Erasmus University Rotterdam

MSc in Maritime Economics and Logistics

2008/2009

Liner Alliance: the Future of the Liner Shipping Industry?

by

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Acknowledgements

First of all, I would like to express my appreciation to my parents, Yun Yong Bok and Kang Sook Kyung, who supported me through out my study period at MEL. I pray to God for their protection and for their health and happiness through out the rest of their lives.

Next, I would like to thank my older brother, Yun Hyeong Jin, who gave me the courage to finish my study and thesis at MEL. Also, I would like to give many thanks to my older brother's wife, Gong Hye Sung, who gave me much encouragements before I entered in MEL. My beautiful and lovely cousin, Yun Yoo Bin, kept my spirits up when I struggled with structuring the research model of the thesis.

Third, I would like to thank my best friends, Jung Jae Ho and Kim Byung Jin, who provided me with encouragement while studying at MEL through online messenger and e-mail. Also, I would like to offer my gratitude to my high school friends, my University friends and my colleagues at the English study club, BIZ English.

Fourth, I would especially, like to thank my thesis supervisor, Mr. Woo Jong Kyun, who gave me a lot of help with successfully completing my thesis. He provided me a lot of support not only for the thesis work, but also while studying at MEL and living in Rotterdam. I also hope he and his family would share the full of glory of God for ever. I would like to thank the MEL office members, and especially Prof. Dr. H. Haralambides who successfully directed the course and offered a lot of encouragement to all the MEL students. As a matter of fact, he helped me in choosing this thesis topic. I also would like to express my appreciation to Mr. Kwak Chan Soon, Mr. Choi Byung Chul and Mr. Kim Thai Young, who all provided me enormous encouragement while studying at MEL. They also tried to keep me well fed and healthy with delicious Korean food.

Last but not least, I would like to express my highest appreciation to my Lord, Jesus Christ who is my savior. He provided me the inspiration and ideas to finish my thesis without major difficulties. I have a firm belief that I would not have been able to write down even one sentence without his sincere care.

Abstract

As the dramatic market changes in the liner shipping business have continued, triggered by the increasing power of shippers, an unexpected world economic downturn, trade imbalance and the trend of trade multipolarization in the world, many liner companies have worried whether they would be able to survive in the current market or not. In this situation, many liner companies that are already participating in liner alliances, as well as those which were considering joining already existing alliances or organizing new alliances, have been confronted with new challenges. Generally, when liner companies are conducting strategic alliance, what is first required is the formulation of a clear process of alliance objective. Next there is the evaluation of partners, negotiation, and the selection process. However, in the liner shipping business, due to its own characteristics, there are also additional requirements that are indeed different from other business sectors.

In this paper, I will begin by reviewing the previous literature and studies related to the liner shipping business and liner alliances. Next, I will focus on the historical changes in the liner business and the recent trends of massive and powerful collaborations and liner alliances. In this study, I propose 10 factors which can help in determining whether liners should participate under particular circumstances. I have used the survey method and by looking closely at the responses, the research hypotheses are verified.

The aim of the thesis is to explore the implications of changes in liner alliance as well as to determine the main prospective trends of liner alliance in the future. Finally, I would like to present some concluding insights for the decision makers at liner companies to help them in determining their own strategies for the future liner shipping market.

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Chapter 1 Introduction

1.1 The Objective of the Thesis

Today, many companies in the world are confronted with global competition. Without exception, from shoes makers to mobile phone manufacturers, companies have not only been trying to survive in an increasingly competitive world market, but have also sought to improve their product quality, as well as the customer service levels. However, they have not been able to manage to do this work all by themselves. Because of changes in global market circumstances, the exclusive competition model has already been transformed in a co-petition model. With the Collaborative Advantage[1] from this co-petition, they have been able to deal with uncertain circumstances which restricted setting plan and strategy.

Maritime business has developed and changed substantially from its early beginnings. However, unlike other business sectors in the maritime field such as bulks and tankers, participating in the liner shipping market has required a huge amount of investment. Hence, the entry barrier has been extremely high. Once a player has come into the business, the company is forced to compete with others in order to survive, not only in freight rate, but also in offering a high level of service for shippers to attract cargoes. However, this pressure, especially related to capital, has become to overbearing for some liner companies that have struggled to run the business by themselves. In this sense, they have needed colleagues who were able to provide several benefits such as cost reduction and shipping network extension.

Hence, in order to provide valuable information to member carriers as well as liner companies that are considering participating in liner alliance, we have selected 10 factors based on previous research and conducted interviews. The 10 factors what were selected for closer examination in this research study include the difference of size in terms of capacities, the difference of multimodality ability, the range of management in know-how sharing, the range of internal information sharing, the

[1] Kanter, Rosabeth Moss, “Collaborative Advantage: The Art of Alliance”, *Harvard Business Review*, July-August, 1994.

range of management strategy sharing, the pressure for establishing policy regarding maritime pollution and security, the satisfaction level regarding shippers' loyalty, the range of collecting cargo overlapping, shippers' strong desire for integrated logistics service and, finally, uncertainty in the world economy and the liner shipping market.

For this work, the survey method has been adopted as the most appropriate method to conduct the required empirical analysis. In total, 75 questionnaire volunteers were selected. The volunteers were made up of professionals from various kinds of logistics fields. We analyzed the collected data using SPSS version 13.0 and Excel 2003 in order to uncover the implications of the analysis. Finally, this analyzed data was used for deducing prospective trends in liner alliance how it might change in the future.

Table 1.1 Relationship between Thesis Objectives and Report Structure

Relationship between Thesis Objectives and Report Structure							
Thesis Objectives	Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 7
To review the characteristic of liner shipping market and its historical changes	▫	▪					▫
To review the trends of liner alliance	▫		▪				▫
To analyze ten selected factors which influence change of liner alliance				▫	▪		▫
To anticipate short-term trend of liner alliance in the future						▪	▫
To anticipate long-term trend of liner alliance in the future						▪	▫

▪ = strong relationship; ▫ = weaker relationship

1.2 Literature Review Research

This section discusses the variety of previous literature available related to general strategic alliance and liner alliance. I have particularly tried to review previous research studies regarding different types of strategic alliances in order to provide different perspectives in terms of liner alliance. Moreover, in the end,

synthetic consideration and related ideas are presented.

1.2.1 Review of Literature on Strategic Alliance

Strategic alliance has been adopted as a management strategy in order to achieve competitive advantage against competitors through the establishment of complementary cooperation and continuous collaborative relationships among more than two companies that have a competitive advantage.[2] At the beginning, when strategic alliances were first being introduced, it structured vertical specialization due to the gap of technologies, R&D, production and management between developed and developing companies. However, recent strategic alliance has been used by management for surviving the sudden change of circumstances.[3]

There are various studies that try to determine the meaning of strategic alliance and how it is organized, and how it operates and how it has changed over the years. Some of the different terms that have been used include 'Cooperative Agreements', 'Strategic Alliance', 'Network', 'International Coalition', 'Hybrid Arrangement', 'Collaborative Agreement', 'International Corporate Linkage', 'Value-Added Partnership', 'Collaborative Venture', 'Cooperative Strategy', 'Cooperative Venture' and 'Alliance Network'.[4] However, these were all related to the strategic and operational collaboration among companies belonging to an alliance.

