A Study on Extraction of International Freight Forwarders' Service Quality Factors: the Case of South Korea

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포워더의 서비스품질 요인의 도출에 관한 연구
– 한국의 사례 –

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Abstract The international freight forwarders in South Korea currently have fierce competition. However, there are still a very small number of studies Korea locally and globally on the service quality of international freight forwarding industry. This study aims to extract international freight forwarders' service quality factors reflecting the characteristics of freight forwarding industry. Measures of service quality have been selected after literature review and interviews, and then surveys have been conducted on exporters and importers in Korea. The collected data has been analyzed using the exploratory factor analysis. As a result, two service quality factors of international freight forwarders have been extracted: operation characteristics factor defined as accuracy, speediness·timeliness and stability, and customer orientation factor defined as professionalism and empathy. An important contribution of this study is that it presents the service quality factors reflecting the characteristics of freight forwarding industry unlike precedent studies. A future research topic is to find out which of the two service quality factors influences more on customer loyalty.

Key Words : International freight forwarder, Service quality factor, Exploratory factor analysis, Operation characteristics, Customer orientation.

요 약 한국의 포워딩산업에서의 업체 간 경쟁은 현재 매우 치열하다. 그러나 포워딩산업의 서비스품질에 관한 연구가 한국과 전 세계적으로 아직 매우 적다. 본 연구는 포워딩산업의 특성을 반영한 포워더의 서비스품질 요인들을 도출하는 것을 연구의 목적으로 하였다. 서비스품질의 측정항목들을 선행연구와 면접조사를 통해 정리한 후, 한국의 수출입업자들을 대상으로 설문조사를 하였으며, 수집된 자료들에 대해 탐색적 요인분석을 실시하였다. 연구결과, 포워더의 서비스품질요인은 정확성, 신속·정시성, 안정성으로 정의되는 운영특성과, 전문성과 공감성으로 정의되는 고객지향성의 두 요인으로 도출되었다. 본 연구의 중요한 기여는 선행연구들과 달리 포워딩산업의 특성을 반영한 서비스품질요인을 제시하였다는 점이다. 향후의 연구과제는 두 요인 중 어느 것이 고객충성도에 더 많은 영향을 미치는 지를 분석하는 것이다.

주제어 : 포워더, 서비스품질 요인, 탐색적 요인분석, 운영특성, 고객지향성

1. Introduction

The international freight forwarding industry promotes international trade by saving logistics costs as an industry providing professional international transport and logistics services to exporters and importers, provides information and consulting to them as logistics professionals, plays the role of partners in trade, and does the role of managing supply chains beyond the scope of transport service as international trade and global SCM have developed much nowadays.

South Korea's freight forwarding industry started officially in 1976 [1], and the no. of freight forwarders has increased continuously since 1992 and is more than 3,000 now. However, the international freight forwarders in South Korea have fierce competition as the manufacturing industry of South Korea has been transferred continuously to overseas countries since 1990s and South Korea's export volume has not increased that much since then due to world-wide economic recession.

As there are still a very small number of studies not only on the service quality of forwarding industry, but also on freight forwarding industry as a key topic, this study aims to extract international freight forwarders' service quality factors by developing the measures reflecting the characteristics of freight forwarding industry.

For the selection of the measures of service quality factors, first of all, literature review is performed and at the same time a survey result on the service quality of a global freight forwarder and forwarding service quality KPIs set by global companies are referred to. And then in-depth interviews with 8 managers holding key functions of the global freight forwarder are conducted two or three times with each of them for the selection of the measures of freight forwarders' service quality. Importers and exporters in South Korea are surveyed and the collected data is analyzed using the statistical analysis program PASW Statistics 18 (SPSS 18).

2. Theoretical background

2.1 Definition and business scope of freight forwarder

The freight forwarder is a service provider who not only arranges any and all the services like consolidation, warehousing and release, loading, transport, insurance, storage, delivery, etc of goods up to delivery to the consignee after taking over the goods from the consigner as an agent of the customer who consigned transport, but also takes responsibility of transport in the whole routes by issuing multi-modal transport documents as a multi-modal transport operator who is the main agent of transport contract under the multi-modal transport system [1], and is the international freight forwarder who operates the international logistics brokerage business which is a business arranging the logistics of importing and exporting goods by making use of logistics facilities, equipment, etc. of others in his/her own name and by his/her calculation at the request of others (Framework Act on Logistics Policies, Article 2(11)).

