

An Approach to the Logistics Outsourcing Factors of the Korean Companies*

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한국 기업의 물류아웃소싱 활용요인에 관한 연구

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주제어: 물류아웃소싱, 물류계약조건, 물류아웃소싱요인

Abstract

본 연구는 한국 기업의 계약 기간에 따른 물류아웃소싱의 패턴을 분석하여 물류기업의 경쟁력 향상에 기여하는데 목적이 있으며, 문헌연구와 실증분석을 병행하여 실시하였다. 설문조사는 2008년 4월부터 5월까지 2개월 간 진행하였다. 총 400개의 물류기업을 대상으로 설문을 배포한 결과 165부의 설문지를 회수하였으며 분석에 적합한 설문 155부를 대상으로 분석을 실시하였다. 요인분석과 요인별 중요도 분석결과 본 연구의 시사점은 크게 세 가지로 요약할 수 있다. 첫째, 한국기업은 물류아웃소싱 동기로서 기업의 전략과 관련된 요인을 중요시한다. 아웃소싱에 대한 결정은 최고경영자에 의해서 이루어지며, 기업은 해외진출 및 해외진출시 제품경쟁전략에 따라 물류아웃소싱을 검토하게 되고 최고경영자의 해외 진출 및 국제화에 대한 의지 정도, 해외에서 판매되는 자사 제품의 판매 전략에 따라 물류아웃소싱의 활용에 크게 영향을 준다. 둘째, 한국기업은 고객요구에 대한 대응정도, 경쟁의 정도에 따라 물류아웃소싱을 고려하며 기업의 특성, 물류비용, 제품의 물리적 특성 등을 감안하여 물류아웃소싱을 결정하게 된다. 셋째, 계약기간에 따른 물류아웃소싱에 대한 차이를 분석한 결과 시장진출요인은 계약기간에 따른 시사점이 도출되지 않았으나 기업전략, 기업특성, 환경 측면에서는 장기간의 계약관계가 중요하게 인식되었다. 상술한 연구결과를 토대로 아웃소싱의 동기, 결정요인과 계약기간을 고려하여 당사자의 입장 차이를 줄이기 위해 정확한 계약조건제시와 주기적인 의사소통을 토대로 물류아웃소싱의 효과를 높여야 할 것이다.

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I . Introduction

Global businesses have been setting the global management strategy to build and operate places to supply raw materials, plants and logistics centers for the world market. They have a complicated logistics system in which internal production elements and information moves actively and needs an efficient logistics network.

Transport Intelligence(2006) reported that the size of the global logistics market was 972 billion dollars (770.7 billion euros). Specifically, emerging markets in Asia/Pacific regions accounting for 412 billion dollars (327.1 billion euros) ranked top, followed by Europe, Middle East/Africa, and Americas, respectively.

<Table 1> Size of the global logistics market

| Description | 2006 | |
|-------------------------------|-------------------------|-----------|
| | Amount(billion dollars) | Weight(%) |
| Global | 972 | 100.0 |
| Emerging Market(Asia/Pacific) | 412 | 42 |
| Americas | 270 | 28 |
| Europe/Middle East/Africa | 290 | 30 |

Source : Transport Intelligence(2006) Global Supply Chain Intelligence Portal.

Global businesses resort to third-party logistics services, or outsourcing to logistics companies in an effort to concentrate resources on key operations, raise the logistics efficiency, improve customer service, and ultimately increase overall competitiveness of the company.

According to the Transport Intelligence(2006), the global 3PL market grew by 10.3% to 116.9 billion euros in 2005 from 106 billion euros in 2004. Regionally, the European 3PL market is the largest, worth 45.98 billion euros as of 2005, remaining the leading 3PL market in the world since 2004. The Asia/Pacific 3PL market sees the market size and global weight growing hand in hand, unlike other regions.

As for the size of the domestic logistics market, national logistics cost also increased 2.3% to 92.459 Trillion KRW in year 2004 compared to its previous year, and when international freight charges are included, the total is equivalent to 123.283 Trillion KRW, which is a 9.9% increase from the previous year. The 3LP

market size is also increasing since year 2000.

As business competition has been expanded from that of companies into competition at the supply chain level, efficient management of supply chains has become the core element of a company's competitiveness. Companies are operating integrated management systems for global logistics, introducing a supply chain management(SCM) concept to integrate and operate global procurement, manufacturing, sales and logistics operations.

<Table 2> The size of the global 3PL market

| Description | 2004 | | 2005 | |
|-------------------------------|----------------------|---------------|----------------------|---------------|
| | Amount(million €) | Weight(%) | Amount(million €) | Weight(%) |
| Global | 105,963 | 100.0 | 116,913 | 100.0 |
| Asia/Pacific | 27,271 | 25.7 | 30,574 | 26.2 |
| USA | 27,841 | 26.3 | 30,833 | 26.4 |
| Europe | 42,374 | 40.0 | 45,981 | 39.3 |
| Total of top three markets | 97,486 | 92 | 107,388 | 91.9 |

Source : Transport Intelligence(2006), Global Contract Logistics 2006: Outsourcing and Collaboration.

Although logistics companies in Korea provide third-party logistics services to shippers, they have weak competitiveness in the global market because limited services are provided in foreign countries. Also, service provided is limited to partial services rather than highly efficient services in order to cut costs, therefore, short term contracts are more frequent in contract terms, and establishment of partnership with shippers is infrequent.

This study aims to understand the conditions for using logistics outsourcing of Korean enterprises, present existing problems, examine factors affecting utility, and analyze the patterns of logistics outsourcing based on contract term, and to ultimately contribute to enhancing competitiveness of logistics enterprises. There are few articles which were investigated about logistics service for overseas enterprises however the papers which were conducted researches in domestic logistics are enough. Comparative analysis which are in existence gap of globalization levels within the industry wasn't performed notwithstanding case studies of a specified

manufacturer are abundant.

