0.459	2.180
	Organizational autonomy	0.322	0.063	0.281	5.128	0.000***	0.365	2.738
	Self determination	0.193	0.053	0.181	0.838	0.416	0.442	2.260
	Modified R^2 = 0.212, F = 114.142, p = 0.000, Durbin-Watson = 2.079							

Note: *p<0.05, **p<0.01, ***p<0.001.

4.2. Empowerment Influence on Work Engagement

Organizational autonomy (t = 5.593, p < 0.001) and enhancing the meaningfulness of work (t = 5.234, p < 0.001) were significant factors in the relationship between empowerment and vigor, whereas authorization, responsibility, and self-determination were not. Meaningfulness of work (t = 6.651, p < 0.001) was a significant factor in the relationship between empowerment and dedication, while the remaining variables were not. Enhancing the meaningfulness of work was a significant factor (t = 9.668, p < 0.001) in the relationship between empowerment's influence on absorption, while the others were not. The results are presented in Table 5.

Table 5. Empowerment Influence on Work Engagement

Dependent variable	Independent variable	Unstandardized coefficient		Standardized coefficient	t	p	Collinearity statistics	
		B	standard error	B			tolerance	VIF
Vigor	(Constant)	0.956	0.262		3.648	0.000		
	Authorization and responsibility	0.093	0.054	0.085	1.713	0.088	0.852	1.174
	Enhancing the meaningfulness of work	0.311	0.059	0.277	5.234	0.000 ***	0.747	1.339
	Organizational autonomy	0.341	0.061	0.287	5.593	0.000 ***	0.797	1.255
	Self determination	0.061	0.054	0.060	1.123	0.262	0.741	1.350
	Modified R^2 = 0.270, F = 33.289, p = 0.000, Durbin-Watson = 1.957							
Dedication	(Constant)	1.051	0.244		4.311	0.000		
	Authorization and responsibility	-0.036	0.050	-0.037	-0.713	0.477	0.852	1.174
	Enhancing The meaningfulness of work	0.367	0.055	0.373	6.651	0.000 ***	0.747	1.339
	Organizational autonomy	0.064	0.057	0.061	1.130	0.259	0.797	1.255
	Self determination	0.077	0.051	0.086	1.531	0.127	0.741	1.350
	Modified R^2 = 0.179, F = 20.007, p = 0.000, Durbin-Watson = 1.736							
Absorption	(Constant)	0.893	0.244		3.666	0.000		
	Authorization and responsibility	0.045	0.050	0.046	0.905	0.366	0.852	1.174
	Enhancing the meaningfulness of work	0.534	0.055	0.513	9.668	0.000 ***	0.747	1.339
	Organizational autonomy	0.032	0.057	0.029	0.563	0.574	0.797	1.255
	Self determination	-0.028	0.051	-0.030	-0.559	0.577	0.741	1.350
	Modified R^2 = 0.267, F = 32.715, p = 0.000, Durbin-Watson = 1.631							

Note: *p<0.05, **p<0.01, ***p<0.001.

4.3. Influence of Perceived P-E Fit on Work Engagement

Perceived P-J fit (t = 3.331, p = 0.001) was a significant factor in the relationship between perceived P-E fit and vigor, whereas perceived person-organization fit was not. Perceived person-organization fit was a significant factor (t = 4.205, p < 0.001) influencing perceived P-E fit's effect on dedication, while perceived P-J fit was not. Regarding the relationship between perceived P-E fit and absorption, perceived person-organization was a significant factor (t = 2.298, p = 0.022), while perceived P-J fit was not. The results are reported in Table 6.

Table 6. Perceived P-E Fit Influence on Work Engagement

Dependent variable	Independent variable	Unstandardized coefficient		Standardized coefficient	t	p	Collinearity statistics	
		B	standard error	B			tolerance	VIF
Vigor	(Constant)	1.830	0.308		5.938	0.000		
	P-J fit	0.343	0.103	0.233	3.331	0.001**	0.533	1.874
	P-O fit	0.122	0.083	0.102	1.463	0.144	0.533	1.874
	Modified R^2 = 0.192, F = 18.642, p = 0.000, Durbin-Watson = 1.946							
Dedication	(Constant)	1.522	0.274		5.543	0.000		
	P-J fit	-0.080	0.092	-0.062	-0.872	0.384	0.533	1.874
	P-O fit	0.312	0.074	0.298	4.205	0.000***	0.533	1.874
	Modified R^2 = 0.162, F = 12.588, p = 0.000, Durbin-Watson = 1.657							
Absorption	(Constant)	1.880	0.297		6.326	0.000		
	P-J fit	-0.027	0.099	-0.019	-0.267	0.789	0.533	1.874
	P-O fit	0.185	0.080	0.167	2.298	0.022*	0.533	1.874
	Modified R^2 = 0.118, F = 4.231, p = 0.000, Durbin-Watson = 1.520							

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

V. Conclusion

This study analyzed the influence of online travel platform employees' empowerment on their perceived P-E fit and work engagement. The results have practical implications for online travel platforms and employees who will lead the industry in the post-COVID world.

First, enhancing the meaningfulness of work and organizational autonomy significantly influenced P-J fit and P-O fit. This means that empowered employees evaluate their job and company to be a good fit. They are satisfied and do not easily change their company. This is useful in situations where it is difficult to hire and maintain IT staff in South Korea.

Second, empowering online travel platform employees significantly influenced their vigor, dedication, and absorption of work engagement. This implies that employees work with more

energy, and are engaged and dedicated when their jobs are meaningful. Members of the MZ generation tend to enjoy meaningful consumption, purchase products from companies that fit their values (i.e., environmental consciousness, fairness, human rights, animal rights, and ethics), and may boycott products from immoral companies (Kim & Kim, 2018). MZ generation employees are also likely to attach similar meanings to these values in their workplace. According to Kim and Kim (2018), individuals under ethical management are likely to be more engaged, and feel more affection for and attachment to the organization. Sharing the company's mission, vision, and environment-social-governance values with employees will foster meaning in their jobs and organizations.

Third, the organizational autonomy of online travel platform employees' empowerment significantly affected their vigor of work engagement. Organizations are energized when employees are allowed autonomy in their work. Therefore, it is desirable to guarantee employees a certain degree of autonomy to accomplish organizational vision and goals. This can be accomplished by supplementing the work style with work systems, including flextime and remote work. Furthermore, as employees may subjectively perceive autonomy, creating guidelines and improving awareness of their autonomous roles are also important.

Fourth, the self-determination of empowerment did not affect work engagement, partly because the online travel platform's customer contact employees find it difficult to make self-directed decisions without a sufficient understanding of IT. Thus, IT training at the company level may encourage employees' self-directed decision making. This can further increase employee opportunities in areas such as collaborative work, symposiums, and job switching.

This study's findings have theoretical implications. While previous studies have focused on online travel platform users, this study considered online travel platform employees, thus expanding the scope of online travel platform research. Second, this study contributed to objectification of the survey subjects. Previous empowerment studies had smaller sample sizes; this study included 26 online travel platform employees, including IT staff members.

Finally, this study has some limitations. First, it was conducted during the COVID-19 crisis; therefore, employees responded to the survey while working from home. Consequently, compared to previous studies, some differences were noted in the responses on empowerment, perceived P-E fit, and work engagement in organizations. Therefore, it would be beneficial to conduct the same study in a post-COVID situation.

Second, this study did not differentiate between job groups within an online travel platform organization. As the results may differ by job group, a between-group comparative study will help organizations develop response measures specific to different jobs.

References

Bakker, A. B. (2011). An evidence-based model of work engagement. *Current Directions in Psychological Science, 20*(4), 265-269. https://doi.org/10.1177/0963721411414534

Burke, W. (1986). Leadership as empowering others. In S. Srivastva (Ed.), *Executive power: How executives influence people and organizations* (pp. 51-77). Jossey-Bass.

Chatman, J. A. (1989). Improving interactional organizational research: A model of person-organization fit. *Academy of Management Review*, *14*(3), 333-349. https://doi.org/10.5465/amr.1989.4279063

Chen, R. (2018). *Differences between initial and mature trust group of OTA: Application of UTAUT2 to C-trip* (Unpublished Doctoral dissertation). Dong-A University.

Cho, M. Y. (2020, May 6). 'How are you here', the only word for platform advancement, last year's R&D expenses were rather reduced. *CEO Score Daily*. http://www.ceoscoredaily.com/page/view/2020050414531498621

Choi, Y. B. (2020). *The effects of transformational leadership on adaptive performance of members in public institutions: The mediating effect of psychological well-being and the moderation effect of person-environment fit* (Unpublished Doctoral dissertation). Ulsan University.

Choi, Y. S. (2020). *The effects of hotel employees' person-environment fit on emotional labor: The mediating effect of customer orientation and moderating effect of perceived value of work* (Unpublished Doctoral dissertation). Sejong University.

Chung, M. J., & Kang, W. J. (2016). The study of the effects of person-environment fit on the career commitment of the airline flight attendants: Focusing on the mediating role of organizational trust. *Journal of the Aviation Management Society of Korea*, *14*, 103-120.

Conger, J. A., & Kanungo, R. N. (1988). The empowerment process: Integrating theory and practice. *Academy of Management Review*, *13*(3), 471-482. https://doi.org/10.5465/amr.1988.4306983

Dumont, F., & Carson, A. D. (1995). Precursors of vocational psychology in ancient civilizations. *Journal of Counseling and Development*, *73*(4), 371-378. https://doi.org/10.1002/j.1556-6676.1995.tb01767.x

Englert, B., Thaler, J., & Helmig, B. (2020). Fit themes in volunteering: How do volunteers perceive person-environment fit?. *Nonprofit and Voluntary Sector Quarterly*, *49*(2), 336-356. https://doi.org/10.1177/0899764019872005

Goh, S. S., & Shin, H. C. (2019). The effect of empowering leadership on job satisfaction through mediation of job induced tension for nurses in a large hospital. *Academic Society of Global Business Administration*, *16*(2), 1151-1135. https://doi.org/10.38115/asgba.2019.16.2.115

Holland, J. L. (1997). *Making vocational choices: A theory of vocational personalities and work environments* (3rd ed.). Psychological Assessment Resources.

Hong, A. J., & Jo, Y. S. (2017). How leaders' authentic leadership and shared leadership affect employees' organizational socialization and person-environment fit. *Korean Human Resource Development Strategy*, *12*(1), 61-90. https://doi.org/10.21329/khrd.2017.12.1.61

Hong, E. Y. (2019). The possibilities and limitations of empowerment education in multicultural societies: Focusing on the theories of Fanon and Memmi and empowerment education in Germany. *Journal of Education Culture*, *25*(3), 771-794. https://doi.org/10.24159/joec.2019.25.3.771

Hur, J., Jung, G. S., & Kang, S. A. (2019). Study on the relationship among empowering leadership, job crafting, job engagement and innovative behavior: Focused on restaurant industry employees. *Culinary Science & Hospitality Research*, *25*(7), 70-80. https://doi.org/10.20878/cshr.2019.25.7.008

Im, S. H. (2020). *The moderating effect of self-direction on learning on the relationship between empowering leadership and job enthusiasm of IT corporate bosses* (Unpublished Master's thesis). Korea University.

Jung, J. W. (2019, April 8). Yanolja, Let's play with 400 new employees. *Maeil Business Newspaper*. https://www.mk.co.kr/news/society/view/2019/04/215163/

Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal, 33*, 692-724. https://doi.org/10.5465/256287

Kanter, R. M. (1993). *Men and women of the corporation* (2nd ed.), Basic Books.

Kim, B. K., & Kim, M. K. (2018). A study on the effects of ethical management in casino industry upon employee's organizational commitments, whistle-blowing intention. *Journal of Tourism Management Research*, *22*(7), 693-712. https://doi.org/10.18604/tmro.2018.22.7.33

Kim, D. W. (2021, February 27). As a bonus, I'll give you one more year's salary ... The war for recruiting developers that 'What you call is worth'. *Hankook Ilbo.* https://www.hankookilbo.com/News/Read/

A2021022609560004763

Kim, S. Y., Lee, I. S., & Jeon, M. K. (2018). The effect of empowering leadership on job engagement and turnover intention: Focusing on job characteristics and goal orientation. *Journal of Business Research*, *33*, 285-309. https://doi.org/10.22903/jbr.2018.33.2.285

Kim, S. M. (2021, June 7). There are more unicorns in Corona, this year alone, Rise. *Chosun Ilbo*. https://www.chosun.com/economy/tech_it/2021/06/07/JF6J3JWF7NHOLMPN4YRLFIAYEY

Konczak, L. J., Stelly, D. J., & Trusty, M. L. (2000). Defining and measuring empowerment leader behaviors: Development of an upward feedback instrument. *Educational and Psychological Measurement*, *60*(2), 301-313. https://doi.org/10.1177/00131640021970420

Korea Tourism Organization (2019, December 16). *2020 domestic travel trends R.E.F.O.R.M* (Press release). https://kto.visitkorea.or.kr/kor/notice/news/press/board/view.kto?id=440543&rnum=2

Kourtesopoulou, A., Theodorou, S. D., Kriemadis, A., & Papaioanou, A. (2019). The impact of online travel agencies web service quality on customer satisfaction and purchase intentions. In V. Katsoni & M. Segarra-Oña (Eds.), *Smart tourism as a driver for culture and sustainability* (pp. 343-356). Springer.

Kristof-Brown, A. L., & Billsberry, J. (2013). Fit for the future. In A. L. Kristof-Brown & J. Billsberry (Eds.), *Organizational fit: Key issues and new directions* (pp. 1-20). Wiley-Blackwell.

Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individuals' fit at work: A meta-analysis of person-job, person-organization, person-group, and person-supervisor fit. *Personnel Psychology*, *58*(2), 281-342. https://doi.org/10.1111/j.1744-6570.2005.00672.x

Kristof, A. L. (1996). Person-organization fit: An integrative review of its conceptualizations, measurement, and implications. *Personnel Psychology*, *49*(1), 1-49. https://doi.org/10.1111/j.1744-6570.1996.tb01790.x

Kwak, D. Y. (2020). Moderating effects of trust, OTA scale, and transaction safety on the relationship between service quality of online travel agency (OTA) and intention of use. *Journal of Tourism Enhancement*, *8*(3), 87-102. https://doi.org/10.35498/kotes.2020.8.3.087

Lee, G. S. (2020), A study on the effect of OTA users' demographic factors on perceived risk, perceived benefits, and brand trust. *Journal of Tourism and Leisure Research*, *32*(10), 149-166. https://doi.org/10.31336/JTLR.2020.10.32.10.149.

Lee, H. S., & Kim, P. S. (2019). The effect of service quality on customer satisfaction and repurchase intention by service channels of online travel agency: Focusing on comparison between mobile app and PC based website. *Korean Business Education Review, 34*(1), 429-454. https://doi.org/10.23839/kabe.2019.34.1.429

Lee, H. S. (2021, February 26). Competition for developers is on fire. *Yonhap News*. https://www.yna.co.kr/view/AKR20210225187800017

Lee, K. S., & Park, H. J. (2013). The effect of core service quality, relational benefit, and customer satisfaction to relational orientation in online travel agency. *Journal of Tourism and Leisure Research, 25*(2), 135-153.

Lee, K. Y., & Lee, K. A. (2020). A case study on the use of artificial intelligence (AI) in platform business in the era of Untact. *Journal of Cultural Product & Design*, *62*, 111-120.

Lee, S. M. (2020, June 16). Hana Tour, organizational reorganization and personnel management … 'preparation for post-coronavirus'. *Chosun Ilbo*. https://biz.chosun.com/site/data/html_dir/2020/06/16/2020061601502.html

Maslach, C., Jackson, S. E., & Leiter, M. P. (1997). Maslach burnout inventory. In C. P. Zalaquett & R. J. Wood (Eds.), *Evaluating stress: A book of resources* (pp. 191-218). Scarecrow Press Education.

Min, S. R., & Lee, S. K. (2020). Effects of OTA service quality on satisfaction and behavioral intention. *Journal of Tourism and Leisure Research*, *32*(3), 147-167. https://doi.org/10.31336/JTLR.2020.3.32.3.147

Min, S. R., Lee, S. K., & Kim, Y. T. (2020). The effects of perceived benefit of OTA users on perceived value and intention to co-create: Focusing on the value-based adoption model. *Journal of Tourism Management Research*, *24*(3), 275-292. https://doi.org/10.18604/tmro.2020.24.3.13

Moulik, M., & Giri, V. N. (2021). Impact of increasing social resources on work engagement and affective organizational commitment: The mediating role of person-job fit. *Management and Labour Studies*, *47*(1), 59-73. https://doi.org/10.1177/0258042X211026147

Muchinsky, P. M., & Monahan, C. J. (1987). What is person-environment congruence? Supplementary versus complementary models of fit. *Journal of Vocational Behavior*, *31*(3), 268-277. https://doi.org/10.1016/0001-8791(87)90043-1

Niu, L. X., & Lee, J. H. (2018). The intention of repurchase on e-service quality by online travel agency site. *International Journal of Industrial Distribution & Business*, *9*(7), 61-70. https://doi.org/10.13106/ijidb.2018.vol9.no7.61.

Park, S. Y., Kim, J. H., & Lim, D. H. (2018). Work engagement in nonprofit organizations: A conceptual model. *Human Resource Development Review*, *17*(1), 5-33. https://doi.org/10.1177/1534484317750993

Park, W. W. (1997). Empowerment: Its meaning and application. *Korean Management Review*, *26*(1), 115-138. https://www.dbpia.co.kr/journal/articleDetail?nodeId=NODE06078970

Quinn, R. E., & Spreitzer, G. M. (1997). The road to empowerment: Seven questions every leader should consider. *Organizational Dynamics*, *26*(2), 37-49. https://doi.org/10.1016/S0090-2616(97)90004-8

Rothbard, N. P. (2001). Enriching or depleting? The dynamics of engagement in work and family roles. *Administrative Science Quarterly*, *46*(4), 655-684. https://doi.org/10.2307/3094827

Rynes, S., & Gerhart, B. (1990). Interviewer assessments of applicant fit: An exploratory investigation. *Personnel Psychology*, *43*(1), 13-35. https://doi.org/10.1111/j.1744-6570.1990.tb02004.x

Ryu, G. P. (2014). Rethinking public service motivation from the perspective of person-environment fit: Complementary or sup-plementary relationship?. *Review of Public Personal Administration*, *37*(3), 351-368. https://doi.org/10.1177/0734371X14540688

Schaufeli, W. B., & Bakker, A. B. (2001). Werk en welbevinden: Naar een positieve benadering in de Arbeids-en Gezondheidspsy-chologie (Work and well-being: Towards a positive occupational health psychology). *Gedrag en Organisatie*, *14*, 229-253.

Schaufeli, W. B., Salanova, M., González-Romá, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies*, *3*(1), 71-92. https://doi.org/10.1023/A:1015630930326

Seo, J. J. (2020). *A study on the influence of human resources development on turnover intention: Focusing on the mediating the effect of authentic leadership on innovative behavior in A public institution effect of job engagement and the moderating effect the effect of authentic leadership on innovative behavior in a public institution of fitness* (Unpublished Doctoral dissertation). University of Ulsan.

Seppälä, P., Mauno, S., Kinnunen, M. L., Feldt, T., Juuti, T., & Tolvanen, A. et al. (2012). Is work engagement related to healthy cardiac autonomic activity? Evidence from a field study among finnish women workers. *Journal of Positive Psychology*, *7*(2), 95-106. https://doi.org/10.1080/17439760.2011.637342

Shin, M. J. (2019, October 9). Travel agency in my hand... the travel industry's landscape is changing with the speed of OTA. *Hangyeo-re*. https://www.hani.co.kr/arti/economy/marketing/912614.html#csidx85d96482aac57448c10a655e9bdab8c

Singh, J., & Chopra, V. G. (2018). Workplace spirituality, grit and work engagement. *Asia-Pacific Journal of Management Research and Innovation*, *14*(1-2), 50-59. https://doi.org/10.1177/2319510X18811776

So, B. G. (2019). *The effect of inclusive leadership on job engagement: Focusing on multiple mediating effects of person-environment fit and self-construal* (Unpublished Doctoral dissertation). University of Ulsan.

Song, H. S. (2018). Smart HR for millennials. *KEF Compensation Quarterly*, *26*, 32-47.

Song, S. T. (2018). *The effect of authentic leadership on innovative behavior in a public institution: The mediating effect of the person-environment fit* (Unpublished Master's Thesis). Department of HRD Consulting, University of Ulsan.

Sung, Y. T., & Lee, J. H. (2019). The impact of empowering leadership on organizational commitment and organizational citizenship behavior: The moderating effect of power distance orientation. *Korean Public Personal Administration Review*, *18*, 97-118.

Te, G., Sohn, Y. W., & Park, J. Y. (2019). The effects of empowering leadership on employee's occupational commitment and proactive behavior: Testing the mediating effects of motivational regulations based on self-determination theory. *Human Resource Management Research, 26*, 97-118.

Thomas, K. W., & Velthouse, B. A. (1990). Cognitive elements of empowerment: An 'interpretive' model of intrinsic task motivation. *Academy of Management Review*, *15*(4), 666-681. https://doi.org/10.5465/amr.1990.4310926

Yang, C. Y. (2018). A comparative study on travelers' online travel agency (OTA) selection attributes and revisit selection attributes. *Management & Information Systems Review*, *37*(4), 175-193. https://doi.org/10.29214/damis.2018.37.4.011

Yang, H. R. (2018). *The effects of empowering leadership on job embeddedness and service-oriented organizational citizenship behavior of flight attendants* (Unpublished Doctoral dissertation). Sejong University.

Yanolja (n.d.). *Yanolja homepage*. https://recruitment.yanolja.co/go/

Yoon, S. H. (2019). The effects of empowering leadership on supervisor trust, intrinsic motivation, and organizational citizen-ship behavior: Focused on local employees of Korean firms in China. *Journal of Chinese Studies, 80*, 271-305.

ISSN 1946-5130 (Print), ISSN 2470-4733 (Online)
http://dx.doi.org/10.20294/jgbt.2023.19.1.143

The Journal of Global Business and Trade

Journal of Global Business and Trade

https://www.pfw.edu/jgbt

A Study on the Effect of FTA Preferential Rules of Origin (PRoO) on Implementation of Preferential Tariff and Export Performance: Focusing on Start-Up Companies

In-Seong Lee[a], Sok-Tae Kim[b]*

[ab]*Department of International Trade, Dongguk University, South Korea*

Received 8 December 2022, Revised 11 January 2023, Accepted 5 February 2023

ABSTRACT

Purpose – This study analyzes the characteristics of preferential rules of origin in terms of restrictiveness, complexity, and uncertainty, and empirically analyzes the effects of these characteristics on the implementation of preferential tariffs for FTAs, and the effects of these on the trade performance of domestic import and export companies. Based on this, we present suggestions.

Design/Methodology/Approach – In order to achieve the purpose of this study, research models and hypotheses were established through literature studies and case studies, and 207 samples were used for empirical analysis. In addition, this study utilized a structural equation model for hypothesis verification, and used AMOS 18.0 as an analysis tool.

Findings – The summary of the results of this study is as follows. First, restrictiveness and uncertainty were found to affect the implementation of preferential tariffs. Second, complexity did not appear to affect the implementation of preferential tariffs. Finally, the implementation of preferential tariffs was found to have a statistically significant effect on the trade performance of start-ups.

Research Implications – This study provided academic implications by analyzing the factors that affect the implementation of preferential tariffs into Restrictiveness, Complexity, and Uncertainty through literature research. In addition, by analyzing the effect of preferential tariff enforcement on trade performance, practical implications for increasing the FTA utilization rate of companies were provided.

Keywords: export performance, FTA, preferential rules of origin, preferential tariff
JEL Classifications: F13, F51, F53

* *Corresponding Author, E-mail: ted7@dongguk.edu*

I. Introduction

Due to the advancement of transportation and technology, coupled with the development of logistics systems, international trade transactions have been significantly expanded, resulting in the entire world being grouped as a single, global marketplace. However, numerous trade barriers remain that limit trade between different countries. In particular, each country constrains free trade by using tariff and non-tariff barriers for import and export goods. While tariffs remain common, they have been significantly eased due to the widespread application of preferential trade arrangements such as free trade agreements (FTAs). FTAs apply preferential tariffs to another country if certain criteria are met between the parties to the agreement, with the core criterion being the origin. In other words, if the parties to the agreement are recognized as the country of origin, preferential treatment is applied (Estevadeordal, 2000).

Since preferential treatment under an FTA applies only to the goods of the contracting parties, in order to apply preferential tariff benefits, the country of origin of the goods concerned must be confirmed. There are Preferential Rules of Origin (PRoO) as a rule for verifying origin, which includes rules and procedures that can grant origin and preferential tariffs to the goods concerned. Although the PRoO are key rules of trade in goods, it is complex and contains issues that can lead to disputes due to ambiguity in the definition of responsibility and risk.

In other words, RoO themselves can be another barrier to trade, and disputes arise due to the Restrictiveness, Complexity, and Uncertainty inherent in the regulations. Efforts have been made to establish globally common uniform rules to address these complex and interconnected issues for RoO, but no RoO model has been specified. Parties concluding an FTA propose RoO that are advantageous in mutual agreements, and want to be reflected in the agreements. In fact, RoO are a necessary requirement for free trade, but they can also act as an obstacle. This is a big factor influencing whether to implement preferential tariffs using country of origin, but it is not easy to find a solution. Rather, each country cannot ignore the requirements of each industry related to its industry group, so when concluding an FTA, it adopts a stricter standard for RoO, which causes excessive cost effects and makes the process difficult, which is an obstacle to FTA utilization.

While tariff barriers are lowered after the application of FTAs, there exist other inherent difficulties . When a company exports to a partner country with which it has formed an agreement, it must meet the rules of origin given in the preferential agreement. This requirement could serve as a barrier, as the rules of origin can restrict the application of preferential treatment to companies conducting international trade transactions.

Therefore, this study aims to present implications based on the results derived from an analysis of the characteristics of the preferential rules of origin, conduct an empirical analysis of the effect of preferential tariffs under the FTA, and investigate how these implications affect the trade performance of domestic import and export companies.

In addition, this study classifies the characteristics of preferential rules of origin by type and analyzes the effects of preferential tariffs on corporate trade performance by characteristics and lack of company participation in origin education due to difficulties in FTAs. In particular, referring to the research of Yi (2016), this study focuses on the effects of the actual Preferential Rules of Origin (PRoO) characteristics on domestic import and export companies, and establishes a new hypothesis. Companies can use the results of this study as guidelines for the use of preferential tariffs under preferential agreements. Moreover, unlike previous studies related to FTAs and country of origin, this study analyzes the relationship between FTA execution and the trade performance of import and export companies.

II. Literature Review and Hypothesis Development

1. The Preferential Rules of Origin (PRoO)

A country of origin refers to a country in which animals and plants have been grown or raised or in which goods have been manufactured, produced, or processed. Here, the country includes an independent tariff area, and the Rules of Origin (RoO) are the laws (domestic and international) and instructions that confirm and determine the nationality of a good. RoO can be divided into PRoO, which apply preferential treatment in terms of tariffs, and Non-PRoO, which are used for purposes other than tariff benefits, according to the method of application and its purpose.

RoO are essential in the application of FTAs because the subject of preferential tariffs under the FTA is limited to products that meet the standards of the country of origin stipulated in the FTA. In free trade negotiations, in addition to trade liberalization, which is an important purpose of the FTA, RoO are considered the most important subject for negotiation regarding the product aspect of an FTA, and is a procedure that exists due to trade liberalization. Even if tariffs on trade products are completely abolished, if the buyer is not satisfied with products of origin under the preferential trade agreement, they cannot benefit from tariff elimination.

Krueger (1993) stated that, in a study on how PRoO affect the FTA as a protective device, that there is no important protectionist bias inherent in the FTA in the customs union. It was confirmed that PRoO actually expand protections because each imported product flows through the country with the lowest tariffs, and some assert that PRoO, unlike the customs union, can be a source of bias against economic inefficiency in the FTA.

Inama (2005) found that, in relation to the complexity of trade with PRoO, agreements such as the Association of Southeast Asian Nations (ASEAN), ASEAN-China, and the Bangkok Agreement apply to the entire value content, except for ASEAN, which stipulates a relatively small number of specific rules for some products (steel, fiber, wood, and others). Many of the countries that use this regulation maintain relatively low or very limited preferential tariff liberalization, so the level of preference is extremely low, which can be supported by evidence such as the low utilization of ASEAN, thus confirming the increasing complexity of RoO among RTA (Regional Trade Agreement) members.

Yi (2016) attempted to analyze the applicability and potential improvement of dispute resolution procedures in FTAs aimed at PRoO. Although PRoO control preferential tariffs granted under the FTA, there are relatively few studies on the procedure for resolving disputes related to RoO under an FTA. Further, by examining the case of disputes related to PRoO, we present that the limitations, complexity, and uncertainty inherent in PRoO can stimulate political tension and anxiety.

2. Characteristics of Preferential Rules of Origin

A pilot study of PRoO found that preferential tariffs can complicate the application of FTAs which allow for them, or may cause trade disputes. In particular, it has been frequently argued in previous studies that RoO can be strictly applied as tools for protective trade in FTAs. Such points were first raised regarding the limitations of PRoO. Under preferential agreements, RoOs are key for trade in goods, but they include complex rules that can cause disputes due to the ambiguity surrounding liability and the definition of risk. The widespread application of FTAs from these strict procedures is controversial in terms of the application and interpretation of RoOs because they can complicate import and export procedures and are ambiguous, akin to the spaghetti bowl effect (Duque, 2020).