The international freight forwarder is a business operator providing a variety of services needed during the process of export and import, with transport service as a basic service for exporting and importing cargo owners, and the FIATA has called it "The Architect of Transport" since 1975 [2] by emphasizing the role of organizing the transport in international transport. However, nowadays as the cargo owners' scope of business activity has become global with the development of information and communication, it is now also called "FLP: freight logistics provider" [3] as its service scope has expanded and become diversified as a logistics service provider also managing the global SCM to meet cargo owners' demand of the third party logistics service [4]. The difference of an FLP from an architect of transport is that an FLP collaborates with multiple supply chain players and provides value added logistics services.

2.2 Current situation of freight forwarders in South Korea

According to the data from the Logistics Policy Division of the Ministry of Land, Infrastructure and Transport of South Korea, the number of the international freight forwarders registered in the cities and provinces of the country as of the end of 2015 is 3,875. But according to the KIFFA (Korea International Freight Forwarders Association), only 2,000 ~ 2,500 forwarders out of the total are registered in the Customs of the cities and provinces of the country and issue House B/L or House AWB, and the others provide simple arrangement service or don't provide any service [5]. As of July 2016, the number of the international freight forwarders registered and operating in Seoul Metropolitan City is 2,390 as in the <Table 1>, and the number of the international freight forwarders in the country as of 2014 is 1,269 according to the data in the Statistics Korea's home page [7]. There are so many forwarders, but most of them are on very small scales. Since the registration of the forwarders started in 1992, 2,319 forwarders including 16 on temporary closure are in Seoul and the remaining 1,556 forwarders are registered in other cities and provinces as of December in 2015. Most of the remaining forwarders are registered in Busan, Incheon and Gyeonggi-do as 438, 243 and 236 forwarders were in those respective cities and provinces in 2012 [8].

<Table 1> Number of forwarders registered in Seoul

Item	No. of forwarders (cummulative)			Annual ave. no. of increase (since 1992)
	1992.12	2015.12	2016.7	
Registered no.	36	4,105	4,192	168
Transferred no.	0	240	240	10
Cancellation, business stop, business closure	12	1,546	1,546	62
Temporary closure	0	16	16	1
No. in operation	24	2,303	2,390	96

Source: [6]

<Table 2> Top 30 forwarders in sales in 2015(KRW mio.)

Rank- ing	Forwarder name	Sales	Operating profit	Net profit
1	Pantos Logistics	1,208,368	30,748	99,548
2	Samsung Electronics Logitech	895,837	16,078	13,165
3	Unico Logistics	232,181	6,895	7,218
4	Eunsan Shipping & Aircargo	181,576	5,880	4,642
5	Hyosung Transworld	181,418	3,746	3,262
6	Taewoong Logistics	180,271	8,044	5,552
7	Schenker Korea*	174,756	8,958	7,472
8	PACTA International	174,654	9,022	8,030
9	Panalpina Korea*	162,707	7,412	5,241
10	Hyupjin Shipping	159,631	16,886	12,879
11	K&N*	144,844	9,444	7,598
12	Hanaro TNS	139,867	2,397	2,747
13	DHL Gobal Forwarding Korea*	134,142	6,183	3,818
14	Sebang Express	110,620	4,512	3,999
15	PNS Networks	93,934	4,255	4,746
16	KWE Korea*	93,886	5,875	5,294
17	Bipex	76,110	3,524	1,657
18	KCTC International	74,899	1,706	2,155
19	Yusen Logistics Korea*	69,983	4,596	4,024
20	Nippon Express Korea*	68,824	3,714	3,621
21	Humex Shipping & Air Freight	60,982	2,490	11,897
22	KMTC Air-Sea Service	54,120	1,372	1,525
23	DHL Excel Supply Chain Korea*	53,536	-698	-868
24	ANC International	52,828	1,190	1,392
25	AC Express	52,184	306	-52
26	Hellmann Worldwide Logistics*	52,018	1,812	1,742
27	Expeditors Korea*	50,530	13,976	10,700
28	Maxpeed	49,349	862	1,134
29	Geodis Wilson Korea*	48,310	9	-420
30	US COM Logistics	45,487	1,544	1,122

* Foreign global forwarders
Source: [9]

The top 3 forwarders of South Korea in sales in 2015 were Pantos Logistics, Samsung Electronics Logitech, Unico Logistics as in the <Table 2>. Pantos

Logistics and Samsung Electronics Logitech have been in the top 2 for more than 10 years, and Unico Logistics has been in the top 3 since 2013. Hyupjin Shipping was in the top 4 in 2012 and 2013, but dropped due to decrease in heavy cargo transport since then. There were 11 global forwarders in the top 30. Schenker Korea, Panalpina Korea, K&N, and DHL Gobal Forwarding Korea have been in the top 4 among global forwarders in South Korea for many years.