This paper is based on an literature review and an empirical study. To verify this study used the structural equation model(SEM) and conducted statistical analysis by using SPSS 15.0 and Lisrel 8.30.

II. Literature Review

1. Characteristics of logistics services

1) Logistics services by type of logistics companies

Characteristics of logistics services can be examined in terms of logistics companies' assets and key services. Muller(1993) divided possession of assets into asset-based, management-based, integrated, and administration-based logistics companies. Africk and Calkins(1994) classify logistics companies into two types: asset-based and non-asset-based ones. Companies of the former category provide logistics services for their customers using their own trucks, ships, and warehouses, while non-asset-based companies do not possess their own logistics assets to provide logistics services, and in general, services are divided into plate forwarding and the ones provided by trans-shippers. Ruygrok and Knippenberg(1994) divided logistics companies into transportation logistics companies and product logistics companies, depending on the key services provided. The former provides transportation services as a sub-contractor of forwarders and performs general logistics services, and the latter is defined as a company specialized in logistics services as a manager of the shipper's logistics chain in relation to the management of a warehouse. Berglund(1999) based his division of logistics companies into service providers and solution providers on the characteristics of the logistics services provided. Service providers provide low-cost standardized services for a multitude of customers, and are best characterized by their services focusing on a particular type of function. In the meantime, solution providers focus their operation on cost reduction and competitive customized logistics services as part of management strategies for customers.

Langley(2003) suggests four models of logistics service provision in light of logistics outsourcing - LSP (Logistics Service Provider), which provides basic

logistics services focusing on cost-reduction, 3P which provides various services, maintaining strategic relationships via specialization in value adding logistics and based on IT, LLP (Lead Logistics Provider), which provides services integrating the 3PL technology, while sharing risks with shippers, as a project manager, and finally, 4P, which provides a wide range of logistics services based on knowledge information, as a supplier-integrator based on partnership.

2) Characteristics of global logistics services

Although it seems that there is no difference between global logistics and local logistics in terms of operations, global logistics is more complicated and expensive than local logistics, due to long distance, complicated documents, diversity of cultures, and various demands of customers.

Global logistics services provided between countries basically need five functions such as transportation, unloading, packing, storage, and information. The logistics process of a company having a global production base follows a series of channels in order: supplier, exportation and clearing customs, domestic transportation (trucking), sea transportation, importation and clearing customs at destination, local production and delivery, warehouse, carrier, exportation and clearing customs for exportation at production point, sea/air transportation, warehouse at the importing country or final destination of the importer, and becomes highly complicated, as it is done in more than two countries. Therefore, overseas (local) transportation, storage, and clearing of customs are less likely to occur, with increasing uncertainty.

As a result, global logistics has a high strategic value, as global logistics services are efficiently provided through networking production and sales-based distributed among countries and requires more costs, compared to domestic operations, as an important factor of production and marketing strategy via efficient flow of raw materials, parts, and finished goods and continued management for cost reduction and enhancement of customer services.

Global logistics services integrate various members and functions and operate the organization efficiently, to meet the requirement of changing global companies' business environment, pursuing for efficient supply chain strategies to deal with diversified and rapidly changing consumer services in a quick and flexible manner, by using an analytical approach to solve problems between organizations and valuing cycle-time.

<Table 3> Comparison of local and global logistics services

| Service function | Local logistics service | Global logistics service |
|-----------------------|---|---|
| Transportation | Transportation via public ways using logistics hubs (public ways, railroad, airplane) | Integrated transportation via ports or airports (sea-air integrated transportation) |
| Warehousing Unloading | Warehousing and unloading centered on logistics centers or delivery centers | Warehousing and unloading at integrated cargo terminals of ports, airports, and inland bases |
| Packing | Focusing on economic advantages, convenience, and simplicity of packing | Focusing on transportation (pallets and containers) |
| Information | Obtaining unique information on shippers, carriers, and service integrators | Once cargo departs from a certain terminal, the route from local shippers to overseas customers can be tracked by EDI and Internet, |

Source: Lee Jae Hyeon, "An empirical study on the effect of e-logistics on the cooperative relation of global logistics", 『Journal of Korea Trade』, Vol.18, No.2, 2003, pp.117-143.

<Table 4> Changes of logistics functions

| Dimension | 1960-1970 | 1980-1990 | 21st Century |
|---------------------|-----------------------|--------------------------|--|
| Focus | Internal-functional | Form | Supply chain |
| Geography | Regional | National | Global |
| Organization | Stable | Downsized | Cross-functional team/group |
| Workforce | Single | Transition | Diverse |
| Technology | Basis for action | Basis for action/network | Basis for information network |
| Performance metric | functional efficiency | Benchmarking/quality | Cycle-time |
| Analytical approach | Trade-off | Modeling | Solving problems between organizations |
| Channel control | Manufacturer push | Mixed | Customer pull |

Source: B. J. La Londe and R. F. Power, "Disintegration and Reintegration : Logistics of the 21st century," International Journal of Logistics Management, Vol.4, No.2, 1993.

2. Domestic Logistics Outsourcing

1) Logistics Outsourcing of Korea

Korea International Trade Association(2007) conducted a study on corporate logistics cost of 2006; and according to its results, sales to logistics cost ratio was found to be 7.8% for large corporations, 10.2% for small and medium enterprises, the ratio of large corporations being 2.4% lower than that of small and medium enterprises, and the ratio for manufacturing and whole sale/retail companies were found to be 9.2% and 12.3% respectively.