After a review of the related research, Parkhe (1993) found that strategic alliances were voluntarily cooperative agreements that were characterized by peculiar instability which occurred from the absence of a powerful authority, and the unexpected future acts and obedience of an uncertain partner company. Das and Teng (1997) defined strategic alliance as 'co-operative arrangements aimed at pursuing mutual strategic goals.' Gulati (1988) defined strategic alliance as the 'active cooperation of organizations related to product, technology or joint development for service, sharing and exchange among companies.' Sergil (1996)

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[2] Kenichi Ohmae(1989), "The Global Logic of Strategic Alliances", *Harvard Business Review*, Vol. 67, No. 2, March~April, pp. 143~154.

[3] Hee Seok, Bang, Jong Sub, Lim (2004), "A Study on the Coalition Factor of Liner Shipping Compaines", *Korea Trade Research Association*, Vol. 29, No. 1, Feb, pp. 157~179.

[4] Joon Yong, Park, *"The Relationship between Performance and Choice of Corporate Structure for Strategic Alliance of Venture Companies"*, Ph.D Thesis, Seoul, South Korea: Hanyang University, 2001, pp. 12-13.

defined strategic alliance as a ‘strategic and tactical relationship in order to obtain co-advantage with complementary interest and objective among more than two companies.’

Some researchers use other terms rather than strategic alliance. Gugler and Dunning (1993) use the word, Cooperative Agreements, which is defined as the ‘long-term participation including all possible relationships among companies.’ Thoreli (1986) uses the term, Network, which he defines as the ‘condition of long-term relationship among more than two organizations.’ Porter and Fuller (1986) use the word, International Coalition, which is defined as ‘the official and long-term alliance in terms of co-management in certain field among companies.’ Powell (1987) uses the word, Hybrid Arrangement, which is defined as ‘the arrangement among organizations in order to use resource and corporate governance.’ Moris and Hergertt (1987) use Collaborative Agreement which they define as ‘a certain form of company in order to share a common objective.’ Auster (1987) uses the word, International Corporate Linkage, which he defines as ‘the contract among organizations in order to obtain strategic advantage in the world market among different companies located in different nations.’ Jonnston and Lawrence (1988) used the term Value-Added Partnership that they define as ‘the cooperation between companies in order to manage product distribution and service by using overall value-added chain.’ Mowery (1988) uses the term, Collaborative Venture, which he defines as ‘a combination form of complementary resource in order to support cooperation in all corporate management fields, expectation of partners’ contribution, response regarding diversity of demand, product, capital and technology.’ Whereas Keegan and Green (1997) use a slight variation on the term, Cooperative Strategy, which they define as ‘a partnership among companies which act jointly in order to achieve the strategic objective.’ Moxon (1989) uses Cooperative Venture which he defines as ‘a combination form of complementary resource in order to compete in the world market.’ And finally, Casseres (1994) uses the term, Alliance Network, which he defines as ‘a kind of negotiation which is a form connected with each other in order to achieve the common objective among companies.’

One reason given for the use of different terminologies and the variety definitions in terms of strategic alliance is because strategic alliances are currently being adopted in a wide awry of businesses. However, perhaps, the real reason for such

variety is that the different points of view of researchers concerning the actual objectives of strategic alliance.[5] In their study, Dussauge and Garrette (1995) divided strategic alliance in to horizontal alliance and vertical alliance. According to their study, horizontal alliance is the relation among companies which conduct business in the same field. Vertical alliance is the relation among companies which exists in the different fields of industry.[6] After taking the former research into consideration, it can be concluded that companies should verify and select partners with clear aims and objectives in mind in order to achieve a successful strategic alliance.

1.2.2 Review of Literature on Liner Alliance

Many liner companies have recognized that establishing a strategic alliance is an essential strategy in order to survive in the competitive global surroundings. There are various kinds of strategic alliance types in the liner shipping business such as Joint Service, Consortium, Global Alliance, Joint Venture and Polling Agreement.[7]

Joint Service is the type of service where more than two shipping companies establish a certain joint hauling route with an advertised vessel schedule to collect cargoes. Frankel (1985) and Gardiner (1994) defined Joint Service as 'an agreement which establishes a new and separate line or service to be operated jointly by partner companies.' A Consortium is a type of corporate union which requires massive capital investment in order to pursue common aims. Hence, Consortiums tend to have more independence than Joint Service. Moreover, Consortiums tend to share more characteristics with cooperative ventures. Koch (1975) and Bras (1991) defined Consortium as 'a cooperative venture of a varying degree of closeness in which shipping companies involved to operate under one name by pooling all or some of their activities in a particular trade.' The Global type of alliance has several characteristics such as cooperation with organized multinational liner companies, mutual complements, extensive and multiple routes, long-term contracts, cooperation including inland transportation, equal partnership

[5] Buckley, P.J. & M.Casson, 'A Theory of Cooperation in International Business', *Cooperative Strategies in International Business*, 1988, pp. 31-51.
[6] Chae Hun, Song, Sun Yok, Song, 'An Empirical Analysis on the Relationship between the Determinants of Strategic Alliance and the Type Choice in the Container Liners', *Korea Logistics Review*, Vol. 17, No.2, June 2007, pp. 110-111.
[7] Ricky W. Griffin & Micheal W. Pusty, *International business, 1st ed.*, 1995, p. 413.

and enlargement of personal exchange. Especially, this type of Global alliance has required the strong confidence among members. Thanopoulou (1997) defines Global Alliance as ‘an agreement between container shipping companies which cooperating on a global trade route basis involving usually the provision of multimodal and logistics services as well.’ According to Koh (2007), Joint Venture is defined as ‘cooperation which is founded through joint investment in order to manage a certain business.’ Moreove, Koh defines a Pooling Agreement as ‘an agreement which is determined by cartel members operating on a certain route in order to distribute net freight income from the common pool.’

The available literature also includes various studies in terms of liner alliance. According to Frankel (1995), liner alliance that combine fleets, equipment and terminals for operation service represents the more standardized, long-term and responsible agreement, rather than the consortium. In his research, Baek (1998) looked closely not only at cooperation among liner companies, but also strategic alliances made between liner companies and airline companies. The motivation of such alliances includes the enlargement of service area, the improvement of customer service and is one management strategy for cost reduction. Kim and Gil (2003) found that liner alliance increased the service of other member liner companies in the same alliance and also led to the reduction of costs with the co-possession of vessels and the common use of terminals. In his research, Kadar (1996) found that the determining factors of liner alliance were cost reduction, strengthening competitive barriers against non-cooperative carriers, ensuring competitive cost advantages and the expansion of customer service. Kwan (2006) insists that the aim of Mergers & Acquisitions (M&A) in the liner shipping market is to decrease unit costs through Economies of Scale. He argued that the economic effect of M&A is cost reduction and the expansion of market range. While Bory and Jemison (1989) point out that the M&A can itself be considered in a broad sense a kind of strategic alliance for liner companies. Moreover, this could be a major factor for liner companies when considering participating in liner alliances. In his work, Speckman (1990) points out that certain equilibrium was achieved when partners in the liner alliance realized that the cost of leaving would be quite large. He found that once liner companies decided to participate in an alliance, then they had to make substantial investments and they also had to share valuable information in order to maintain cooperation with other member carriers. In his study, Baek (1997) found that because of the massive capital investments required for building main routes

and obtaining their own terminals, IT systems and logistics base, liner companies tried to generalize participating in liner alliances in order to share the risks of potential cost reductions while improving service and enjoying Economies of Scale.
In addition, there are several other studies that were conducted in order to uncover the motivation for participating in liner alliances. Song (1996) points out that there are three motivating factors for forming alliances, these include improving customer service, improving competitiveness and the reduction of costs. Sim (1996) suggests that there are five motivating factors which are risk reduction, maintenance or enlargement of market share and improvement of competitiveness.