2.3 Current situation of global forwarders

DP (Deutsche Post) purchased Danzas in 1999 to obtain 20% of DHL shares, took over the U.S. air freight forwarder AEI in the same year [10], obtained 100% of DHL shares in 2002, acquired the U.K. logistics company Exel in December 2005 to become the world number one logistics group, and then changed the name of its logistics division company to DHL Global Forwarding. DB (Deutsche Bahn) took over in 2002 the German freight forwarder Schenker which was established in 1872 to become its parent company, and achieved a remarkable growth by taking over the U.S. forwarder Bax Global in 2005. Kuehne + Nagel (K+N), a pure freight forwarder which was founded in Germany in 1890 and moved its head office company to Switzerland in 1975, has grown to a leading company in fiercely competitive Europe logistics market thanks to Swiss government's business overseas expansion program and support for logistics business in 1980s, and then has further grown to a global leading logistics company with business growth in North America. UPS Supply Chain Solutions, a subsidiary company of UPS, strengthened its logistics business by acquiring Fritz and Menlo Worldwide in 2003 and 2004, respectively [11,12]. Other major M&As in the past are CEVA's acquisition of EGL, Geodis' acquisition of OHL, Kuehne + Nagel's acquisition of ReTrans, XPO's acquisition of Norbert Dentressangle and Con-way, DSV's acquisition of US forwarder UTi Worldwide, Kintetsu World Express'

acquisition of APL Logistics, Panalpina's acquisition of Airflo, and so on. As the top 3 global forwarders did in the past, other major forwarders are also increasing their scales by M&A, in order to leverage their buying power with carriers, to broaden their geographic scope, and to develop their range of services. They are also continuing to invest in IT system in order to obtain competitiveness by differentiation and to improve service quality. Meanwhile, SME forwarders are being forced to evolve. They need to develop their levels of expertise in specialized sectors with higher barriers to market entry in order to differentiate their services—which can be costly and time consuming [13].

<Table 3> Top 25 global freight forwarders in 2015

A&A rank*	Provider	Gross revenue (US$ M)	Ocean TEUs	Airfreight metric tons
1	DHL Supply Chain & Global Forwarding	29,562	2,930,000	2,109,000
2	Kuehne + Nagel	21,100	3,820,000	1,250,000
3	DB Schenker	17,160	1,942,000	1,128,000
4	Nippon Express	15,822	855,002	711,354
5	Sinotrans	7,314	2,801,300	522,600
5	Expeditors	6,617	1,043,880	872,480
7	Panalpina	6,091	1,593,900	836,200
8	UPS Supply Chain Solutions	8,215	615,000	935,300
9	DSV	7,574	855,319	311,193
10	Hellmann Worldwide Logistics	3,987	888,284	561,240
11	CEVA Logistics	6,959	642,370	451,000
11	Bolloré Logistics	4,998	844,000	580,000
13	GEODIS	5,864	677,465	299,032
14	DACHSER	6,264	568,500	275,300
15	Agility	3,907	513,500	372,700
15	Yusen Logistics	3,835	547,000	344,000
17	Kerry Logistics	2,723	785,600	282,200
18	Kintetsu World Express	3,729	463,000	457,000
19	C. H. Robinson	13,476	485,000	115,000
19	UTi Worldwide	3,696	512,550	353,300
21	Toll Group	5,822	542,000	114,000
22	Damco	2,740	744,000	180,000
23	Hitachi Transport System	5,612	330,000	190,000
24	Logwin	1,175	593,000	137,000
25	NNR Global Logistics	1,683	140,540	264,068

* Freight forwarders are ranked using a combined overall average based on their individual rankings for gross revenue, ocean TEUs and air metirc tons.
Source: [14]