<Table 5> Corporate Logistics Cost

(Unit: %)

| Category | | Sales/ Logistics Cost | Classification of logistics cost by function (Total 100%) | | | |
|--------------------------------------|------------------------------|--------------------------|---|---------|-----------|---------------------------------------|
| | | | Transportation | Storage | Packaging | Logistics information management cost |
| Total | | 9.7 | 58.3 | 27.7 | 11.3 | 2.7 |
| Corporate Size (Number of employees) | Large corporations | 7.8 | 61.0 | 28.4 | 7.7 | 2.9 |
| | small and medium enterprises | 10.2 | 57.5 | 27.6 | 12.2 | 2.7 |
| Industry (Broad classification) | Manufacturing | 9.2 | 59.2 | 26.4 | 12.0 | 2.4 |
| | Whole sale/Retail | 12.3 | 53.5 | 33.8 | 8.3 | 4.4 |

Source: Korea International Trade Association(2007), 2006 Corporate logistics cost research and corporate logistics cost estimation report.

Researches pertaining to logistics outsourcing of Korean corporations and use of 3PL service were conducted by many agencies. When results of such studies are integrated, outsourcing for logistics is increasing, especially the use of 3PL service is expected to show a greater increase.

Domestic logistic market continues to grow with economic growth, and when observing by business type, the sales to logistic cost ratio is higher in small and medium enterprises than in large corporations, and higher in whole sale and retail than in manufacturing companies. By function, the expenditure is in the order of transportation, storage, and packaging. When the size of logistics outsourcing is observed, it was reported that as corporate logistics cost increases, the use of 3PL also increases.

<Table 6> Logistics Outsourcing and Logistics Market Size

(Unit: Trillion KRW)

| Year | Corporate Logistics Cost | Consignments (%) | | | Consignment logistics cost | Logistics market size |
|------|--------------------------|------------------|------------------------|-----------------------|----------------------------|-----------------------|
| | | Total | Second party logistics | Third party logistics | | |
| 2001 | 62.69 | 34.50 | 17.25 | 17.25 | | |
| 2002 | 68.55 | 38.60 | 19.30 | 19.35 | 26.46 | 48.97 |
| 2003 | 68.88 | 42.70 | 21.35 | 21.35 | 29.41 | 51.47 |
| 2004 | 71.15 | 47.50 | 23.75 | 23.75 | 33.80 | 59.14 |
| 2005 | 73.48 | 48.69 | 22.56 | 26.13 | 35.78 | 62.62 |
| 2006 | 75.91 | 51.48 | 21.44 | 30.05 | 39.08 | 68.39 |
| 2007 | 78.41 | 54.92 | 20.36 | 34.55 | 43.06 | 75.36 |
| 2008 | 81.00 | 57.35 | 19.35 | 38.01 | 46.46 | 81.30 |
| 2009 | 83.69 | 59.25 | 19.35 | 39.91 | 49.59 | 86.78 |
| 2010 | 86.47 | 61.25 | 19.35 | 41.90 | 52.96 | 92.68 |

Source: Korea Transportation Institute(2004), Improvement plan for integrated logistics for strengthening competitiveness of Logistics industry p.73.

2) Problems of Domestic Logistics Outsourcing

Datamonitor(2003) investigated the factors American corporations consider when using logistics outsourcing with shippers as the subjects. The results showed that the primary factors considered include geographical coverage, service portfolio, price, flexibility, and customer service. However, the results of study conducted in Korea revealed that outsourcing is used with the respect of fixed costs, labor cost and facility management costs. The longest contract term for logistics outsourcing in the US was 5 years or longer at 55%. In contrast, contract terms in Korea were primarily short term based, with 70% of contract terms being shorter than 2 years. Such short term based contracts signifies that companies do not have overall confidence in the benefits of 3PL service; and at the same time, companies are not satisfied with the capacity of 3PL service providers.

Many companies believe that by outsourcing, they can concentrate on their core capacity, can cut costs, and improve services. However, the performance and results corporations wish for cannot be accomplished merely by outsourcing 3PL companies. Problems of 3PL have been found to be weakening of control in

logistics, insignificant cost cuts, non reduction of time and effort, and increase in customer dissatisfaction; also although companies use 3PL because problems with their own logistics, they are rarely satisfied.

Majority of studies point out loss of control as the biggest problem, and strongly suggests that companies perform their own main tasks and outsource tasks that are non-core. However, because the most advanced information technology allows real time verification of work place, control will probably be possible even when outsourcing.

<Table 7> shows the most frequent answers to the question of why Korean companies do not utilize 3PL according to the research conducted by Korea International Trade Association(2006), and the answers included companies cannot expect substantial decrease in logistics costs, they are satisfied with their own logistics companies, and they do not have knowledge in 3PL service. Unlike previously conducted studies, the fact that there are not many answers pertaining to loss of control and possibility of internal information leak suggests that outsourcing of shipping companies and logistics companies of Korea are in the form of simple outsourcing rather than one that is strategic and that the partnership between the two industries are rather shallow.

<Table 7> Key Reasons for not using 3PL

(Unit: %)

| Classification | Year | | |
|---|------|------|------|
| | 2002 | 2005 | 2006 |
| Lack of knowledge and information on 3PL service | 46.4 | 19.0 | 20.9 |
| Assumption that substantial reduction in logistics cost will not result | 18.8 | 19.0 | 24.6 |
| Concerns of losing direct control over logistic activities | 2.7 | 6.8 | 7.3 |
| Possible external leak of corporate information | 5.4 | 6.5 | 4.5 |
| Difficulty in verifying professionalism of 3PL businesses | 7.6 | 6.5 | 6.5 |
| Satisfied with use of 1PL & 2PL | 16.9 | 24.2 | 24.1 |

Source: Korea International Trade Association(2006), Study for understanding use of 3rd party logistics services of import/export companies

In corporate global supply chain management, global companies are provided integrated logistics service for their entire supply chain through a single contract rather than individual outsourcing of a number of companies. Especially those

global enterprises that must conduct global logistics conduct logistics outsourcing through professional logistics companies that possess regional offices and distribution networks all over the world, and their level of relationship can be described as being a strategic affiliation and in order to establish a closer relationship.