Owing to inconsistency in RoO interpretation, it is often unclear which side is responsible, and there

are issues when applying an FTA. Certificates of origin for goods subject to preferential application are issued in the country of manufacture and production, but in the event of problems related to preferential tariffs, the customs authorities of the importing country enforce them on the importer, which can cause uncertainties. Such uncertainty may push companies to hesitate before applying FTAs in international trade transactions. All things considered, RoO usage is limited, complicated, and uncertain.

Based on the aforementioned previous studies, this study aims to conduct an analysis by defining the specificity of the preferential origin regulation as restrictiveness, complexity, and uncertainty.

2.1. The Relationship between Restrictiveness and the Implementation of Preferential Tariffs

Restrictiveness refers to the degree of strictness and permissiveness of origin determination criteria, which are used to apply preferential agreements. Ju and Krishna (1998), in a study on corporate form and market access in an RoO-applied free trade area, argued that RoO hinder the trade creation effect on member countries; RoO require companies to use inefficient regional inputs to produce finished products.

Complicated procedures dealing with confidential regulations in the country of origin place an enormous burden on the enterprise, and customs authorities can revoke benefits from preferential tariffs (Yi, 2016). In previous studies on PRoO, various factors that could not be used and caused trade disputes were selected. The most frequently raised problem in previous studies are that RoO can be applied very strictly as an implicit tool to promote protected trade in FTAs. We can infer this from debate on the restrictive nature of PRoO.

Ju and Krishna (1998) warned that the trade creation effect of FTAs on member countries is hampered by RoO that require companies to use inefficient regional inputs to produce finished products, and that limited RoO hinder input transactions between finished products and member states. Krishna and Krueger (1995) and Krueger (1993) recommended that countries replace tariffs and use RoO as a tool for trade policy. There are many domestic and foreign analyses suggesting that that RoO and FTAs affect global trading company use of FTAs. Baccini et al. (2018) analyzed the correlation between the limitations and utilization of PRoO, and Sytsma (2021) identified the determinants of the phenomenon of the spaghetti ball effect in the use of an FTA already in effect. Isono (2008) found that the reason for the low rate of utilization of FTAs by small and medium enterprises (SMEs) arose from the lack of information and that RoO were both difficult and complicated for SMEs. As discussed in several previous studies, the following hypothesis was established to verify whether the limitations of RoO affect the execution of preferential tariffs due to the restrictiveness, such as whether the use of FTAs and the use of inputs from the region of origin in PRoO negatively impact the process. From this, the following hypothesis was proposed.

H1: Restrictions will not affect the implementation of preferential tariffs.

2.2. The Relationship between Complexity and the Implementation of Preferential Tariffs

Due to their complexity, RoO differ among contracting countries, which acts as a trade barrier, or causes issues in international trade. Duque (2020) framed the problems of complex and restrictive RoO as a spaghetti ball effect while also pointing out the inefficiency of simultaneous FTA agreements. The complexity of RoO increase in the following two situations. when (1) RoO for a product vary by regulation, and (2) when the rules are applied under complex trading patterns between parties under an FTA. In a study conducted by Cadot et al. (2006) on the complexity of product specific rules (PSR) applied to a preferential trade agreement between the Pan-

European Economic Union (PANEURO), the North American Free Trade Agreement (NAFTA), and the European Union (EU), it was stated that the high management costs of PANEURO occur as a result of red-tape formalities to obtain certification from PANEURO. From the perspective of a company that utilizes preferential tariffs, RoO may vary for each country it does business with, which means that it will inevitably face difficulties preparing documents to prove country of origin. Therefore, to verify the extent to which the complexity of RoO affects the actual implementation of preferential tariffs, the following hypothesis was established.

H2: Complexity of RoO will not affect the implementation of preferential tariffs.

2.3. The Relationship between Uncertainty and the Implementation of Preferential Tariffs

Estevadeordal (2000) suggested that complex RoO increase costs and uncertainty for both the public and private sectors. Izam (2003) claimed that there are significant problems in the RoO verification process from the viewpoint of dispute resolution. Because the customs authorities of both parties are involved in the verification process under an FTA, the interpretation of the origin of one party may not always concur with the interpretation of the origin of the other party. Cantin and Lowenfeld (1993) stated that there is a potential difference in the interpretation and understanding of RoO between exporting and importing countries. As the procedure of origin verification involves two countries with different legal and cultural backgrounds, there is room for controversy concerning understanding and applying RoO. Some of the major issues in origin verification are as follows. First, customs authorities have to pay a significant amount of money to visit the other party for verification, the effectiveness of which cannot be guaranteed without pleasant cooperation between customs authorities in the case of indirect verification. Second, Harris and Staples (2009) pointed out that another dilemma of the procedure is the imbalance of rights and obligations between producers and importers. While producers are familiar with the source of origin of their products, importers are the ones responsible for paying customs duties. Therefore, if a producer provides false information on the origin of the product through fraud or negligence, the importer will be liable for unpaid customs duties and penalties. If an importer decides to adopt a self-certification method to protect himself/herself from the aforementioned problems, more costs may be incurred and the process may become more inconvenient. Third, uncertainty in the verification process may increase the operating costs of the FTA, preventing companies from practicing free trade. In addition, verification procedures can often be inefficient due to budgetary constraints put on visits for authentication. Countries tend to toughen pre-export inspections during the certification process to compensate for weaknesses in the post-verification process. However, in doing so, exporters can often be subjected to strict pre-export inspections (Manchin & Pelkmans-Balaoing, 2007). This may lead to disputes as it increases uncertainty about corporate responsibility for RoO and reduces the use of FTAs. As such, the following hypothesis was established to examine whether the uncertainty of RoO reflecting these inherent risks from the use of preferential tariffs affects the actual implementation of preferential tariffs by foreign trade companies.

H3: Uncertainty of RoO will not affect the implementation of preferential tariffs. 4.

3. The Relationship between Export Performance and the Implementation of Preferential Tariffs.

Diverse factors influence companies engaging in international trade. Among these, preferential tariffs from the expanding application of the FTA for more free trade between nations will

significantly impact relevant companies and countries. Regarding the economic effects of preferential agreements, Petros (2018) inferred the effects of origin standards in FTAs on the economy. In particular, he analyzed the issues of origin standards in the textile industry, a highly disputed field in the Korean Free Trade Agreement (KORUS FTA), and calculated the relationship between the utilization of FTAs and origin standards in NAFTA. Yi (2016) examined how domestic import-export companies improved their use of finite resources and corporate capabilities through a globalization strategy, and analyzed the factors that affect export performance in international trade in an FTA environment. Estevadeordal et al. (2007) evaluated the restrictiveness and complexity of RoO that limit the application of preferential tariffs in preferential agreements, associated costs, and their impacts on exporters, producers, and importers, being the relevant parties to the agreement. Tovar (2022) analyzed the effect of the post-verification procedure of origin on the implementation of preferential tariffs, and asserted that a difference of understanding or a lack of responsibility between exporters, producers, importers, and customs authorities, the relevant parties to the agreement, on the storage and issuance of supporting documents of the origin will lead to uncertainty toward the post-verification procedure, which, in turn, will restrict the functions of FTA preferential tariffs. Edward and David (2020) identified the major factors influencing the decision on the origin standard for each FTA industry, and established the origin standard suitable for each. A study on the implementation and utilization of FTAs in major countries, such as countries in ASEAN, the EU, and the United States, conducted by Adarov and Ghodsi (2021) pointed out that the use of FTAs is affected by the actual benefit from the preferential tariff rates of the FTA, the degree of support for the use of the FTA, the post-verification procedure of the origin, and the characteristics of the RoO. Kawecka-Wyrzykowska (2020) extended the scope of research on the complex and restricted characteristics of international trade related laws to suggest improvements for preferential RoO, and later derived theoretical and policy implications for preferential RoO. With a focus on Korea's major traded goods, Mohammad and Bashar (2019) quantitatively measured the rigidity of the RoO of FTAs, and based on the findings, analyzed how the measured index affects the volume of trade.

Based on the aforementioned literature, a hypothesis was formulated focusing on the relationship between the characteristics of PRoO to investigate whether the implementation and successful use of preferential tariffs according to preferential treatment affect the trade performance of import-export companies.

H4: Successful implementation of preferential tariffs will not affect the trade performance of export-import enterprises.

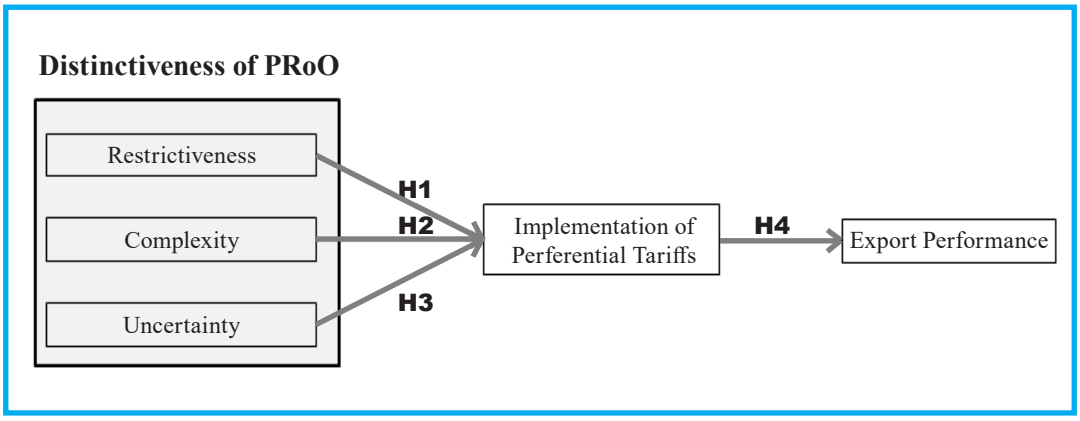
4. Degree of Impact from the Characteristics of Rules of Origin on Implementation of Preferential Tariffs

The characteristics of PRoO, key in applying preferential tariffs when forming agreements on business between parties in different countries, were categorized. The following hypothesis was developed to confirm whether the characteristics of restrictiveness, complexity, and uncertainty have the same impact on the implementation of preferential tariffs under an FTA.

H5: The characteristics of the RoO, restrictiveness, complexity, and uncertainty, will have an equivalent level of impact on the implementation of preferential tariffs for an FTA.

Based on the previous literature and research hypotheses mentioned above, this study established the research model shown in Fig. 1, assuming that the characteristics of PRoO will form a causal relationship with the successful implementation and trade performance of preferential tariffs by import-export companies engaging in international trade.

Fig. 1. Research Model



III. Research Methodology

1. Research Subjects and Data Collection

To analyze the effect of the distinct characteristics of PRoO on the implementation of preferential tariffs and export performance, companies in business incubation centers in major universities across the country were selected as research subjects. As start-up companies lack human and material resources, the FTA spaghetti bowl effect occurs strongly. A survey was conducted for empirical analysis, prior to which a preliminary survey of 32 graduate students in business schools currently working or running a business was conducted to improve the quality of the questionnaire. All product groups, excluding commodity products, were included in the survey to strengthen the representativeness of the survey. The MTI classification was employed.

The survey was conducted for four weeks from January 1, 2022 to February 1, 2022, and a total of 221 valid responses were obtained for the analysis.

2. Measurement of Variables and Research Methodology

In order to achieve the purpose of this study, a research model and research hypotheses were established based on previous studies, and questionnaire items that fit the research hypotheses were formed to identify companies that utilize country of origin and preferential tariffs and experts in charge of consulting in the relevant field. Statistical analysis was performed by conducting a questionnaire survey on the subjects. Based on the questionnaire items collected for this study, it is necessary to verify the research model and hypothesis, and empirical analysis was conducted for reliability and validity analysis. Prior to statistical analysis for empirical analysis, the reliability of the questionnaire items and set variables is measured. To measure the same concept, the internal consistency of each item is analyzed and measured by Cronbach's α. In addition, exploratory factor analysis was conducted to identify the characteristics of each variable and confirm the inherent correlation. Next, path analysis was conducted to determine the relationship between each variable in the research model.

In addition, to achieve the purpose of this study, the items to be measured were constructed based on previous literature (Table 1), and a 5-point Likert scale ranging from 1 to 5 was used. In addition, the study used frequency analysis, confirmatory factor analysis, and structural equation modelling for the analysis. SPSS 23.0 and AMOS 18.0 were utilized to derive the results of the research.

Table 1. Measurement Items

Construct		Item	References
①	RES1	Degree of understanding restrictiveness	Brandstatter (2011), Lumpkin and Dess (2001)
	RES2	Impact on FTA utilization	
	RES3	Restriction on the use of local inputs	
	RES4	Difficulty in determining the origin	
②	COM1	Degree of understanding complexity	
	COM	Impact on FTA utilization	
	COM3	Degree of complexity between contracting countries	
	COM4	Level of burden for document preparation	
③	UNC1	Degree of understanding uncertainty	
	UNC2	Impact on origin verification procedure	
	UNC3	Impact of responsibility for penalties during verification procedure	
	UNC4	Limitations on and inefficiencies regarding budget for validation	
④	IPT1	Effect of restrictiveness on implementation of preferential tariffs	Ma et al. (2009),
	IPT2	Effect of complexity on implementation of preferential tariffs	
	IPT3	Effect of uncertainty on implementation of preferential tariffs	
	IPT4	Negative impact of characteristics of PRoO	
⑤	EXP1	Export performance and impact from the characteristics of PRoO	Sousa et al. (2008)
	EXP2	Growth of new business	
	EXP3	Cost reduction from FTA utilization	

Note: ① Restrictiveness ② Complexity ③ Uncertainty ④ Implementation of Preferential Tariffs ⑤ Export Performance.

IV. Results of Empirical Analysis

1. General Characteristics of Research Samples

Frequency analysis was used to determine the general characteristics of the research sample, the results of which are as shown in Table 2. The study surveyed start-up companies with less than seven years of work history, as stated in the Support for Small and Medium Enterprise Establishment Act. Companies with more than a year and less than three years of work history constituted the majority of those surveyed, and companies with less than ten full-time employees accounted for approximately 77% of the total respondents. Furthermore, companies exporting to China, North America, and the EU accounted for 73% of the surveyed businesses

2. Correlation between Variables

The correlation between constructs used in the study is shown in Table 3. The analysis revealed a significant correlation between constructs overall. In particular, complexity had a relatively higher correlation. The subfactors of PRoO showed a high correlation between restrictiveness, complexity, and uncertainty. The average was 3.962, and 'restrictiveness' and 'implementation of preferential tariffs had the highest and lowest values, respectively. The standard deviation was highest for the variable 'complexity' at .822, and lowest for the variable 'implementation of preferential tariffs' at .711.

Table 2. Demographic Characteristics

	Item	Frequency	%		Item	Frequency	%
Company Age	1Y↓	21	8.6%	Employees	3↓	5	1.3%
	1Y~3Y↓	100	45.6%		3~5↓	67	30.6%
	3Y~5Y↓	76	34.7%		5~10↓	96	43.8%
	5Y~7Y↓	24	11.1%		10↑	51	23.3%
	Total	221	100%		Total	221	100%
Trade Good	Processed Food	42	19.1%	Main Market	China	66	30.2%
	Chemical Item	39	17.9%		North America	52	23.7%
	Fabric Item	21	9.5%		EU	42	19.2%
	Electric Item	34	15.5%		ASEAN	33	15.1%
	Automobile Item	33	14.8%		Japan	13	5.9%
	Precision Item	43	18.9%		Middle East / Africa	9	3.1%
	Others	9	4.3%		Others	6	2.7%
	Total	221	100%		Total	208	100

Table 3. Correlations Among Constructs

CONSTRUCT	①	②	③	④	⑤
	.833				
	.597**	.844			
	.314**	.502**	.885		
	.197*	.327**	.191*	.902	
	.231**	.285**	.302**	.387**	.875
Mean	3.962	3.896	3.787	3.245	3.297
Std D	.754	.822	.782	.711	.806

Note: ① Restrictiveness ② Complexity ③ Uncertainty ④ Implementation of Preferential Tariffs ⑤ Export Performance.

3. Reliability and Validity of Variables

To validate the reliability and validity of the variables used in the study, confirmatory factor analysis was conducted, the results of which are presented in Table 4. As indicated the table, the minimum t-value was greater than 15.731, which means that all measured items were significant at the 99% confidence level. In addition, the conceptual reliability (CR) value was greater than 0.7, and the mean variance extraction (AVE) value was greater than 0.5, which allows us to conclude that the measurement items of the variables are reliable (Ma et al., 2009).

4. Results of Empirical Test

AMOS 18.0 was used to verify the research model presented in Fig. 1. To verify the hypotheses, a model fit analysis of the research model was performed. The results are shown in Table 5, and they were analyzed to be satisfactory compared to the standard index.

The result of hypothesis verification is as follows. First, restrictiveness, selected as a variable among the characteristics of PRoO, affects the implementation of preferential tariffs. Second, analyzing the impact of complexity, selected as a variable among the characteristics of

Table 4. Confirmatory Factor Analysis

Construct	Item	Loading	Std. Error	Std Loading	t value	Cronbach α	CR	AVE
①	RES1	1.000	-	.875	-	.932	.775	.639
	RES2	.928	.048	.883	19.868			
	RES3	.987	.047	.848	19.559			
	RES4	.931	.049	.874	20.997			
②	COM1	1.000	-	.856	-	.921	.820	.711
	COM2	1.012	.048	.910	20.767			
	COM3	1.112	.046	.839	21.321			
	COM4	1.035	.057	.885	20.101			
③	UNC1	1.000	-	.729	-	.906	.823	.795
	UNC2	.989	.096	.810	18.787			
	UNC3	.954	.093	.786	19.210			
	UNC4	.976	.092	.784	18.319			
④	IPT1	1.000	-	.815	-	.865	.776	.605
	IPT2	.998	.068	.856	16.765			
	IPT3	1.001	.069	.834	15.713			
	IPT4	1.007	.067	.667	16.903			
⑤	EXP1	1.000	-	.904	-	.879	.784	.653
	EXP2	.912	.057	.867	19.913			
	EXP3	.898	.058	.775	17.216			

Note: ① Restrictiveness ② Complexity ③ Uncertainty ④ Implementation of Preferential Tariffs ⑤ Export Performance.

PRoO, revealed that domestic export companies face difficulties due to complexity, but it does not affect the implementation of preferential tariffs. Third, uncertainty, selected as a variable among the characteristics of PRoO, affects the implementation of preferential tariffs. Fourth, successful implementation of preferential tariffs impacts the trade performance of domestic import-export companies. Fifth, regarding the degree to which these characteristics impact the successful implementation of the preferential tariffs of an FTA, restrictiveness and uncertainty were statistically significant, while uncertainty was not. However, the standardized path coefficient showed that the effects were shown in the order of uncertainty, restrictiveness, and complexity. In addition, with regard to the degree to which the characteristics of PRoO impact the implementation of the preferential tariff of an FTA, the respondents tended to be aware of the impact in the order of uncertainty, complexity, and restrictiveness.

Table 5. Model Fit Index

Index	x^2/df	GFI	AGFI	CFI	NFI	IFI	RMSEA
Std	3≥	0.9≤	0.8≤	0.9≤	0.9≤	0.9≤	0.08≥
Result	2.82	.92	.45	.94	.95	.93	.06

Table 6. Analysis Results

	Path		p-value	Result
H1	Restrictiveness → Implementation of Preferential Tariffs	0.312**	0.014	Reject
H2	Complexity → Implementation of Preferential Tariffs	0.346**	0.000	Accept
H3	Uncertainty → Implementation of Preferential Tariffs	0.278*	0.005	Reject
H4	Implementation of Preferential Tariffs → Export Performance	0.377**	0.016	Reject

Note: *p<.05. **p<.01.

V. Conclusions and Implications

In line with the recent expansion of FTAs, various research is being conducted on their use and economic impacts, a comparison of RoO of FTAs, comparative analysis between FTAs, and characteristics of RoO and utilization strategies. On the other hand, relatively few studies have explored dispute cases and systems for resolution according to the use of FTAs, or the effect of the characteristics of PRoO on the implementation of FTA preferential tariffs and companies. Effective use of FTAs encourage revitalization and the growth of international trade. However, RoO, which are essential to benefit from preferential tariffs under preferential agreements such as

FTAs, may be cumbersome for users. Therefore, this study examined how the characteristics of PRoO actually impact the relevant parties of international trade, and how they affect the implementation of preferential tariffs and company export performance by classifying characteristics by type.

In a preferential trade agreement, RoO present only the general principles, so the relevant parties of the agreement prepare their own regulations and implementation plans. Therefore, how the parties interpret or apply the regulations may differ on certain matters, causing issues during post-verification procedures, and exporters or importers that have been granted preferential tariffs under the agreement may suffer damage. This places a significant burden on companies using FTAs.

In addition, RoO, which are particularly important in the commodity trade, have various characteristics to consider. Three characteristics were identified, restrictiveness, complexity, and uncertainty, and the study examined how these impact the implementation of preferential tariffs, and if affected, how they relate to the trade performance of companies based on the previous literature on PRoO.

In this study, the characteristics of PRoO were analyzed on the effect of preferential tariff practice and the export performance of companies under FTA. It was confirmed that the characteristics of RoO affect the implementation of preferential tariffs through FTA, and consequently, it is related to the export performance of companies in international trade.

The results of the empirical analysis of this study are summarized as follows.

First, among the characteristics of PRoO, the limitation selected as a variable affects the implementation of preferential tariffs. Second, as a result of analyzing the effect of complexity, which was selected as a major variable of PRoO characteristics, on preferential tariff execution, it was found that domestic import and export companies had difficulties due to complexity, but it did not affect preferential tariff execution. Third, among the characteristics of PRoO, uncertainty affects the implementation of preferential tariffs. Fourth, the successful implementation of preferential tariffs affects the trade performance of domestic import and export companies. Fifth, among the characteristics of PRoO, when it comes to the degree of influence on the successful implementation of FTA preferential tariffs, limitations and uncertainties have a statistically significant effect, while complexity does not have a statistically significant effect. However, as a result of standardized path coefficients, the effects were shown in the order of Uncertainty > Restrictiveness > Complexity. In terms of perception, it was found that they were recognized in the order of Uncertainty > Complexity > Restrictiveness.

Despite its implications, this study has the following limitations. Opposing results were found in some hypotheses in which the characteristics of PRoO were selected as factor variables. It is assumed that although the preparation and management of documents to adhere to the complex regulations of different countries to receive benefits through preferential tariffs is challenging, the research subjects of the study, which are domestic import-export companies, can respond to such complexity with accumulated experience and knowledge in utilizing FTAs. In addition, it is considered that the more a company accumulates experience utilizing FTAs, the more competent it becomes in complex origin management. Furthermore, it will be necessary to subdivide the research subjects into exporters and importers, and conduct research on how RoO affect different industries or regions. Once the problems that exporters, importers, and various industries face are identified and effective countermeasures have been established, domestic import-export companies will be able to refer to the findings to apply preferential tariffs according to their needs.

References

Adarov, A., & Ghodsi, M. (2021). The impact of the Eurasian Economic Union: Iran preferential trade agreement on mutual trade at aggregate and sectoral levels. *Eurasian Economic Review, 11*, 125-157.

Brandstätter, H. (2011). Personality aspects of entrepreneurship: A look at five meta-analyses. *Personality and Individual Differences*, *51*(3), 222-230.

Cadot, O., Carrere, C., DeMelo, J., & Tumurchudur, B. (2006). Product-specificrulesof origin in EU and US preferential trading arrangements: an assessmen. *World Trade Review, 5*(2), 199-224.

Cantin, F. P., & Lowenfeld, A. F. (1993). Rules of origin, the Canada-Us FTA, and the Honda case. *The American Journal of International Law, 87*(3), 375-390.

Edward, J. B., & David, G. T. (2020). Comparison of deep integration in the Melitz, Krugman and Armington models: The case of the Philippines in RCEP. *Economic Modelling*, *85*, 255-271.

Estevadeordal, A. (2000). Negotiating preferential market access: The case of the North American free trade agreement. *Journal of World Trade, 34*(1), 141-198.

Estevadeordal, A., Harris, J., & Suominen, K. (2007, September 10-12). Multilateralizing preferential rules of origin around the world. Paper presented at the WTO/HEI/NCCR trade/CEPR conference. Geneva, Switzerland.

Duque, G. G. (2020). The termination agreement of Intra-EU bilateral investment treaties: A spaghetti-bowl with fewer ingredients and more questions. *Journal of International Arbitration, 37*(6), 797-826.

Harris, J., & Staples, B. R. (2009). *Origin and beyond: Trade facilitation disaster or trade facility opportunity?* (ADBI Working paper Senies). Asian Development Bank Institute, 1-12.

Inama, S. (2005). The Association of South East Asian Nations-People's Republic of China free trade area: Negotiating beyond eternity with little trade liberalization?. *Journal of World Trade, 39*(3), 559-579.

Isono, I. (2008). Impediments to FTA utilization and industrial clusters. In A. Kikuchi & M. Tsuji (Eds.), *Midterm Report* (pp. 150-151). IDE-JETRO.

Izam, M. (2003). *Rules of oigin and trade facilitation in preferential trade agreements in Latin America.* United Nations, Economic Commission for Latin America and the Caribbean.

Ju, J., & Krishna, K. (1998). *Firm behavior and market access in a free trade area with rules of origin* (Working paper No. 6857). National Bureau of Economic Research.

Kawecka-Wyrzykowska, E. (2020). Importance and motives of preferential trade agreements in the EU's external trade. *Economics and Business Review, 6*(3), 3-22.

Krueger, A. O. (1993). *Free trade agreements as protectionist devices: Rules of origin* (Working paper No. 4352). National Bureau of Economic Research.

Krishna, K., & Krueger, A. O. (1995). *Implementing free trade areas: Rules of origin and hidden protection* (Working paper No. 4983). National Bureau of Economic Research.

Baccini, L., Dür, A., & Elsig, M. (2018). Intra-industry trade, global value chains, and preferential tariff liberalization. *International Studies Quarterly, 62*(2), 329-340.

Lumpkin, G. T., & Dess, G. G. (2001). Linking two dimensions of entrepreneurial orientation to firm performance: The moderating role of environment and industry life cycle. *Journal of Business Venturing*, *16*(5), 429-451.

Manchin, M., & Pelkmans-Balaoing, A. (2007). *Rules of origin and the web of East Asian free trade agreements* (World Bank Policy Research Working paper No. 4273). World Bank.

Ma, X., Yao, X., & Xi, Y. (2009). How do inter organizational and interpersonal networks affect a firm's strategic adaptive capability in a transition economy?. *Journal of Business Research, 62*(11), 1087-1095.

Mohammad, I., & Bashar, H. (2019). The design and operation of rules of origin in Greater Arab free trade

area: Challenges of implementation and reform. *Journal of World Trade, 53*(2), 243-272.

Petros, C. M. (2018). The case for dropping preferential rules of origin. *Journal of World Trade, 52*(1), 1-13.

Sousa, C. M. P., Martínez-López, F. J., & Coelho, F. (2008). The determinants of export performance: A review of the research in the literature between 1998 and 2005. *International Journal of Management Reviews, 10*(4), 343-374.

Sytsma, T. (2021). Rules of origin and trade preference utilization among least developed countries. *Contemporary Economic Policy, 39*, 701-718.

Tovar, P. (2022). Political–economic determinants of external import protection under a preferential trade agreement. *World Trade Review, 21*(2), 159-184.

Yi, J. S. (2016). A study on the dispute settlement procedure for the preferential rules of origin. *Journal of Arbitration Studies, 26*(3), 3-26.

ISSN 1946-5130 (Print), ISSN 2470-4733 (Online)
http://dx.doi.org/10.20294/jgbt.2023.19.1.157

The Journal of Global Business and Trade

Journal of Global Business and Trade

https://www.pfw.edu/jgbt

Does Commodity Trade Openness Beneficial to the Tourism Sector in Korea?

Soo-Eun Kim[a], Jun Ho Seok[b]*

[a]*Jeonbuk Institute, South Korea*
[b]*Department of International Trade, Jeonbuk National University, South Korea*

Received 24 November 2022, Revised 3 January 2023, Accepted 5 February 2023

ABSTRACT

Purpose – Recently, trade openness has expanded in the world level as well as high trade dependent countries like Korea. In turn, a rise of trade openness is expected to affect on the tourism industry. This study investigates the causal relationship between trade openness, outbound tourism expenses, and inbound tourism receipts to explore whether or not trade openness benefits the tourism sector of Korea.

Design/Methodology/Approach – We utilized the vector error correction (VECM) model, directed acrylic graph (DAG), and Impulse Response Function (IRF) methods to examine those relationships. While VECM allows to figure out the predictive causation, DAG can test the contemporaneous relationship. IRF allows to find the different effect of trade openness on outbound tourism expenses and inbound tourism receipts.

Findings – Our results for VECM and DAG demonstrate that there are causalities of trade openness on inbound tourism receipts and outbound tourism expenses. To evaluate the effect of trade openness on domestic tourism sector in terms of economics and sustainability, we perform the IRF. Results of IRF show that trade openness has a positive and negative effect on outbound tourism expenses and inbound tourism receipts, respectively.