To summarize the relevant research literature, liner companies have used alliances in order to obtain extensive advantages from the co-usage of vessels, multimodality related to inland transportation, the co-usage of terminals and the development of IT systems. Establishing such alliances has minimized the amount of investment required while providing service differentiation. Yet, the main reason liner companies are expanding the range of their alliances seems to be a widely shared concern of merely surviving in the uncertain liner shipping market.

Chapter 2 Consideration of the Liner Shipping Business

2.1 Characteristics of the Liner Shipping Business

A liner shipping company is defined as 'a company which operates container ships on the same certain route regularly and repeatedly regardless of loading cargo volumes'. The specific route, sailing schedule and the terms of tariff for these container ships are all announced in advance. These ships are used not only for transporting general cargo but also packaged cargo of unspecific shippers.[8] Liner transportation has been one of the transportation sectors which have used container vessels in order to transport the cargo of shippers from a certain point to a final destination point. It has obtained earnings from the service it provides. In other words, liner companies have operated their own ships on their service route and sold its capacity to unspecific shippers.

There are three common characteristics associated with liner transportation. First, liner transportation is associated with multiple ships sailing repeatedly on a specific route. A sailing schedule would be announced in advance, so cargo owners could load their cargoes on the ship in enough time before its scheduled departure. The second common characteristic associated with liner transportation is the huge investment that is required for container ships, building terminals, constructing inland transportation systems and transportation facilities or equipments. The third characteristic is that the same freight rate is applied to all of cargo owners by tariff.[9]

In terms of management, when liner companies borrowed ships, the fluctuation of charterage and ship price was great, so the management risk was too high. Hence, it could be said that the liner shipping business is the one industry which has both the high risk of finance leverage and management leverage.[10]

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[8] Soon-Hwan, Jeon, *'International Transportation & Logistics'*, 2007, p. 77.
[9] Soon-Hwan, Jeon, *'International Transportation & Logistics'*, 2007, p. 78.
[10] LSE(1999), "Shipping Seeks New Global Role", *Lloyd's Shipping Economist*, Vol. 21, No. 11, Nov., pp. 7~10

2.2 Trends in the Liner Shipping Business

In order to mitigate management risks, liner companies have tried to cooperate with others especially through forming strategic alliances.[11] For example, CKHY, Grand Alliance and The New World Alliance were organized for cost reduction in operation, but they extended the cooperation to other related sectors such as container terminals, inland transportation and IT systems. The logistics circumstances have also been rapidly changing. Huge logistics providers, referred to as 3rd party logistics companies, such as FedEx, TNT and UPS, have also been able to provide a logistics service, as well as managing the shipper's supply chain. They also even had consulting abilities. This has put a lot of pressure on liner companies to change their business plan and strategy. In the next section, the historical changes that have affected the liner shipping business changing from a more competitive situation to a situation of strategic cooperation and M&A in the market have been shown.

2.2.1 Historical Changes in the Liner Shipping Business

The operating ships of liner companies' have generally been classified according to two different categories. They are either container ships or general cargo ships. Container ships have occupied the majority of the main routes of liner companies. The total world fleet consists of five sectors, including the tanker, bulk, container, general cargo and passenger ship. The significant thing is that the growth of container ships has increased when compared to the other sectors. The following Figure 2.1 presents trends in changes in the world fleet from 1980 to 2008.

[11] Ranjay Gulati, "Social Structure and Alliance Formation Patterns: A Longitudinal Analysis", *Administrative Science Quaterly*, Vol. 40, No. 5, June 1995, pp. 619-652.

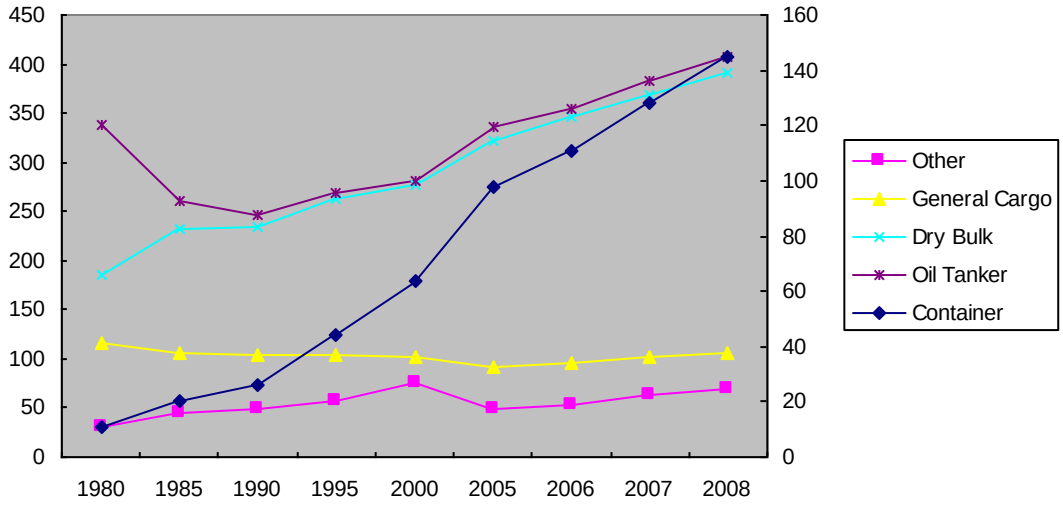

Figure 2.1 World Fleet by Principal Vessel Types, Selected Years
Source: Review of Maritime Transport, UNCTAD, 2008.

Based on Table 2.1 below, when comparing the data for the years 2004 and 2008, it shows that only the percentage of container ships increased, while the others decreased.

Table 2.1 The Change of World Fleet Line-Up

Section	Tonnage('08)	Tonnage Weight(%)		Annual Average Growth(%)		
	Million Dwt	2004	2008	Number of Ship	Dwt	TEU
Tanker	439.3	41.3	40.7	3.1	6.0	-
Bulk Ship	386.6	35.9	35.8	3.9	6.4	-4.1
Container Ship	144.6	10.7	13.4	8.8	12.5	13.8
General Cargo Ship	102.8	11.3	9.5	1.7	1.9	2.1
Passenger Ship	6.2	0.7	0.6	1.1	1.5	-
Total	1,079.5	100.0	100.0	2.9	6.5	11.0

Source: The Change of World Fleet Structure and Its Consideration, Korea Maritime Institute, 2008.

However, the growth of container capacity in the world has been decreasing since the middle of the 1980's. The main reasons for this decrease have been uncertainty

in the global economic situation, the diversity of shippers' demands and the globalization of carriers due to the importance of multimodality.[12] In this way, liner companies have faced more risks in order to survive in the liner shipping market. Therefore, many companies have been eager to cooperate with others, even former competitors as well. However, perhaps the most significant reason has been the desire to decrease heavy and large sized cargoes through innovation of technology. In addition, the development of SCM and global sourcing in the manufacturing field has required increased efficiency in order to adopt the JIT system properly. Therefore, manufacturers have tried to reduce lead-time, inventories and the uncertainty of cargo delivery. In the meantime, the use of air transportation for shopping cargo has also been increasing. This trend has has a negative affect on the liner shipping business.