<Table 4> Summary of precedent studies related with forwarders' service quality

Researcher	Research topic	Research contents
S. K. Kim (1998) [15]	Customer satisfaction on service attributes against domestic forwarders and foreign forwarders in Korea	As forwarder selection criteria during shipment process and after shipment, 25 service attributes were selected, and a survey was conducted on the importance of each service attribute and on the satisfaction degree for each service attribute against domestic forwarders and foreign forwarders. 160 exporters operating in Seoul and Gyeonggido responded. The T-test was used for analysis.
H. J. Ahn (2004) [16]	Satisfaction with international logistics service and on priority for the selection of the service providers	A survey was conducted on degree of satisfaction with international logistics service and on priority for the selection of the service providers. 117 SME importer and exporters responded. Speediness and accuracy was on the top priority, followed by price competitiveness and stability.
Lai and Cheng (2004) [17]	Freight forwarders' logistics service capability and service performance	A survey questionnaire on logistics service capability and service performance was administered to freight forwarders and 3PL service providers in Hong Kong and 221 responses were analyzed. The study suggests that forwarders in Hong Kong broaden the scope of their services into 3PL services to meet customer needs.
Liang, Chou and Kan (2006) [18]	Importance and satisfaction levels of service needs attributes of ocean freight forwarders	A survey questionnaire of 22 items about ocean freight forwarders was administered to shippers in Taiwan, and 92 responses were analyzed using exploratory factor analysis and FQFD (Fuzzy Quality Function Deployment). Importance and satisfaction levels of service needs attributes of ocean freight forwarders were rated, and priority for service quality management requirements to meet customer needs was obtained.
C. H. Ahn (2006) [19]	Impact of service orientation upon employee satisfaction, service quality and business performance of international freight forwarders	Surveys were conducted targeting two targets: employees of internal freight forwarders and employees of shippers. The impact of service orientation upon employee satisfaction, service quality and business performance of international freight forwarders was analyzed using the multiple regression analysis methhod.
K. S. Yoon (2007) [20]	Importance and satisfaction levels per service attribute of freight forwarders	The questionnaire items of Lai and Cheng(2004) and Liang, Chou and Kan(2006) were used for the survey to employees of freight forwarders and of shippers. The collected data from 144 respondents was analyzed using the T-test and the IPA method.
M. Y. Choi (2009) [21]	Shippers' freight forwarder selection factors and satisfaction level for forwarding service	A survey on freight forwarder selection factors (size, price, document service, transport(speed, timeliness), risk management capability, value-added service, HR) and satisfaction levels for forwarding service was administered to 200 shippers in Busan. The collected data from 156 shippers was analyzed using the multiple regression analysis method.
Wenyong, Jing and Hongxiang(2010) [22]	Priority of service quality factors and customer satisfaction level for service quality	17 measures for freight forwarders' service quality of 5 dimensions of Responsiveness, Tangibles, Reliability, Empathy, and Assurance were analyzed using the AHP method for priority of service quality factors, and then surveyed targeting the customers and employees of a freight forwarder in Suzhou, China. A sample of 220 respondents was analyzed using the FCA(fussy comprehensive appraisal) for the analysis of customer satisfaction for service quality.
C. H. Oh (2011) [23], J. H. Kim (2015) [24], H. J. Kim (2016) [25]	Causal relationship of forwarders' service quality	All of them surveyed freight forwarders' service quality of 5 dimensions of tangibles, reliability, responsiveness, assurance and empathy targeting importing and exporting manufacturers and trading companies, and studied the causal relationship of service quality with customer satisfaction as mediating variables. C. H. Oh studied the service quality with customer loyalty as dependent variable using the SEM method, J. H. Kim studied it with long-term orientation as dependent variable by the multiple regression analysis, and H. J. Kim studied it with repurchase intention as dependent variable also by the multiple regression analysis.
C. H. Kim (2012) [26]	Causal relationship of forwarders' service quality	The influence of freight forwarders' service system(information system, logistics network, multi-modal transport chains) and service delivery quality(accuracy, speediness, economic feasibility(price) and kindness) on customer satisfaction and repurchase intention was studied by analyzing 320 responses from customers of freight forwarders using the multiple regression analysis.
H. R. Choi et. al.(2012) [27]	Effects of a relationship marketing on customer response and long-term relationship orientation	282 responses from a survey administered to employees of international freight forwarders in Busan and Gyeongnam province were analyzed by the SEM method for the study on the effects of a relationship marketing on long-term relationship orientation with customer response as a mediating variable.
Kilibarda, Nikolicic and Andrejic (2016) [28]	Measurement of freight forwarding service quality by customers from different market segments	An online survey targeting 120 logistics professionals dealing with import and export trade flows in Serbia was conducted for the assessment of freight forwarders' service quality by the difference between the expected and perceived values of measures for the SERVQUAL factors. It was found out by the factor analysis and ANOVA that customers from different market segments assess the quality of freight forwarding services in a different way, depending on the structure of services as well as the mutual relation between the freight forwarder and the customers.