Research Implications – These results indicate that trade openness is not beneficial to the tourism sector of Korea, which implies trade openness's effect on domestic tourism is not sustainable in terms of economic sense.

Keywords: directed acyclic graph, inbound tourism receipt, outbound tourism expense, trade openness, vector error correction model

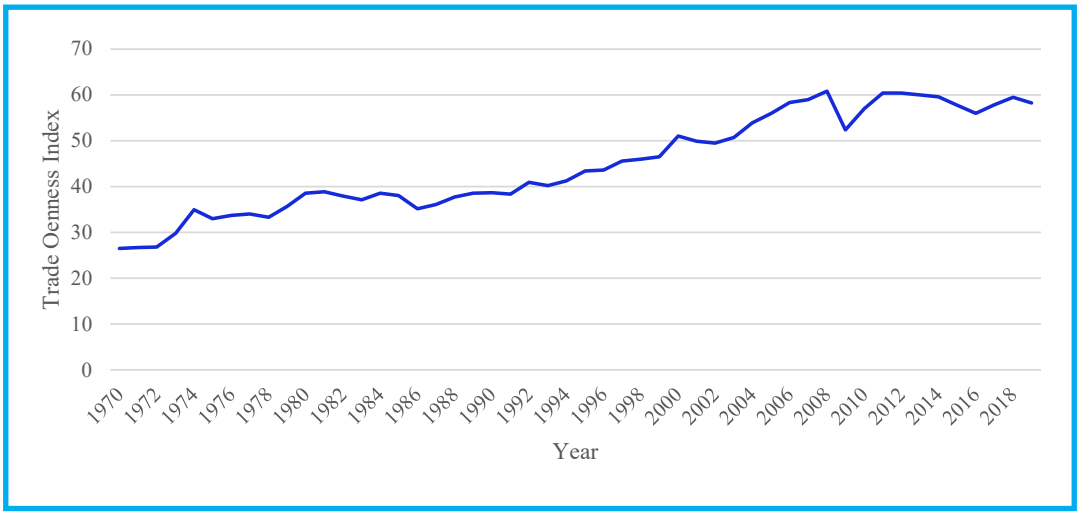
JEL Classifications: F14, Z32, Z38

* *Corresponding Author, E-mail: junhoseok@jbnu.ac.kr*

I. Introduction

Trade liberalization has been gaining momentum across the world in the past several decades. Fig. 1 demonstrates that trade openness advances globally based on the trade openness index. Those increased trade openness might be explained by a surge of regional trade agreements (RTAs) in the world. According to the data of World Trade Organization (WTO), while the cumulative number of RTAs currently in force in 1990 was 22, that number has increased to 354 in 2022. About three decades, numbers of RTAs have increased more than 16 times. Increasing trade openness that is leaded by series of RTAs may influence several macroeconomic factors. Correspondingly, many previous studies have explored the relationship between trade openness and macroeconomic factors such as economic growth (Awokuse, 2008; Ulaşan, 2015; Yanikkaya, 2003), productivity (Abizadeh & Pandey, 2009; Wong, 2009), and employment (Awad-Warrad, 2018; Ngouhouo & Nchofoung, 2021).

Fig. 1. World Trade Openness Index (1970–2018)



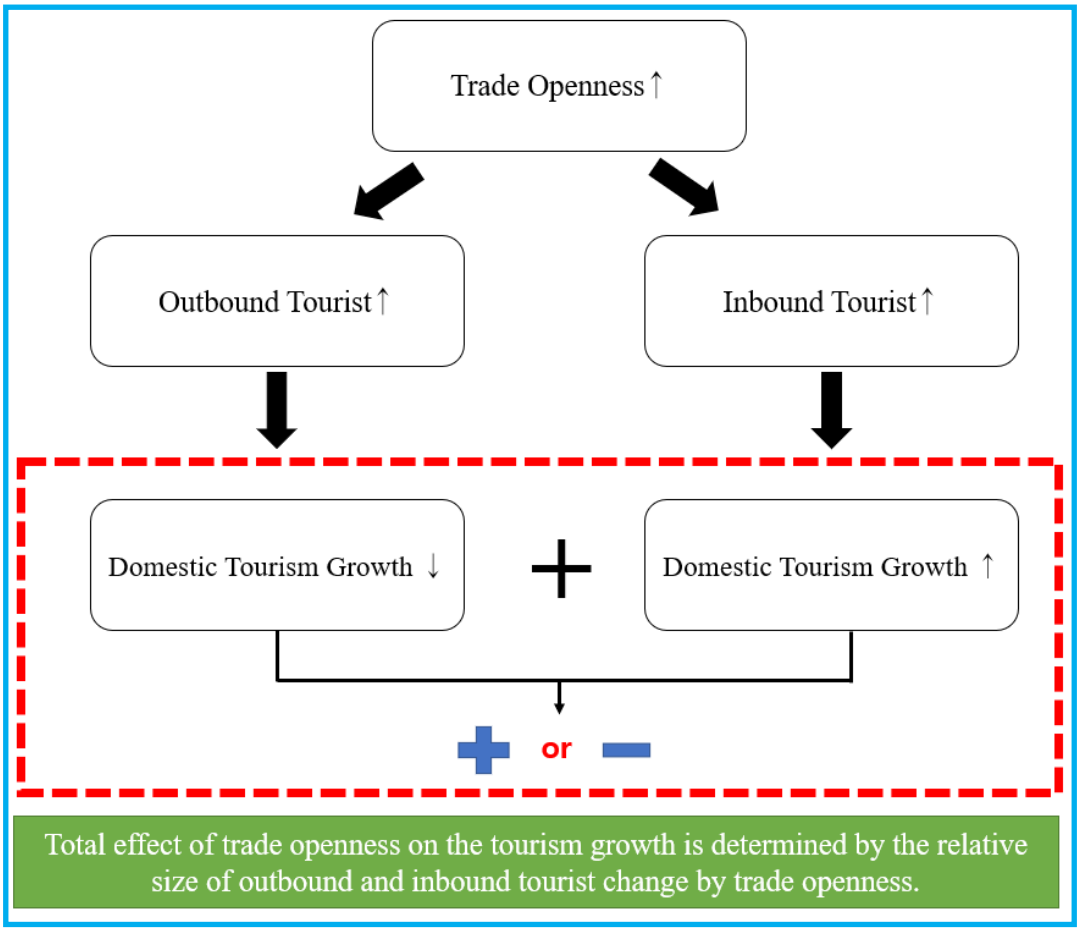
Note: Trade Openness Index is calculated by (Export + Import)/GDP.
Source: Author's Calculation Using World Bank (2018).

Considering the aim of RTA is facilitating trade flows as well as economic integration (Khalid et al., 2022), a rise of trade openness is expected to affect on the tourism sector. There are indirect and direct effects of trade agreements that have an impact on tourism. Indirectly, an increased international trade can promote business trips as well as leisure tourism by simulating awareness and curiosity on trading partner countries (Khalid et al., 2022). Directly, RTAs might promote tourism the provisions for the tourism sector (Khalid et al., 2022). In turn, while trade reflect only indirect effect of RTAs, the trade openness can consider direct and indirect effect of trade agreements. As results, many empirical studies such as Wong and Tang (2010) and Habibi and Ahmadzadeh (2015) have examined the causal relationship between trade openness and tourism rather than trade and tourism.

Even though trade openness that is caused by a recent trend of RTAs affects on inbound and outbound tourism at the same time, previous studies have not explored whether which effect

is larger than the other. In other words, previous studies have not explored whether or not trade openness benefits the tourism sectors of specific countries from the economic perspective, since they have focused on examining the casual direction between trade openness and tourism based on the Granger causality test method. While an increase in inbound tourists benefits the host country, an escalation of outbound tourists is expected to be detrimental. Consecutively, the relative size of the increased volume of inbound and outbound tourists driven by trade openness may determine whether or not trade openness is beneficial to the tourism sectors of specific countries from the economic viewpoint (see. Fig. 2).

Fig. 2. The Increasing Effect of Trade Openness on the Tourism Growth



The question as to whether trade openness benefits the tourism sector is critical for countries that have experienced a high level of trade openness by series of RTAs. Accordingly, this study focuses on South Korea (hereafter called Korea) since the country has experienced a rapid expansion in trade openness. Korea signed its first free trade agreement (FTA) with Chile

in 2004, and has implemented 16 additional FTAs, including with Australia, the U.S. and the European Union (EU) as of 2020. Consequently, Korea's trade openness level from RTAs is much higher than the world average. According to the World Bank database, while the average trade openness index is 58.2 in the world, it is 77 in Korea.

This study investigates whether trade openness benefited the tourism sector in Korea in economic terms to test the sustainability of tourism sector according to the trade liberalization trend that is caused by series of RTAs. Specifically, it examines the causal relationship between trade openness, inbound tourism receipts, and outbound tourism expenses utilizing the vector error correction model (VECM) between 1975 and 2019. By categorizing tourism into inbound tourism receipts and outbound tourism expenses, we can evaluate whether trade openness is beneficial to the tourism sector by comparing receipts and expenses, with a positive effect of trade openness captured by inbound tourism receipts, and a negative effect by outbound tourism expenses. Additionally, we also employed the impulse-response function to comprehensively analyze the impact of trade openness on the tourism sector. Furthermore, we also examined the contemporaneous causal relationship between trade openness, inbound tourism receipts, and outbound tourism expenses by utilizing the directed acyclic graph.

This study is expected to contribute to previous studies in several ways. First, we expand the literature on the relationship between trade openness and tourism in terms of estimating whether or not it benefits the tourism sector of a specific country. In other words, this paper tests the sustainable growth of tourism sector according the trade liberalization trend in terms of economic sense. Second, this study also contributes to previous studies on trade and tourism in terms of considering trade openness rather than trade. As Wong and Tang (2010) mentioned earlier, there are relatively many studies that performed empirical analysis between tourism and trade, whereas only limited literature exists regarding the relationship between tourism and trade openness. Third, we adopted the impulse response function for our analysis, which allow to derive the innovation shock of trade openness on the tourism sector by classifying tourism into inbound tourism receipts and outbound tourism expenses. Fourth, this study examines the contemporaneous causal relationship by using the directed acyclic graph as well as predictive causality based on the Granger causality test that is usually utilized by many previous literatures.

II. Literature Review

As RTAs have explosively expanded for recent few decades, many studies have performed on the impact of RTAs on trade (Dennis, 2006; Grant & Lambert, 2008), employment (OECD, 2012), as well as tourism (Khalid et al., 2022). According to the international trade theory, the objective of RTA is facilitating trade and economic integrations between members (Khalid et al., 2022). It is so trivial that RTAs abolish the tariff and non-tariff barriers, which affect on trade flows as well as the level of economic integration. If we focus on the relationship between RTAs and tourism, there are two paths of RTAs effect on the tourism sector. First path is that an increased trade by a rise of trade openness based on the expansion of RTAs is expected to promote business trips as well as leisure tours according to an increase of curiosity and awareness for partner countries of RTAs (Khalid et al., 2022). Second path is the facilitated tourism between RTAs countries based on non-trade provisions that is regulated by RTAs (Khalid et al., 2022). As a results, many previous studies have performed on the relationship between tourism and trade or trade openness.

Empirical studies on tourism and trade have so far focused on the causalities between these two factors. We can segregate previous empirical literatures into four categories. The first relates to studies for determining the uni-directional causal relationship between tourism and trade or determinants for tourism focusing on trade.

Second, there are studies for the bi-directional causality between these two variables. Third, some empirical studies found results for the direction of causality. Last, there are few studies on the causality between trade and tourism based on trade openness rather than trade such as trade value, export value, or import value.

Previous literatures such as Keintz (1968), Keum (2011), Tsui and Fung (2016), and Turner and Witt (2001) fall under the purview of the first category of research for uni-directional relationship between trade and tourism as well as determinants for tourism focusing on trade. Keintz (1968) attempted to identify the determinants for travel that reflects international tourism. The findings, based on data from the U.S., reveal that total trade value is a crucial factor for international tourism demand. Meanwhile, Turner and Witt (2001) investigated the effect of possible determinants for international tourists, visits to friend and relatives, holidays, and business visits, as well as international trade on international tourism utilizing the structural equation model. Focusing on inbound tourists to New Zealand dividing into Australia, Japan, the U.K., and the U.S., they found the important role of trade on business visits. Keum (2011) assessed the causal relationship between tourism and trade in Korea using data on tourism flows and goods trade flows. Based on the Granger causality test results, Keum (2011) reported the uni-directional effect of tourism flows on trade flows. Tsui and Fung (2016) evaluated the causal relationship between business travel and trade volume in Hong Kong, focusing on three main trading countries — China, Taiwan, and the U.S.. While they determined the bi-directional causality between business travel and trade volume with the U.S., their results present the uni-directional causality of trade volume on travel with China and Taiwan, according to the Granger causality test.

The second category of studies for the bi-directional relationship between trade and tourism can be summarized by the following study. Shan and Wilson (2001) analyzed the relationship between tourism and trade in China utilizing international travel and trade. Based on the Toda and Yamamoto (1995) Granger causality test method, they found a bi-directional causal relationship between tourism and trade in China.

Many articles determined mixed or inconclusive causality between trade and tourism. Fry et al. (2010) examined the causal relationship between tourism and trade in 40 South African countries using the panel timeseries method. Specifically, they used tourist arrivals and trade (export + import) as variables for tourism and trade, respectively. Their results showed that tourism and trade have a bi-directional causal relationship based on the sample of all 40 African countries. However, there were inconclusive results on the causal relationship between tourism and trade when they divided the 40 countries into individual nations. Kulendran and Wilson (2000) examined the causal relationship between trade and tourism using total trade, total travel, real exports, real imports, holiday travel, and business travel. Their findings showed that the causal relationship among variables differed according to the countries, which include the U.S., Japan, and the U.K. based on the Granger causality test. Specifically, their results were mixed. Lee (2012) investigated the causal link between exports, imports, international tourism, and economic growth in Singapore. Lee's results support export-led tourism and tourism-led imports in a short-run. Khan et al. (2005) performed the Granger causality test for real imports, real exports, real total trade, business arrivals, and total arrivals for examining the causal relationship between tourism and trade. Focusing on Singapore and trading partners such as Australia, Japan, the U.S., and the U.K., their results were mixed, according to country and proxy variables for tourism and trade.

With regard to the last category, previous studies of causality between trade and tourism utilizing trade openness as a variable for trade are Wong and Tang (2010) and Fernandes et al. (2019). Wong and Tang tested the causal relationship between tourism and trade utilizing total visitor arrivals and openness of trade as variables for tourism and trade, respectively. Specifically, they focused on Singapore and their main trading

partners that include Malaysia, China, the U.S., Japan, and Korea. Their findings showed that trade openness may not drive tourist arrivals depending on countries. Conversely, they found that tourism can encourage trade in Singapore. Fernandes et al. explored the causality between trade openness, tourism openness, and currency-purchasing power in Brazil, utilizing Johansen cointegration, vector error correction model, variance decomposition, and the Granger causality test. They found the uni-directional Granger causality of trade openness and currency-purchasing power on tourism openness.

In brief, previous empirical studies that examined causality between trade or trade openness and tourism derived different results according to a specific country or estimating methods. Considering that a recent increase of trade or trade openness is originated from RTAs, trade openness is more accurate proxy variable for RTAs. Furthermore, trade openness can capture the effect of RTAs well compared to trade in terms of direct effect (by specific provision) or indirect effect (an increase of business trip or leisure trip by RTAs). One of gaps in existing literature is that previous ones did not examine whether or not trade openness is beneficial to home countries, which is closely related to the sustainability of tourism sector according to the trade liberalization trend. In addition, previous studies did not explore the causality based on the contemporaneous concept, whereas they only utilized the test method for predictive causality based on the Granger causality test. Consecutively, our approach for whether or not trade openness (proxy for RTAs) is beneficial for home countries and the contemporaneous causation test based on the directed acyclic graph is expected to contribute to existing literature on trade and tourism.

III. Data and Methodologies

1. Data

The main variables used in this study are trade openness, inbound tourism receipts, and outbound tourism expenses. Trade openness was measured by (Export + Import)/GDP. Real GDP data were gathered from the world development indicator (WDI) of World Bank, while export and import data were collected from the Korea International Trade Association. To realize export and import, we divided export and import by the GDP deflator (base year: 2015) that was obtained from WDI. Inbound tourism receipts and outbound tourism expenses were obtained from the Korea Tourism Organization. These tourism receipt and expense were also divided by the GDP deflator from WDI for realization. Our data are yearly data that cover the period between 1975 and 2019. For our analysis, we used the natural log of those three variables: trade openness, inbound tourism receipts, and outbound tourism expenses. Table 1 reports the descript statistics for the three variables of natural logarithm.

Table 1. Descriptive Statistics

Variables	Observation	Mean	Std. dev.	Min	Max
Open	45	-8.256	0.174	-8.534	-7.761
Receipt	45	11.051	0.735	9.646	12.205
Expense	45	11.017	1.148	8.125	12.615

Note: *Open, Receipt,* and *Expense* indicate the natural log of trade openness, inbound tourism receipt, and outbound tourism expense, respectively.

2. Methodologies

2.1. Directed Acyclic Graph (DAG)

Most previous studies on the causal relationship between trade and tourism utilized the testing method for the predictive causation that is the framework of the Granger (1969) causality test. Specifically, previous literature for trade and tourism have not considered contemporaneous causation. As indicated by Bessler et al. (2003), predictive causation does not demonstrate the actual causality between variables. Conversely, testing the contemporaneous causation is expected to indicate the actual relationship between trade and tourism. DAG is one of the effective options to evaluate the contemporaneous causal relationship since it allows a non-time sequence rather than a time sequence that is usually utilized by the Granger causality framework (Awokuse & Xie, 2015). DAG presents the causal relationship based on an arrow symbol or a vertex (Kim et al., 2020). The error correlation matrix from VECM and the vector autoregressive (VAR) model can be used for the DAG analysis (Spirtes et al., 2000). Specifically, this study utilizes the method of Bessler and Akleman (1998) that performed DAG based on the variance-covariance of innovations being derived from the first-stage of VECM.

Deriving the causal relationship from DAG is based on the conditional independence that is well presented by Pearl (1995) and Whittaker (2009). Understanding conditional independence is crucial for performing DAG (Kim et al., 2020). We can present the conditional independence of DAG in the mathematical formation based on the recursive product decomposition (Pearl, 2009).

$$\mathrm{pr}(x_1, x_2, x_3 \cdots x_n) = \prod_{i=1}^{n} pr(x_i \,|pa_i) \tag{1}$$

where vertices of $(x_1, x_2, x_3 \cdots x_n)$'s probability between variables of x is presented as $pr(\cdot)$. The preceding of x_i in order of $(x_1, x_2, x_3 \cdots x_n)$ on some subset of variables is realized being presented as pa_i.

This study utilizes the PC algorithm for examining the contemporaneous relationship. As idicated by Awokuse and Xie (2015), the PC algorithm has been widely adapted in several previous studies. The PC algorithm that was developed by Spirtes et al. (2000) is operated by the following steps to test the contemporaneous causal relationship. The PC algorithm is set with an unrestricted set of relationship among variables and removes edges depending on the existence of zero or partial correlation among variables (Bessler et al., 2003). By these sequential and stepwise processes, we can derive the causal flow (Bessler et al., 2003). If we find the output such as $X \rightarrow Y$ or $Y \rightarrow X$ from DAG, then we can conclude the existence of causal relationship based on the edge. Conversely, if the results of DAG show $X - Y$, then it implies a correlation rather than causality (Scheines et al., 1998).

2.2. Johansen Cointegration Test and VECM

This study utilizes the Johansen's multivariate cointegration methodology to examine the existence of the long-run relationship among trade openness, inbound tourism receipts, and outbound tourism expenses. To apply the Johansen cointegration test, the following VECM is estimated:

$$\Delta Z_t = \mu + \sum_{i=1}^{p-1} \Gamma_i \Delta Z_{t-k} + \Pi Z_{t-1} + \varepsilon_t \tag{2}$$

Where Z_t is a 3 × 1 column vector of *Open*, *Receipt*, and *Expense*, which represent the natural log of trade openness, inbound tourism receipts, and outbound tourism expenses of Korea, respectively. Meanwhile, 3 × 1 vector of constant term is written as μ. Δ presents the operator of first difference. k is the lag length and the matrix $\prod$ is an impact matrix for a long-run relationship between *Open*, *Receipt*, and *Expense*. $\prod$ can be presented as $\alpha\beta$ (=$\prod$). Meanwhile, α and β are parameters for the speed of convergence into the long-run equilibrium and the matrix of cointegration vector parameters, respectively, and ε_t is the error term that follows N (0, Σ).

To derive the cointegration rank, this study adopts the likelihood ratio test based on trace test statistics. If the null hypothesis of zero rank of cointegration vectors is not rejected, then our three variables are not cointegrated. If the null hypothesis is rejected, then our vector of variables has a long-run relationship and should test more for null hypothesis of r=1. This process has to be continued until the null hypothesis is not rejected. The null hypothesis of rank k is examined by computing the likelihood ratio statistics for the trace test. Specifically, if the likelihood statistics is higher than the critical value being calculated by Osterwald-Lenum (1992), then the null hypothesis of cointegration rank for a specific number is rejected.

$$\text{Trace} = -\text{T}\sum_{i=r+1}^{n} \ln(1-\lambda_i) \tag{3}$$

IV. Empirical Results

To verify the stationarity of each variable, this study employs the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), and DF-GLS unit root tests (see. Table 2). Generally, the ADF test is performed to examine the existence of unit root, while the PP test covers the problem of autocorrelation and heteroscedasticity in the ADF unit root test (Phillips & Perron, 1988). DF-GLS has an advantage in overall performance in terms of power and small sample by modifying the ADF statistics with generalized least squares (Elliott et al., 1992). Table 2 shows the results of the three unit root tests that are ADF, PP, and DF-GLS. Our three variables are not stationary based on those three stationary tests at 10% significance level. However, the first difference of *Openness*, *Receipt*, and *Expense* do not have the unit root at 1% significance level. Consecutively, our three variables are shown to be I(1) based on ADF, PP, and DF-GLS tests.

The results of the tri-variate (*Openness*, *Receipt*, and, *Expense*) Johansen cointegration test are reported in Table 3. Our results show that the Johansen trace test rejects the finding that our three variables are not integrated at 1% significance level. However, the null hypothesis that *Openness*, *Receipt*, and, *Expense* are cointegrated less than equal to one was not rejected at 10% significance level. To sum up, the Johansen cointegration results determine that the rank of our tri-variate model is one.

Table 4 represents the VECM results for the tri-variate model (*Openness*, *Receipt*, and, *Expense*). Among three coefficients for ECT terms, only the *Receipt* equation's ECT coefficient is significant at 10% significance level. To be specific, the coefficient of speed of adjustment for the equation *Receipt* is -0.5286 that indicates 52.86% adjustment toward the long-run equilibrium for each period. Considering that the t-test for the speed of adjustment can be interpreted as weak exogeneity tests, we can derive the long-run causality based on this t-test (Chen & Saghaian, 2016). Our results for *ECT* coefficients indicate that

Table 2. Unit Root Tests

		Openness	*Receipt*	*Expense*
ADF	Level	-2.185	-0.812	-2.317
	1st Difference	-5.86***	-5.596***	-5.506***
PP	Level	-2.112	-1.331	-2.378
	1st Difference	-5.86***	-5.596***	-5.506***
DF-GLS	Level	-0.645	0.13	0.554
	1st Difference	-5.039***	-2.013*	-4.86***

Note: 1%, 5%, and 10% significance are presented as ***, **, and *, respectively. Three stationary tests are performed with an intercept. The optimal lag is selected based on the Schwarz criterion.

Table 3. Johansen Cointegration Test for the Trivariate Model (Openness, Receipt, and Expense)

H0	Trace Statistics	5% Critical Value	1% Critical Value
$r = 0$	55.15	29.68	35.65
$r \leq 1$	12.97***	15.41	20.04
$r \leq 2$	1.00	3.76	6.65

Note: *** indicates 1% significance level for selecting the rank. The critical value is calculated from Osterwald-Lenum (1992) and the optimal lag is selected based on the Schwartz Information Criteria.

Openness and *Expense* have a long-run Granger causation on *Receipt*. Importantly, we found the opposite sign of the long-run relationship between *Openness–Receipt* and *Openness–Expense* based on the estimated cointegration vector. While our cointegration vector reports the negative relationship between *Openness* and *Receipt*, the estimated cointegration vector presents the positive relationship between *Openness* and *Expense*. Specifically, our estimated cointegration vector implies that trade openness does not benefit the tourism sector of Korea. It is evident because inbound tourism receipts decrease with trade openness in the long-run, while outbound tourism expenses increase.

This paper tests the stability condition to check whether the number of long-run equation is correctly selected. As Asgari et al. (2020) mentioned, the stability condition is satisfied if all characteristics roots are within the unit circle. We present plots the roots of the companion matrix to test whether all characteristic roots are located in the unit circle. As you can see Fig. 3, the stability condition is satisfied because all characteristics roots are within the unit circle.

Based on the Wald test, this study also performs

Table 4. Results of VECM

	$\Delta Openness_t$	$\Delta Receipt_t$	$\Delta Expense_t$
ECT_{t-1}	-0.0578 (0.0982)	-0.5286*** (0.1162)	0.2563 (0.1912)
Intercept	0.0162 (0.0480)	0.0337 (0.0568)	0.0731 (0.0934)
$\Delta Openness_{t-1}$	0.1315 (0.2701)	0.0509 (0.3197)	0.4785 (0.5260)
$\Delta Openness_{t-2}$	-0.1499 (0.2782)	-0.3210 (0.3293)	0.6034 (0.5419)
$\Delta Openness_{t-3}$	0.0655 (0.3056)	-0.4322 (0.3618)	0.0599 (0.5953)
$\Delta Openness_{t-4}$	0.0689 (0.3191)	-0.9897*** (0.3778)	0.3429 (0.6216)
$\Delta Openness_{t-5}$	-0.4648 (0.3478)	-1.3090*** (0.4118)	0.1310 (0.6776)
$\Delta Openness_{t-6}$	-0.1223 (0.3231)	-1.2709*** (0.3825)	0.1987 (0.6294)
$\Delta Openness_{t-7}$	-0.0754 (0.3588)	-1.4183*** (0.4248)	0.3115 (0.6989)
$\Delta Receipt_{t-1}$	0.0509 (0.3355)	1.4133*** (0.3973)	-0.7718 (0.6536)
$\Delta Receipt_{t-2}$	-0.3210 (0.3447)	1.6704*** (0.4081)	-0.3147 (0.6714)
$\Delta Receipt_{t-3}$	-0.4322 (0.3195)	1.4780*** (0.3783)	-0.7219 (0.6224)
$\Delta Receipt_{t-4}$	-0.9897 (0.3009)	1.4068*** (0.3562)	-0.3289 (0.5861)
$\Delta Receipt_{t-5}$	-1.3090 (0.2796)	1.1733*** (0.3310)	-0.5239 (0.5446)
$\Delta Receipt_{t-6}$	-1.2709 (0.2533)	0.9974*** (0.2999)	-0.0104 (0.4934)
$\Delta Receipt_{t-7}$	-1.4183 (0.2378)	0.6431** (0.2816)	-0.0221 (0.4633)
$\Delta Expense_{t-1}$	-0.0835 (0.2486)	-1.3438*** (0.2943)	0.3293 (0.4842)
$\Delta Expense_{t-2}$	-0.3224 (0.2115)	-1.0199*** (0.2504)	-0.1447 (0.4120)
$\Delta Expense_{t-3}$	0.0021 (0.1925)	-0.8492*** (0.2279)	0.2571 (0.3749)
$\Delta Expense_{t-4}$	-0.1512 (0.1654)	-0.3882** (0.1958)	-0.0548 (0.3221)
$\Delta Expense_{t-5}$	0.0886 (0.1329)	-0.0677 (0.1573)	0.0335 (0.2588)
$\Delta Expense_{t-6}$	0.0146 (0.1143)	0.0942 (0.1354)	-0.0347 (0.2227)
$\Delta Expense_{t-7}$	-0.0291 (0.1126)	0.2711** (0.1333)	0.0871 (0.2193)
Cointegration vector		(1 3.82 -2.86)	

Note: 1%, 5%, and 10% significance are presented as ***, **, and *, respectively. The standard errors are presented in parenthesis. the optimal lag is selected based on the Schwartz Information Criteria.

the short-run Granger causality test. Table 5 shows the results of short-run Granger causality test between variables. Among possible six bilateral causalities, only two pairs show the short-run Granger causalities. While trade openness causes the inbound tourism receipts, outbound tourism expenses cause inbound tourism receipt in terms of short-run Granger causality. These results are similar with the long-run causality based on the weak exogenous test.

To comprehensively examine the relationship between *Openness–Receipt* and *Openness–Expense*, we also examined contemporaneous causation based on the DAG method. Fig. 4 presents the results of DAG based on the PC algorithm at 5% significance level. Specifically, Fig. 4 highlights the results of DAG based on the variance–covariance of innovations from VECM utilizing the PC algorithm. Our results indicate that there is no residual relationship between trade openness and inbound tourism receipts in Korea. However, the DAG results represent undirected causal relationships between trade openness and outbound tourism expenses. These results imply that the contemporaneous causal relationship only exist between trade openness and tourism outbound expenses rather than tourism inbound receipts. These results are different with the weak exogenous tests based on the *t*-test of coefficients for speed of adjustments and short-run Granger causality test. According to the predictive causality concept, trade openness causes inbound tourism receipts. However, only trade openness has a contemporaneous causal relationship with outbounds tourism expense.