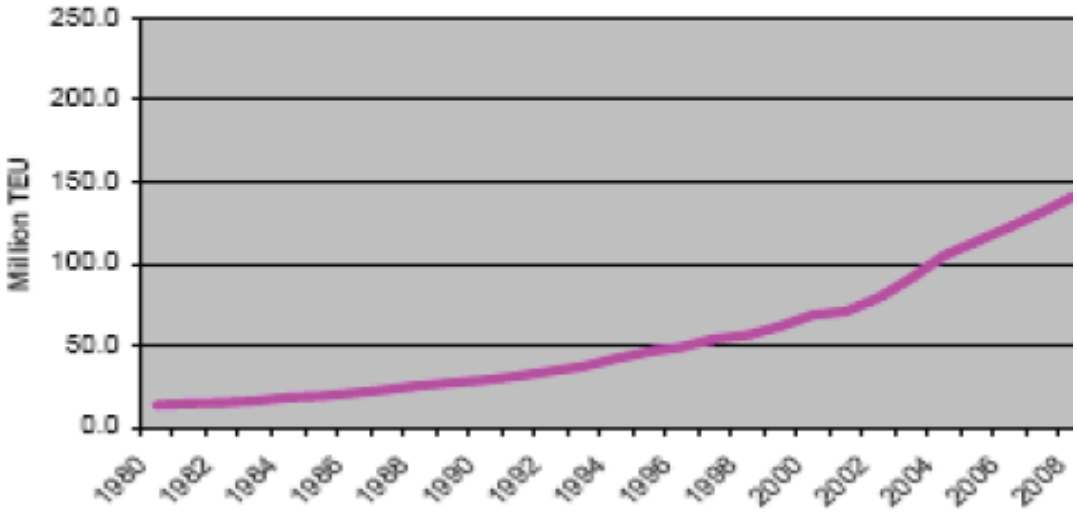

Figure 2.2 Global Container Trade Growths
Source: Liner Shipping Competition Policy, APEC, 2008.

During this period, there were three issues primarily affecting the situation of the liner shipping business First, there was the issue of the trend in the multipolarization of world trade, such as the Free Trade Agreement (FTA). In order to overcome economic blocks and restore economic benefits, many countries that were leading the world economy have been trying to negotiate with each others. This was the 'country to country' point of view, not 'block to block'. It is to be expected that this

[12] Yoon Jin, Roh, *"A Study on the Performance Estimation of Liner Alliance"*, MSc Thesis, Seoul, South Korea: Chung-Ang University, 2000, pp. 9.

required the various feeder networks and multimodal services more than now. Second, there was an issue of increasing trade imbalance. Because of the cargo imbalance between Asia and America or Europe, the optimization of container movement has been one of the largest hot issues for liner companies, so this initiated cooperation. Finally, there was the issue of the increase in shippers' power. As we have seen the trend of weakening the maritime conference originated when the market changed from a carriers' market to a shippers' market. Also, due to the trends in global sourcing and SCM, carriers should also consider broadening their own maritime transport service to providing a total logistics service.[13] Therefore, these changing situations in the liner shipping market have forced management to maintain a more collaborative strategy and practice global management for carriers.

There are two additional characteristics of carriers' globalization that can be identified. First, there is the trend of mega vessels. Due to equalization of service quality and decreasing freight rate, carriers have been willing to obtain economies of scale from mega size vessels, which could lead to the reduction of slot cost.

Table 2.2 The Cost Reduction Effect of Large Container Vessel

(Unit: US$)

Cost	6,000TEU	4,000TEU	Cost Reduction Effect (%)
Manning	125	188	33.5
Repair & Maintenance	171	225	24.0
Insurance	150	175	14.3
Supply & Lubricant Oil	50	63	20.6
General Management	29	44	34.1
Fuel	706	912	22.6
Port & Harbor	417	481	13.3
Total	1,648	2,088	21.1

Source: Hyo Jin, Kwan, 'Trend of World Liner Alliance and Consideration of the Prospect', 2006, p.49.

Since 1994, carriers have started to operate Post-Panamax vessels on service routes. There were 21 vessels in 1997, but because of the Asian economic crisis, by

[13] Chae Hun, Song, Sun Yok, Song, 'An Empirical Analysis on the Relationship between the Determinants of Strategic Alliance and the Type Choice in the Container Liners', *Korea Logistics Review*, Vol.17. No.2. June.2007, pp.109.

1998 there were only 17 vessels and by 1999 there were 15 vessels. However, by 2000, this decline had stopped. In 2000, there were 38 vessels recorded and after this time period many liner companies began to order new ships.

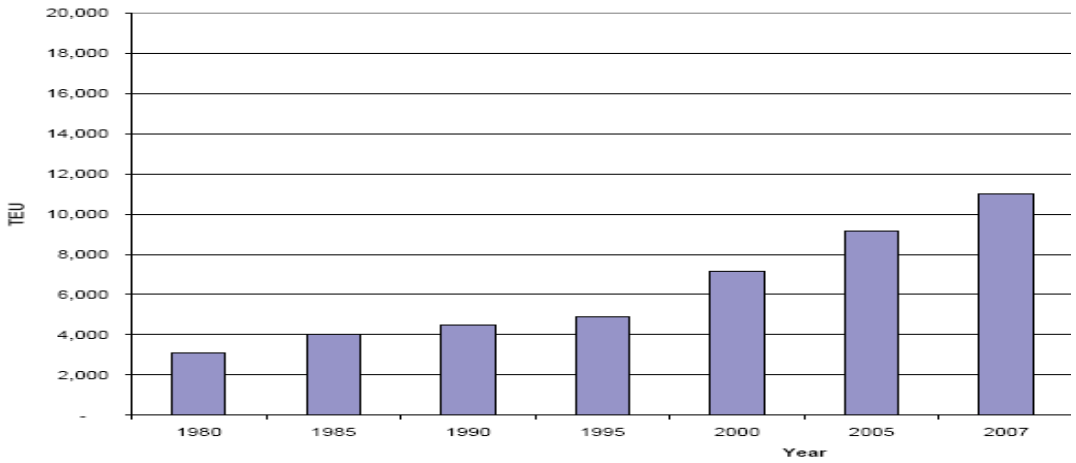

Figure 2.3 Largest Container Ship Sizes, 1980~2007

Source: Liner Shipping Competition Policy, APEC, 2008.

Table 2.3 World Containership Fleet (fully cellular), 2007

Size Class (TEU)	Existing Fleet		Ordered		Orders / Fleet (TEU)
	No. of Ships	'000 TEU	No. of Ships	'000 TEU	
<500	438	136	13	3	2%
500-999	752	549	155	128	23%
1000-1499	611	722	170	202	28%
1500-1999	486	826	120	207	25%
2000-2499	302	692	21	46	7%
2500-2999	348	947	137	362	38%
3000-3999	317	1082	80	273	25%
4000-4999	354	1553	217	944	61%
5000-5999	239	1300	59	310	24%
6000-6999	114	740	121	788	160%
7000-7999	49	360	6	42	12%
8000-8999	93	767	95	798	104%
9000-9999	36	336	38	355	106%
10000+	5	68	77	857	1260%
Total	4,144	10,077	1,309	5,315	53%

Source: Liner Shipping Competition Policy, APEC, 2008.