Armstrong & Associates, Inc. has published the ranking of global freight forwarders every year, and the <Table 3> shows the top 25 global freight forwarders in 2015. The top 3 global logistics providers that cover all of land, air and ocean in global logistics industry are DHL Supply Chain & Global Forwarding under DP, Kuehne + Nagel in Switzerland, DB Schenker under DB, who have been stable top 3 for the recent 6 years including 2015 mainly thanks to their development of technological capabilities. The best placed Asia-based forwarder was Nippon Express which was ranked 4th in both 2014 and 2015 thanks to increase in demand, particularly in the automobile and electronics sectors. Expeditors recorded strong growth of 6% over the past year with ranking the 5th together with Sinotrans while UPS Supply Chain Solutions finished strong in the 8th place. Panalpina went up to the 4th in 2013 from the 5th in 2012, but then dropped to the 5th in 2014 and the 7th in 2015. Hyundai Glovis was ranked 24th in 2010 and 22nd in 2011, Pantos Logistics 12th in 2010, 15th in 2011, 14th in 2012, and 16th in 2013, and CJ Korea Express 25th in 2014.

2.4 Precedent studies

According to the research of the author of this study, globally there are still a very small number of studies not only on the service quality of freight forwarding industry, but also on freight forwarding industry as a key subject, especially very few foreign studies on the service quality of freight forwarding industry. Most of the studies on the service quality of freight forwarders focused on forwarder selection factors and evaluation of satisfaction degrees as in the <Table 4> [15,16,18,20,21,22,28]. Some studies dealt with the service quality while researching into other concepts [17,19,27] and a few studies in South Korea dealt with the causal relationship of forwarders' service quality [23,24,25,26]. However there were no studies that extracted freight forwarders' service quality factors reflecting the characteristics of freight forwarding industry by the exploratory factor analysis. Therefore this study aims to extract international freight forwarders' service quality factors by developing the measures reflecting the characteristics of freight forwarding industry.
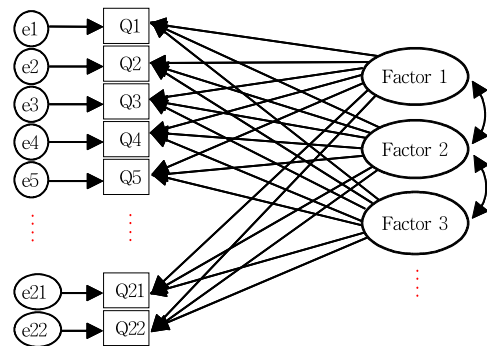
3. Research model design and research method

3.1 Definition of service quality

In this study, service quality is defined as customers' overall judgement on the excellence of a specific service referring to the SERVQUAL model by Parasuraman, Zeithaml and Berry [29,30,31,32,33], and measured with the performance of service quality measures as in the SERVPERF model by Cronin and Taylor [30,31,32,34].

3.2 Research model

The research model of this study is an exploratory factor analysis model shown in the [Fig. 1] where the forwarders' service quality has a few factors and each measure belongs to one of the factors.

[Fig. 1] Research model

3.3 Selection of measures of service quality

For the selection of the measures of service quality factors, first of all, literature review was performed and at the same time a survey result on the service quality

of a global freight forwarder and forwarding service quality KPIs set by global companies' were referred to. And then in-depth interviews with 8 managers(air import, air export, ocean import, ocean export, 2 sales, quality, and finance) holding key functions of the global freight forwarder were conducted two or three times with each of them for the selection of the measures of

freight forwarders' service quality for 7 weeks from July 11, 2016 to August 26, 2016.