Fig. 3. Characteristic Roots of the Polynomial Based on Our Estimated VECM

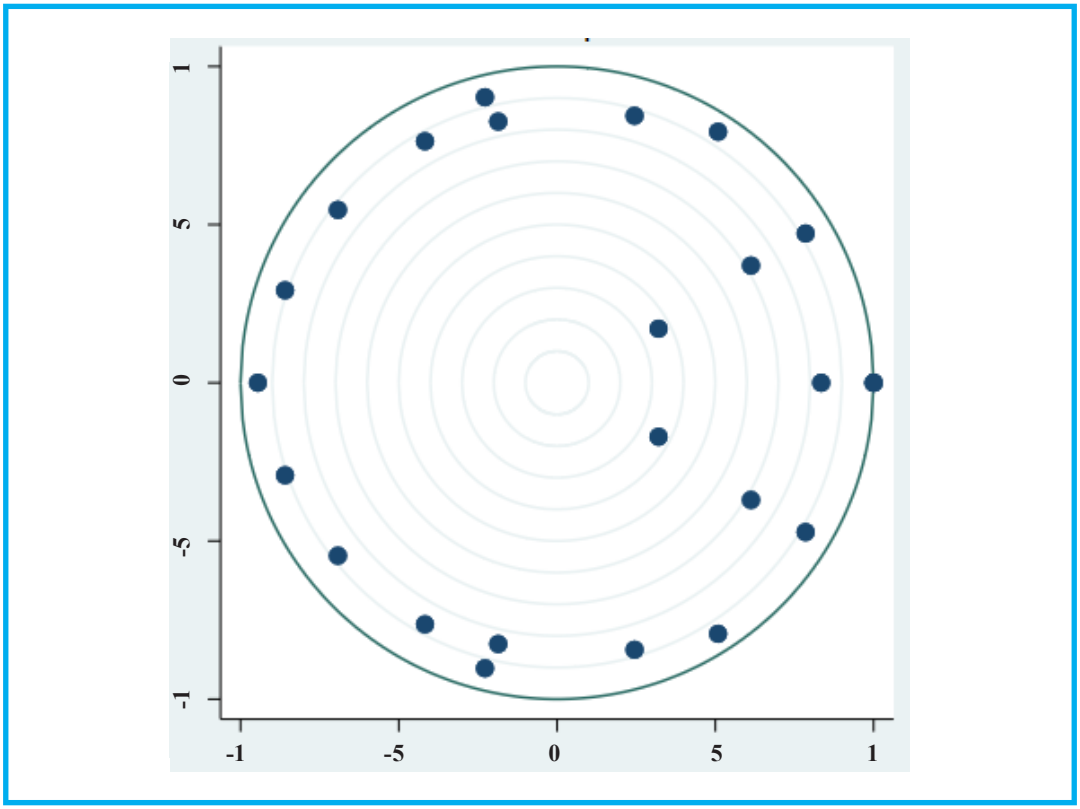


Table 5. Results of Short-run Granger Causality

Null Hypothesis	Chi-square	P-value
$Receipt \nrightarrow Openness$	2.37	0.94
$Expense \nrightarrow Openness$	4.53	0.72
$Openness \nrightarrow Receipt$	24.63***	0.00
$Openness \nrightarrow Expense$	2.56	0.92
$Receipt \nrightarrow Expense$	5.38	0.61
$Expense \nrightarrow Receipt$	25.25***	0.00

Note: 1%, 5%, and 10% significance are presented as ***, **, and *, respectively.

This study also performs the impulse response function based on these possible causalities based on predictive and contemporaneous causation concepts at the same time. Specifically, we try to see the impulse of trade openness and outbound tourism expenses on responses of inbound tourism receipts and outbound tourism expenses (see. Fig. 5). Results of impulse response function present that while one innovation shock of trade openness has a negative effect on inbound tourism receipts, one innovation shock of trade openness has a positive effect on outbound tourism expenses. And one standard deviation shock of innovation of outbound tourism expenses have a positive effect on inbound tourism receipts. These results imply that trade openness is not beneficial to domestic tourism sector of Korea in terms of economics as well as sustainable growth. It is because a positive effect of outbound tourism expenses reflects that domestic tourists spend their moneys to foreign countries rather than their home country. Furthermore, trade openness has a negative effect on inbound tourisms receipts, which means that the tourism sector of Korea does not get beneficial aspects of trade openness.

Fig. 4. DAG Results Based on the PC Algorithm (5% Significance Level)

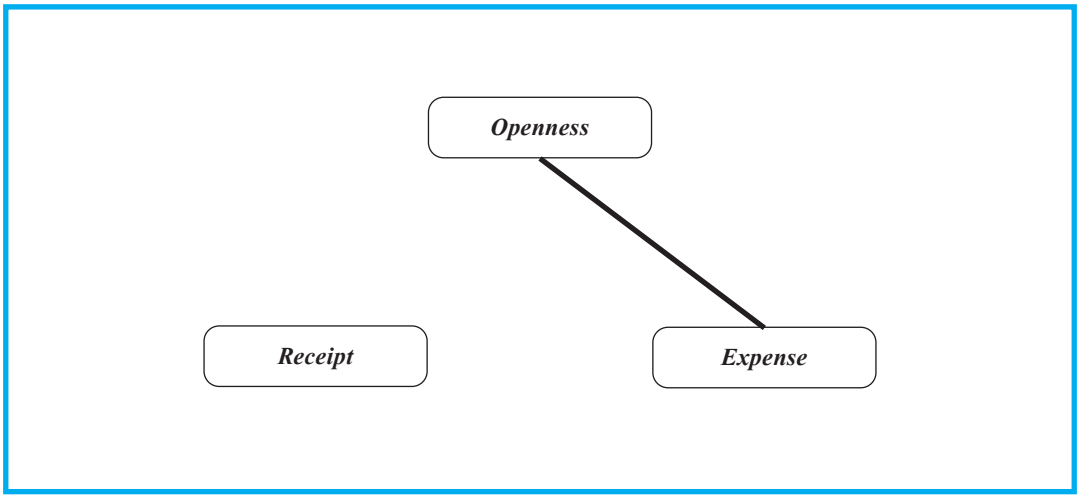
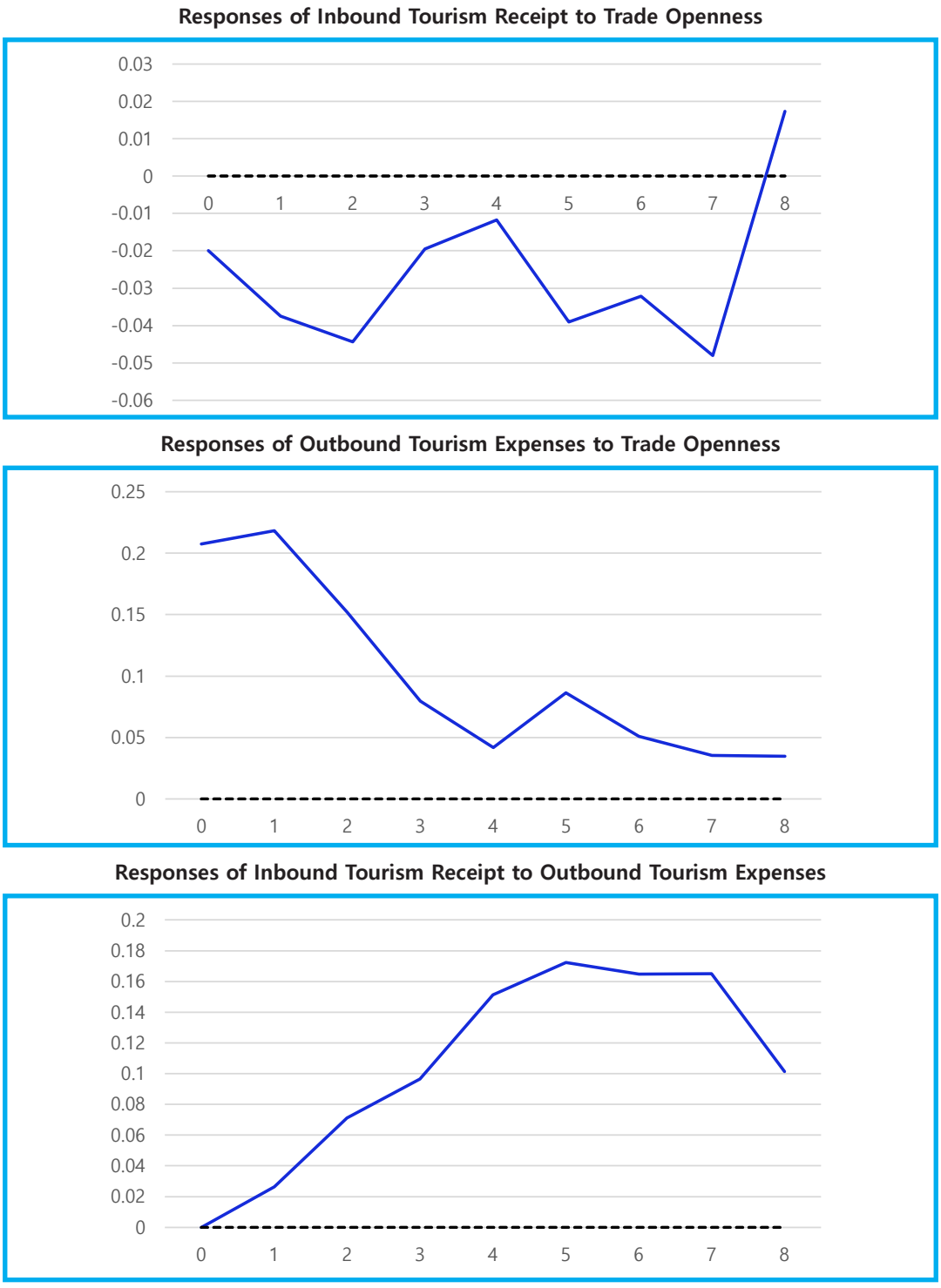


Fig. 5. Impulse-Responses of Cholesky One S.D. Innovations (8 Years Horizon)



V. Conclusions and Implications

This study investigated the causal relationship between trade openness, outbound tourism expenses, and inbound tourism receipts to examine whether or not trade openness is beneficial for the tourism sector in Korea. It is because a rise of trade openness in Korea is largely explained by series of RTAs. And, RTAs that can be measured by trade openness have an impact of tourism in directly and indirectly. By utilizing the VECM, we attempted to determine the long-run Granger causality based on the weak exogenous test. This study also adopts DAG for testing the contemporaneous causation between variables. Finally, we explored the innovation shock of trade openness on outbound tourism expenses and inbound tourism receipts by using the impulse response function.

The results of the Johansen cointegration test indicate that trade openness, outbound tourism expenses, and inbound tourism receipts in Korea have a long-run relationship. According to the weak exogenous test results for a long-run Granger causality, trade openness and outbound tourism expenses have a long-run causation on inbound tourism receipts. The cointegration vector reports that while trade openness has a positive relationship with outbound tourism expenses, trade openness has a negative relationship with inbound tourism receipts. The short-run Granger causality test results also show that trade openness and outbound tourism expenses have a causality on inbound tourism receipts. The contemporaneous causality test results based on DAG also highlight the uni-directional causal relationship between trade openness and outbound tourism expenses. However, there is no causal relationship between trade openness and inbound tourism receipts according to the DAG approach. Based on these predictive and contemporaneous causal relationships, we perform the impulse response function to evaluate the effect of trade openness on sustainable tourism growth in Korea based on the economic sense. Results of impulse response function report that trade openness is not beneficial as well as sustainable for domestic tourism sector of Korea.

Our findings provide some crucial implications for Korea as well as other countries. For Korea, our results of trade openness' unbeneficial effect on the tourism sector provide some policy implications. First, Korea should introduce some supporting policies for the domestic tourism sector considering that its basic trend for trade is free trade. Specifically, Korea needs to examine why the trade openness trend that is caused by series of RTAs is unbeneficial to the tourism sector. Based on these approaches, the Korean government may develop appropriate policies for dealing with the unbeneficial effects of trade openness on domestic tourism. Our study also offers some implications for other countries. Considering that trade openness can have an impact on the tourism sector of each country, countries that have plans to open up their markets by bilateral and multilateral trade agreements also should take into consideration the tourism sector. If trade openness is beneficial to their tourism industry, it does not make any difference. However, if trade openness is unbeneficial to their tourism sectors, these countries have to consider a buffer policy to manage the effects of an increase in trade openness. In addition, future studies should address the research question as to whether or not trade openness is beneficial to the home country's tourism sector, especially for nations with a high trade openness trend or those that are planning to open up their markets.

References

Abizadeh, S., & Pandey, M. (2009). Trade openness, structural change and total factor productivity. *International Economic Journal*, *23*(4), 545-559. https://doi.org/10.1080/10168730903372273

Asgari, M., Saghaian, S. H., & Reed, M. R. (2020). The Impact of energy sector on overshooting of agricultural prices. *American Journal of Agricultural Economics*, *102*(2), 589-606. https://doi.org/10.1002/ajae.12035

Awad-Warrad, T. (2018). Trade openness, economic growth and unemployment reduction in arab region. *International Journal of Economics and Financial Issues*, *8*(1), 179-183.

Awokuse, T. O. (2008). Trade openness and economic growth: Is growth export-led or import-led?. *Applied Economics*, *40*(2), 161-173. https://doi.org/10.1080/00036840600749490

Awokuse, T. O., & Xie, R. (2015). Does agriculture really matter for economic growth in developing countries?. *Canadian Journal of Agricultural Economics/Revue Canadienne D'agroeconomie*, *63*(1), 77-99. https://doi.org/10.1111/cjag.12038

Bessler, D. A., & Akleman, D. G. (1998). Farm prices, retail prices, and directed graphs: Results for pork and beef. *American Journal of Agricultural Economics*, *80*(5), 1144-1149. https://doi.org/10.2307/1244220

Bessler, D. A., Yang, J., & Wongcharupan, M. (2003). Price dynamics in the international wheat market: Modeling with error correction and directed acyclic graphs. *Journal of Regional Science*, *43*(1), 1-33. https://doi.org/10.1111/1467-9787.00287

Chen, B., & Saghaian, S. (2016). Market integration and price transmission in the world rice export markets. *Journal of Agricultural and Resource Economics*, *41*(3), 444-457.

Dennis, A. (2006). *The impact of regional trade agreements and trade facilitation in the middle east and north Africa region* (SSRN Scholarly paper No. 922963). https://papers.ssrn.com/abstract=922963

Elliott, G., Rothenberg, T. J., & Stock, J. H. (1992). *Efficient tests for an autoregressive unit root* (Working paper No. 130; Technical Working paper Series). National Bureau of Economic Research. https://doi.org/10.3386/t0130

Fernandes, E., Pacheco, R. R., & Fernandes, V. A. (2019). Tourism openness, trade openness, and currency-purchasing power in Brazil: A causality analysis. *International Journal of Tourism Research*, *21*(2), 197-205. https://doi.org/10.1002/jtr.2254

Fry, D., Saayman, A., & Saayman, M. (2010). The relationship between tourism and trade in south africa. *South African Journal of Economics*, *78*(3), 287-306. https://doi.org/10.1111/j.1813-6982.2010.01245.x

Granger, C. W. J. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica*, *37*(3), 424-438. https://doi.org/10.2307/1912791

Grant, J. H., & Lambert, D. M. (2008). Do regional trade agreements increase members' agricultural trade? *American Journal of Agricultural Economics*, *90*(3), 765-782. https://doi.org/10.1111/j.1467-8276.2008.01134.x

Habibi, F., & Ahmadzadeh, K. (2015). Tourism development, trade openness and economic growth: The case of Malaysia. *European Journal of Economics, Finance and Administrative Sciences*, *78*, 129-139.

Keintz, R. M. (1968). A study of the demand for international travel to and from the United States. *Travel Research Bulletin*, *7*(1), 6-10. https://doi.org/10.1177/004728756800700102

Keum, K. (2011). International tourism and trade flows: A causality analysis using panel data. *Tourism Economics*, *17*(5), 949-962. https://doi.org/10.5367/te.2011.0054

Khalid, U., Okafor, L. E., & Burzynska, K. (2022). Do regional trade agreements enhance international tourism flows? Evidence from a cross-country analysis. *Journal of Travel Research*, *61*(6), 1391-1408. https://doi.org/10.1177/00472875211028321

Khan, H., Toh, R. S., & Chua, L. (2005). Tourism and trade: Cointegration and granger causality tests. *Journal of Travel Research*, *44*(2), 171-176. https://doi.org/10.1177/0047287505276607

Kim, G., Choi, S. K., & Seok, J. H. (2020). Does biomass energy consumption reduce total energy CO2 emissions in the US?. *Journal of Policy Modeling*, *42*(5), 953-967. https://doi.org/10.1016/j.jpolmod.2020.02.009

Kulendran, N., & Wilson, K. (2000). Is there a relationship between international trade and international travel?. *Applied Economics*, *32*(8), 1001-1009. https://doi.org/10.1080/000368400322057

Lee, C. G. (2012). Tourism, trade, and income: Evidence from Singapore. *Anatolia*, *23*(3), 348-358. https://doi.org/10.1080/13032917.2012.701596

Ngouhouo, I., & Nchofoung, T. N. (2021). Does trade openness affects employment in Cameroon?. *Foreign Trade Review*, *56*(1), 105-116. https://doi.org/10.1177/0015732520961307

OECD (2012). *Policy priorities for international trade and jobs*.

Osterwald-Lenum, M. (1992). A note with quantiles of the asymptotic distribution of the maximum likelihood cointegration rank test statistics. *Oxford Bulletin of Economics and Statistics*, *54*(3), 461-472.

Pearl, J. (1995). Causal diagrams for empirical research. *Biometrika*, *82*(4), 669-688. https://doi.org/10.1093/biomet/82.4.669

Pearl, J. (2009). *Causality*. Cambridge University Press.

Phillips, P. C. B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, *75*(2), 335-346. https://doi.org/10.1093/biomet/75.2.335

Scheines, R., Spirtes, P., Glymour, C., Meek, C., & Richardson, T. (1998). The TETRAD project: Constraint based aids to causal model specification. *Multivariate Behavioral Research*, *33*(1), 65-117. https://doi.org/10.1207/s15327906mbr3301_3

Shan, J., & Wilson, K. (2001). Causality between trade and tourism: Empirical evidence from China. *Applied Economics Letters*, *8*(4), 279-283. https://doi.org/10.1080/135048501750104114

Spirtes, P., Glymour, C. N., Scheines, R., & Heckerman, D. (2000). *Causation, prediction, and search*. MIT Press.

Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of Econometrics*, *66*(1), 225-250. https://doi.org/10.1016/0304-4076(94)01616-8

Tsui, W. H. K., & Fung, M. K. Y. (2016). Causality between business travel and trade volumes: Empirical evidence from Hong Kong. *Tourism Management*, *52*, 395-404. https://doi.org/10.1016/j.tourman.2015.07.010

Turner, L. W., & Witt, S. F. (2001). Factors influencing demand for international tourism: Tourism demand analysis using structural equation modelling, revisited. *Tourism Economics*, *7*(1), 21-38. https://doi.org/10.5367/000000001101297711

Ulaşan, B. (2015). Trade openness and economic growth: Panel evidence. *Applied Economics Letters*, *22*(2), 163-167. https://doi.org/10.1080/13504851.2014.931914

Whittaker, J. (2009). *Graphical models in applied multivariate statistics*. Wiley.

Wong, K. N., & Tang, T. C. (2010). Tourism and openness to trade in Singapore: Evidence using aggregate and country-level data. *Tourism Economics*, *16*(4), 965-980. https://doi.org/10.5367/te.2010.0017

Wong, S. A. (2009). Productivity and trade openness in Ecuador's manufacturing industries. *Journal of Business Research*, *62*(9), 868-875. https://doi.org/10.1016/j.jbusres.2008.10.009

World Bank (2018). *World Development Indicator*. https://databank.worldbank.org/source/world-development-indicators

Yanikkaya, H. (2003). Trade openness and economic growth: A cross-country empirical investigation. *Journal of Development Economics*, *72*(1), 57-89. https://doi.org/10.1016/S0304-3878(03)00068-3

ISSN 1946-5130 (Print), ISSN 2470-4733 (Online)
http://dx.doi.org/10.20294/jgbt.2023.19.1.173

The Journal of Global Business and Trade

Journal of Global Business and Trade

https://www.pfw.edu/jgbt

The Spillover Effects of Privatization on Efficiency and Income Inequality in China

Xinyu Li[a], Sunghwan Kim[b]*, Yongshang Liu[c]

[abc]*School of Business Administration, Kyungpook National University, South Korea*

Received 19 December 2022, Revised 19 January 2023, Accepted 5 February 2023

ABSTRACT

Purpose – This study examines the spatial and inter-temporal spillover effects of privatization on the corporate efficiency and regional income inequality of Chinese state-owned enterprises (SOEs).

Design/Methodology/Approach – The spatial Durbin model (SDM) is used in regressions to examine the spatial and inter-temporal spillover effects of the privatization of SOEs on improving the efficiency and income inequality of Chinese firms across regions. A panel dataset of Chinese-listed firms from 2008 to 2018 is used. The stochastic frontier analysis method is applied in estimating corporate efficiency.

Findings – First, the privatization of Chinese SOEs increased their efficiency, but exacerbated their income inequality. Second, the globalization activities after the privatization of Chinese SOEs increased their efficiency, but exacerbated their income inequality. Specifically, exports decrease income inequality, while outward foreign direct investment or OFDI has an inverse U-shaped effect on income inequality. Third, the privatization improved overall corporate efficiency within the province and that of neighboring provinces. Fourth, the Chinese SOE firms after privatization aggravated income equality within the province and that of neighboring provinces.

Research Implications – In general, the results of this study indicate that the privatization of SOEs and the globalization activities after the privatization have improved the efficiency of Chinese firms, but worsened income equality within the province and that of neighboring provinces. Therefore, there is a strong need for governmental policies to cure income equality in provinces around the location of privarized firms.

Keywords: China, Efficiency, Income Inequality, Inter-temporal Spatial Regression, Privatization
JEL Classifications: L10, L63, M13, O25, O31

* *Corresponding Author, E-mail: indianak@knu.ac.kr*

I. Introduction

Prior to the reform and opening up of the Chinese economy in 1978, most Chinese firms had been governed by the government. According to World Bank statistics, such firms, called state owned enterprises or SOEs, significantly outperformed private firms in many aspects in financing, but performed worse in value addition and production (Hong & Park, 2016; Martin & Roman, 2001; Tiemann & Schreyögg, 2012; Zhang, 2015).

The privatization of SOEs aimed to improve the operating results of firms, promote the development of the regional economy, and reduce the financial burden of the government (Brandt et al., 2003; Garnaut et al., 2003; Li, 2002; Park & Shen, 2002; Su & Jefferson, 2003). Therefore, studies on privatization mainly examined the motivation for and economic effects of privatization from the perspective of the government (Guo & Yao, 2005).

Since the mid-1990s, China has been silently but extensively privatizing firms (Cao et al., 1999; Garnaut et al., 2003; Lin & Zhu, 2001). Between 1996 and 2001, the number of SOEs decreased by 40%, and the majority of the remaining SOEs were set to be privatized within a few years (Garnaut et al., 2003). According to recent studies, privatization has improved the efficiency of firms (Jefferson & Su, 2006; Song & Yao, 2004; Xu et al., 2005).

While China has succeeded in the aspect of efficiency improvement, it has not been successful in improving another important issue, namely income equality in China on which the Chinese government has always placed a high priority as a socialistic regime. Although Adams (2006) reported that privatization did not increase but rather decreased income inequality, Wan et al. claimed that it aggravated the problem. While the Chinese government committed to income equality across provinces during its market-oriented reforms by facilitating the movement of labor and funds between classes in the markets, it has reportedly been getting worse nationwide for a long time due to the persistent factors, such as disparities in education, industrial development, and geographical location (Yang, 2002).

According to Wang et al. (2006), it was expected that the relation between income disparity and economic growth in China would worsen in the future due to growth rate, income redistribution, and the availability of public goods and infrastructure. The Chinese government implemented more benevolent policy measures with lower interest rates for the less developed provinces in the inland to lessen the economic gap between those provinces and the rest of the country (Xie, 2006). As reported by Jahmane and Gaies (2020), with the advancement of economic globalization, the main driving force of corporate growth includes not only the internal efforts of the firms, but also the coordinated development with neighboring firms and even foreign firms. Bahar et al. (2014) showed that with neighboring countries already in the market, these countries are more likely to successfully export their new product. Gao et al. (2021) found that when a region has a neighboring region already in a new industry, the region successfully diversifies into other industries in China.

This study focuses on the inequality issue around the privatization of SOEs, compared with non-privatized firms in terms of efficiency, with corporate efficiency measured by using the stochastic frontier analysis (SFA) and regional income inequality using the Gini index. To fully diagnose the effects of privatization in China on corporate efficiency and regional income inequality, this study not only uses the fixed effects model to test, but also uses the spatial Durbin model (SDM) to uniquely examine the regional spillover effects of privatization on the efficiency and income inequality of neighboring firms influences for Chinese listed firms from 2008 to 2018.

The following are major findings of this study: First, the privatization of Chinese SOEs increased their efficiency, but exacerbated their income inequality. Second, the globalization activities after the privatization of Chinese SOEs increased their efficiency, but exacerbated their income inequality. Specifically, exports decrease income inequality, while outward foreign direct investment

or OFDI has an inverse U-shaped effect on income inequality. Third, the privatization improved overall corporate efficiency within the province and that of neighboring provinces. Fourth, the Chinese SOEs firms after privatization aggravated income equality within provinces and that of neighboring provinces. The results of this study imply that there is a strong need for governmental policies to cure income equality within the province and that of neighboring provinces.

This study proceeds as follows. Section II discusses related previous studies, and Section III presents the hypotheses and research models. Section IV presents the findings of the empirical test results, and Section V summarizes the empirical test results and discusses the implications of this study.

II. Literature Review

When a country grows, it usually obtains more capital, resulting in more funds and income for capital owners and, hence, resulting in a greater inequality. In developing countries, the gains from economic growth have not been distributed equally. As a result, income disparity has become a major issue for the majority of countries because it threatens social stability and long-term economic growth. According to Kuznets (1955), economic disparity was the result of economic growth and goes up and down after its peak after reaching specific developmental and income thresholds.

In contrast with the top-down approaches used in former Soviet states and Eastern European countries, China has taken a bottom-up approach in the privatization of SOEs of the templates being tested in various locations before being sanctioned and promoted by the central government (Cao et al., 1999). During economic growth cycles, the inverted U-shaped relationship between economic development and income disparity. According to Bourguignon (2004), in less developed economies, income inequality and poverty were positively correlated. Since the mid-1990s, China has been silently but extensively privatizing firms (Cao et al., 1999; Garnaut et al., 2003; Lin & Zhu, 2001). Between 1996 and 2001, the number of SOEs decreased by 40%, and the majority of the remaining SOEs were set to be privatized within a few years (Garnaut et al., 2003). According to recent studies, privatization has improved the efficiency of firms (Jefferson & Su, 2006; Song & Yao, 2004; Xu et al., 2005).

With the development of economic globalization, the main driving force of corporate growth includes not only the internal efforts of the firms, but also the coordinated development policies with neighboring firms and even foreign firms. In recent decades, the focus of studies has moved from financial representations of corporate performance to more holistic concepts (Jahmane & Gaies, 2020).

Bahar et al. (2014) showed that when neighboring countries already enter a new product, these countries are more likely to successfully export the product. Gao et al. (2021) found that when a region with its neighboring region already in a new industry, the region successfully enter into the new industry in China. According to Yang (2002), the economic growth of China in the 1980s and early 1990s was driven by extremely large shares of FDI and international trade; the majority of the benefits of economic growth went to the coastal regions where FDI was concentrated; and the inland-coastal inequality increased to represent the majority of regional inequality.

The Chinese government has committed to achieving income equality between provinces during its market-oriented reforms by facilitating the movement of labor and funds between classes in the markets. The inequality issue is getting worse in China nationwide and expected last in China for a long time due to the persistent factors, such as disparities in education, industrial composition, and geographical location (Yang, 2002).

Wang et al. (2006) asserted that the relation between income disparity and economic growth in China would worsen in the future due to growth rate, income redistribution, and the availability of public goods and infrastructure. China implemented more benevolent policy measures with lower interest rates for the less developed

provinces in the inland to lessen the economic gap between those provinces and the rest of the country (Xie, 2006).

Since the 11th Five-Year Plan of China in 2006, the growing socioeconomic disparities brought on by the country's rapid economic growth have gained more attention from officials. In terms of regional development and income, the gap between urban and rural areas, as well as coastal and inland provinces, was expanding. According to the World Bank (2008), the disparities between urban and rural areas were primarily caused by unequal access to education and poor healthcare services. Furthermore, the income disparity between urban and rural areas has widened.