The second additional characteristic of carriers' globalization is the spread of strategic alliances caused by increasing competition. This trend has widened due to the weakness of shipping conferences, service improvement and cost rationalization. However, strategic alliance in the middle of the 1990's could not provide enough advantages to liner companies who belonged to alliance, so several liner companies tried to eliminate the overlapping of management organization and the complexity of control through M&A.[14]

During the previous maritime conference period, carriers tried to expand their market share with service differentiation. However, they also made attempts at cost reduction in maritime sector by engaging in strategic alliances. Moreover, they tried to obtain margins through competitive advantage with the inland logistics sector. In other words, global carriers sought to minimize maritime transportation costs through strategic alliance. While the companies may have sought to maximize profits from overall logistics service through IT improvement, equipment and facility utilization and optimization of multimodality, the liner companies soon discovered that only companies which had these abilities and could provide these services could survive in the liner shipping market.

[14] Yoon Jin, Roh, *"A Study on the Performance Estimation of Liner Alliance"*, MSc Thesis, Seoul, South Korea: Chung-Ang University, 2000, p. 40.

Table 2.4 The Change of Liner Market Environment

Section	Introduction	Growth	Maturity	Advanced Maturity
Periodization & Definition	-1956~1967 -Introduction of containerization	-1968~1982 -Period of containerization	-1983~1999 -Period of international mutimodal transportation	-2000~ -Period of international overall logistics
Change of Ship Sizes	-300~500TEU	-Appearance of 2000TEU(1972) -1000~1500TEU	-Extension of hauling route -Reorganization of joint operation -Appearance of 4000, 5000TEU	-Appearance of 6000TEU -Globalization of competition -Appearance of TSL(Techno super line)
Management Environment	-Service development -Operation focus -Container standard change	-High profit -Fixing the service period -Revitalization of container transportation	-Competition of freight rate -Low profit -Market segmentation -Differentiation of service quality -Strategic alliance -Prevalence of M&A	-Extensive competition of service quality -Diversification of shippers' demand -Market oligopoly -Route focusing on Asia

Source: Hee-Seok, Bang, 'International Transportation', 1999, p.82.

2.2.2 Status of Liner Shipping Market Position

When comparing the years 1991 and 2007, the changes in the top ten carriers' fleet were very dramatic. Maersk Line was the largest carrier in the world in 1991, but the interesting thing is the gap of capacity between Maersk and others was expanding during this period. The main reason for Maersk's increasing capacity was due to two tremendous and successful M&A trials, Sealand in 1999 and P&O Nedlloyd in 2005. Another interesting issue shown in the table below was the dramatic capacity increase for MSC and the enlargement of capacity for European

carriers.

Table 2.5 Top Ten Carrier Fleet Capacity Increases, 1991 compared with 2007

Line	Position	Fleet TEU slots		Growth Index
		2007	1991	
Maersk Line	1	1,638,898	220,000	7.45
MSC	2	1,200,668	30,000	40.02
CMA-CGM	3	694,239	66,000	10.52
Evergreen Line	4	620,610	131,000	4.74
Hapag-Lloyd	5	491,954	57,000	8.63
COSCO	6	426,814	97,000	4.40
CSCL	7	418,858	-	N / A
APL (NOL)	8	399,896	100,000	4.00
OOCL	9	351,542	-	N / A
NYK Line	10	331,083	107,000	3.09

Source: Liner Shipping Competition Policy, APEC, 2008.

In Figure 2.4 below, it shows that among the top 20 global carriers, 4 European carriers were among the 5 top mega carriers in the world. As a result, the liner shipping market has mostly been led by European carriers. So, in order to respond their expansion of influencing power, many Asian carriers maintained cooperation through liner alliance. It is not surprising that in such a market there was strong competition to attract cargoes on the Europe-Asia route between European carriers and Asian carriers.

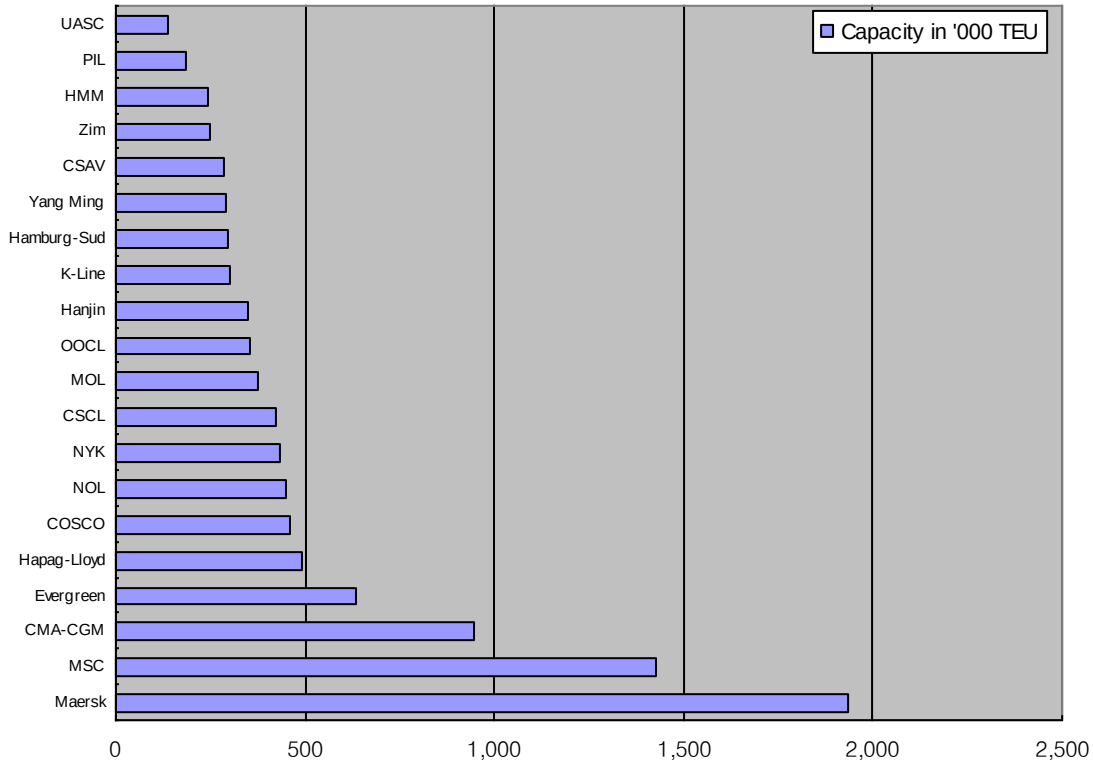

Figure 2.4 Top 20 Global Container Shipping Company, 2008
Source: Trends in Container Shipping amidst general Economic Recession, Hapag-Lloyd, 2009.

Nevertheless, the consolidation of liner shipping market has gradually increased due to the M&A trials. There was a significant gap between 1995 and 2009, which was 23%. In 2007, the Top 20 liner companies possessed 82% in the world's total container capacities. The interesting thing is that the significant percentage gap between 1996 and 1998 occur during the same period when liner alliance was first being organized. Due to the organization of liner alliances and high growth of mega carriers, a lot of mid or small carriers disappeared and their market shares went directly to liner alliances and mega carriers. This will be discussed in more detail in the next chapter.