The interview was conducted in the way that the author of this study explains his draft measures of forwarders' service quality to interviewees in a comfortable atmosphere, asks open questions if there are any missing or duplicate items, if expressions are

<Table 5> Measures of service quality

Variable name	Character-istics of measures	Measures	Sources
Q1	Accuracy	Accuracy in handling the receipt of transport order	[15,37]
Q2		Accuracy in issuing the transport documents(B/L, AWB, cargo manifest, etc)	Customer KPI (Samsung Electronics Logitech, Logitech, Schaeffler, BASF), a global forwarder's survey result, [15,20,21,37,38,39]
Q3		Accuracy in transport information(shipment advice, arrival notice, EDI input, etc)	Customer KPI (LG Display, Samsung Electronics Logitech, Logitech, L'Oreal, Continental), a global forwarder's survey result, [16]
Q4		Accuracy in invoice contents	Customer KPI (Logitech, Johnson & Johnson, Continental, BASF), a global forwarder's survey result
Q5	Speediness·Timeliness	Prompt provision of flight/sailing schedule and schedule change information	Customer KPI(BASF), [23,40]
Q6		Prompt notification in case of irregularity	Customer KPI(Logitech), [16]
Q7		Timeliness in transport process(takeover, loading, arrival, delivery, etc)	Customer KPI (LG Display, Samsung Electronics Logitech, , Samsung Heavy, Johnson & Johnson, Continental, Robert Bosch, L'Oreal, Adidas, Schaeffler), [15,16,20,21,38,39,41,42,43,44,45,46]
Q8		Timely provision of transport information(shipment advice, arrival notice, EDI input, etc)	Customer KPI (Samsung Electronics Logitech, Samsung Heavy, Logitech, Adidas), [15,20,21]
Q9		Timely issuance of transport documents and invoices	Customer KPI (Samsung Electronics Logitech, Adidas, BASF), a global forwarder's survey result
Q10	Stability	Safe transport without loss or damage of goods	Customer KPI (LG Display, Samsung Electronics Logitech, , Samsung Heavy, Robert Bosch), [15,20,21,37,38,47,48]
Q11		Transport with legal compliance	A global forwarder's survey result, forwarding expert interview
Q12		Transport with observance of cargo transport guideline	Customer KPI (Samsung Heavy), forwarding expert interview
Q13		Excellence in securing transport space(shipping space, flight space)	Customer KPI (Samsung Heavy), [15,20,37,41]
Q14	Profession-alism	Provision of various transport service products(transport schedule. transport mode, transport route)	A global forwarder's survey result, [15,16,20,37,41,42]
Q15		Advice and proposal for customised service (packing, transport mode, transport route, etc)	[15,16,20,21,39]
Q16		Excellence in solving problems concerning cargo	[15,16,20,39,41,42,45,46,49]
Q17		Excellence in cargo tracking services	Customer KPI (Robert Bosch, Henkel, Continental, L'Oreal, ASML), a global forwarder's survey result, [15,16,20,37,38,39,41,45,46]
Q18	Empathy	Attention to customers' requests and Prompt feedback	Customer KPI (Samsung Heavy), [16,20,21,37,38,40,41,44,48,49,50,51,52]
Q19		Active efforts for settlement of cargo accidents	A global forwarder's survey result, [16,20,21,37,38,41,52]
Q20		Honesty in transactions with customers	[20,52,53]
Q21		Employees' courteous and kind attitude	A global forwarder's survey result, [20,21,23,37,38,39,41,42,44,45,49,53]
Q22		Easy access to forwarder's employees	A global forwarder's survey result, forwarding expert interview, [39,53,54]

proper, and if groupings are appropriate, listens to their opinions, groups the measures per common characteristics based on the MECE (mutually exclusive and collectively exhaustive) principle, and goes on to interview the next interviewee with the measures resulted from the previous interview until all the interviewees agree to the resulted measures. The interview was quite similar to the Delphi method [35,36].

The resulted measures are shown in the <Table 5>.

3.4 Research method

A survey is conducted for the population of about 16,000 exporting and importing companies [55] in South Korea. An online survey is administered to them by sending an online solution link. The collected data is analyzed by the exploratory factor analysis.