According to Candelaria et al. (2009), variations in labor equality, industrial mix, and geographical locations in and across provinces may account for some of the disparities. Despite the significant improvement in living standards and growth rate in China, the absolute terms of income inequality have worsened, with wider income inequalities between rural and urban areas as well as inland and globally oriented coastal areas (Whalley & Yue, 2009). Even though inequality is inevitable in the course of economic growth and development, it violated the egalitarian ideal of the Chinese communist regime.

More recently, there are more studies on the spillover effects of policies on corporate performance. Bahar et al. (2014) showed that with neighboring countries are more likely to successfully export their new product while Gao et al. (2021) found that a neighboring region that succeeded in one industry is more likely to succeed in another industry in China.

III. Hypotheses and Test Models

1. Hypotheses

Before the mid-1990s, SOEs had dominated the Chinese economy. However, as Chinese openness has become more evident, SOEs have begun losing out in the market competition. Several SOEs have been privatized to improve their market competitiveness. Guo and Yao (2005) identified five basic market assumptions for the privatization of SOEs. They proposed that one of the objectives of the privatization of SOEs was to improve their efficiency and profitability. North (1990) pointed out that institutions evolve in the pursuit of economic advantage in the broadest sense. Thus, the following hypotheses are presented:

H1: Privatization of SOEs positively (+) affects their efficiency.

According to Walder (2002), communist countries, such as China, provided material benefits and more opportunities for favored political elites to access higher education and collect public funds, resulting in a greater disparity in rural regions. Although privatization has improved the efficiency of firms, it has also significantly increased regional income inequality. Thus, the following hypotheses are presented:

H2: Privatization of SOEs positively (+) affects regional income inequality.

The globalization activities of China not only promote its economic development but also effectively increase the earnings of low-income people, thereby reducing the income gap. According to Whalley and Yue (2009), however, the absolute terms of income inequality have worsened, with wider income disparity between rural and urban areas as well as inland and globally oriented coastal areas, despite the significant improvement in living standards and growth rate in China. Thus, the following hypothesis is presented:

H3: Globalization activities positively (+) affect income inequality.

Recently, local governments at all levels are the main driving force for privatization. Although only some local governments have adopted open and thorough privatization, almost all local governments are considering various other

methods to privatize the enterprises under their jurisdiction. The ongoing privatization process in China results from inter-regional competition (Zhang & Li, 1998). Weingast (1993) and Qian and Weingast (1995) emphasized that market-protecting federalism provided an excellent political rationale for economic development. They pointed out that regional competition not only played a crucial role in the rise of the British economic empire in the 18th century and the American economic power in the 19th century, as well as in the rise of Chinese economy in the past 45 years, and reported that under the influence of inter-regional competition, the privatization of SOEs promotes the efficiency of neighboring firms, but also exacerbates the income inequality of neighboring provinces. Thus, the following hypotheses are presented:

H4: Privatization of SOEs positively (+) affects the adjacent firms' efficiency.

H5: Privatization of SOEs positively (+) affects the adjacent regional income inequality.

2. Empirical Models

The Gini index is proposed by an Italian economist Gini in 1912 to measure the relative level of gross income per household or individual within a country or region. Traditionally, the Gini index has been widely used as an income inequality index, while the Lorenz curve can be used to determine how to calculate the relative Gini index. In this study, the provincial relative Gini index is calculated in Equation (1).

$$Province - GINI = \frac{1}{2\mu}\sum_{i=1}^{n}\sum_{j=1}^{n}\pi_i\pi_j|x_i - x_j| \quad (1)$$

μ : mean of firms' value in a province
x_i : sales per firm i (SMEs)
x_j : sales per firm j (large firms)
π_i : the relative poverty level of firm i
π_j : the relative poverty level of firm j

This study calculates corporate efficiency, using stochastic frontier analysis (SFA), as in Equation (2).

$$\text{Ln\_}OIPS_{i,t} = \beta_0 + \beta_1 \text{Ln\_}RD_{i,t} + \beta_2 \text{Ln\_}EMP_{i,t} + \text{Ln\_}ASSET_{i,t} + v_{i,t} - u_{i,t} \quad (2)$$

where, $SFA_{i,t}$ = efficiency of firm i in year t
Ln_$OIPS_{i,t}$ = Ln(operating profit of firm i in year t)
Ln_$RD_{i,t}$ = Ln(R&D expenses of firm i in year t)
Ln_$EMP_{i,t}$ = Ln(number of employees of firm i in year t)
Ln_$ASSET_{i,t}$ = Ln(total assets of firm i in year t)

where $v_{i,t}$ is the error term reflecting statistical noise; $u_{i,t}$ is the calculated technical non-efficiency value, which obeys $v_{i,t}$~N (0, σ_v), $u_{i,t}$~N^+(0, σ_u) half-normal distribution; $SFA_{i,t}$ is the measure of technical efficiency, the closer it is to 0, the higher the degree of technical inefficiency. When $SFA_{i,t}$ is 1, the technical efficiency is the highest.

$$SFA_{i,t} = \exp(-u_{i,t}) \tag{3}$$

To study the effect of the privatization of Chinese SOEs on improving the efficiency of firms, the following empirical analysis is used as shown in Equation (4).

$$\begin{aligned} SFA_{i,t} = {} & \beta_0 + \beta_1 \mathrm{Priv}\_D_{i,t} + \beta_2 \mathrm{Export}\_R_{i,t} + \beta_3 OFDI\_R_{i,t} + \beta_4 OFDI\_R_{i,t}^2 + \beta_5 Gov\_Sh_{i,t} + \beta_6 For\_Sh_{i,t} \\ & + \beta_7 Global\_D_{i,t} + \beta_8 HHI_{i,t} + \beta_9 Turnover_{i,t} + \beta_{10} Inventory\_R_{i,t} + \beta_{11} Exchang\_R_{i,t} \\ & + \beta_{12} ROA_{i,t} + \beta_{13} Tang\_R_{i,t} + \beta_{14} Debt\_R_{i,t} + \beta_{15} \mathrm{Ln}(Asset)_{i,t} + \eta_i + \lambda_t + \epsilon_{i,t} \end{aligned} \tag{4}$$

To study the effect of the privatization of Chinese SOEs on improving regional income inequality, the following empirical analysis is used as shown in Equation (5).

$$\begin{aligned} GINI_{j,t} = {} & \beta_0 + \beta_1 \mathrm{Priv}\_D_{i,t} + \beta_2 \mathrm{Export}\_R_{i,t} + \beta_3 OFDI\_R_{i,t} + \beta_4 OFDI\_R_{i,t}^2 + \beta_5 Gov\_Sh_{i,t} + \beta_6 For\_Sh_{i.t} \\ & + \beta_7 Global\_D_{i,t} + \beta_8 HHI_{i,t} + \beta_9 Turnover_{i,t} + \beta_{10} Inventory\_R_{i,t} + \beta_{11} Exchang\_R_{i,t} \\ & + \beta_{12} ROA_{i,t} + \beta_{13} Tang\_R_{i,t} + \beta_{14} Debt\_R_{i,t} + \beta_{15} \mathrm{Ln}(Asset)_{i,t} + \eta_i + \lambda_t + \epsilon_{i,t} \end{aligned} \tag{5}$$

where, i denotes firm i, j denotes province j, and t denotes year t.
$SFA_{i,t}$: Corporate efficiency index. Measured using SFA method
$GINI_{i,t}$: Gini index of enterprises in each province in China
$\mathrm{Priv}\_D_{i,t}$: Privatized firm dummy variable. 1 if true, 0 otherwise
$\mathrm{Export}\_R_{i,t}$: Export ratio. [Export(t)/Total assets(t)]
$OFDI\_R_{i,t}$: Outward FDI to asset ratio. [Outward foreign direct investment(t)/Total assets(t)]
$OFDI\_R_{i,t}^2$: Square of the OFDI to asset ratio. [Outward foreign direct investment(t)/Total assets(t)]^2
$Gov\_Sh_{i,t}$: Government ownership. [Share of the government ownership/Total shares]
$For\_Sh_{i,t}$: Foreign ownership. [Share of the foreign ownership/Total shares]
$Global\_D_{i,t}$: Global firm dummy variable. 1 if true, 0 otherwise.
$HHI_{i,t}$: Ownership concentration. $[\sum_{n=1}^{5} SH_{n,t})^2] / [(\sum_{n=1}^{5} SH_{N,T})^2]$
$Turnover_{i,t}$: Turnover to total assets. [Sales(t)/Total assets(t)]
$Inventory\_R_{i,t}$: Inventory ratio. [Inventory assets(t)/Total assets(t)]
$Exchange\_R_{i,t}$: Exchange rate. [Yuan/US Dollar]
$ROA_{i,t}$: Return on assets. [Net income(t)/Total assets(t)]
$Tang\_R_{i,t}$: Tangible asset ratio. [Tangible assets(t)/Total assets(t)]
$Debt\_R_{i,t}$: Debt ratio. [Total debts(t)/Total assets(t)]
$\mathrm{Ln}(Asset)_{i,t}$: Total assets in natural logarithm. [Ln(Total assets, Amount unit: 1,000 RMB)]

To study the effect of privatization of neighboring firms on the SFA of firms and GINI of the region, the spatial Durbin analysis model equations are used. The following matrix is applied to reflect the neighborhood of firms in the adjacent provinces.

$$W = \begin{pmatrix} D_{1,1} \cdots D_{1,i} \\ \vdots \ \ddots \ \vdots \\ D_{j,1} \cdots D_{j,i} \end{pmatrix}$$

where Rank(i) = Rank(j). D is 1 if the two firms are in adjacent provinces. Otherwise, D is 0.

$$\begin{aligned} SFA_{i,t} = {} & \rho W^{*} SFA_{j,t} + \beta_1 \mathrm{Priv\_}D_{i,t} + \beta_2 \mathrm{Export\_}R_{i,t} + \beta_3 OFDI\_R_{i,t} + \beta_4 OFDI\_R_{i,t}^2 + \beta_5 Gov\_Sh_{i,t} + \beta_6 For\_Sh_{i,t} \\ & + \beta_7 Global\_D_{i,t} + \beta_8 HHI_{i,t} + \beta_9 Turnover_{i,t} + \beta_{10} Inventory\_R_{i,t} + \beta_{11} Exchang\_R_{i,t} \\ & + \beta_{12} ROA_{i,t} + \beta_{13} Tang\_R_{i,t} + \beta_{14} Debt\_R_{i,t} + \beta_{15} \mathrm{Ln}(Asset)_{i,t} \\ & + W^{*} \beta_{16} \mathrm{Priv\_}D_{j,t} + W^{*} \beta_{17} \mathrm{Export\_}R_{j,t} + W^{*} \beta_{18} OFDI\_R_{j,t} + W^{*} \beta_{19} OFDI\_R_{j,t}^2 + W^{*} \beta_{20} Gov\_Sh_{j,t} + W^{*} \beta_{21} For\_aSh_{j,t} \\ & + W^{*} \beta_{22} Global\_D_{j,t} + W^{*} \beta_{23} HHI_{j,t} + W^{*} \beta_{24} Turnover_{j,t} + W^{*} \beta_{25} Inventory\_R_{j,t} + W^{*} \beta_{26} Exchang\_R_{j,t} \\ & + W^{*} \beta_{27} ROA_{j,t} + W^{*} \beta_{28} Tang\_R_{j,t} + W^{*} \beta_{29} Debt\_R_{j,t} + W^{*} \beta_{30} \mathrm{Ln}(Asset)_{j,t} + \eta_i + \lambda_t + \epsilon_{i,t} \end{aligned} \quad (6)$$

where ρ is the matrix autoregressive coefficients for dependent variables.

$$\begin{aligned} GINI_{i,t} = {} & \rho W^{*} GINI_{j,t} + \beta_1 \mathrm{Priv\_}D_{i,t} + \beta_2 \mathrm{Export\_}R_{i,t} + \beta_3 OFDI\_R_{i,t} + \beta_4 OFDI\_R_{i,t}^2 + \beta_5 Gov\_Sh_{i,t} + \beta_6 For\_Sh_{i,t} \\ & + \beta_7 Global\_D_{i,t} + \beta_8 HHI_{i,t} + \beta_9 Turnover_{i,t} + \beta_{10} Inventory\_R_{i,t} + \beta_{11} Exchang\_R_{i,t} \\ & + \beta_{12} ROA_{i,t} + \beta_{13} Tang\_R_{i,t} + \beta_{14} Debt\_R_{i,t} + \beta_{15} \mathrm{Ln}(Asset)_{i,t} \\ & + W^{*} \beta_{16} \mathrm{Priv\_}D_{j,t} + W^{*} \beta_{17} \mathrm{Export\_}R_{j,t} + W^{*} \beta_{18} OFDI\_R_{j,t} + W^{*} \beta_{19} OFDI\_R_{j,t}^2 + W^{*} \beta_{20} Gov\_Sh_{j,t} + W^{*} \beta_{21} For\_Sh_{j,t} \\ & + W^{*} \beta_{22} Global\_D_{j,t} + W^{*} \beta_{23} HHI_{j,t} + W^{*} \beta_{24} Turnover_{j,t} + W^{*} \beta_{25} Inventory\_R_{j,t} + W^{*} \beta_{26} Exchang\_R_{j,t} \\ & + W^{*} \beta_{27} ROA_{j,t} + W^{*} \beta_{28} Tang\_R_{j,t} + W^{*} \beta_{29} Debt\_R_{j,t} + W^{*} \beta_{30} \mathrm{Ln}(Asset)_{j,t} + \eta_i + \lambda_t + \epsilon_{i,t} \end{aligned} \quad (7)$$

IV. Data and Regression Analyses

1. Samples and Descriptive Statistics

In this study, we used data on SOEs listed on the Shanghai and Shenzhen stock exchanges in China from 2008 to 2018, and the sample firms were obtained using a combined dataset of RESSET and CSMAR. In some cases, financial data must be available for at least two consecutive years during the variable calculation process. Therefore, firms without relevant data were excluded from this study. A total of 13,332 sample firms met the above criteria. The data are unbalanced across years.

Table 1 summarizes the distribution of the sample between privatized and non-privatized firms by year and group. A total of 13,332 firm-year observations were used, with 7,838 privatized firms (58.79%) and 5,494 non-privatized firms (41.21%). Since 2008, the privatization of SOEs has accelerated for listed firms, increasing from 36.54% in 2008, 44.74% in 2010, 53.76% in 2012, and 61.24% in 2018.

Table 1. Sample Distribution of Privatized and Non-Privatized Firms

Year	Total Samples(A)	Privatized Firms (B)	Non-Privatized Firms	Proportion (C=B/A)
2008	208	76	132	36.54%
2009	326	140	186	42.94%
2010	561	251	310	44.74%
2011	589	308	281	52.29%
2012	1,198	644	554	53.76%
2013	1,496	886	610	59.22%
2014	1,623	999	624	61.55%
2015	1,544	958	586	62.05%
2016	1,737	1,066	671	61.37%
2017	1,981	1,243	738	62.75%
2018	2,069	1,267	802	61.24%
Total	13,332	7,838	5,494	58.79%

Table 2 presents the corporate efficiency calculated using the SFA method in this study. In most years, the efficiency of the privatized firms in this study is higher, ranging from 0.454 to 0.602, which is not significantly different from that of the non-privatized firms. However, since the magnitude of the change in efficiency varies from year to year by industry, the absolute value is of little significance.

Table 2. Comparison of SFA Efficiency between Privatized and Non-Privatized Firms

Year	Total Samples(A)	Privatized Firms (B)	Non-Privatized Firms(C)	Proportion (D=B-C)
2008	0.473	0.454	0.483	-0.029
2009	0.496	0.493	0.498	-0.005
2010	0.600	0.602	0.598	0.004
2011	0.558	0.546	0.572	-0.026
2012	0.502	0.491	0.516	-0.025
2013	0.494	0.498	0.488	0.010
2014	0.500	0.503	0.496	0.007
2015	0.505	0.510	0.498	0.012
2016	0.530	0.549	0.499	0.050
2017	0.585	0.587	0.582	0.005
2018	0.596	0.587	0.611	-0.024

Table 3. Descriptive Statistics

Variable	Obs.	Mean	Median	Std. Dev.	Minimum	Maximum
SFA	13,332	0.5377	0.5380	0.3021	0.0001	1.0000
GINI	13,332	0.3338	0.3259	0.0420	0.2677	0.5387
Priv_D	13,332	0.5879	1.0000	0.4922	0.0000	1.0000
Export_R	13,332	0.0278	0.0000	0.0966	0.0000	2.5337
OFDI_R	13,332	0.5200	0.1927	0.6796	0.0000	4.4194
Gov_Sh	13,332	0.0392	0.0000	0.1294	0.0000	0.8947
For_Sh	13,332	0.0100	0.0000	0.0627	0.0000	0.8234
Global_D	13,332	0.5086	1.0000	0.4999	0.0000	1.0000
HHI	13,332	0.1595	0.1303	0.1148	0.0005	0.7942
Turnover	13,332	0.6368	0.5498	0.4052	0.0124	4.8847
Inventory_R	13,332	0.1407	0.1180	0.1090	0.0000	0.8223
Exchange_R	13,332	6.5164	6.5342	0.3034	6.0969	6.9370
ROA	13,332	0.0492	0.0387	0.0426	0.0000	0.4939
Tang_R	13,332	0.9174	0.9509	0.0968	0.1099	1.0000
Debt_R	13,332	0.4156	0.4096	0.1963	0.0080	0.9994
Ln(Asset)	13,332	22.1952	22.0132	1.2830	17.8061	28.5200

Table 3 shows the summary statistics of the variables used in this study. First, the corporate efficiency (SFA) index has a mean of approximately 0.538 and a standard deviation of 0.3021. The Gini index of firms, another dependent variable, has a mean of 33.38% and a standard deviation of 4.2%. The means of the privatized firm dummy (Priv_D), export ratio (Export_R), and OFDI (OFDI_R) are 58.79%, 2.78%, and 52.00%, with a standard deviation of 49.22%, 9.66%, and 67.96%, respectively.

The means of the control variables are 3.92%, 1%, 50.86%, and 15.95% for government ownership (Gov_Sh), foreign ownership (For_Sh), global firm dummy variable (Global_D), and ownership concentration (HHI), respectively. The average total asset turnover (Turnover), inventory ratio (Inventory_R), firm profitability (ROA), tangible asset ratio (Tang_R), and debt ratio (Debt_R) are 63.68%, 14.07%, 4.92%, 91.74%, and 41.56%, respectively. The average exchange rate of yuan per US dollar during the period (Exchang_R) is 6.5164 yuan. Lastly, in natural log, the average firm size or total assets expressed in thousand yuan (Ln(Asset)) is approximately 22.2.

2. Correlation Analyses

Table 4 presents Pearson's correlation coefficients between the variables used in this study. The correlations between variables are mostly significant at the 1% level. In this case, the variance inflation factor (VIF) test should be used to diagnose multicollinearity issues and must be handled appropriately.

3. Mean Comparison Tests

Table 5 shows the results of the comparative analysis, regarding the differences in the means of the main variables of the privatized and non-privatized firms. The privatized firms is a 0.4% point higher corporate efficiency (SFA), but the difference is not statistically significant at the 10%

level. At the 1% level, the mean of the Gini index of firms is lower for privatized firms than that for non-privatized firms. In addition, the export ratio of the privatized firms (Export_R) and OFDI ratio (OFDI_R) are significantly higher by 1.4% and 3.8% points than those for non-privatized firms, respectively, all of which significant at the 1% level.

Table 4. Pair-wise Correlation Matrix between Variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
GINI	0.01	1.00														
Priv_D	0.01	-0.03 ***	1.00													
Export_R	0.04 ***	-0.03 ***	0.07 ***	1.00												
OFDI_R	0.03 ***	0.07 ***	0.03 ***	0.30 ***	1.00											
Gov_Sh	0.03 ***	0.09 ***	-0.34 ***	-0.02 *	0.06 ***	1.00										
For_Sh	0.02 **	0.03 ***	-0.06 ***	0.06 ***	0.05 ***	-0.02 *	1.00									
Global_D	-0.02 **	-0.02 **	0.11 ***	0.25 ***	0.75 ***	0.05 ***	0.06 ***	1.00								
HHI	0.05 ***	0.02 ***	-0.21 ***	-0.03 ***	0.00	0.20 ***	0.12 ***	-0.05 ***	1.00							
Turnover	0.09 ***	0.09 ***	-0.14 ***	0.10 ***	0.37 ***	0.03 ***	0.01	0.01	0.11 ***	1.00						
Inventory_R	-0.04 ***	0.06 ***	-0.07 ***	-0.02 *	0.10 ***	0.02 **	-0.01	0.03 ***	0.03 ***	0.14 ***	1.00					
Exchange_R	0.08 ***	0.19 ***	0.00	0.15 ***	-0.02 ***	0.01	-0.01	-0.01	-0.05 ***	-0.04 ***	-0.06 ***	1.00				
ROA	0.60 ***	0.08 ***	0.10 ***	0.02 **	0.04 ***	-0.06 ***	0.07 ***	-0.02 **	0.07 ***	0.13 ***	-0.13 ***	0.01	1.00			
Tang_R	-0.06 ***	0.09 ***	-0.15 ***	-0.05 ***	0.06 ***	0.04 ***	0.00	-0.05 ***	0.12 ***	0.18 ***	0.25 ***	-0.12 ***	0.00	1.00		
Debt_R	-0.11 ***	0.04 ***	-0.28 ***	-0.01	0.11 ***	0.16 ***	-0.06 ***	0.02 ***	0.08 ***	0.19 ***	0.29 ***	0.02 *	-0.35 ***	0.12 ***	1.00	
Ln(Asset)	0.10 ***	-0.11 ***	-0.31 ***	0.00	0.05 ***	0.22 ***	-0.04 ***	0.04 ***	0.27 ***	0.07 ***	0.06 ***	0.11 ***	-0.06 ***	0.00	0.51 ***	1.00

Notes: 1. Numbers in parentheses: (1) for SFA, (2) for GINI, (3) for Priv_D, (4) for Export_R, etc.
2. ***, ** and * denote a statistical significance at 1%, 5%, and 10% levels in two-tailed tests, respectively.

Table 5. Group Mean Difference Tests between Privatized and Non-Privatized Firms

Variables	Privatized Firms(A)	Non-Privatized Firms(B)	Difference (A-B)	t-statistic
SFA	0.539	0.535	0.004	0.796
GINI	0.333	0.335	-0.003***	-3.551
Export_R	0.034	0.020	0.014***	8.208
OFDI_R	0.536	0.497	0.038***	3.210
Gov_Sh	0.003	0.092	-0.089***	-41.488
For_Sh	0.007	0.014	-0.007***	-6.478
Global_D	0.555	0.443	0.112***	12.818
HHI	0.140	0.188	-0.048***	-24.329
Turnover	0.589	0.704	-0.115***	-16.285
Inventory_R	0.134	0.150	-0.016***	-8.434
Exchange_R	6.516	6.517	-0.001	-0.054
ROA	0.053	0.044	0.009***	12.165
Tang_R	0.905	0.935	-0.030***	-17.810
Debt_R	0.370	0.481	-0.111***	-33.455
Ln(Asset)	21.858	22.676	-0.818***	-38.163

Note ***, ** and * denote a statistical significance at 1%, 5%, and 10% levels in two-tailed tests, respectively.

4. Regression Analyses

For the regression analyses, as indicated in tables 6 and 7, model selection tests are conducted using statistics from both Breusch and Pagan Lagrange multiplier tests (LM tests) for time effects and Hausman tests for group- or firm-specific effects. In general, for panel data, the most suitable model is selected among the ordinary least squares models, random effects panel models, and fixed effects panel models (FEMs) through the model selection process. In this study, we used the results of the FEMs since all of the above mentioned tests are statistically significant. Furthermore, the results of the F tests and values indicate that the linear regression models are well fit. Using the VIF tests, the values range from 1.00, the smallest, to 3.53, the largest, still being small compared with the critical value of 10 in VIF.

4.1. Effects of Privatization on Corporate Efficiency

For H1, the effects of privatization on corporate efficiency measured using SFA in China are analyzed using FEMs, whose results are shown in Table 6. Firms are classified into privatized and non-privatized firms and analyzed according to whether they have undergone privatization. The F test results are all significant at the 1% level, and the adjusted r-squared values are 0.2376, 0.2664, and 0.2326, respectively.

According to the results of the regression analysis, the dummy variable of privatized firms (Priv_D), an explanatory variable, significantly positively (+) affects the corporate efficiency index (SFA). Therefore, the privatization of Chinese firms can help improve the efficiency of firms, which supports **H1**. The export ratio (Export_R) positively (+) affects the efficiency of firms (SFA)

in all firms and privatized firms and is statistically significant at the 1% and 5% levels, respectively.

The coefficient of squared OFDI or $(OFDI\_R)^2$ is negative (-), and, thus, OFDI has inverse U-shaped effects on the efficiency of firms. This indicates that as OFDI increases, the efficiency of firms first increases and then starts to decline after a certain level.

Moreover, government ownership (Gov_Sh) has a statistically significant positive (+) effect on corporate efficiency (SFA) at the 1% level in all firms and a statistically significant positive effect on privatized and non-privatized firms at the 5% level. The global firm dummy variable (Global_D) negatively (-) affects corporate efficiency (SFA) at the 5% level. The control variables, such as the

Table 6. Effects of Privatization on Corporate Efficiency

Variable SFA	(1) Full Samples		(2) Privatized Firms		(3) Non-Privatized Firms	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Priv_D	0.0239 **	2.10				
Export_R	0.0508 ***	2.34	0.0438 **	1.69	0.0479	1.24
OFDI_R	0.0367 ***	2.96	0.0128	0.82	0.0602 ***	3.01
$(OFDI\_R)^2$	-0.0115 ***	-3.08	-0.0084 **	-1.74	-0.0130 **	-2.24
Gov_Sh	0.0398 ***	2.66	0.2409 **	1.95	0.0278 **	1.81
For_Sh	0.0163	0.53	0.0347	0.68	0.0014	0.04
Global_D	-0.0225 **	-2.27	-0.0120	-1.00	-0.0470 ***	-2.82
HHI	0.1702 ***	4.97	0.0840 **	1.81	0.1967 ***	3.88
Turnover	0.0634 ***	6.85	0.0667 ***	5.13	0.0556 ***	4.22
Inventory_R	0.0366	1.11	0.0290	0.70	0.0417	0.78
Exchange_R	0.0059	1.19	-0.0048	-0.74	0.0247 ***	3.34
ROA	7.0695 ***	134.98	6.7870 ***	104.71	8.1882 ***	90.89
Tang_R	-0.2047 ***	-7.83	-0.1946 ***	-6.68	-0.1237 **	-2.03
Debt_R	-0.1326 ***	-7.51	-0.1826 ***	-8.39	-0.0307	-1.03
Ln(Asset)	0.0989 ***	28.71	0.1036 ***	23.03	0.1026 ***	18.41
Constant	-1.8897 ***	-21.77	-1.8597 ***	-17.08	-2.2664 ***	-15.17
Obs. (Firms)	13,332 (2,629)		7,838 (1,707)		5,494 (1,064)	
R^2 Within	0.6749		0.6897		0.6889	
R^2 Between	0.2376		0.2664		0.2326	
R^2 Overall	0.3631		0.3849		0.3390	
F test	1,479.39 ***		971.04 ***		698.53 ***	
LM test	8,136.68 ***		4,696.89 ***		3,143.72 ***	
Hausman test	4,829.81 ***		2,407.02 ***		6,007.32 ***	
VIF test	1.04~3.42		1.00~3.53		1.03~3.45	

Notes: 1. Based on model specification tests such as Lagrange multiplier test (LM test) and Hausman test, both significant at 1% level (in one tailed test), fixed effects models are selected, and their results are reported.
2. ***, ** and * denote a statistical significance at 1%, 5% and 10%, respectively.

total asset turnover (Turnover), firm profitability (ROA), and firm size (Ln(Asset)), positively (+) affect corporate efficiency (SFA) at the 1% level.