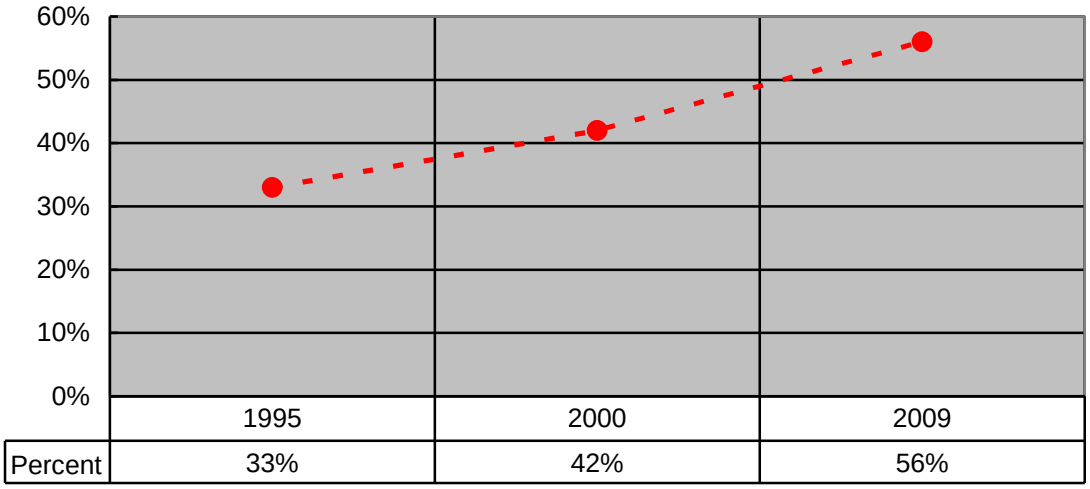

Figure 2.5 Capacity Shares of Top 10 Carriers

Source: Trends in Container Shipping amidst general Economic Recession, Hapag-Lloyd, 2009.

Table 2.6 Trend in Carrier Consolidation, 1988~2007

Year	Fleet TEU	World	Share World
	Top 20		Top 20
1988	N / A	N / A	35%
1996	N / A	N / A	50%
1998	N / A	N / A	70%
2000	3,370,901	4,769,327	71%
2001	3,785,958	5,318,173	71%
2002	4,408,673	5,947,443	74%
2003	4,952,059	6,462,140	77%
2004	5,486,856	7,090,897	77%
2005	6,240,979	7,957,409	78%
2006	7,463,347	9,265,784	81%
2007	8,640,273	10,571,865	82%

Source: Liner Shipping Competition Policy, APEC, 2008.

In 2007 the top 5 global carriers possessed 43.1% of cumulative shares in the world container capacities. European carriers in top 5 possessed 37.3% of total shares and the Asian carrier in top 5, which was Evergreen, only possessed 5.8%. However, in comparison with capacity shares between top 20 European carriers and Asian carriers, European carriers possessed 39.2%, which in only a 1.9% increase

compared to the shares of the top 4 European carriers, but Asian carriers possessed 39.3%, which is a 33.5% increase when compared to the share of Evergreen.

Table 2.7 Carrier Shares of the World Fully-Cellular Containership Fleet, 2007

Carrier	Ranking	Capacity TEU	Number Ships	Share TEU	Cumulative Share
World Fleet at 1 Dec. 2007	0	10,571,865	4,242	-	-
Maersk Line	1	1,616,749	435	15.3%	15.3%
MSC	2	1,170,031	333	11.1%	26.4%
CMA CGM	3	671,507	212	6.4%	32.7%
Evergreen Line	4	614,724	174	5.8%	38.5%
Hapag-Lloyd	5	485,738	138	4.6%	43.1%
COSCO	6	423,870	137	4.0%	47.1%
CSCL	7	394,915	95	3.7%	50.9%
APL (NOL)	8	389,294	110	3.7%	54.5%
OOCL	9	351,402	82	3.3%	57.9%
NYK Line	10	329,257	85	3.1%	61.0%
Hanjin	11	326,730	75	3.1%	64.1%
MOL	12	323,881	102	3.1%	67.1%
K-Line	13	291,152	90	2.8%	69.9%
Yang Ming	14	267,319	81	2.5%	72.4%
Zim	15	235,418	80	2.2%	74.7%
Hamburg Sud	16	196,363	75	1.9%	76.5%
HMM	17	187,413	43	1.8%	78.3%
PIL	18	136,967	70	1.3%	79.6%
Wan Hai Line	19	118,616	71	1.1%	80.7%
CSAV	20	108,927	48	1.0%	81.7%

Source: Liner Shipping Competition Policy, APEC, 2008.

2.2.3 History of Mergers & Acquisitions (M&A) in Liner Shipping Market

Since the 1990's, M&A in liner shipping market have frequently occurred. This has particularly been the trend since 1995. There have been two tendencies for the survival of globalization in the liner shipping market, i.e. strategic alliance and M&A. Strategic alliance was a strategy adopted by liner companies in order to survive in a

more competitive by saving high amount of investments, so that they could not only concentrate on their core business market, but could also establish a global shipping network. However, M&A was yet another survival strategy of liner companies which sought to expand the market share as an active investment for physical integration. The interesting thing is that highest percentage of possession in top 20 carriers consisted of Asian carriers, but since 1995 the majority of M&A trials have been implemented by European carriers. This fact is related to the domination of the 4 European carriers in top 5 and their tendency to promote the continued oligopolistic situation in liner shipping market.

Table 2.8 Examples of Mergers & Acquisitions in the Shipping Industry

Year	Acquisitor	Target
1996	P&O	Nedlloyd
	CMA	CGM
1997	Hanjin	DSR-Senator
	NOL	APL
1998	Evergreen	Lloyd Triestino
	Hamburg Sud	Alianca
1999	Maersk	Safmarine
	Hamburg Sud	Transroll Nav.S.A
	Maersk	Sea-Land
2000	CSAV	Norasia
2002	Hamburg Sud	Ellerman services to Med/India
2003	Hamburg Sud	Kien Hung Shipping Co.
2005	Maersk	Royal PONL
	CMA-CGM	Bollore(Delmas)
	Hapag-Lloyd	CP Ships
2007	Hamburg Sud	Costa Container Lines

Source: Trends in Container Shipping amidst General Economic Recession, Hapag-Lloyd, 2009.

There are different types of Mergers and Acquisitions that can be distinguished. We can classify the M&A of liner companies as the M&A among mega carriers, undertaking, amalgamation as equals, M&A between mega carriers and mid or small size carriers, M&A among mid or small size carriers, M&A between the same

national carriers, M&A with foreign carriers and M&A with companies that are not within the maritime industry.[15] The current trend of M&A in liner shipping market has been led by mega carriers. The main reason for mega carriers to engage in M&A was in order to obtain Economies of Scale through high market share. The most significant year for M&A trials was in 2005. For example, in 1999 there was a M&A between the Maersk Line and Sea-Land which was one of the largest carriers in the U.S. In 2005, they instituted another M&A with P&O Nedlloyd which was 3rd biggest carrier at that time. With the help of M&A, the Maersk Line was able to obtain approximately 19% of the total world container capacities, which had 549 container ships with the ability to ship 1.5 million TEU. This size was about 2.3 times more than MSC, which was the second largest carrier in the world. The objective of the M&A for Maersk Line was increasing capacity, improving service levels with the combination of management know-how and shipping network and the reduction of by reducing the required human resources and overlapping organization. Moreover, a German liner company, Hapag-Lloyd that was the 13th largest carrier at that time, merged with a Canadian liner company, CP Ships which was considered the 16th largest carrier in 2005. Later CMA-CGM also merged Delmas. Therefore CMA-CGM with M&A emerged as the third largest carriers, which possessed 244 ships and 488,755 TEU total capacities, eventually moving Evergreen Line out of the way.