Problems of logistics outsourcing in Korea were found to be that the motive for outsourcing is to simply cut labor and facility costs, and that services the shipping company's demand are simply limited to transportation, storage, and packaging. For these problems, because logistics companies do not induce establishing of partnership through service improvement but provide services for meeting the demands of shipping companies, they experience limitations in providing global logistic services. In order to provide global logistics service and to establish a global SCM with shipping companies, strategic affiliation relationships with long term contracts will need to be maintained.

<Table 8> Domestic and Global Logistics Services of Major Domestic Providers

| logistics service | Korea Express | | Hanjin | | Hyundai Logistics | | CJ GLS | | Hansol CSN | |
|-------------------------|---------------|----------|---------|----------|-------------------|----------|---------|----------|------------|----------|
| | onshore | offshore | onshore | offshore | onshore | offshore | onshore | offshore | onshore | offshore |
| transportation | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | ○ | |
| loading | ○ | | ○ | ○ | ○ | | ○ | | ○ | |
| warehousing | ○ | ○ | ○ | | ○ | | ○ | | ○ | ○ |
| inventory management | ○ | | ○ | | ○ | | ○ | | ○ | |
| customs clearance | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| freight forwarding | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| consulting | ○ | | ○ | | ○ | | ○ | | ○ | |
| information management | ○ | | ○ | | | | ○ | | ○ | |
| distribution processing | ○ | | ○ | | ○ | | ○ | | ○ | |
| order processing | ○ | | ○ | | ○ | | ○ | | ○ | |
| freight payment | ○ | | | | ○ | | | | ○ | |
| carrier selection | ○ | | ○ | | ○ | ○ | ○ | | ○ | |
| parcel delivery | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | |

Following table <Table 9> is summarized literature study of logistics outsourcing.

<Table 9> Literature Study about Logistics Outsourcing Factors

| Researcher | Major Findings |
|-------------------------------------|--|
| Bhatngar, Sohal & Millen | Major motivations of logistics outsourcing invitation are cost reduction, customer satisfaction and flexibility. |
| Boyson, Corsi, Dresner & Rabinovich | Companies can accomplish to achieve improvement of customer service, cost reduction and competitive advantage. |
| Van Laarhven, Berglund & Peters | Manufacturers can accomplish to achieve improvement of customer service, cost reduction and competitive advantage. |
| Baumgarten & Walter | Companies want to achieve flexibility, cost reduction and improvement of service level. |
| Baumgarten & Thoms | The ratio of logistics outsourcing is significantly higher and has continued to grow. |
| Deepen | Major inducements of logistics outsourcing introduction are cost reduction and service level improvement. |
| Knemeyer, Corsi & Murphy | Partnership with shipper and 3PL occurs benefit, but on the other hand expense. |
| Langley, Allen & Colombo | TPL service changes continuously and differences of expectations are existed business connections, suppliers and users |
| Stank, Goldsby, Vickery & Savitskie | Main performance which uses logistics service providers is satisfaction for clients. |
| Knemeyer & Mruphy | Various dimensions of relationship marketing which are composed of communication, trust and opportunism affect to recognize 3PL performance. |
| Engelbrecht | Performance of outsourcing is concluded outsourcing level. |
| Knemeyer & Murphy | Communication is more important to improve outsourcing performance than numbers of outsourcing functions, 3PL providers. |
| Langley, Dort, Ang & Sykes | Shippers want to construct cooperative partnership with logistics providers and the most important factor for selection logistics providers is price. |
| Razzaque & Sheng | They researched outsourcing invitation through literature study about logistics outsourcing. |
| Byrne | There are improvement of market prospect, betterment of organization structure and construction of supply chain partnership through logistics outsourcing. |
| Cooper & Gardner | Study about alliance ranges and motivations |
| Gilley | Utilization factors of logistics services are CEO's will, strategic types and environmental dynamism. |
| Rao & Young | Major factors are extracted outsourcing behaviors of shippers by case study. |

III. An empirical study on factors of the use of logistics outsourcing

1. Overview of the study and methodology

In this study, a questionnaire survey was administered on manufacturers in order to examine factors of the use of global logistics outsourcing depending on globalization level of individual companies.

<Table 10> Corporate statistical characteristics

| | Description | Frequency | Ratio(%) |
|---|---|-----------|----------|
| Business type | Food/grocery manufacturing | 11 | 7.1 |
| | Semiconductor/electricity/electronics manufacturing | 29 | 18.7 |
| | Wood/paper manufacturing | 1 | 0.6 |
| | Chemical/petroleum/rubber/plastics | 22 | 14.2 |
| | Fabric/apparel & leather industry | 19 | 12.3 |
| | Machinery & equipment manufacturing | 23 | 14.8 |
| | Automobile/auto parts industry | 19 | 12.3 |
| | Non-metals/minerals/primary industry | 11 | 7.1 |
| | Computer/communication equipment industry | 1 | 0.6 |
| | Construction | 4 | 2.6 |
| | Others | 15 | 9.7 |
| | Total | 155 | 100.0 |
| Type of logistics service | Self-logistics | 46 | 21.2 |
| | Logistics affiliates | 9 | 4.1 |
| | 3rd party logistics (local) | 116 | 53.5 |
| | 3rd party logistics (foreign) | 46 | 21.2 |
| | Total | 217 | 100 |
| contract terms for use of logistics service | less than 1 year | 40 | 25.8 |
| | more than 1 year - less than 2 years | 66 | 42.6 |
| | more than 2 years - less than 3 years | 24 | 15.5 |
| | more than 3 years | 25 | 16.1 |
| | Total | 155 | 100 |