4.2. Effects of Privatization on Regional Income Inequality

For H2 and H3, we again used FEMs to examine the effect of privatization, exports, and OFDI on income inequality with the results shown in Table 7. As in the previous analysis, all firm samples were divided into two groups: privatized and non-privatized. As indicated in the table, the regressions are consistent with the F test statistics, which are all significant at the 1% level, and the adjusted r-squared values of the firms are 0.0001, 0.0017, and

Table 7. Effects of Privatization on Regional Income Inequality

Variable SFA	(1) Full Samples		(2) Privatized Firms		(3) Non-Privatized Firms	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Priv_D	0.0239 **	2.10				
Export_R	0.0508 ***	2.34	0.0438 **	1.69	0.0479	1.24
OFDI_R	0.0367 ***	2.96	0.0128	0.82	0.0602 ***	3.01
$(OFDI\_R)^2$	-0.0115 ***	-3.08	-0.0084 **	-1.74	-0.0130 **	-2.24
Gov_Sh	0.0398 ***	2.66	0.2409 **	1.95	0.0278 **	1.81
For_Sh	0.0163	0.53	0.0347	0.68	0.0014	0.04
Global_D	-0.0225 **	-2.27	-0.0120	-1.00	-0.0470 ***	-2.82
HHI	0.1702 ***	4.97	0.0840 **	1.81	0.1967 ***	3.88
Turnover	0.0634 ***	6.85	0.0667 ***	5.13	0.0556 ***	4.22
Inventory_R	0.0366	1.11	0.0290	0.70	0.0417	0.78
Exchange_R	0.0059	1.19	-0.0048	-0.74	0.0247 ***	3.34
ROA	7.0695 ***	134.98	6.7870 ***	104.71	8.1882 ***	90.89
Tang_R	-0.2047 ***	-7.83	-0.1946 ***	-6.68	-0.1237 **	-2.03
Debt_R	-0.1326 ***	-7.51	-0.1826 ***	-8.39	-0.0307	-1.03
Ln(Asset)	0.0989 ***	28.71	0.1036 ***	23.03	0.1026 ***	18.41
Constant	-1.8897 ***	-21.77	-1.8597 ***	-17.08	-2.2664 ***	-15.17
Obs. (Firms)	13,332 (2,629)		7,838 (1,707)		5,494 (1,064)	
R^2 Within	0.6749		0.6897		0.6889	
R^2 Between	0.2376		0.2664		0.2326	
R^2 Overall	0.3631		0.3849		0.3390	
F test	1,479.39 ***		971.04 ***		698.53 ***	
LM test	8,136.68 ***		4,696.89 ***		3,143.72 ***	
Hausman test	4,829.81 ***		2,407.02 ***		6,007.32 ***	
VIF test	1.04~3.42		1.00~3.53		1.03~3.45	

Notes: 1. Based on model specification tests such as Lagrange multiplier test (LM test) and Hausman test, both significant at 1% level (in one tailed test), fixed effects models are selected, and their results are reported.
2. ***, ** and * denote a statistical significance at 1%, 5% and 10%, respectively.

0.0106, respectively. In addition, the VIF values are not so high as the overall rejection level of 10.

The beta coefficient of the dummy variable for privatized firms (Priv_D) is 0.0050, statistically significant at the 5% level, indicating that the income inequality of privatized firms is approximately 0.5% points higher than that of non-privatized firms. This result supports H2. Exports, another explanatory variable, have a statistically negative (-) effect on income inequality (GINI) in all samples at the 1% level, which supports H3. OFDI, or $(OFDI\_R)^2$, has an inverse U-shaped effect on income inequality (GINI) since the coefficient of squared OFDI or $(OFDI\_R)^2$ is significantly negative (-), at the 1% level in all firms and non-privatized firms.

In other words, as OFDI increases, income inequality increases first, and once it reaches a certain level, it starts to decline for all firms and non-privatized firms only in the tests, not just for privatized firms.

In addition, the control variables, namely, government ownership (Gov_Sh), foreign ownership (For_Sh), ownership concentration (HHI), exchange rate (Exchang_R), firm profitability (ROA), and debt ratio (Debt_R), have a statistically significant positive (+) effect on income inequality (GINI) for all samples at the 1% level. However, the global firm dummy variable (Global_D), tangible asset ratio (Tang_R), and firm size (Ln(Asset)) have a statistically significant negative (-) effect on income inequality (GINI) at the 1% level in all groups and subgroups.

5. Spatial Regression Analyses

For comparison, we examined and divided the fixed effects spatial Durbin models (SDMs) into three models: individual fixed, time fixed, and spatio-temporal (dual) fixed, whose results are shown in Table 8. The results indicate that the value (δ) of the spatio-temporal fixed effect SDM model is the lowest at 0.0020, which implies that the model has the highest degree of fit. In addition, in terms of log-likelihood value, the spatio-temporal fixed effects SDM model has the highest log-likelihood or the highest explanatory power or degree of fit.

Therefore, it is appropriate to examine the spatial effect of privatization on the efficiency of firms, using the spatio-temporal fixed effect SDM model. The results of the regression analysis reveal that the dummy variable for privatized firms (Priv_D) by province has a significantly positive (+) effect on the efficiency of firms at the 1% level. In other words, regional privatization has a significant effect on improving the efficiency of firms, and the Chinese government should continuously promote the privatization of SOEs to improve their efficiency.

Regarding H4 for the spillover effects of privatization to neighboring provinces in terms on corporate efficiency (W × Priv_D), the statistically significant positive beta value in the spatio-temporal fixed effects SDM model on corporate efficiency indicates that there is a positive effect of corporate efficiency in a Chinese province on that of another one in the same period. The effect is in some context consistent with that of Qian and Weingast (1995) who claimed that under the influence of inter-regional competition, the privatization of SOEs promotes the efficiency of neighboring firms. Thus, the hypothesis (H4: Privatization of SOEs positively (+) affects the adjacent firms' efficiency) is supported.

Table 9 indicates the spatial regression results of the effect of the privatization of SOEs on income inequality across provinces in China. The results indicate that the value (δ) of the spatio-temporal fixed effect SDM model is the lowest at 0.6171, which implies that the model has the highest degree of fit. The table shows that the spatio-temporal fixed effects SDM model has the highest log-likelihood value of 685.99, implying that the model is best fit, in terms of the best explanatory power. The dummy variable for privatized firms by province (Priv_D) shows a statistically significant positive (+) effect on income inequality at the 1% level. In other words, the privatization worsened the income inequality of regions and thus of the country.

Table 8. Spatial Effects of Privatization on Corporate Efficiency: Spatial Durbin Model

Variables (SFA*)	(1) Individual Fixed Spatial Durbin Model		(2) Time-Fixed Spatial Durbin Model		(3) Both-Fixed Spatial Durbin Model	
	Coefficients	z-stats	Coefficients	z-stats	Coefficients	z-stats
Priv_D*	0.2028 ***	2.80	-0.0552	-0.77	0.1954 ***	2.47
Export_R*	-0.1554	-0.74	0.1550	0.85	-0.1512	-0.70
OFDI_R*	0.1115	1.03	-0.0387	-0.29	0.1458	1.24
OFDI_R²*	-0.0406 *	-1.57	-0.0032	-0.11	-0.0416 *	-1.40
Gov_Sh*	0.3438	1.12	0.6085 **	2.01	0.3184	1.18
For_Sh*	-0.1649	-0.39	0.1875	0.41	-0.3817	-1.06
Global_D*	-0.1628 ***	-3.44	-0.0797	-0.82	-0.1920 ***	-4.35
HHI*	-1.1168 ***	-4.35	-0.2514 *	-1.62	-0.9999 ***	-3.98
Turnover*	0.1328	0.94	0.0515	0.48	0.1519	1.09
Inventory_R*	-0.1546	-0.48	0.5394 **	2.20	-0.0353	-0.11
Exchange_R*	-0.2673 ***	-3.08			0.0000	
ROA*	5.0751 ***	9.09	4.4614 ***	6.30	4.9268 ***	7.55
Tang_R*	-0.0486	-0.19	-0.5151 **	-1.82	-0.0637	-0.22
Debt_R*	0.1349	0.80	0.0555	0.45	0.0900	0.57
Ln(Asset)*	0.0375 *	1.51	0.0003	0.01	0.0316	1.13
W Priv_D*	0.2449 **	1.73	0.0826	0.67	0.2092 *	1.29
W × Export_R*	-0.4968	-1.12	-1.0327 **	-1.83	-0.5106	-0.89
W × OFDI_R*	0.5403 **	2.19	0.2084	0.64	0.6199 **	1.88
W ×OFDI_R²*	-0.1482 **	-2.23	-0.0844	-1.08	-0.1557 **	-1.94
W × Gov_Sh*	0.5509 **	1.85	1.4868 ***	2.89	0.4146	0.87
W × For_Sh*	-1.1979 *	-1.50	1.0979	1.20	-1.8125 **	-2.06
W × Global_D*	-0.1909 **	-1.80	-0.2293	-1.14	-0.2915 **	-2.03
W × HHI*	0.0595	0.12	0.1600	0.63	0.5358	0.84
W × Turnover*	-0.0036	-0.02	0.2975 **	1.77	0.0581	0.32
W × Inventory_R*	0.6233	1.06	1.0718 **	1.99	1.0118 **	1.75
W × Exchange_R*	0.2950 ***	3.39	0.2000 **	2.22	0.3340 ***	3.19
W × ROA*	-1.2285	-1.26	-0.3346	-0.36	-1.3830 *	-1.36
W × Tang_R*	-0.5136	-0.86	-0.5014	-0.80	-0.4612	-0.70
W × Debt_R*	0.0351	0.18	-0.0575	-0.24	-0.0976	-0.43
W × Ln(Asset)*	-0.0005	-0.01	-0.0541 **	-1.81	-0.0139	-0.13
δ	0.1720 ***	2.61	0.0042 ***	5.02	0.0020 ***	4.06
Spatial FE	Yes		No		Yes	
Time-period FE	No		Yes		Yes	
Log Likelihood	360.99		285.97		368.00	
R^2 Within	0.7080		0.4742		0.3786	
R^2 Between	0.0844		0.7738		0.0964	
R^2 Overall	0.0966		0.6074		0.1156	

Notes: 1. ***, ** and * are statistically significant at the level of 1%, 5% and 10% (one-side tests), respectively.
2. Priv_D*, Export_R*, and OFDI_R* are figures calculated by province.
3. FE (fixed efffect) indicates whether spatial or time-period effect dummy variables are or not included in the models.

Table 9. Spatial Effects of Privatization on Regional Income Inequality: Spatial Durbin Model

Variables (GINI*)	(1) Individual Fixed Spatial Durbin Model		(2) Time-Fixed Spatial Durbin Model		(3) Both-Fixed Spatial Durbin Model	
	Coefficients	z-stats	Coefficients	z-stats	Coefficients	z-stats
Priv_D*	0.0530 ***	4.05	-0.0020	-0.26	0.0564 ***	3.14
Export_R*	0.0005	0.01	-0.0193	-0.58	0.0201	0.44
OFDI_R*	0.0369 **	1.81	0.0329	1.26	0.0141	0.56
OFDI_R²*	-0.0144 *	-1.64	-0.0079	-0.88	-0.0102	-1.09
Gov_Sh*	0.0573 *	1.64	-0.0065	-0.17	0.0103	0.36
For_Sh*	0.1227	1.20	0.1382 *	1.45	0.0665	0.59
Global_D*	-0.0275 ***	-2.37	-0.0080	-0.66	-0.0196 *	-1.48
HHI*	0.0269	1.02	0.0154	0.71	0.0436 *	1.32
Turnover*	0.0040	0.21	0.0033	0.17	0.0218	1.17
Inventory_R*	0.0051	0.10	-0.0210	-0.69	-0.0109	-0.24
Exchange_R*	0.0127 *	1.44			0.0000	
ROA*	-0.0551	-0.75	-0.0612	-0.70	-0.1535 **	-1.93
Tang_R*	0.0454 *	1.28	0.1453 ***	4.90	0.0216	0.57
Debt_R*	0.0098	0.49	0.0031	0.15	0.0036	0.18
Ln(Asset)*	0.0025	0.54	0.0013	0.33	0.0051	1.02
W × Priv_D*	0.1150 ***	3.68	-0.0068	-0.36	0.1500 ***	4.14
W × Export_R*	-0.1647 **	-2.13	-0.0763	-0.85	-0.0980	-1.09
W × OFDI_R*	0.0063	0.24	0.0038	0.10	-0.0722 *	-1.35
W × OFDI_R²*	0.0078	0.84	-0.0008	-0.07	0.0250 **	1.75
W × Gov_Sh*	0.0041	0.05	-0.0119	-0.12	-0.0382	-0.42
W × For_Sh*	0.0822	0.42	0.0613	0.37	-0.0350	-0.19
W × Global_D*	-0.0259 *	-1.54	0.0067	0.30	0.0025	0.12
W × HHI*	-0.1896 ***	-2.55	-0.0745 *	-1.30	-0.1038	-1.08
W × Turnover*	-0.0011	-0.03	-0.0584 **	-1.99	0.0184	0.43
W × Inventory_R*	-0.0692	-0.82	-0.0433	-0.62	-0.0785	-0.94
W × Exchange_R*	-0.0050	-0.48	0.0164	1.13	0.0195 *	1.42
W × ROA*	0.0391	0.31	0.0913	0.58	-0.2226 *	-1.49
W × Tang_R*	-0.1293	-1.12	0.1699 **	1.91	-0.1650 *	-1.47
W × Debt_R*	0.0384	0.88	0.0239	0.53	0.0229	0.50
W × Ln(Asset)*	-0.0083	-0.86	-0.0112 **	-2.06	-0.0056	-0.37
δ	0.7386 ***	14.84	0.7696 ***	15.68	0.6171 ***	7.84
Spatial FE	Yes		No		Yes	
Time-period FE	No		Yes		Yes	
Log Likelihood	680.71		619.87		685.99	
R^2 Within	0.5832		0.0329		0.1892	
R^2 Between	0.0383		0.0197		0.0310	
R^2 Overall	0.0407		0.0009		0.0514	

Notes: 1. ***, ** and * are statistically significant at the level of 1%, 5% and 10% (one-side tests), respectively.
2. Priv_D*, Export_R*, and OFDI_R* are figures calculated by province.
3. FE (fixed efffect) indicates whether spatial or time-period effect dummy variables are or not included in the models.

Regarding **H5** for the spillover effects of privatization to neighboring provinces (W × Priv_D), the statistically significant positive beta value in the spatio-temporal fixed effects SDM model on the regional income inequality indicates that there is a positive effect of income inequality in a Chinese province on that of another one in the same period. The effect is in some context consistent with that of Qian and Weingast (1995) who claimed that under the influence of inter-regional competition, the privatization of SOEs exacerbates the income inequality while improving the efficiency of neighboring firms. Thus, the hypothesis (**H5**: Privatization of SOEs positively (+) affects the adjacent regional income inequality) is supported.

V. Conclusion

This study examines the spatial and inter-temporal spillover effects of the privatization of Chinese SOEs on their efficiency and income inequality using a merged dataset from the RESSET and CSMAR databases, 13,332 observations (year-firms) from firms listed on the Shanghai and Shenzhen stock exchanges from 2008 to 2018, and the SFA method and spatial Durbin model. Specifically, this study focuses on the inequality issue around the privatization of SOEs, compared with non-privatized firms in terms of efficiency, with corporate efficiency measured by using the stochastic frontier analysis (SFA) and regional income inequality using the Gini index. To diagnose the effects of privatization in China on corporate efficiency and regional income inequality, this study uses the fixed effects model to test, but also uses the spatial Durbin model (SDM) to uniquely examine the regional spillover effects of privatization on the efficiency and income inequality of neighboring firms. The results of this study are summarized as follows.

First, the privatization of Chinese SOEs increased their efficiency, but exacerbated their income inequality.

Second, the globalization activities after the privatization of Chinese SOEs increased their efficiency, but exacerbated their income inequality. Exports decrease income inequality, while outward foreign direct investment or OFDI has an inverse U-shaped effect on income inequality.

Third, the privatization improved overall corporate efficiency within the province and that of neighboring provinces.

Fourth, the Chinese SOEs firms after privatization aggravated income equality within the province and that of neighboring provinces.

In general, the results of this study indicate that the privatization of SOEs has improved the efficiency of Chinese firms. However, the benefits of privatization like improvements in corporate efficiency resulted in more severe problems in income equality within the province and that of neighboring provinces. Likewise, the globalization activities after the privatization of Chinese SOEs increased their efficiency and decreases income inequality through exports, while outward foreign direct investment or OFDI has an inverse U-shaped effect on income inequality.

With their spillover effects to neighboring firms and provinces, the results imply that the privatization of SOEs and the globalization activities like OFDI after the privatization have improved the efficiency of Chinese firms, but worsened income equality within the province and that of neighboring provinces, except for exports. Therefore, there is a strong policy need to cure income equality through exports and OFDI within the province and that of neighboring provinces, which might have been worsened after the privatization of SOEs and their globalization activities.

References

Adams, S. (2006). The impact of privatization on economic growth and income inequality in Sub-Saharan Africa. *The Journal of Social, Political, and Economic Studies, 31*(3), 295-320.

Bahar, D., Hausmann, R., & Hidalgo, C. A. (2014). Neighbors and the evolution of the comparative advantage of nations: Evidence of international knowledge diffusion?. *Journal of International Economics, 92*(1), 111-123. https://doi.org/10.1016/j.jinteco.2013.11.001

Bourguignon, F. (2004). *The poverty-growth-inequality triangle* (Working paper No. 125). Indian Council for Research on International Economic Relations.

Brandt, L., Roberts, J., & Li, H. (2003). *Governments, banks, and firms: The case of privatization in China*. Department of Economics, University of Toronto.

Candelaria, C., Daly, M. C., & Hale, G. (2009). *Beyond Kuznets: Persistent regional inequality in China* (Working paper series 2009-07). Federal Reserve Bank of San Francisco.

Gao, J., Jun, B., Pentland, A. S., Zhou, T., & Hidalgo, C. A. (2021). Spillovers across industries and regions in China's regional economic diversification. *Regional Studies*, *55*(7), 1311-1326. https://doi.org/10.1080/00343404.2021.1883191

Cao, Y., Qian, Y., & Weingast, B. (1999). From federalism, Chinese style to privatization, Chinese style. *Economics of Transition, 7*(1), 103-131. https://doi.org/10.1111/1468-0351.00006

Garnaut, R., Song, L., Tenev, S., & Yao, Y. (2003). *A study of firm restructuring in China, manuscript.* World Bank.

Guo, K., & Yao, Y. (2005). Causes of privatization in China: Testing several hypotheses. *Economics of Transition*, *13*(2), 211-238. https://doi.org/10.1111/j.1468-0351.2005.00221.x

Hong, J. E., & Park, K. B. (2016). Analysis of privatization performance: Focusing on efficiency and productivit. *Journal of the Korean Society of Industrial-Academic Technology*, *17*(3), 298-309.

Jahmane, A., & Gaies, B. (2020). Corporate social responsibility, financial instability and corporate financial performance: Linear, non-linear and spillover effects: The case of the CAC 40 companies. *Finance Research Letters, 34*, 101483. https://doi.org/10.1016/j.frl.2020.101483

Jefferson, G. H., & Su, J. (2006). Privatization and restructuring in China: Evidence from shareholding ownership, 1995-2001. *Journal of Comparative Economics, 34*(1), 146-166. https://doi.org/10.1016/j.jce.2005.11.008

Kuznets, S. (1955). Economic growth and economic inequality. *American Economic Review, 45*(1), 1-28.

Li, H. (2002). Government's budget constraint, competition, and privatization: Evidence from China's rural industry. *Journal of Comparative Economics, 31*(3), 486-502. https://doi.org/10.1016/S0147-5967(03)00070-2

Lin, Y., & Zhu, T. (2001). Ownership restructuring in Chinese state industry: An analysis of evidence on initial organizational changes. *The China Quarterly, 166*(1), 305-341. https://doi.org/10.1017/S000944390100016X

Martín, J. C., & Roman, C. (2001). An application of DEA to measure the efficiency of Spanish airports prior to privatization. *Journal of Air Transport Management*, *7*(3), 149-157. https://doi.org/10.1016/S0969-6997(00)00044-2

North, D. C. (1990). *Institutions, institutional change and economic performance.* Cambridge University Press.

Park, A., & Shen, M. (2002). Joint liability lending and the rise and fall of China's township and village enterprises. *Journal of Development Economics, 71*(2), 497-531. https://doi.org/10.1016/S0304-3878(03)00038-5

Qian, Y., & Weingast, B. R. (1996). China's transition to markets: Market-preserving federalism, Chinese style. *The Journal of Policy Reform, 1*(2), 149-185. https://doi.org/10.1080/13841289608523361

Song, L., & Yao, Y. (2004). *Privatization and firm performance in China. Stanford center for international development.* (Working paper No. 204). Stanford University.

Su, J., & Jefferson, G. (2003). *A theory of decentralized privatization: Evidence from China*. Graduate School

of International Economics and Finance, Brandeis University.

Tiemann, O., & Schreyögg, J. (2012). Changes in hospital efficiency after privatization. *Health Care Management Science, 15*(4), 310-326. https://doi.org/10.1007/s10729-012-9193-z

Walder, A. G. (2002). Markets and income inequality in rural China: Political advantage in an expanding economy. *American Sociological Review, 67*(2), 231-253. https://doi.org/10.2307/3088894

Wang, X. L., Shi, K., & Fan, H. X. (2006). Psychological mechanisms of investors in Chinese stock markets. *Journal of Economic Psychology, 27*(6), 762-780. https://doi.org/10.1016/j.joep.2006.06.007

Weingast, B. R. (1995). The economic role of political institutions: Market-preserving federalism and economic development. *The Journal of Law, Economics, and Organization, 11*(1), 1-31. https://doi.org/10.1093/oxfordjournals.jleo.a036861

Whalley, J., & Yue, X. (2009). Rural income volatility and inequality in China. *CESifo Economic Studies, 55*(3-4), 648-668. https://doi.org/10.1093/cesifo/ifp014

Xie J. G. (2006). Technology spillover of foreign direct investment to China: A study based on panel data of Chinese provinces. *Economics (Quarterly), 5*(4), 1109-1128.

Xu, L., Zhu, T., & Lin, Y. (2005). Politician control, agency problems and ownership reform: Evidence from China. *Economics of Transition, 13*(1), 1-24. https://doi.org/10.1111/j.1468-0351.2005.00205.x

Yang, D. T. (2002). What has caused regional inequality in China?. *China Economic Review, 13*(4), 331-334.

Zhang, M. (2015). Analysis of Xinjiang's industrial enterprise privatization reform based on DEA's economic performance perspective. *Journal of Sichuan University of Technology (Natural Science Edition), 28*(4), 95-100.

Zhang, W. Y., & Li, S. H. (1998). Interregional competition and privatization of state-owned enterprises in China. *Economic Research, 12*, 13-22.

ISSN 1946-5130 (Print), ISSN 2470-4733 (Online)
http://dx.doi.org/10.20294/jgbt.2023.19.1.193

The Journal of Global Business and Trade

Journal of Global Business and Trade

https://www.pfw.edu/jgbt

Research on the Influencing Factors and Transformation Path of Logistics Enterprise Low-Carbon Performance*

Jian Li[a], Seung-Lin Hong[b]**

[a]*Department of Logistics, Yancheng Teachers University, Hohai University, China*
[b]*Department of International Trade, Hansung University, South Korea*

Received 28 December 2022, Revised 21 January 2023, Accepted 5 February 2023

ABSTRACT

Purpose – This study expounds that logistics enterprises should make use of an information-sharing mechanism, benefit distribution mechanism, and government guarantee mechanism to optimize and balance resource allocation with cooperative participants.

Design/Methodology/Approach – This study developed a theoretical research model with interface management analysis, interface resource allocation, and interface management measures as independent variables; an interface connection mechanism and collaborative innovation capability as intermediary variables; and the low-carbon performance of enterprises as a dependent variable based on the structural equation model (SEM) and the empirical test, by selecting a certain number of logistics enterprises nationwide as research objects.

Findings – This study discloses that elements such as interface management analysis, interface resource allocation, interface management measures, interface connection mechanism, and collaborative innovation capability contribute proportionally to the low-carbon performance of logistics enterprises. Meanwhile, the interface connection mechanism plays an intermediary role in the impact of interface management analysis and interface management measures on the low-carbon performance of enterprises.

Research Implications – This study proposes that the collaborative innovation capability of enterprises should be improved through various interface management measures, and that R&D and the application of low-carbon technology and equipment must be accelerated, thus promoting the improvement of the low-carbon performance of enterprises, and enabling a low-carbon transformation in logistics enterprises, and even the whole logistics industry, so as to help achieve the carbon peak and move toward carbon neutrality as soon as possible.

Keywords: carbon peak, collaborative innovation, interface management, logistics enterprises, low-carbon performance

JEL Classifications: F43, F63, O15

* *This work is financially supported by Hansung University.*
** *Corresponding Author, E-mail: dean44@hansung.ac.kr*

I. Introduction

The intensifying greenhouse effect poses a great threat to the development of human economy and society. To address climate change, Chinese President Xi Jinping proposed 2060 Goals at the 75th Session of the United Nations General Assembly on September 22, 2020 (Xi, 2021). A comprehensive and systematic interpretation of the "community of human and natural life" fully demonstrates China's determination and confidence in low-carbon development. Opportunities usually go hand in hand with challenges, especially in terms of the aspiration on the development of a low-carbon economy. Currently, coal is a dominant source of energy in China, which massive structural contradictions, whereas due to the extensive economic development mode China has adopted, energy application witnesses a relatively low level of efficiency. Based on the background of the current transformation stage of Chinese logistic, this paper constructs an evaluation index system and a theoretical research model of the influencing factors of an enterprise's low-carbon performance based on interface management using a literature review and questionnaire. Additionally, it aims to analyze the low-carbon performance of logistics enterprises from the perspective of interface management, and the low-carbon performance of logistics enterprises based on an empirical analysis. As a consequence, it will propose some targeted countermeasures and suggestions to promote the low-carbon transformation of logistics enterprises.

The carbon emissions of the logistics industry mainly come from the fuel consumption of transportation, storage, loading, unloading, and handling equipment, as well as the consumption of packaging materials, such as cartons and plastic bags. Based on the collected data from the above, this paper roughly estimates carbon emissions according to the IPCC Guidelines for National Greenhouse Gas Inventories. Therefore, it is speculated that the logistics industry is an industry with high carbon emissions. Peak carbon in 2030 is a daunting task, which makes the acceleration of the low-carbon transformation of logistics enterprises urgent. According to the 2020 China Statistical Yearbook, the energy consumption of transportation, storage, and postal services increased from 103 million tons of standard coal in 2001 to 436 million tons of standard coal in 2018, and its share in total energy consumption rose from 7.6% to 9.24%, among which the substantial increase in the consumption of diesel, gasoline, kerosene, fuel oil, and electricity caused a sharp increase in carbon dioxide emissions in the logistics industry. In addition, China's express delivery services consumed 14.22 billion boxes, 5 billion woven bags, 6.5 billion envelopes, 42.55 billion meters of adhesive tape, 63.52 billion express waybills, and 22.02 billion plastic bags in 2019, according to China Post data. In contrast, the actual recovery rate of cardboard and plastic in the express delivery industry is less than 10%. Packaging materials and specifications affect recycling efficiency to a great extent, indirectly leading to a large number of carbon emissions in the packaging process of the logistics industry. Based on the relevant data of the above two aspects, this paper roughly estimates carbon emissions according to the IPCC Guidelines for National Greenhouse Gas Inventories and finds that the logistics industry is an industry with high carbon emissions. It is an arduous task to reach carbon peak in 2030, and the acceleration of the low-carbon transformation of logistics enterprises is urgent.

It is vital for logistics enterprises to realize a low-carbon transformation to promote the research, development, and application of low-carbon equipment and low-carbon recyclable packaging materials through technological innovation. However, technological innovation is uncertain, and the risk avoidance behavior of business operators is not conducive to technological innovation. Combined with the risk dispersion theory proposed by R. E. Aves and G. V. Stevens, cooperation between multiple innovation subjects can effectively reduce the risk of technological innovation (Yuan et al., 2019). In the

process of collaborative innovation, the interaction of knowledge, capital, tasks, information, and resources, as well as conflicts, is inevitable. The existence of interface barriers makes collaborative innovation inefficient (Wang et al., 2019). The impact of COVID-19 in 2020 on logistics enterprise supply chain management regarding the ability to achieve a low-carbon transformation and sustainable development is important to note. The new trends and performance of logistics enterprises in the new era are inseparable from inclusive and innovative sustainable development planning (Lee et al., 2021). Interface management refers to the coordination and control of interface conflicts among enterprises. By solving conflicts among interface members, the overall efficiency of management can be improved, and collaborative innovation is promoted. Beyer and Ullrich (2022) believed that organizational complexity in enterprise management will develop into a highly complex state over time. Therefore, enterprises must adopt active complexity management methods to operate NES and N-type natural, E-type engineering, or S-type sliding systems by applying tree attribute matrix modeling methods. Effective resource allocation and collaborative innovation among enterprises can effectively improve operational efficiency.

According to data published on relevant websites and valid questionnaires collected, this study found that the main factors restricting the low-carbon transformation of logistics enterprises are as follows. First, some logistics enterprises are not active in a low-carbon transformation due to the abnormal fluctuations in carbon-related policies and the market, as well as the lack of new logistics infrastructure. Second, to avoid "free rider" behavior, the sharing degree of knowledge, information, and other resources owned by enterprises is low, and in the long run, an "Information Isolated Island" is formed. Third, the innovation ability of logistics enterprises is not high; the number of low-carbon patents owned by enterprises is very small, and many low-carbon patents are concentrated in Yuancheng Group, JD, and other large enterprises. Fourth, different information sources of different organizations make it impossible to avoid possible moral hazards and adverse selection problems in cooperation, which is difficult for enterprises to prevent. Fifth, and most importantly, based on the above reasons, although the surveyed enterprises generally realize that climate change will have an impact and that the benefits of low-carbon transformation outweigh the risks, except for some enterprises, the culture of green development is not strong, and the importance of green development is not yet deeply rooted.