As a matter of fact, the real objective of M&A in the liner shipping market was to obtain overwhelming market power in a short period of time. They could obtain high market share in a relatively short time by using M&A, when compared with ordering new ships which would take much longer. Moreover, they believed that they could obtain a stable logistics base with the integration of both companies' terminals. Offering an appraisal of these M&A, it appears the liner companies managed to catch two rabbits, Economies of Scale and Economies of Scope. Due to the enormous capacity, they could provide low freight rate to shippers as well as high quality of service with their expanded maritime network, terminals and multimodality related to inland connection. However, after the M&A, there were some initial problems that emerged. For instance, the Maersk Line struggle to integrate the IT networks between the Maersk Line and P&O Nedlloyd. So in the beginning, they had a lot of losses. However, with the fast growth of shippers' power, the advantage of M&A soon became readily apparent and began to show above the waterline.

[15] Lloyd's Shipping Economist, February 2000, p. 14.

The M&A issue with Maersk Line especially stimulated the alliance group, New World Alliance. P&O Nedlloyd possessed the largest portion in Grand Alliance, so other member carriers in Grand Alliance became concerned about the potential negative impact from the secession of P&O Nedlloyd. Given this situation, member carriers in the New World Alliance extended their contracts even though the expiration date remained. And then, they started to operate together on the main routes with Grand Alliance. Hence, we can conclude how important it was for liner companies to maintain market share in the liner shipping market. Moreover, the major M&A trials could be seen one of the important triggers for member carriers belonging to an alliance group to strengthen their level of cooperation.

Yet another motivation for M&A was to satisfy shippers' increasing demands. Global Sourcing and SCM require speediness, connectivity and accuracy from liner companies. Under such circumstances, liner companies have to select a management method which is efficient and effective to obtain an advantage over their keen competition. In addition, they have to try to establish an efficient transportation system as well as multimodal ability in the liner shipping market. Of course, the key of survival in the liner shipping market is to provide high quality transportation service from door to door with the lowest price compared to other competitors. This could be one of the main reasons why M&A should be the best alternative.

2.3 Chapter Conclusion

In this chapter, we examined the major characteristics of the liner shipping business and its trends. In the past, liner companies sold their slots to unspecific shippers for moving cargoes from point to point. They managed the maritime transportation service by establishing a stable and regular schedule, so that it would reduce the burden of inventories and uncertainties for cargo owners. In spite of the growth of containers in the maritime transportation sectors, the actual volume of container cargo has been declining because of the slow growth in the world economy as well as growing competition with other transportation sectors including air transportation. As high-tech industries have developed in the world economy, the

products they produce are often small in size, but high in value, so the shippers have increasing started to use air transportation for such products. This has led to further attempts to develop more efficient transportation means. For instance, the JIT system was developed to address shippers concerns with speed and the reduction of lead-time.

Regarding the status of the liner shipping market position, there are two important trends. These include the increasing market consolidation in terms of mega carriers and capacity competition between European carriers and Asian carriers. There were three significant issues discussed that affect the liner shipping business. These were the trend of trade multipolarization in world trade, an increasing trade imbalance and the increasing shippers' power. In the liner shipping market, there are two issues that emerged as trends, i.e. the construction of mega container vessels and the establishment of liner alliances. Mega carriers have been increasing their capacities primarily through M&A, so the liner shipping market has been going through a period of consolidation. After the successful trial of M&A, mega carriers have been eager to expand their shipping networks, as well as terminal and inland transportation systems. In this way, liner companies have sought to obtain higher market share based on different characteristics between the liner shipping business and other business sectors.

Chapter 3 Consideration of Liner Alliance

3.1 Concept of Strategic Alliance

Before the emergence of strategic alliances, limited cooperation between companies could be found. This type of cooperation emerged primarily to sell technology or products from the developed countries to the developing countries, and was partially related to technology licensing or joint investment. However, after the 1980's, the idea of strategic alliance had expanded so much that the division between strategic alliance and international cooperation was continuously vague. Some researchers argued that in this way strategic alliance was just a new name given to traditional cooperation among companies in order to emphasize the change of circumstances.[16] While, other researchers have maintained that the concept of strategic alliance today represents a new form of cooperation in the international market, and furthermore, M&A falls within the scope of this new idea of establishing strategic alliances.[17]

In the 1970's, most companies that sought to expand their business tried to develop and grow their organizations from within. In this way, companies could maintain control over every part of their organizations and there was no problem regarding the integration of organizations as well. However, this development strategy required an enormous investment over a long-term period. This also meant that there were not enough ways to sufficiently spread management risks. Moreover, the possibility for improving management of the company by obtaining valuable know-how or resources from outside was limited. During the 1980's, companies used M&A in order to expand their growth. They expected from M&A the successful integration of each company and the continued improvement product and service supply in the market. However, some companies suffered major difficulties after the M&A. A side effect of the integration process, many companies were confronted with the immediate increase in costs because of the massive spending investments

[16] Gulati, R, 'Alliances and Networks', *Strategic Management Journal*, 1988, pp.293-317.
[17] Borys, B. & Jemison, D.B, "Hybrid Arrangements as Strategic Alliance; Theoretical Issues in Organizational Combinations", *Academy of Management Review*, Vol.14, No.2, 1989, p.234.

required and adjusting to the complexity of new regulation in integrated organization over a short period of time.

Since the 1990's, companies have used strategic alliance as a strategic collaboration tool in order to maximize the companies management abilities with low costs and investments. It was an effective way which provided the sharing of resources, the speedy expansion of market share, complement of internal ability, the minimizing of required investments and the spreading of risk among companies. However, companies that formed strategic alliances were often met with difficulties including the complexity of management and their limited power when managing the many parts in an alliance situation.

Table 3.1 Development Steps of Modern Companies

Section	Internal Development	M&A	Strategic Alliance
Period	1970's	1980's	1990's
Advantage	-High level of organization integration -High level of control power	-Costs and investments reduction through bigger size	-Fast growth / expansion -Minimizing costs and investments -Possible to use external abilities and resources
Disadvantage	-Slow growth / expansion -Massive investments and costs -Impossible to use external abilities and resources	-Massive investments and costs -Problem regarding integration of each organization -Difficulties in terms of internal innovation and change	-Complexity of management -Lack of control power regarding various management parts

Source: Joong-Hee,Choi, 'A Study on Change of Liner Alliance in Liner Shipping Market', Maritime Fisheries Korea, Vol.203, 2001, p.18.

It is very hard to define strategic alliance in a simple way, but it would be safe to say that strategic alliance has been used as an innovative management tool that can be differentiated from traditional cooperation among companies. After reviewing

previous studies, Hamel and Prahalad established two standards: strategic intent and strategic form.

Table 3.2 Comparison between Traditional Cooperation and Strategic Alliance

Section		Traditional Cooperation	Strategic Alliance
Strategic Intent	Motivation for Cooperation	Local market / Limited	Global market / Coverage
	Relationship of Cooperation	South and North relation / Latent cooperation	Existing competition / Limited cooperation
	Scope of Cooperation	Technology transfer / Simple area	Technology development / Special area
	Number of Participation	Minority	Majority
Strategic Form	Form of Cooperation	Fixed form / Unit contract	Unfixed form / Multi contract
	Field of Cooperation	Unit business / Limited	Multi business / Organic
	Period	Short term / Throwaway	Flexibility / Renegotiable
	Representative Form	Technology licensing Joint investment	Cross licensing Joint venture

Source: G. Hamel and C.K.Prahalad, 'Strategic Intent', Harvard Business Review, May-June, 1989, p.127.