The targets of survey were manufacturers, such as exporters, overseas enterprises, which took advantages of global logistics service from service providers. The logistics outsourcing factors were derived from the former studies and pilot study. For verification this study used the structural equation model(SEM) and conducted

statistical analysis by using SPSS 15.0 and Lisrel 8.30. The questionnaire was distributed with a total of 400 copies for 2 months from April to May in 2008, among which 165 copies (41.3%) were collected and 155 copies (38.8%) were used for analysis.

Participants were permitted to respond to the question about logistics service type redundantly, and the responses were as follows: third-party logistics (local firms) 53.5%, third-party logistics (foreign firms) 21.2%, self-logistics 21.2%, and logistics affiliate 4.1%, respectively. Third-party logistics companies accounted for around 75%. Answers to contract terms with logistics companies for use of logistics services were: 42.5% for more than 1 year - less than 2 years, 25.8% for less than 1 year, 16.1% for more than 3 years, and 15.5% for more than 2 years - less than 3 years.

2. Factor analysis

In the model of this study, a factor analysis was performed to identify the correlation between factors affecting the use of global logistics outsourcing of manufacturers. An exploratory factor analysis was conducted for the general judgment of reliability and validity, with the Varimax rotation method used for the factor analysis. A theoretical analysis generated eight factors of the use of global logistics outsourcing. All factors used for the analysis showed relative high scores, which indicates that the generated characteristics were clearly identified. These factors were CEO will, product competition, market entry, weight of logistics cost, characteristics of products and the organization, uncertainty, customers' demands, and competition environment.

Out of the eight factors, CEO will, product competition, and market entry were included in corporate strategy factors, weight of logistics cost, characteristics of products and the organization, and uncertainty in corporate characteristics, and customers' demands and competition environment in environmental factors, to constitute the factors of the use of global logistics outsourcing.

Pearson's correlation coefficient is the method of measuring the correlation. It gives information about the degree of correlation as well as the direction of the correlation. The analysis results of correlation coefficient are highly significant. There are positive correlation with every research unit. All of coefficients have criteria validity because p values are under 1 point.

<Table 11> Results of factor analysis of global logistics outsourcing use parameters*

| Organization concept | Item | Ratio | | | | | | | |
|--|------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Customers' demand | X3 | .755 | .115 | .055 | .094 | .156 | .019 | .090 | .279 |
| | X6 | .674 | .057 | .357 | .203 | .155 | .121 | -.087 | -.068 |
| | X7 | .626 | .058 | .537 | .232 | .051 | .017 | .054 | -.030 |
| | X1 | .581 | -.064 | .294 | .107 | .085 | .030 | .313 | .335 |
| | X12 | .529 | .212 | .167 | .199 | .224 | .346 | .154 | .048 |
| Weight of logistics cost | X16 | .023 | .891 | .040 | .155 | .043 | -.006 | .049 | -.032 |
| | X15 | -.028 | .808 | .047 | .064 | .094 | .248 | .161 | -.096 |
| | X17 | .305 | .744 | -.013 | .178 | .069 | .019 | .189 | .185 |
| | X20 | .094 | .562 | .133 | .470 | -.013 | .107 | .194 | .294 |
| Competition environment | X2 | .193 | -.071 | .692 | .097 | .001 | .239 | .293 | .184 |
| | X9 | .183 | .092 | .637 | .325 | .151 | .071 | -.048 | .138 |
| | X8 | .458 | .141 | .581 | .053 | .227 | .117 | -.071 | .007 |
| | X5 | .122 | .095 | .543 | -.057 | .320 | .153 | -.178 | .126 |
| Characteristics of products and organization | X23 | .185 | .167 | .002 | .783 | .313 | .043 | .150 | .022 |
| | X24 | .431 | .056 | .124 | .682 | .138 | .128 | .213 | -.195 |
| | X22 | .039 | .245 | .347 | .628 | -.042 | .233 | -.034 | .106 |
| | X21 | .091 | .397 | .297 | .555 | .064 | -.012 | .154 | .369 |
| | X19 | .345 | .400 | -.113 | .501 | -.060 | -.126 | .219 | .239 |
| CEO' will | X26 | .104 | -.042 | .100 | .292 | .757 | .142 | .071 | .139 |
| | X33 | .164 | .177 | .151 | -.001 | .699 | .219 | .014 | -.037 |
| | X27 | .150 | .034 | .075 | .261 | .588 | .083 | -.018 | .529 |
| | X29 | .124 | .143 | .204 | -.060 | .568 | .445 | -.073 | .222 |
| | X4 | .079 | -.120 | .487 | -.003 | .498 | .005 | .129 | .222 |
| Product competition | X31 | .059 | .134 | .103 | .025 | .324 | .807 | -.019 | .135 |
| | X30 | .076 | .002 | .381 | .270 | .293 | .652 | .002 | .042 |
| Uncertainty | X14 | .187 | .145 | -.054 | .094 | .089 | .022 | .847 | -.056 |
| | X13 | -.059 | .266 | .116 | .145 | .009 | -.100 | .785 | .054 |
| | X10 | .330 | .159 | -.148 | .224 | -.152 | .394 | .454 | .194 |
| Market entry | X25 | .129 | .045 | .265 | .028 | .373 | .180 | .098 | .685 |
| | X28 | .221 | .121 | .291 | .070 | .127 | .453 | -.147 | .556 |

* Detailed items are included in Appendix.