II. Literature Review and Theoretical Hypotheses

1. Literature Review

1.1. Research Status of Enterprise Interface Management

Research on interface management originated in the field of engineering technology in the 1960s (Souder & Chakrabarti, 1978), and was introduced into the field of management, which refers to the interaction generated between departments or organizational units during management activities. Since the 1990s, information technology has prevailed through evolution and iteration. Therefore, it has become a central bright spot in the domestic management circle, and has been applied to interface management in the process of enterprise innovation, interface management in R&D/marketing (Guan et al., 1999), interface management in cooperative technology innovation, and the effectiveness of the enterprise innovation interface. Many other aspects have made remarkable achievements; some explore interface problems from the perspective of organizational structure and integrated management, and some combine interface management with supply chain management, dynamic alliance, process management, and other fields to conduct research. However, due to the short time scale, there are still some aspects that have not been deeply

investigated, and the overall research level of interface management in the non-economic management field is far lower than that in the pure economic management field. The literature analysis included an interface management study in the early 1960s and a study by Elnaz Keivani using Data Envelope Analysis (DEA) of emission reduction efficiency and carbon performance in 2020, which is concluded as broad and inclusive in the field.

1.2. Status Quo of Research on Corporate Carbon Performance

From DuPont's financial analysis system to Kaplan's balanced scorecard, we have witnessed the increasing complexity and continuous improvement of corporate performance evaluation methods. With increasingly prominent environmental problems, performance evaluation indicators are gradually extended to the environmental field, of which carbon performance is an important branch. Carbon performance evaluation research has also experienced a transformation from a single index (Zhou et al., 2010) to a comprehensive index, and then to an index system (Hoffmann & Busch, 2008). Data envelopment analysis (DEA) is the most mature method applied in the field of carbon performance evaluation, and many scholars have applied it in the study of emission reduction efficiency and carbon performance. The global impact of COVID-19 has led to major changes in the food supply chain. Consumer food purchasing dynamics are different, and there is increasing concern about the sustainability of food packaging and waste, corporate low-carbon transformation, and corporate green supply chain management (Charlebois et al., 2021). Khanzad and Gooyabadi (2021) used the Meyer model, PESTEL model, and Integration model to organize small enterprises affected by COVID-19 and other environmental shocks, and formulated a post-epidemic strategic elastic framework. It is extremely challenging for companies to cope with the consequences of the massive negative economic side effects of a devastating global pandemic through their own interconnected mechanisms, and to survive reduced revenues, job losses, and other economic plights.

The concept of carbon performance was put forward late in China. Influenced by foreign studies, most scholars prefer to directly build carbon performance evaluation systems. Chinese research on the low-carbon performance evaluation of enterprises can be divided into two categories: the first studies the evaluation system of low-carbon performance of enterprises from the perspective of input–output, and in the second, non-financial indicators that can represent low-carbon status are included on the basis of traditional financial indicators to study the performance evaluation system of enterprises in a low-carbon economy (Yan et al., 2016).

In sum, in terms of enterprise interface management, the existing research on interface management mainly focuses on four aspects: first, the analysis and management methods of the R&D–manufacturing–marketing interface; second, most studies focus on inter-organizational interfaces rather than interdepartmental interfaces; third, the focus is mainly on the development process of new products; fourth, there is a trend of diversification in interface management research. However, in the context of countries around the world vigorously developing a low-carbon economy, this study found that there are still few empirical studies on the impact of interface management on enterprise low-carbon performance by consulting numerous studies.

Enterprise low-carbon performance can be found by sorting data related to low-carbon performance at home and abroad, the research is mainly based on the evaluation of low-carbon performance or the construction of index systems, and there are few empirical studies on the influencing factors of low-carbon performance.

In the context of low-carbon economic development, it is necessary to analyze the influencing factors of enterprise low-carbon performance from different perspectives and put forward targeted suggestions to promote low-

carbon transformation. Interface management theory is one of these perspectives.

2. Theoretical Hypothesis

2.1. Analysis of the Impact of Interface Management, Interface Resource Allocation, and Interface Management Measures on Enterprise Low-Carbon Performance

McLellan et al. (2021) believed that innovative project management methods could improve enterprise resource allocation and risk operation, thus improving customer asset efficiency and competitiveness, promoting market expansion and reducing financial risks. Due to the different nature of logistics enterprises, universities, scientific research institutions, and other units, the expectations of low-carbon technology innovation research and development are also different, and the lack of effective communication in an organizational interface will lead to conflicts of interests on both sides. Dai et al. (2019) proposed that by analyzing and managing different interfaces generated during cooperation between organizations, strengthening effective communication between organizations, coordinating contradictions in resources, human resources, technology, and information, and identifying and dealing with technical problems in advance, the overall benefit of a project could be improved, and the low-carbon performance of the enterprise can be promoted.

In conclusion, it is assumed that

H1a: Interface management analysis has a significant, positive impact on enterprise low-carbon performance.

The optimal allocation of innovation team resources based on interface management can not only improve a team's innovation ability but also become an important guarantee to enhance enterprise competitiveness and drive economic and social development. To further explore the impact of interface resource allocation on enterprise low-carbon performance, this study, combined with the classification of resources by many scholars and according to the attribute characteristics of resources themselves, divided interface resources into four types: talents, capital, material objects, and knowledge. Some scholars pointed out that enterprises, universities, scientific research institutions, and other parties should jointly integrate and use innovative elements such as intellectual property rights, physical property rights, human resources, and financial capital in the region (Bowman, 2008), promote the construction of community innovation systems, and contribute to the realization of green, ecological, and low-carbon.

In conclusion, it is assumed that

H1b: Interface resource allocation has a significant, positive impact on enterprise low-carbon performance.

Many scholars believe that interface management can promote the low-carbon performance of enterprises, and interface management measures are the approach. Combined with the various viewpoints of many scholars, this study verified and explored the impact of interface management measures on enterprise low-carbon performance from four perspectives: interface management team, enterprise operation, risk control, and supply chain integration.

When making business decisions, ethical leaders can consciously assume social responsibilities and consider the environmental benefits of enterprises. Therefore, it can be inferred that healthy business operations contribute to the improvement of the low-carbon performance of enterprises. In addition, some scholars have pointed out that when cooperating with other organizations, enterprises use the interface management as a bridge and coordinate with the different organization systems. At the same time, the risk culture rooted in the supply chain network organizations enhances the ability to identify and control risk, enhances risk management to reduce costs, and improves the level of supply chain integration to achieve

the optimal combination of resources, industrial transformation, and upgrading through integrated innovation, which can effectively improve green extension performance (He et al., 2017).

In conclusion, it is assumed that

H1c: Interface management measures have a significant, positive impact on enterprise low-carbon performance.

2.2. The Impact of Interface Connection Mechanism and Collaborative Innovation Capability on Enterprise Low-Carbon Performance

The establishment of connection rules between innovation subjects is conducive to promoting green innovation, so as to realize the improvement of green innovation ability and performance, as well as the improvement of sustainable competitive advantage (Wang et al., 2021). Compared with the administrative mechanism of internal layers of organizations, or the price mechanism of market transactions, the link mechanism between enterprises is of benefit and risk sharing based on full information sharing and resource flow. Therefore, this study constructed an interface connection mechanism with the independent management and service mechanism of information resources, market operation and disposal mechanism, benefit distribution mechanism, and government guarantee mechanism as the core to explore its impact on the low-carbon performance of enterprises.

You and Song (2018) believed that the establishment of a scientific and reasonable benefit distribution mechanism for industry–university–research eco-technology cooperation innovation, and the government's introduction of relevant policies to build an incentive and constraint mechanism for eco-technology innovation, namely, the government guarantee mechanism, can help promote the improvement of environmental benefits. In addition, the independent management and service mechanism of information resources, and the market operation and disposal mechanism are the key links in the coupling coordination of resource sharing. In an information society, access to knowledge, information channels, and necessary institutional guarantee are indispensable for the improvement of enterprise environmental performance.

In conclusion, it is assumed that

H2a: Interface connection mechanism has a significant, positive impact on enterprise low-carbon performance.

Some scholars have proposed that the collaborative innovation capability based on the synergistic theory refers to the ability of enterprises to acquire external knowledge and create new knowledge together with external organizations through collaboration and interaction, thus generating a greater effect compared a single innovation subject (Luo et al., 2018). The degree of green collaboration between organizations has a positive impact on enterprise environmental performance (Chen, 2015). Based on the viewpoints of many scholars, this study decided to explore the impact of collaborative innovation capability on enterprise low-carbon performance from the perspectives of information level, cooperative innovation capability, product development cycle, and product development efficiency.

In order to promote the low-carbon performance of enterprises, a higher level of information and cooperative innovation ability that can help enterprises grasp the market development trend, the effective shortening of the product development process, the improvement of product development efficiency, promotion of the sustainable development of green technology, improvement of the core competitiveness of enterprises through the upgrade of green technology, and promotion of the conversion of enterprises to clean and low-carbon energy use is needed (Shen & Zhao, 2002).

In conclusion, it is assumed that

H2b: Collaborative innovation capability has a significant, positive impact on enterprise low-carbon performance.

2.3. The Mediating Role of the Interface Connection Mechanism

The analysis and management of the organization, contract, and technology interface should eliminate the negative impact of interface barriers in organization, contract, and technology as much as possible under the action of information-sharing and institutional guarantee mechanisms to promote low-carbon performance.

In conclusion, it is assumed that

H3a: The interface connection mechanism plays a mediating role in the impact of the interface management analysis on enterprise low-carbon performance.

To achieve a strong collaborative innovation effect across organizations, information communication and exchange between departments and institutions are necessary, which requires good resource sharing and information communication among collaborative participants (Yi, 2018). Reasonable profit distribution and information-sharing mechanisms play a mediating role in the influence of resource allocation optimization and information communication between organizations on enterprise environmental performance.

In conclusion, it is assumed that

H3b: The interface connection mechanism plays a mediating role in the impact of interface resource allocation on enterprise low-carbon performance.

Interface and interface management measures, such as business management teams, are also only supported by the actions of the information-sharing and system guarantee mechanisms to acquire information to change the social environment, and the differences in the organization systems of different partners allow varied responses. The protection of such a mechanism can be supported by resource reorganization to realize the integration of the supply chain. Only in this way can risks be quickly identified and dealt with in the low-carbon innovation projects and promotion of low-carbon performance.

In conclusion, it is assumed that

H3c: The interface connection mechanism plays a mediating role in the impact of interface management measures on enterprise low-carbon performance.

2.4. The Mediating Role of Collaborative Innovation Capability

Through analysis of different interfaces, an effective information channel is established to effectively maintain necessary communication between each obstacle; the integration of different interfaces creates synergies, improves the degree of green collaboration between organizations, and promotes environmental performance.

In conclusion, it is assumed that

H4a: Collaborative innovation capability plays a mediating role in the impact of interface management analysis on enterprise low-carbon performance.

Some scholars have constructed an analytical framework of the "resource allocation—capacity formation—Innovative output—Innovative market" in their research, and found that the allocation optimization of inter-organizational resources contributes to the improvement of enterprise innovation ability. Synergy between enterprises, other organizations, and the market can directly improve innovation output and enhance the effect intensity of innovation capability and innovation output, thus promoting the improvement of low-carbon performance.

In conclusion, it is assumed that

H4b: Collaborative innovation capability plays a mediating role in the impact of interface resource allocation on enterprise low-carbon performance.

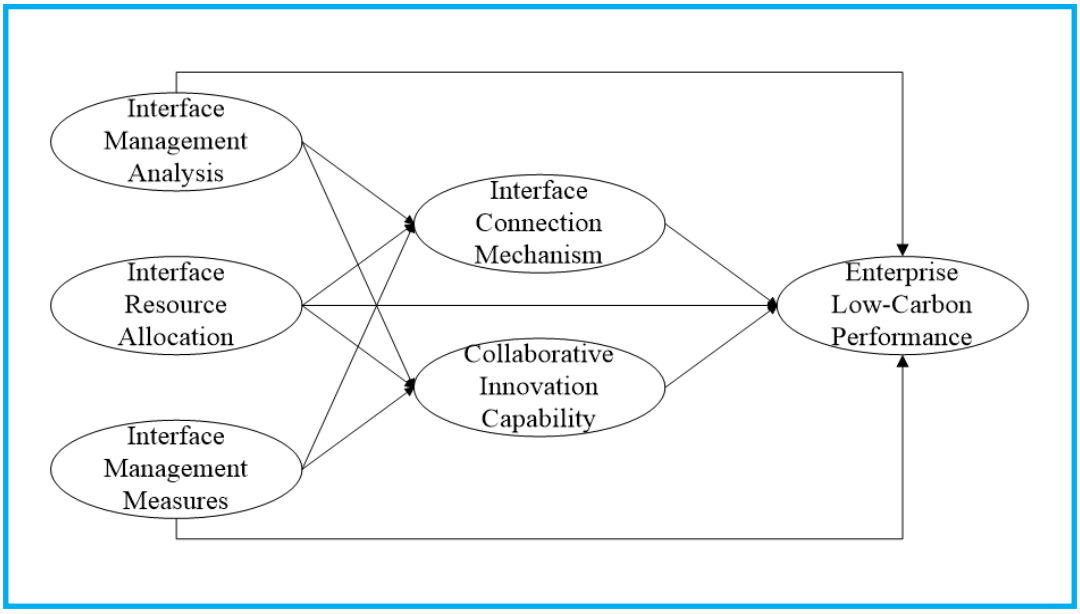
Some scholars have shown through investigation and research that by optimizing the cluster industrial chain, enterprises with different roles in the upper, middle, and lower reaches of the industry can be organically combined to carry out the specific division of labor and close cooperation, so as to play a synergistic effect role. Additionally, healthy business decisions set up strategies oriented toward the collaborative innovation of a dynamic evolution information monitoring platform, help to realize the integration of the supply chain, improve the green degree of collaboration between organizations, improve the low-carbon technologies of collaborative innovation ability, and promote the low-carbon performance of enterprises.

In conclusion, it is assumed that

H4c: Collaborative innovation capability plays a mediating role in the impact of interface management measures on enterprise low-carbon performance.

Based on the above literature and research assumptions, the theoretical framework model constructed in this study is shown in Fig. 1.

Fig. 1. Theoretical Research Model



III. Variable Index Selection and Data Source

1. Variable Index Selection

Combined with the theoretical research model in Fig. 1, this study measured interface management factors that affect the low-carbon performance of logistics enterprises, including interface management analysis, interface resource allocation, interface management measures, interface connection mechanism, and collaborative innovation ability. When designing the evaluation index system, this paper follows the principles

of scientific, comprehensiveness, operability, and purpose according to the viewpoints of Peng. At the same time, to ensure the reliability and validity of the measurement tools, this study conducted a preliminary survey on some logistics enterprises before the questionnaire was formally confirmed, and solicited the opinions of instructors to evaluate the rationality of the questionnaire design.

In the analysis of interface management, Li (2004) divided it into management, technical, static, and dynamic interfaces. In combination with the viewpoints of the above scholars, this paper analyzed inter-organizational interface management based on three types of interfaces: organization, contract, and technology. Grant (1991) divided resources into financial, material, human, technology, reputation, and organizational resources. Marino (1996) divided resources into physical, human, and organizational assets. Haffeez et al. (2002) divided resources into physical, knowledge, and cultural assets, while Trejo et al. (2002) conducted an in-depth study on the allocation and optimization of human resources. Based on the viewpoints of the above scholars, this paper refined interface resources into talents, capital, objects, and knowledge.

In the investigation of interface management measures, He et al. (2017) proposed five interface management measures: establishing an interface management team, continuously improving the interface list, fully sharing information using BIM technology, the localization of talents, and the harmonizing of interests and goals of all parties through technical and economic means. Zhu et al. (2005) took three interface management measures from the perspective of enterprise operation, risk control, and supply chain integration, respectively. Based on the viewpoints of the above scholars, this paper took interface management team, enterprise operation, risk control, and supply chain integration as the evaluation indexes of interface management measures. Wang and Yang (2015) regard the relationship connection, interactive behavior, trust, benefit distribution, and policy mechanisms as the operational mechanisms of the interface management platform. Hu et al. (2020) pointed out the importance of a government guarantee mechanism for logistics enterprises. According to the viewpoints of the above scholars, this paper took autonomous management and the service mechanism, market operation and the disposal mechanism, the benefit distribution mechanism, and the government guarantee mechanism as the interface-connecting mechanisms of this research. Jin (2020) took information level and cooperative innovation ability as evaluation indicators of cooperative innovation. Ma et al. (2013) measured the influence of internal and external integration on new product development level through the product development cycle and product development efficiency. Based on the viewpoints of the above scholars, the above four points were taken as measurement indexes of collaborative innovation capability. Based on the low-carbon performance of enterprises, Mai and Mai (2013) took the low-carbon deviation index, low-carbon sustainability, and low-carbon initiative as dynamic assessment indexes of low-carbon performance. Zhang and Wang (2017) used 16 indicators, including ownership of low-carbon patents, as evaluation indicators of low-carbon performance. Wang et al. (2017) pointed out that logistics performance evaluation systems in developed countries fully consider logistics efficiency, cost index, safety, logistics service quality, environmental sustainability, society, and other factors. Tang et al. (2019) took 10 indicators as performance evaluation indicators. Based on these scholars, this paper took low-carbon initiative, ownership of low-carbon patents, quality of service, and operating cost as evaluation indexes of enterprise low-carbon performance, where a low-carbon initiative equals a carbon neutrality/carbon footprint. The questionnaire adopted a five-level Likert scale, inviting respondents to evaluate the importance of interface management according to the current situation of the enterprise. On the scale, 1 indicates strongly disagree, and 5 indicates strongly agree.

2. Data Source

In this study, according to the number of provincial administrative regions across the country, the corresponding number of logistics enterprises in corresponding regions was selected as empirical research object in a certain proportion (17:1). From April 9th, 2021 to May 9th, 2021, local enterprises were determined mainly through the statistical yearbook of the National Bureau of Statistics and local government websites, and the questionnaire was sent to internal managers of the enterprises via email. To ensure the research results are more reliable and applicable, this study selected several green logistics enterprises that are leading low-carbon transformation progress, including China Railway, Sinotrans, Yuencheng, Deppon Express, SF Express, Shenghui, EMS, JD, Suning, and Cainiao when issuing questionnaires. A total of 600 questionnaires were sent out, and 557 were recovered, with a recovery rate of 92.8%. Then, 494 valid questionnaires were screened according to whether the questionnaires were standardized, with an effective questionnaire rate of 88.69%.

IV. Empirical Analysis

1. Reliability and Validity Analysis of the Questionnaire

The validity and reliability of the scale need to be tested before the research hypotheses can be verified. Relevant cases are provided in this paper, and representative logistics enterprises in China, such as Yuancheng, Deppon, SF Express, Shenghui, Post, Jingdong, and Suning were selected from the questionnaire for empirical analysis. This research used a scale KMO value of 0.896, which is greater than the 0.7 standard, and Bartlett's sphericity test of a less than 0.005 significance level,for exploratory factor analysis. After, each factor was categorized as its own variable, and subordinate load factors were greater than 0.5. These representatives have good construction validity (Qiu, 2006). Second, AMOS 24.0 was used to conduct confirmatory factor analysis for each variable. The degree of fit between the data and the model followed the standard of Wu (2009), assuming that if $\chi 2/df$ is less than 3, then the model is acceptable. When the goodness of fit index (GFI) is greater than 0.9, the model fit is relatively decent. Thus, the adjustment of goodness of fit index (AGFI) greater than 0.8 will generate a good model fit. A comparative fit index value (CFI) greater than 0.9 with a root mean square (RMESA) of less than 0.08 and a rectified comparative fit index value (PCFI) of greater than 0.5 gives a good model fit. We constructed a first-order oblique intersection model for the interface connection mechanism and collaborative innovation ability. In terms of model fitting indicators, $\chi^2/df = 1.223 < 3$, indicating a good matching degree; $SRMR = 0.027 < 0.08$, indicating a good matching degree; $GFI = 0.989 > 0.9$, indicating a good matching degree; $AGFI = 0.978 > 0.9$, indicating a good matching degree; $CFI = 0.998 > 0.9$, indicating a good matching degree; $RMSEA = 0.021 < 0.08$, indicating a good matching degree; and $PCFI = 0.677 > 0.5$, indicating a good matching degree. All indicators were evaluated within the acceptable range. The first-order model illustrated the interface connection mechanism, and the collaborative innovation ability was matched better with the data. As shown in Table 1, the key fitting indexes of $\chi 2/DF$, SRMR, GFI, AGFI, CFI, RMSEA, and PCFI all met the limited requirements, indicating that the research model had a good degree of fit. Meanwhile, the normalized factor load (λ) of all observed variables on the corresponding latent variables ranged from 0.689 to 0.844. The average variation extraction volume (AVE) ranged from 0.542 to 0.641, all of which were above 0.5, indicating that the scales adopted in this paper had good convergence validity (see Table 2). According to the calculation results, the AVE square root values of all variables were greater than the vertical and horizontal correlation coefficients, indicating that each variable had good discriminant validity (see Table 3).

Table 1. Summary of Fitting Indexes for Each Model

Index Name	STD	Independent Variable Model	Intermediate Variable Model	LC Performance of Enterprises	Lumped Model
CMIN		54.356	23.240	2.234	517.196
DF		41	19	2	215
χ^2/df	<3	1.326	1.223	1.117	2.406
SRMR	<0.08	0.028	0.027	0.022	0.038
GFI	>0.90	0.981	0.989	0.998	0.919
AGFI	>0.80	0.969	0.978	0.989	0.897
CFI	>0.90	0.995	0.998	1.000	0.948
RMSEA	<0.08	0.026	0.021	0.015	0.053
PCFI	>0.50	0.741	0.677	0.633	0.806

Table 2. Summary of First-Order Model Confirmatory Factor Analysis

Latent Variable	Observed Variable	λ	λ2	1 − λ2	CR	AVE
Interface Management Analysis	IMA1	0.789	0.623	0.377	0.817	0.598
	IMA2	0.739	0.546	0.454		
	IMA3	0.791	0.626	0.374		
Interface Resource Allocation	IRA1	0.792	0.627	0.373	0.867	0.620
	IRA2	0.739	0.546	0.454		
	IRA3	0.771	0.594	0.406		
	IRA4	0.844	0.712	0.288		
Interface Management Measures	IMM1	0.812	0.659	0.341	0.850	0.587
	IMM2	0.785	0.616	0.384		
	IMM3	0.772	0.596	0.404		
	IMM4	0.689	0.475	0.525		
Interface Connection Mechanism	ICM1	0.781	0.610	0.390	0.825	0.542
	ICM2	0.706	0.498	0.502		
	ICM3	0.711	0.506	0.494		
	ICM4	0.745	0.555	0.445		
Collaborative Innovation Capability	CIC1	0.838	0.702	0.298	0.877	0.641
	CIC2	0.763	0.582	0.418		
	CIC3	0.819	0.671	0.329		
	CIC4	0.780	0.608	0.392		
Low-Carbon Performance of Enterprises	CP1	0.746	0.557	0.443	0.847	0.581
	CP2	0.715	0.511	0.489		
	CP3	0.752	0.566	0.434		
	CP4	0.830	0.689	0.311		

Table 3. Summary of Discriminant Validity and Correlation Analysis

Variable	1	2	3	4	5	6
1. Interface Management Analysis	0.773					
2. Interface Resource Allocation	.365 **	0.787				
3. Interface Management Measures	.451**	.406 **	0.766			
4. Interface Connection Mechanism	.442 **	.302 **	.359 **	0.736		
5. Collaborative Innovation Capability	.474 **	.322 **	.384 **	.375 **	0.801	
6. Low-Carbon Performance of Enterprises	.529 **	.434 **	.538 **	.453 **	.519 **	0.762

Note: ** denotes $p<0.01$.

As shown in Table 2, the standardized factor load of each observed variable was greater than 0.5, the composition reliability (CR) was above 0.6, and the average variant extraction (AVE) was above 0.5, indicating that each scale used in this paper had good convergence validity. Difference validity is the validity that can be effectively distinguished between variables. The root values of the average variant extrications (AVE) are usually compared with the correlation coefficients of each correlation term matrix. If they are greater than the correlation coefficient, this means differential validity. As shown in Table 3, the AVE root number value for the interface management analysis was 0.773, 0.787 for the interface resource configuration, 0.766 for the interface management measure, 0.736 for the interface linkage mechanism, 0.801 for collaborative innovation capacity , and enterprise low-carbon performance was 0.762; all were greater than the vertical and horizontal correlation coefficients. This shows that there was a good difference in validity between the variables. Finally, Cronbach's α and constituent reliability (CR) were used to measure the reliability level of the questionnaire. Cronbach's α ranged from 0.817 to 0.876, indicating good reliability and high internal consistency. In addition, the CR value of each factor in the scale was between 0.817 and 0.877, much higher than the restrictive level of 0.6. The above analysis proves that the scale adopted in this study has good reliability and validity, and can be further applied for structural equations.

2. Descriptive Statistical Analysis

The descriptive statistical analysis of this table is shown in Table 4. The mean of each variable exceeded the center of 3 points, indicating that the subjects of interface management analysis, interface resource configuration, interface management measures, interface linkage mechanism, collaborative innovation ability, and enterprise low-carbon performance have a moderate status. The absolute values of deviation and kurtosis were less than 3, indicating the data present an approximate normal distribution.

3. Fitting Analysis of the Model

To test the series of hypotheses proposed in this study, the structural equation must be established as shown in FIG2. The interface management analysis, interface resource allocation, and interface management measures were exogenous variables, and the three exogenous variables were connected. The interface connection mechanism and collaborative innovation capability were endogenous variables, and the structural equation

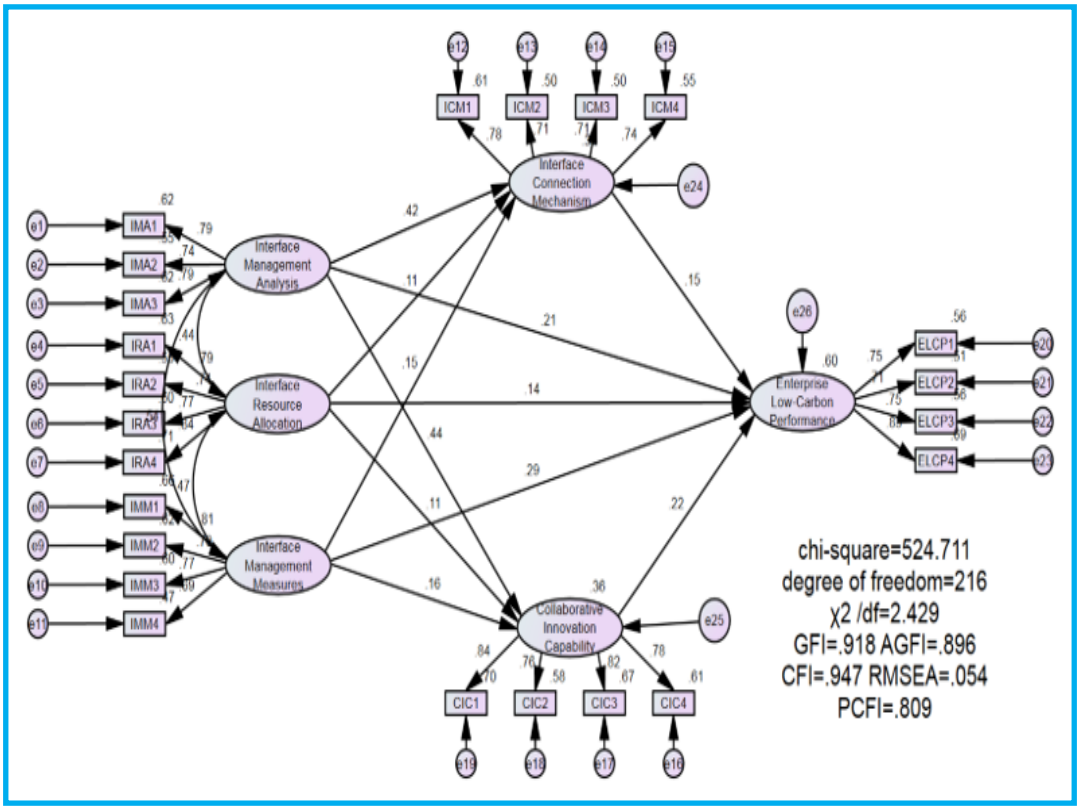
Table 4. Descriptive Statistical Analysis of Questionnaire Variables

Item/Variable	Case Number	MIN	MAX	MEAN	S.D.	Skewness	Kurtosis
IMA1	494	1	5	3.717	1.140	−0.600	−0.514
IMA2	494	1	5	3.721	1.160	−0.693	−0.340
IMA3	494	1	5	3.686	1.115	−0.532	−0.499
Interface Management Analysis	494	1	5	3.708	0.974	−0.798	−0.066
IRA1	494	1	5	3.727	1.011	−0.460	−0.479
IRA2	494	1	5	3.767	0.995	−0.562	−0.142
IRA3	494	1	5	3.777	1.003	−0.597	−0.189
IRA4	494	1	5	3.765	0.988	−0.543	−0.224
Interface Resource Allocation	494	1	5	3.759	0.844	−0.694	−0.274
IMM1	494	1	5	3.783	1.125	−0.682	−0.360
IMM2	494	1	5	3.713	1.119	−0.646	−0.291
IMM3	494	1	5	3.662	1.041	−0.555	−0.200
IMM4	494	1	5	3.575	1.063	−0.390	−0.476
Interface Management Measures	494	1	5	3.683	0.902	−0.889	0.331
ICM1	494	1	5	3.528	1.102	−0.382	−0.618
ICM2	494	1	5	3.399	1.102	−0.089	−0.953
ICM3	494	1	5	3.565	1.060	−0.366	−0.515
ICM4	494	1	5	3.522	1.075	−0.270	−0.679
Interface Connection Mechanism	494	1	5	3.504	0.878	−0.421	−0.738
CIC1	494	1	5	3.802	1.142	−0.714	−0.394
CIC2	494	1	5	3.761	1.054	−0.658	−0.183
CIC3	494	1	5	3.818	1.114	−0.573	−0.640
CIC4	494	1	5	3.674	1.010	−0.571	−0.274
Collaborative Innovation Capability	494	1	5	3.764	0.923	−0.905	−0.085
CP1	494	1	5	3.783	1.017	−0.567	−0.294
CP2	494	1	5	3.767	1.023	−0.605	−0.289
CP3	494	1	5	3.939	1.089	−0.789	−0.287
CP4	494	1	5	3.832	1.030	−0.665	−0.187
Low-Carbon Performance of Enterprises	494	1	5	3.830	0.859	−0.868	−0.084

had to be established. After fitting the data, it was found that the load of each factor was between 0.5 and 0.95, which did not violate the model estimation, and the standardized path coefficient was not higher than 1 or lower than −1, indicating that the model did not have multicollinearity problems.