4. Empirical analysis

4.1 Survey

An online survey was administered to 9,850 companies whose email addresses are available, by sending an online solution link. 120 companies completed the online survey and 80 companies completed the survey by phone call because they had given up the online survey. The response rate was 2.0% with 200 responses. The survey was conducted for 3 weeks from September 19, 2017 to October 7, 2017. The collected data was analyzed using the statistical analysis program PASW Statistics 18 (SPSS 18).

The no. of companies and ratio per business type for the sample and population are shown in the <Table 6>, where most of them are from manufacturing business followed by distribution business and overall the sample of this study is not biased toward a few specific business types. The profile of the sample is shown in the <Table 7>, where most companies in the sample have a small no. of employees and the positions of the respondents are evenly distributed.

<Table 6> Business type distribution for sample and population

Business type	Sample		Population	
	Frequency	Ratio	Frequency	Ratio
Manufacturing	114	57.0%	8,924	55.2%
Distribution	50	25.0%	5,875	36.3%
Logistics	8	4.0%	403	2.5%
Service	21	10.5%	734	4.5%
Others	7	3.5%	242	1.5%
Total	200	100.0%	16,178	100.0%

<Table 7> Profile of sample

Classification		Frequency	Ratio
No. of employees	1-50	153	76.5%
	51-100	33	16.5%
	101-150	6	3.0%
	151-200	3	1.5%
	201-250	0	0.0%
	251-	5	2.5%
	Total	200	100.0%
Position of respondents	Director	90	45.0%
	Bujang	24	12.0%
	Chajang	11	5.5%
	Gwajang	41	20.5%
	Daeri	17	8.5%
	Staff	16	8.0%
	Other	1	0.5%
	Total	200	100.0%

4.2 Exploratory factor analysis

The exploratory factor analysis is a process of transformation of variables into a linear combination of factors [56], and as a result of the exploratory factor analysis, two service quality factors have been extracted as in the <Table 8> and [Fig. 2]. The factor loadings that show the correlations between each item and a factor are all above 0.6 for a factor, and lower for the other factor, which means that the measures have the convergent validity and the discriminant validity. In social science area, Cronbach's α 0.6 or above indicates in general that the measures have reliability [57]. As the Cronbach's α for each factor is far higher than 0.6, the measures for each factor have reliability, that is, internal consistency. As there were no measures in the 22 measures that increase the Cronbach's α when deleted, there are no measures hindering the reliability,

and all the 22 measures belong to the 2 factors.

As the first factor which is measured by Q1 ~ Q13 represents accuracy, speediness·timeliness and stability, the author of this study names it "operation characteristics", and as the second factor which is measured by Q14 ~ Q22 represents professionalism and empathy, names it "customer orientation".

The communality is the ratio that the whole factors explain the variance of each variable, and the communalities are high enough, all above 0.6 except 0.583 of the Q14. The eigenvalue is the ratio that each factor explains the variance of the whole variables, and the cumulative values of eigenvalue for the two factors is 71.706, which means that 71.7% of the whole variables are explained by the two factors. The KMO (Kaiser-Meyer-Oklin)'s measure of sampling adequacy

<Table 8> Exploratory factor analysis for service quality factors

Variable name	Measures	Characteristics of measures	Factor loadings	Communalities	Eigen values	Cumulative % of variance	KMO	Cronbach's α
Q1	Accuracy in handling the receipt of transport order	Accuracy	.827	.785	8.496	38.617	.927	.961
Q2	Accuracy in issuing the transport documents(B/L, AWB, cargo manifest, etc)		.836	.731				
Q3	Accuracy in transport information(shipment advice, arrival notice, EDI input, etc)		.836	.734				
Q4	Accuracy in invoice contents		.751	.666				
Q5	Prompt provision of flight/sailing schedule and schedule change information	Speediness·Timeli-ness	.694	.699				
Q6	Prompt notification in case of irregularity		.713	.670				
Q7	Timeliness in transport process(takeover, loading, arrival, delivery, etc)		.753	.753				
Q8	Timely provision of transport information(shipment advice, arrival notice, EDI input, etc)		.742	.699				
Q9	Timely issuance of transport documents and invoices		.772	.640				
Q10	Safe transport without loss or damage of goods	Stability	.761	.675				
Q11	Transport with legal compliance		.784	.683				
Q12	Transport with observance of cargo transport guideline		.752	.723				
Q13	Excellence in securing transport space(shipping space, flight space)		.699	.675				
Q14	Provision of various transport service products(transport schedule. transport mode, transport route)	Profession-alism	.639	.583	7.28	71.706		.953
Q15	Advice and proposal for customised service (packing, transport mode, transport route, etc)		.804	.712				
Q16	Excellence in solving problems concerning cargo		.848	.806				
Q17	Excellence in cargo tracking services		.796	.775				
Q18	Attention to customers' requests and Prompt feedback	Empathy	.832	.795				
Q19	Active efforts for settlement of cargo accidents		.872	.856				
Q20	Honesty in transactions with customers		.797	.723				
Q21	Employees' courteous and kind attitude		.815	.735				
Q22	Easy access to forwarder's employees		.765	.659				