<Table 12> The Pearson correlation coefficient table

| Factor | Corporate strategy | Corporate characteristics | Environment |
|---------------------------|--------------------|---------------------------|-------------|
| Corporate strategy | 1.000 | | |
| Corporate characteristics | .357(**) | 1.000 | |
| Environment | .605(**) | .483(**) | 1.000 |

**p<0.001

3. Analysis of the importance by factor

The findings from the analysis on the importance of the factors of global logistics outsourcing use showed that corporate strategy was considered most important at 4.03, followed by the environmental at 3.87 and corporate characteristics at 3.26, respectively. As far as the importance by sub-factors was concerned, market entry was found to be the highest at 4.17, followed by competition environment at 4.06, product competition at 3.94, and CEO will at 3.93, respectively. Meanwhile, uncertainty was found to be the least important factor at 3.17, followed by weight of logistics cost at 3.29 and characteristics of products and the organization at 3.32. It is worthy to note that in the analysis of the importance by factor, corporate characteristics was considered the least important and among sub-factors. The importance of uncertainty, weight of logistics cost, and characteristics of products and the organization were found to be the lowest.

<Table 13> Use factors of global logistics services

| Item | | Mean (rank) | SD | Factor mean |
|------------|---------------------------|-----------------------------------|---------|-------------|
| Use factor | Corporate strategy | CEO's will | 3.93(4) | 4.03 |
| | | Product competition | 3.94(3) | |
| | | Market entry | 4.17(1) | |
| | Corporate characteristics | Weight of logistics cost | 3.29(7) | 3.26 |
| | | Product & organizational features | 3.32(6) | |
| | | Uncertainty | 3.17(8) | |
| | Environment | Customer demands | 3.66(5) | 3.87 |
| | | Competition environment | 4.06(2) | |

4. Differences in logistic outsourcing based on contract term

There are probably differences in use of logistics outsourcing based on the contract term between shipping companies and logistic companies. This study classified the contract terms between shipping companies and logistics companies as less than 1 year, more than 1 year - less than 2 years, more than 2 years - less than 3 years, and more than 3 years, conducted a variance analysis, and the differences in average by each type were analyzed.

H: There will be differences in factors for using logistic outsourcing based on contract terms.

H1. There will be differences in corporate strategy of logistics outsourcing based on contract terms.

H2. There will be differences in corporate characteristics of logistics outsourcing based on contract terms.

H3. There will be differences in the environment of logistics outsourcing based on contract terms.

1) Differences in corporate strategy of logistics outsourcing based on contract term

Based on the analysis results of differences in corporate strategy by contract terms, each type showed differences in CEO' will, product competition, and market entry.

<Table 14> Variance Analysis of Corporate Strategy

| Factor | type | contract terms | N | mean | standard variation | F | Sig. |
|---------------------|------|-------------------------------------|-----|-------|--------------------|-------|-------|
| CEO ' will | 1 | less than 1 year | 40 | -0.08 | 1.16 | .830 | 0.479 |
| | 2 | more than 1 year-less than 2 years | 66 | -0.07 | 0.81 | | |
| | 3 | more than 2 years-less than 3 years | 24 | 0.20 | 1.07 | | |
| | 4 | more than 3 years | 25 | 0.18 | 1.06 | | |
| | | Total | 155 | -0.00 | 0.99 | | |
| Product competition | 1 | less than 1 year | 40 | -0.23 | 0.96 | 3.450 | 0.018 |
| | 2 | more than 1 year-less than 2 years | 66 | 0.10 | 0.97 | | |
| | 3 | more than 2 years-less than 3 years | 24 | -0.32 | 1.03 | | |
| | 4 | more than 3 years | 25 | 0.42 | 0.94 | | |
| | | Total | 155 | 0.00 | 1.00 | | |
| Market entry | 1 | less than 1 year | 40 | 0.18 | 0.96 | 4.462 | 0.005 |
| | 2 | more than 1 year-less than 2 years | 66 | 0.04 | 0.88 | | |
| | 3 | more than 2 years-less than 3 years | 24 | -0.64 | 1.17 | | |
| | 4 | more than 3 years | 25 | 0.22 | 0.96 | | |
| | | Total | 155 | 0.00 | 1.00 | | |

For statistical significance, p values of product competition and market entry were 0.018 and 0.005 respectively, showing significant differences; and in the analysis of CEO intentions, the p value was 0.479, which was not statistically significant.

When differences for product competition and market entry among factors of corporate strategy by each type are closely observed, differences are observed in two classification of groups. In order to evaluate based on what type such differences are observed, additional analysis was conducted for each individual type. For additional analysis method, Duncan's multiple range test was used.

In product competition, contract term of more than 2 years-less than 3 years and less than 1 year showed differences with contract term of more than 3 years, and it can be said that the shipper prefers long term contracts with logistic companies as product competition becomes more intense. Also, there were no differences in market entry among more than 1 year-less than 2 years, less than 1 year, and more than 3 years; and these three types showed differences with the more than 2-less than 3 years.