The model fit index was $\chi^2/DF = 2.429 < 3$, indicating a good degree of compatibility; GFI = 0.918 > 0.9, indicating a good degree of compatibility; AGFI = 0.896 > 0.8, indicating a good degree of coordination; CFI = 0.947 > 0.9, indicating a good degree of compatibility; RMSEA = 0.054 < 0.08, indicating a good degree of compatibility; and PCFI = 0.809 > 0.5, indicating a good degree of compatibility. All indexes were within the acceptable range, indicating that the model was well matched with the data.

Fig. 2. Structure Diagram of Standardized Structural Equation



4. Interpretation of Results

Table 4 shows the standardized regression coefficient parameters derived from the study of the structural mode analysis chart. β was the standardized regression path coefficient, t (the value of C.R. in the AMOS output report) was greater than 1.96, and the corresponding p value was less than 0.05, indicating that the path had statistical significance. According to the data, interface management analysis had a significant positive influence on the interface bonding mechanism ($\beta = 0.418$, $t = 6.347$, $p < 0.001$); interface management analysis had a significant

positive influence on collaborative innovation capability (β = 0.437, t = 7.010, p < 0.001); interface resource allocation had a significant positive effect on the interface bonding mechanism (β = 0.111, t = 1.970, p < 0.05); interface resource allocation had a significant positive influence on collaborative innovation capability (β = 0.112, t = 2.099, p < 0.05); interface management measures had a significant positive effect on the interface bonding mechanism (β = 0.150, t = 2.387, p < 0.05); interface management measures had a significant positive influence on collaborative innovation capability (β = 0.156, t = 2.633, p < 0.01); and interface management analysis had a significant positive influence on enterprise low-carbon performance (β = 0.214, t = 3.332, p < 0.001): therefore, H1a is true. Interface resource allocation had a significant positive influence on enterprise low-carbon performance (β = 0.140, t = 2.983, p < 0.01), so H1b is true. Interface management measures had a significant positive impact on enterprise low-carbon performance (β = 0.290, t = 5.371, p < 0.001), so H1c is true. The interface connection mechanism had a significant positive influence on enterprise low-carbon performance (β = 0.154, t = 3.003, p < 0.01), so H2a is true. Collaborative innovation capability had a significant positive impact on the low-carbon performance of enterprises (β = 0.219, t = 4.279, p < 0.001), so H2b is true.

Table 5. Summary of Standard Path Coefficients of Structural Equations

Path			β	S.E.	t	p
Interface Connection Mechanism	←	Interface Management Analysis	0.418	0.063	6.347	***
Collaborative Innovation Capability	←	Interface Management Analysis	0.437	0.066	7.010	***
Interface Connection Mechanism	←	Interface Resource Allocation	0.111	0.061	1.970	0.049
Collaborative Innovation Capability	←	Interface Resource Allocation	0.112	0.064	2.099	0.036
Interface Connection Mechanism	←	Interface Management Measures	0.150	0.059	2.387	0.017
Collaborative Innovation Capability	←	Interface Management Measures	0.156	0.062	2.633	0.008
Low-Carbon Performance of Enterprises	←	Interface Management Analysis	0.214	0.054	3.332	***
Low-Carbon Performance of Enterprises	←	Interface Resource Allocation	0.140	0.044	2.983	0.003
Low-Carbon Performance of Enterprises	←	Interface Management Measures	0.290	0.045	5.371	***
Low-Carbon Performance of Enterprises	←	Collaborative Innovation Capability	0.219	0.041	4.279	***
Low-Carbon Performance of Enterprises	←	Interface Connection Mechanism	0.154	0.045	3.003	0.003

Note: *** denotes p<0.001; β is the normalized regression coefficient.

In order to further test the mediating effect, this study followed the suggestion of Wen et al. (2004) and used the Bootstrap method to analyze the multiple mediating effects and test the significance, so as to cross-verify the conclusions of the structural equation model test. At the same time, this study referred to the multiple mediation effect analysis program proposed by Fang et al. (2014). Among these, the 95% confidence interval should not include 0, indicating a mediating effect.

Bootstrap was set to 5,000 runs in this study. The results are shown in Table 5. The estimated coefficient of interface management analysis → interface connection mechanism → enterprise low-carbon performance was 0.054 with a 95% CI (confidence interval) = [0.017, 0.114] without 0, indicating a mediation effect and that interface management analysis can affect enterprise low-carbon performance through the interface connection mechanism, if H3a is supported. The confidence interval of 95% CI = [0.036, 0.147] without 0, which indicates that there is a mediating effect and that the interface management analysis can affect the low-carbon performance of enterprises through the collaborative innovation ability if H4a is supported. The estimated coefficient of interface resource allocation → interface connection mechanism → enterprise low-carbon performance was 0.016, and the confidence interval was 95% CI = [−0.001, 0.049] including 0, indicating that there is no intermediary effect if H3b is not supported. The estimated coefficient of interface resource allocation → collaborative innovation capability → enterprise low-carbon performance was 0.023, and the confidence interval was 95% CI = [0.001, 0.060] without 0, indicating that there is a mediation effect, and that interface resource allocation can affect enterprise low-carbon performance through collaborative innovation capability if H4b is supported. The estimated coefficient of interface management measures → interface connection mechanism → enterprise low-carbon performance was 0.019, with a 95% CI = [0.002, 0.054] not including 0, indicating that there is a mediation effect, and that interface management measures can affect enterprise low-carbon performance through the interface connection mechanism if H3c is supported. The estimated coefficient of interface management measures → collaborative innovation ability → enterprise low-carbon performance was 0.028 with a 95% CI = [0.005, 0.070] without 0, indicating a mediation effect, and that interface management measures can affect enterprise low-carbon performance through collaborative innovation ability if H4c is supported.

Table 6. Mediating Effect Test

Mediation Path	Estimate	95% CI Lower	95% CI Upper	p
Interface management analysis → interface connection mechanism → enterprise low-carbon performance	0.054	0.017	0.114	0.006
Interface management analysis → collaborative innovation ability → enterprise low-carbon performance	0.081	0.036	0.147	0.000
Interface resource allocation → interface connection mechanism → enterprise low-carbon performance	0.016	−0.001	0.049	0.054
Interface resource allocation → collaborative innovation ability → enterprise low-carbon performance	0.023	0.001	0.060	0.044
Interface management measures → interface connection mechanism → enterprise low-carbon performance	0.019	0.002	0.054	0.021
Interface management measures → collaborative innovation ability → enterprise low-carbon performance	0.028	0.005	0.070	0.015

Based on 494 valid samples, this study confirmed the validity of the scale through exploratory factor analysis, confirmatory factor analysis, and reliability analysis, and found that each variable had good discriminant validity according to the discriminant validity and correlation analyses. Finally, the structural equation was tested according to the research hypotheses of this study. Through the above hypothesis deduction, data analysis, and hypothesis testing, the main conclusions of this study were drawn as shown in Table 7.

Table 7. Summary of Hypotheses and Analysis

Hypothesis	Conclusion
H1a: Interface management analysis has a significant, positive impact on enterprise low-carbon performance.	T
H1b: Interface resource allocation has a significant, positive impact on enterprise low-carbon performance.	T
H1c: Interface management measures have a significant, positive impact on enterprise low-carbon performance.	T
H2a: The interface connection mechanism has a significant, positive impact on enterprise low-carbon performance.	T
H2b: Collaborative innovation capability has a significant, positive impact on enterprise low-carbon performance.	T
H3a: The interface connection mechanism plays a mediating role in the impact of interface management analysis on enterprise low-carbon performance.	T
H3b: The interface connection mechanism plays a mediating role in the impact of interface resource allocation on enterprise low-carbon performance.	F
H3c: The interface connection mechanism plays a mediating role in the impact of interface management measures on enterprise low-carbon performance.	T
H4a: Collaborative innovation capability plays a mediating role in the impact of interface management analysis on enterprise low-carbon performance.	T
H4b: Collaborative innovation capability plays a mediating role in the impact of interface resource allocation on enterprise low-carbon performance.	T
H4c: Collaborative innovation capability plays a mediating role in the impact of interface management measures on enterprise low-carbon performance.	T

The results of the various hypotheses obtained through reliability and confirmatory factor analysis show that Hypotheses 1 (a, b, c) on interface management analysis, interface resource allocation, and interface management measures all have a significant, positive impact on corporate low-carbon performance. The interface influence mechanism can effectively solve the problems existing in the low-carbon performance operation of logistics enterprises. Hypotheses 2 (a, b) found the interface connection mechanism and collaborative innovation ability have a significant impact on the low-carbon performance of enterprises. Hypotheses 3 (a, b, c) found that interface connection mechanism played an intermediary role in the impact of the interface on the low-carbon performance of the enterprise and the intermediary effect of the interface management measures on the low-carbon performance of the enterprise, but the assumption

of the impact on the low-carbon performance of the enterprise in the allocation of interface resources was not established. It is necessary to build a connection mechanism and take management measures under the influence of the information sharing and system guarantee mechanisms to promote the improvement of the low-carbon performance of the enterprise. Hypotheses 4 (a, b, c) concerned collaborative innovation capabilities in the interface management analysis interface resource allocation interface management measures. Both play a mediating role in the impact of corporate low-carbon performance. Through the analysis of different interfaces, an effective information channel between interfaces can be established to integrate different interfaces, which can effectively improve the degree of green collaboration among organizations, and promote the improvement of corporate environmental performance.

In this study, a certain proportion of logistics enterprises nationwide were selected as empirical research objects, and questionnaires were distributed via E-mail. A large logistics enterprise in the questionnaire was selected as Case A for analysis. Through the case study process, it could be seen that Enterprise A's understanding of the low-carbon transformation is still stuck in a single link of energy conservation and emission reduction, largely failing to grasp the enterprise's low-carbon transformation at a macro-level. In the process of low-carbon transformation, the company mainly faced four problems: (1) the low-carbon target was not clear; (2) transportation measures to reduce emissions were not perfect; (3) unreasonable choice of mode of transport; and (4) the transportation route was unreasonable. The above problems have greatly increased the actual operational risks of the enterprise, and actually hindered the sustainable development of the enterprise to a certain extent. One way to achieve sustainable development lies in whether the enterprise can effectively realize low-carbon transformation. As Enterprise A gains a better understanding of low-carbon performance using interface management methods in practice, talent–capital–physical interfaces, such as fully configured, integrated resources. resource waste reduction, and active responses to government policies will be independent of the management and service, market operation and disposal, and interest distribution mechanisms, and combine the government guarantee mechanism to control business risk in the actual operation of the enterprise. At the same time, when cooperating with other enterprises, Enterprise A uses interface management as a bridge to reduce risk management costs, realize the optimal combination of resources, improve the level of supply chain integration, realize industrial transformation and upgrading through collaborative innovation with other enterprises, and effectively improve green extension performance.

V. Countermeasures and Suggestions for Promoting Low-carbon Transformation Based on Interface Management

According to the results of the empirical analysis, this study proposes that logistics enterprises should attach importance to the optimal allocation of resource integration and concerted parties, fully use the information sharing, interest distribution, and government guarantee mechanisms in the process of cooperative organization, and use contracts and technical analysis, such as interface management through interface management measures, to improve the collaborative innovation ability of enterprises. It is neccesary to accelerate the R&D and application of low-carbon technology and equipment, promote the improvement of the low-carbon performance of enterprises, and then promote the low-carbon transformation of logistics enterprises and the whole logistics industry to help achieve carbon peak as soon as possible and move toward carbon neutrality.

1. Strengthening the Government Guarantee Mechanism

The government guarantee mechanism is the premise of everything. Through the empirical analysis of logistics enterprises, this study found that to promote the low-carbon transformation of logistics enterprises, strengthening the government guarantee mechanism can be started from two perspectives.

First, relevant policies and systems must be improved. The government needs to improve policies conducive to carbon emission reduction, such as the carbon information disclosure system, market-oriented trading system of carbon emission rights, carbon tax policy, new energy subsidy policy, and intellectual property protection policy, which can effectively improve the enthusiasm of enterprises for low-carbon technological innovation. By improving the carbon information disclosure system, a unified carbon performance evaluation system can be established. Through perfecting the marketization of the carbon emissions trading system and promoting the formation of a unified national carbon trading market price mechanism, a reasonable and stable carbon price can promote the development of the carbon financial market, which will further promote reasonable carbon price stability, enable the liquidity of the carbon market, and provide tools for stakeholders for risk aversion. In addition, along with a scientific and reasonable carbon tax policy, new energy car allowance subsidy policy, an intellectual property rights (IPR) protection policy to reduce the cycle of patent examination, security policies adhering to the "efficient market" and "promising government", the combination of more market-oriented measures to encourage the green transition of enterprises can effectively promote logistics enterprise low-carbon technology innovation, the low-carbon performance of logistics enterprises, and ultimately the low-carbon green transformation of the logistics industry.

Second, it is vital to accelerate the process of new logistics infrastructure. The new infrastructure includes 5G networks, blockchain, big data centers, artificial intelligence, and charging piles for new energy vehicles. The synergy of new infrastructure can further drive the emergence of intelligent transportation. The importance of new infrastructure to China's low-carbon economy is self-evident. The "Fourteenth Five-Year Plan" has been proposed to strengthen the construction of the modern logistics system, speed up the digital and intelligent transformation of traditional logistics infrastructure, and promote the integration of traditional logistics infrastructure and new infrastructure. At present, new logistics infrastructure projects are in the initial stage. The government should accelerate the promotion of new logistics infrastructure, especially the construction of new energy vehicle charging stations and charging piles, which can effectively reduce the carbon emissions of logistics enterprises and promote the low-carbon transformation of the logistics industry.

2. Building an Information Sharing Platform with Blockchain as the Underlying Technical Framework

With the participation of social capital, an information sharing platform was constructed on the premise of independent management and service of information resources, market operation, and the disposal mechanism, with blockchain as the underlying technical framework. First, according to financial data released by the Ministry of Finance, as of the end of December 2020, China's outstanding government debt was CNY 46.55 trillion, including CNY 25.66 trillion of local government debt and CNY 20.89 trillion of central government debt. The construction of new infrastructure cannot completely rely on the financial support of the government. The proper introduction of social capital can improve the enthusiasm of enterprises and reduce financial pressure on the government. Second, blockchain, which is composed of a hash algorithm, P2P network technology, asymmetric encryption technology, a proof of work mechanism, Merkle tree, and other key technologies, has characteristics

of decentralization and traceability, which can encrypt and protect data to the maximum extent, and at the same time, ensure the authenticity and reliability of the data source, time, and involved subjects (Zhu & Fu, 2017). Therefore, using blockchain as an underlying technical framework to build an information sharing platform can help to truly realize the sharing of knowledge and information between organizations, break the phenomenon of the "information island", and promote the improvement of the innovation ability of logistics enterprises.

Based on the perfect information sharing platform, logistics enterprises can also use big data information shared by the platform, intelligent path optimization algorithm, and other technologies to create a transport routing scheduling system so as to reduce transport mileage, reduce fuel consumption, reduce carbon emissions, and promote low-carbon transformation.

3. Building a Five-in-One Collaborative Innovation Platform of "Government, Industry, Academic, Research, Enterprise"

Guided by the market, with schools and research institutions as the means, financial institutions as the support, a government policy guarantee, logistics enterprises as the main body, and interface management teams as the bridge, a five-in-one collaborative innovation platform of "government, industry, academic, research, enterprise" can be built. The establishment of a collaborative innovation platform can break through barriers between innovation subjects, and carry out the interactive sharing of talents, capital, material objects, knowledge, and other resources with the help of the concentration of innovation resource elements, the promotion of integrated allocation, and optimization of resources can aid in transformation. It is important to effectively promote the low-carbon transformation of different types of logistics enterprises in the logistics industry chain, and then help accelerate the low-carbon and green transformation of the whole logistics industry.

The co-innovation of low-carbon technologies is multi-faceted, including improving fuel efficiency., Research and development is needed for: clean energy mainly based on new energy to make it low-carbon, efficient, and affordable; low-carbon equipment for transportation, loading, unloading, and handling; recyclable packaging and degradable materials; and unmanned warehouse, UAV design, and operation. These projects cannot be undertaken by a single logistics enterprise, but rather require multiple logistics enterprises to work together with schools and scientific research institutions under the guarantee of a collaborative innovation platform to cooperate in low-carbon innovation. A collaborative innovation platform is an important cornerstone of the low-carbon transformation of logistics enterprises.

4. Constructing a Reasonable Benefit Distribution Mechanism among Participants of Collaborative Innovation

To ensure the sustainable development of a collaborative innovation platform, it is necessary to establish a scientific and reasonable benefit distribution mechanism among participants of collaborative innovation. The application of blockchain technology to the information sharing platform provides shared data with the characteristics of decentralization and trust, which makes the information, except some encrypted private information, highly transparent, and all nodes can freely access the information recorded in the block, which is conducive to promoting collaborative innovation. In order to avoid the possible risk of moral hazard and adverse selection, in accordance with the relevant laws and regulations, it is important to establish a reasonable risk-and benefit-sharing mechanism of interest distribution. After the preliminary conclusion of the cooperation intention, the benefit distribution mechanism should be followed and combined with the actual mechanism, collaborative innovation should be developed

before the distribution of gains or losses, and there should be clear synergy innovation on both sides of the profit and loss sharing ratio. In addition to the ownership of intellectual property rights, the elimination of worries will help improve the enthusiasm of enterprises and other organizational units for collaborative innovation, and promote the low-carbon performance of logistics enterprises.

5. Establishing and Practicing Corporate Green Values

The green values of logistics enterprises contribute to their low-carbon green transformation. Green values need to be rooted establishing the concept of green development, forming a green enterprise culture and practicing the green enterprise theme. To establish the concept of green development requires logistics enterprises to fully realize the importance of low-carbon environmental protection, improve their sense of responsibility in dealing with climate change, urge logistics enterprises to put environmental protection into action, and pay attention to resource conservation and environmental protection. While benefitting from social rights, we should undertake corresponding social responsibility at the same time to create a green corporate culture that affects everyone in a imperceptible way as early as possible to develop the low-carbon transformation of a scientific and effective strategy and roadmap, work to establish an effective management structure, optimize the internal management process, improve the executive force of enterprise low-carbon green transformation, and promote low-carbon logistics enterprise transformation.

VI. Research Shortage and Envisage

1. Actual Impact

In terms of the new logistics infrastructure, The State Council Information Office mentioned in the white paper "Sustainable Development of China's Transportation" that by the end of 2019, more than 430,000 new-energy trucks had been built, and more than 7,400 charging piles had been put into operation in 942 expressway service areas (parking areas) across the country. The number of new energy and clean energy vehicles in terms of postal express vehicles and the proportion of use in key areas have steadily increased, but compared with current domestic logistics vehicles (20 million vehicles), fuel vehicles are still mainstream. New energy logistics vehicles have great prospects for development.

New logistics infrastructure projects are in their infancies. According to the Chinese league, based on data released in December 2020, the charging infrastructure of the country's total number was only approximately 1.681 million units. In December 2020, the national electricity infrastructure operation, for the most part, limited the size of the new energy vehicle logistics, which is not conducive to the upgrading of low-carbon transport logistics enterprises. The same is true of the rest of the logistics infrastructure.

This paper took the low-carbon performance of logistics enterprises, interface management analysis, interface resource allocation, and interface management measures as independent variables. The interface connection mechanism and collaborative innovation ability were intermediary variables, and enterprise low-carbon performance was the dependent variable, and used the structural equation model. Thus, logistics enterprises should pay attention to collaborative participant resource integration optimization and allocation, and fully use the information-sharing, benefit distribution and government guarantee mechanisms, as well as the collaborative process of organization, contract, and technology interface analysis management, through interface management measures, to improve the enterprise collaborative innovation ability, accelerate low-carbon technology research and development application, promote enterprise low-carbon performance, and promote the logistics industry, helping to achieve peak carbon as soon as possible and move toward carbon neutral.

2. Prospect

The ultimate purpose of this study was to analyze factors influencing the low-carbon performance of logistics enterprises from the perspective of interface management based on the background and current situation of the low-carbon transformation of logistics enterprises in China, verify hypotheses with the help of the structural equation model, and then put forward countermeasures and suggestions to promote the low-carbon transformation of logistics enterprises in China and the entire logistics industry, as well as assist the logistics industry in the "2060" carbon peak carbon neutralization task as soon as possible. However, due to the lack of ability and time, the author did not calculate the carbon emissions of the logistics industry, and only provided a method, which made it impossible to compare the low-carbon transformation effect of the logistics industry in recent years from an overall perspective. Empirically, there is no detailed study on the relationship between the interface connection mechanism and collaborative innovation capability, and the number of samples is relatively small. In addition, although this study chose representative variable indicators, the logistics enterprise low-carbon transformation is affected by many factors, and the selection of variable indexes cannot involve various aspects. Therefore, this research hopes to influence the performance of logistics enterprise low-carbon interface management-related factor analysis, and it does not fully represent the actual development of the low-carbon transformation of logistics enterprises.

In the future, further studies can be carried out on the level of the collaborative innovation capability of logistics enterprises through interface management, the analysis of the cooperative innovation ability level in the interface-coupling mechanism, and the relationship between low-carbon logistics enterprise performance and the significance degree in order to support the dual connection guarantee of the government and the market, promote low-carbon logistics collaborative innovation technology and equipment, promote the improvement of the low-carbon performance of logistics enterprises and the implementation of low-carbon transformation strategies, drive the logistics industry to achieve the low-carbon transformation of the whole industry chain, transform from a logistics country to a logistics power one, and provide an important force for the realization of the high-quality development of China's low-carbon economy and 2060 carbon neutrality

References

Beyer, U., & Ullrich, O. (2022). Organizational complexity as a contributing factor to underperformance. *Businesses, 2*(1), 82-96. https://doi.org/10.3390/businesses2010005

Bowman, M. J. (2008). *The power of place: A national strategy for building America's communities of innovation,* Association of University Research Parks, 27.

Charlebois, S., Juhasz, M., & Music, J. (2021). Supply chain responsiveness to a (Post)-Pandemic grocery and food service e-commerce economy: An expioratory Canadian case study. *Businesses*, *1*(2), 72-90. https://doi.org/10.3390/businesses1020006

Chen, Y. (2015). Performance evaluation of inter-enterprise implementation of green supply chain: Based on ANP analysis. *Operations Management*, 126-128.

Dai, C. Q., Tian, D. F., & Huan, W. Z. (2019). Research on interface management in EPC project implementation. *Construction Economics, 40*, 52-55.

Fang, J., Zhang, M., Gu, H., & Liang, D. (2014). Moderated mediation model analysis based on asymmetric interval. *Advance in Psychological Science*, *22*(10), 1660-1668.

Guan, J., Zhang, H., & Gao, B. (1999). An empirical study of R&D/marketing interface management. *Chinese Journal of Management Science*, *7*(2), 8-16.

He, H. Z., He, J., Wang, J., & Dai, T. J. (2017). Application of interface management in design management of EPC general contractor of large-scale construction project. *Construction Technology*, *46*, 138-142.

Hoffmann, V. H., & Busch, T. (2008). Corporate carbon performance indicators. *Journal of Industrial Ecology*, *12*(4), 505-520. https://doi.org/10.1111/j.1530-9290.2008.00066.x

Hu, X. J., Qian, H. M., & Qian, H. J. (2020). Research on "wisdom + Sharing" mode of logistics enterprises. *Donghua University of National Science Education*, *46*, 156-162.

Jin, M. (2020). Information level, cooperative innovation capability and firm performance: A case study of retail firms. *Business Economics Research,* 140-142.

Hafeez, K., Zhang, Y., Malak, N. (2002). Determining key capabilities of a firm using analytic hierarchy process. *International Journal of Production Economics*, *76*(1), 39-51.

Khanzad, Z. G., & Gooyabadi, A. A. (2021). Development of strategic resilience framework for small businesses Post-COVID-19. *Businesses*, *1*(3), 127-141. https://doi.org/10.3390/businesses1030010

Liu, L. J., & Dai, X. J. (2007). Research on interface management of cooperative technology innovation and its new progress. *Science Research Management*, 1-8.

Lee, V., Marasini, D. D., Dong, W., Lee, H. J., & Lee, D. (2021). Comparative study of key supply chain management elements in sustainability reports. *Businesses, 1*(3), 168-195. https://doi.org/10.3390/businesses1030013

Li, L. (2004). Effective management of design interface of large construction projects. *Building Economics, 10*, 71-74.

Luo, X. G., Chen, H. H., & Zhang, X. D. (2018). The impact of collaborative innovation capability on open innovation: A moderating role based on network interaction. *Technology Economics, 37*, 66-72.

Ma, W. C., Dai, B. J., Zhao, G. L. (2013). The influence mechanism of internal and external integration on development efficiency in new product development. *Research in Science Education, 31*, 567-577.

Mai, H. Y., & Mai, H. J. (2013). Dynamic performance evaluation of enterprise low-carbon level. *Financial. Accounting*, *1*, 26-27.

Marino, K. E. (1996). Developing consensus on firm competencies and capabilities. *The Academy of Management Executive, 10*(3), 40-51.

McLellan, J., Young, W. A., Levin, E. C., & Johnson, L. W. (2021). Developing innovative integrated business solutions using a scrum project management. *Businesses, 1*(2), 91-101. https://doi.org/10.3390/businesses1020007

Qiu, H. (2006). *Quantitative research and statistical analysis*. Wunan Book Publishing.

Shen, Z., & Zhao, Y. (2002). Interface management in the process of enterprise management. *Science and Technology Progress and Countermeasures, 9*, 98-99.

Souder, W. E., & Charkrabarti, A. K. (1978). The R&D/marketing interface: Results from an empirical study of innovation projects. *IEEE Transaction on Engineering Management, EM-25*(4), 88-93.

Tang, L., Li, Q. G., & Sheng, W. Q. (2019). Evaluation of railway logistics service scheme based on grey relational analysis. *Railway Transportation Economics, 41*, 7-12.

Trejo, D., Patil, S., Anderson, S. D., & Cervantes, E. (2002). Framework for competency and capability assessment for resource allocation. *Journal of Management in Engineering, 18*(1), 44-49.

Wu, M. L. (2009), *Structural equation model-operation and application of AMOS*. Chongqing University Press.

Wang, A. F., Wang, B. J., & Liu, C. J. (2019). Research on spatial-temporal optimization strategy of application mode of innovation method. *Journal of Hebei University of Engineering (Social Science Edition)*, *36*, 64-69.

Wang, B., & Yang, D. (2015). Research on interface management of industry-university-research collaboration innovation. *Forum on Science and Technology in China, 10*, 22-27.

Wang, C., Yang, G., & Chao, L. (2017). Research status and trend of logistics performance evaluation. *China Circular Economics, 31*, 16-24.

Wang, L., Chen, M. Y., & Ning, L. (2021). Research on the path construction and dynamic evolution of enterprise green innovation. *China Soft Science*, 141-154.

Wen, Z. L., Chang, L., Hou, K. T., & Liu, H. Y. (2004) Testing and application of the mediating effects. *Acta Psychologica Sinica*, *36*(5), 614-620.

Xi, J. P. (2021, September 21). *A green and low-carbon economy.* UN News. https://news.un.org/en/story/2021/09/1100642

Yan, H. H., Wang, Q. F., & Bao, J. (2016). Construction and application of enterprise performance evaluation system based on carbon emission value chain. *Audit Research, 6*, 55-63.

Yi, G. (2018). Key factors and connection mechanism of university-enterprise collaborative innovation interface management. *Higher Education Research, 39*, 27-35.

You, D., & Song, Z. (2018). Research on the influence of government regulation on innovation and diffusion of eco-technology cooperation. *Soft Science, 32*, 1-6, 10.

Yuan, C. H., Wang, Y. Y., & Chao, L. (2019). Case study of four new R&D institutions in Chongqing. *Forum on Science and Technology in China*, *2*, 22-28.

Zhou, P., Ang, B. W., & Han, J. Y. (2010). Total factor carbon emission performance: A malmquist index analysis. *Energy Economics, 32*(1), 194-201.

Zhu, J., & Fu, Y. (2017). Progress in blockchain application research. *Science & Technology Review*, *35*(13), 70-76.

Zhu, Q. C., Chen, Y. G., & Kang, X. H. (2005). Study on project interface risk management modelling. *Science Research Management, 6*, 149-156.