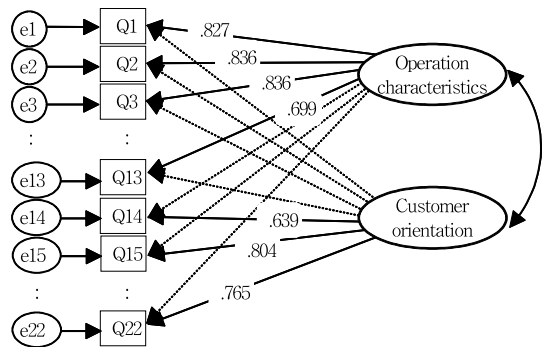Note) Extraction method: Principal Component Analysis, Rotation method: Varimax

of this data, which is the index testing whether the data is appropriate for factor analysis, is greater than 0.9, and the result of Bartlett's test of sphericity shows significance. Therefore this data is very appropriate for the factor analysis.

4.3 Results of analysis

The results of the exploratory factor analysis for service quality showed that the service quality of freight forwarders are divided into the operation characteristics factor and the customer orientation factor. The operation characteristics factor is defined as accuracy, speediness·timeliness and stability which are the service quality characteristics essential for operation of goods carriage, and the customer orientation factor is defined as professionalism and empathy which are the professionalism of service and the characteristics of considering customers.

4.4 Discussion of analysis results

The operation characteristics are the basic conditions that the freight forwarders providing transport service need to have. Out of the operation characteristics, timeliness in transport process and safe transport without loss or damage of goods are much dependent on performing carriers rather than freight forwarders, but the customer orientation is the service quality factor unique to freight forwarders, varying with forwarders. A study [58] defined the customer orientation as "the set of beliefs that put the customer's interest first, while not excluding those of other stakeholders such as owners, managers and employees, in order to develop a long-term profitable enterprise". Another study [59] defined it as a way of business operation that an enterprise operates its business in the perspective of thinking in customer's position. The definition of the customer orientation varies with studies, but a common thing is that all those definitions consider customer' position.

[Fig. 2] Results of exploratory factor analysis

5. Conclusion

This study aimed to extract international freight forwarders' service quality factors. For the selection of the measures of service quality factors, first of all, literature review was performed and at the same time a survey result on the service quality of a global freight forwarder and forwarding service quality KPIs set by global companies' were referred to. And then in-depth interviews with 8 managers holding key functions of the global freight forwarder were conducted two or three times with each of them for the selection of the measures of freight forwarders' service quality. Korean importing and exporting companies were surveyed and 200 responses were collected and the collected data has been analyzed using the exploratory factor analysis. The results showed that the service quality of freight forwarders reflecting the characteristics of freight forwarding industry has two factors: operation characteristics factor defined as accuracy, speediness·timeliness and stability, and customer orientation factor defined as professionalism and empathy. This study makes an important contribution to the forwarding industry in the respect that it presents the service quality factors reflecting the characteristics of freight forwarding industry. An academic implication of this study is that unlike most precedent studies using the SERVQUAL's 5

dimensions, the freight forwarding service quality has two dimensions, A managerial implication is that the international freight forwarders need to improve service quality by focusing on the measures of the two factors for the improvement of their competitiveness. However, as shown in the no. of employees in the sample profile, the sample is biased toward small and medium companies, and therefore this study has a limitation that the opinions of large companies have not been included enough in the results of this study. For a future research agenda, it is recommended to find out which one of the service quality factors extracted by this study influences more on customer loyalty with service value and customer satisfaction as mediators using the structural equation modeling method.

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