<Table 15> Post hoc test for variance analysis of corporate strategy factors
 (Duncan Analysis)

| Factor | contract terms | N | Subset for alpha = .05 | |
|---------------------|-------------------------------------|----|------------------------|------|
| | | | 1 | 2 |
| Product competition | more than 2 years-less than 3 years | 24 | -0.32 | |
| | less than 1 year | 40 | -0.23 | |
| | more than 1 year-less than 2 years | 66 | 0.10 | 0.10 |
| | more than 3 years | 25 | | 0.42 |
| Market entry | more than 2 years-less than 3 years | 24 | -0.64 | |
| | more than 1 year-less than 2 years | 66 | | 0.04 |
| | less than 1 year | 40 | | 0.18 |
| | more than 3 years | 25 | | 0.22 |

2) Differences in corporate characteristics of logistics outsourcing based on contract term

Analysis results of corporate characteristics based on contract term showed differences of average by type in logistics ratio, product & organization feature, and uncertainty; however, only characteristics of product or organization showed statistically significant differences with p value of 0.099, and no statistically significant differences were found in logistics cost and uncertainty.

<Table 16> Variance Analysis of Corporate Characteristics

| Factor | type | contract terms | N | mean | standard variation | F | Sig |
|---------------------------------|------|-------------------------------------|-----|-------|--------------------|-------|-------|
| Weight of logistics cost | 1 | less than 1 year | 40 | 0.01 | 1.24 | .616 | .605 |
| | 2 | more than 1 year-less than 2 years | 66 | 0.09 | 0.91 | | |
| | 3 | more than 2 years-less than 3 years | 24 | -0.10 | 0.83 | | |
| | 4 | more than 3 years | 25 | -0.19 | 0.95 | | |
| | | Total | 155 | -0.00 | 1.00 | | |
| Products & organization feature | 1 | less than 1 year | 40 | 0.92 | 0.96 | 2.131 | 0.099 |
| | 2 | more than 1 year-less than 2 years | 66 | -0.19 | 0.95 | | |
| | 3 | more than 2 years-less than 3 years | 24 | 0.01 | 1.11 | | |
| | 4 | more than 3 years | 25 | 0.37 | 0.98 | | |
| | | Total | 155 | -0.00 | 1.00 | | |
| Uncertainty | 1 | less than 1 year | 40 | -0.10 | 0.66 | 1.882 | 0.135 |
| | 2 | more than 1 year-less than 2 years | 66 | 0.17 | 1.08 | | |
| | 3 | more than 2 years-less than 3 years | 24 | -0.34 | 1.01 | | |
| | 4 | more than 3 years | 25 | -0.02 | 1.11 | | |
| | | Total | 155 | -0.01 | 0.99 | | |

Post hoc test results for characteristics of product and organization among corporate characteristics showed differences in more than 1 year-less than 2 years and more than 3 years; and analysis found that shippers who use outsourcing based on characteristics of product or organization prefer long term contracts

<Table 17> Post hoc test for variance analysis of corporate characteristic factors (Duncan Analysis)

| Factor | contract terms | N | Subset for alpha = .05 | |
|---------------------------------|-------------------------------------|----|------------------------|------|
| | | | 1 | 2 |
| Products & organization feature | more than 1 year-less than 2 years | 66 | -0.19 | |
| | more than 2 years-less than 3 years | 24 | 0.01 | 0.01 |
| | less than 1 year | 40 | 0.09 | 0.09 |
| | more than 3 years | 25 | | 0.37 |

3) Differences on logistics outsourcing environment based on contract term

When differences in environment based on contract term was analyzed, results showed average differences for each type in financial environment, but as for statistical significance, the value of customer demands was 0.0000 showing significant differences; and it was found that financial environment does not have statistically significant differences.

<Table 18> Variance Analysis of Environment

| Factor | type | contract terms | N | mean | standard variation | F | Sig. |
|-------------------------|------|-------------------------------------|-----|-------|--------------------|--------|-------|
| Customers' demand | 1 | less than 1 year | 40 | -0.66 | 1.19 | 11.266 | 0.000 |
| | 2 | more than 1 year-less than 2 years | 66 | 0.17 | 0.74 | | |
| | 3 | more than 2 years-less than 3 years | 24 | -0.20 | 0.94 | | |
| | 4 | more than 3 years | 25 | 0.58 | 0.75 | | |
| | | Total | 155 | -0.00 | 1.00 | | |
| Competition environment | 1 | less than 1 year | 40 | -0.12 | 1.15 | .942 | .422 |
| | 2 | more than 1 year-less than 2 years | 66 | -0.04 | 0.97 | | |
| | 3 | more than 2 years-less than 3 years | 24 | 0.43 | 0.93 | | |
| | 4 | more than 3 years | 25 | 0.28 | 0.87 | | |
| | | Total | 155 | 0.00 | 1.00 | | |

<Table 19> shows post hoc test results for customer demands among environmental factors. It was found that long term contract is preferred when company is more sensitive to customer demands.

<Table 19> Post hoc analysis for variance analysis of environment factors

| Factor | contract terms | N | Subset for alpha = .05 | | |
|------------------|-------------------------------------|----|------------------------|-------|------|
| | | | 1 | 2 | 3 |
| Customer demands | more than 1 year-less than 2 years | 66 | -0.66 | | |
| | more than 2 years-less than 3 years | 24 | | -0.02 | |
| | less than 1 year | 40 | | 0.17 | 0.17 |
| | more than 3 years | 25 | | | 0.58 |

After verification all the hypotheses, the results were the following <Table 20>.

<Table 20> The results of hypothesis verification

| Hypothesis | | Result |
|------------|--|--------|
| H1 | There will be differences in corporate strategy of logistics outsourcing based on contract terms. | accept |
| H2 | There will be differences in corporate characteristics of logistics outsourcing based on contract terms. | reject |
| H3 | There will be differences in the environment of logistics outsourcing based on contract terms. | accept |

IV. Conclusion

In this study, in order to understand the motives for logistics outsourcing of Korean enterprises and to analyze outsourcing patterns based on contract terms, factors that effect use of outsourcing and contract terms were studied through a survey. 8 factors were identified, and they were classified into three broad factors of corporate strategy, corporate characteristics, and environment. They were then analyzed for their level of importance; and for contract terms, analysis was conducted based on four categories of less than 1 year, more than 1 year-less than 2 years, more than 2 years-less than 3 years, and more the 3 years.

The results of the analysis on the importance of the factors of global logistics outsourcing use showed that corporate strategy was considered the most important at 4.03, followed by the environmental factor at 3.87 and corporate characteristics at 3.26, respectively. As far as the importance by sub-factors was concerned, market entry (4.17) was found to be the highest, followed by competition environment (4.06) and product competition (3.94), respectively.

From the results of the factor analysis and the analysis of the importance by factor, the implications of this can be summarized in two aspects as below.

Firstly, Korean companies value factors relative to corporate strategies as motivating factors for logistics outsourcing. Decisions on outsourcing are made by the CEO, and companies consider logistics outsourcing on the basis of making an entry into overseas markets and strategies for product competition. The CEO's will of making an entry into overseas markets and globalization, and strategies for the

sales of products sold in overseas markets were found to have an effect on the use of logistics outsourcing.

Secondly, Korean companies consider logistics outsourcing depending on how to handle customers' demands and the severity of competition. Logistics outsourcing is used depending on the weight of logistics cost as a current characteristic of a company, complexity and demand for specialization as a physical characteristic of a product, and how systematically to deal with logistics.

When analysis of differences in outsourcing based on contract term was conducted, the results found that first, in order for product competition from the perspective of corporate strategy, establishing a long term relationship between shipper and logistics company is more important; and no other suggestions based on contract term was found in market entry. Second, from the perspective of corporate characteristics, it was found that product and organization characteristics is perceived as more important when contract term with logistics business is longer. third, from the environmental perspective, customer demand is perceived as more important when a long term relationship exists.

The implications can be observed into two aspects. Firstly once the logistics outsourcing between manufacturers and logistics companies are determined, it was verified that mutual agreement, particular contracts and periodic communications can increase the outcome. Secondly the logistics outsourcing appeared to be different depending on the level of entering to foreign market and resulted in higher performance as well.

Further studies are needed to analyze specifically the relationship between the use of logistics outsourcing and the outcome in order to gain an understanding on which factors of the use of the logistics outsourcing identified in this study have a stronger effect on the performance of a company.

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<Appendix> Questionnaire questions

| Organiz- ation concept | Description | |
|------------------------------|-------------|--|
| Use factors | X1 | How much do customers demand differentiated logistics service? |
| | X2 | How quickly does the company respond to customers' demands, compared with competitors? |
| | X3 | Do customers want electronic and automated logistics service ? |
| | X4 | How much does the relationship between CEO and existing customers improve? |
| | X5 | How much does the company make efforts to find new customers, compared with competitors? |
| | X6 | How is the competition for quick delivery? |
| | X7 | How is the competition by meeting the deadline for delivery? |
| | X8 | How is the competition via better services in overseas markets, compared with competitors? |
| | X9 | How is the competition depending on meeting various demands of customers about products? |
| | X10 | How does the company predict environmental changes in general (change of customers' demands, technical change)? |
| | X12 | How much have customers' demands or technologies changed? |
| | X13 | How much control is been imposed on logistics service providers? |
| | X14 | How much does the company pay for information processing |
| | X15 | What ratio do fixed capital costs for logistics (warehouse, etc.) account for? |
| | X16 | What ratio do costs for logistics facilities management account for? |
| | X17 | What ratio does logistics labor cost account for? |
| | X19 | How complex the company's logistics operations are, compared with competitors? |
| | X20 | What kinds of handling works, facilities, equipment, and workers does the company need for special logistics operations? |
| | X21 | How different do your logistics operations by item? |
| | X22 | How does CEO perceive the need for logistics management? |
| | X23 | What process is used for logistics service or how much is the process systemized? |
| | X24 | How much power does the logistics department have to set a plan, coordinate and share works ? |
| | X25 | How willing is CEO to make an entry into overseas markets? |
| | X26 | What experience in overseas markets does CEO have? |
| | X27 | What are CEO 's globalization strategies and visions ? |
| | X28 | Is there any need for making entry into overseas markets? |
| | X29 | How much does CEO understand characteristics of overseas markets and consumers by region and country? |
| | X30 | How is the competition for standardization of product specifications? |
| | X31 | What are competitive edges of technology? |
| | X33 | How is CEO dedicated to key operations? |

< Abstract >

An Approaches to the Logistics Outsourcing Factors of the Korean Companies

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This study aims to understand the conditions for using logistics outsourcing of Korean enterprises, present existing problems, examine factors affecting utility, and analyze the pattern of logistics outsourcing based on contract term, and to ultimately contribute to enhancing competitiveness of logistics enterprises.

Through the literature survey 8 factors were identified as three broad factors of corporate strategy, corporate characteristics, and environment. Factor analysis was conducted on the bases of 155 collected data among 400 distributions for 2 months from April to May in 2008.

From the result of analysis, the implication and finding can be summarized into three aspects. Firstly, Korean companies value factors relative to corporate strategies as motivating factors for logistics outsourcing. Secondly, Korean companies consider logistics outsourcing depending on how to handle customers' demands and the severity of competition. Thirdly, it was found that product and organization characteristics are perceived as more important when contract term with logistics business is longer.

The implications can be observed into two aspects. Firstly once the logistics outsourcing between manufacturers and logistics companies are determined, it was verified that mutual agreement, particular contracts and periodic communications can increase the outcome. Secondly the logistics outsourcing appeared to be different depending on the level of entering to foreign market and resulted in higher performance as well.

□ Key Words: Logistics Outsourcing, Logistics Contract Terms, Logistics Outsourcing Factors