In terms of the first category, strategic alliance represents a form of total cooperation form regardless of specific coalition form.[18] Therefore, in this situation, strategic alliance has included forms of traditional cooperation such as technology licensing, sales contract and joint investment. In terms of the second standard category, strategic alliance is intended to apply to limited international cooperation which only had strategic intent and represents and untraditional coalition form.[19] This type of alliance focused on two-way cooperation such as mutual licensing and mutual sales contracts.

[18] Contractor, F.J & P. Lorange, 'Why Should Firms Cooperate? The Strategy and Economic Basis for Cooperative Venture', *Cooperative Strategic in International Business*, 1988, pp.3-30.

[19] Hergert, M. & D. Morris, 'Trends in International Collaborative Agreements', *Cooperative Strategic in International Business*, 1988, pp.99-109.

Table 3.3 Definition of Strategic Alliance

Terminology	Definition
Competitive Collaboration	All of company cooperation form in the international business relation regardless of specific coalition form
Global Strategic Alliance	Horizontal relationship between more than two companies to achieve common goal in long term strategy which obtains global competition advantage
Collaborative Venture	Having cooperation relationship through certain business and operation between companies which are in competitive situation
Hybrid Arrangement	Arrangement among organization to use more than one of the organization resource and management

Source: Hyo Jin, Kwan, 'Trend of World Liner Alliance and Consideration of the Prospect', 2006, p.24.

3.1.1 Type of Strategic Alliance

Five types of strategic alliance can be identified. These include technology alliance, supply alliance, production alliance, sales alliance and capital alliance. First, a technology alliance is a strategic alliance that is provided for research and development areas. The aim of this alliance is to develop new technology together or exchanging each other's technology. It also had characteristics which were easily applicable to production and sales cooperation. Besides, it was easy to get rid of technology gaps and to develop new technology or new products. The most representative way, among the various ways of organizing an alliance for the interactive exchange of technologies, is cross licensing. It was the way that a company used another company's technology as an equivalent instead of providing their own technology. Here mutual supplementation was the core factor. Companies developed new technology together by sharing R&D resources such as manpower and capital. This was a joint research development. Second type of strategic alliance is supply alliance which was established to achieve parts or products reliably in the long term. This type of alliance appears especially among global companies. In the past, this type of alliance often proceeded as a subcontract and would be produced on the basis of a temporary commission between forerunners and companies that would depart later, but recently there has developed mutual

complementary alliances among forerunners. The third type is production alliance which is a form of strategic alliance which participates together supplying production technology interactively in order to obtain cost reductions in production and higher market position. While the supply alliance is the more one-sided form of alliance which supplies parts or products from other companies, production alliance is the form of alliance that secures the way of common production with interactive supply on competitive advantage resource. The fourth type of strategic alliance is the sales alliance. Sales alliances are form to share resources related to sales such as distribution channels and marketing know-how. It is called the product swap. Recently, in terms of globalization, sales alliances have been used as a way of entering overseas markets and enhancing marketing ability. If there was no sales network, then they had to depend entirely on to the other company's sales network. However, recently, overseas branches have exploited their own sales network and have contracted selective sales alliances. Lastly, capital alliance is the form of strategic alliance which requires the movement of capital such as purchasing a certain company's partial equity or founding a joint venture. Capital alliances include collaborative production investment, collaborative R&D investment and collaborative sales investment. However, it should be noted that these characteristics often occur simultaneously with functional cooperation. Moreover, in case of subsidiary establishment, it could adjust control through equity rates.

3.1.2 Success Factors in Strategic Alliance

In order to make successful strategic alliances, both companies should be guaranteed additional profits or value-added benefits. These benefits should be distributed equally.[20] Establishing strategic alliances is one way of expanding and facilitating growth without depending on additional investments or management innovations.[21] However, in order to organize a strategic alliance or obtain the right working relationship, many factors must be taken into account.

[20] Dale Littler & Fiona Leverick, "Joint Ventures for Product Development: Learning from Experience", *Long Range Planning*, Vol. 28, No. 3, 1995, pp. 58-67.

[21] J. Bleek & D. Ernest, "Is Your Strategic Alliance Really a Sale?", *Harvard Business Review*, Jan-Feb, 1995.

Table 3.4 Success Factors of Strategic Alliance 1

Section	Success Factor	Failure Factor
Selection of Partner	-Complement of core ability and capital -Common objective -Culture accord and Mutual trust	-Overlapping ability and Lack of complement -Conflict objective and goal -Heterogeneous culture and Mutual distrust
Organization of Alliance	-Clear principal and Long-term plan -Common customers -Equivalent partnership	-Unclear contract regarding main affair -Overweight for internal problem -Condition of more advantage for one partner
Implement of Alliance	-Prudent integration and adjustment -High response and Leadership -Authority delegation in terms of alliance organization	-Limited integration of organization and information flow -Passive management posture -Little authority to alliance organization

Source: Joong-Hee,Choi, 'A Study on Change of Liner Alliance in Liner Shipping Market', Maritime Fisheries, Vol.203, 2001, p.18.

To establish a cooperative relationship between two heterogeneous companies having different cultures and business patterns is not easy work. As a matter of fact, when looking at the history of advanced companies' cooperation, there has been more failure than success in the past. Therefore, special care is needed in order to ensure the success of a strategic alliance. These measures can include obtaining an advanced cost benefit analysis and securing the confidence of cooperative companies.[22] However, the most important factor for success is to select a proper partner. In order to select a proper partner, the company should be able to consider at least three factors, which are compatibility, capability and commitment. For example, when participating in a strategic alliance, even a company with great abilities is likely to fail if there is a problem with cooperation. Therefore, before selecting a partner, the company must determine the objective of alliance, their points of contribution and business strategies. Moreover, management resources

[22] Jeffrey E. McGee, Michael J. Dowling & William L. Megginson, "Cooperative Strategy and New Venture Performance: The Role of Business Strategy and Management Experience", *Strategic Management Journal*, Vol. 16, 1995, pp. 565-580.

and core abilities of the company should also be evaluated since at least such an analysis should be aware of the potential weakness of a future alliance partner.[23] In this way, the possibility of establishing successful alliances would increase if the size and core ability of the companies forming the strategic alliance were at the same level. Lastly, a company should find a partner which has resources and is willing to cooperate.[24] It does not matter how excellent a company's ability and fitness, if a partner does not properly manage resources, then the success of their alliance will be unlikely.

One of the basic characteristics of strategic alliance is the sharing of risk and performance. Generally, a company took the risk and performance just in order to participate and contribute in the decision making. Hence, strategic alliance should not be seen as a tool promoting short-term benefit, but a tool creating bigger value through resource sharing.[25]

Table 3.5 Success Factors of Strategic Alliance 2

Company Culture	Clear acknowledgement for the culture difference between companies is needed
Reliance	Clear communication and information sharing can be achieved by sincere reliance
Common Ground of Strategy	Each company should have the same objective which coincides with the aim of strategic alliance
Functional Capability	Resources and core ability of partner have to be understood perfectly and it should be utilized to maximize the performance of alliance
Communication	Communication channel and information sharing are crucially important

[23] Rosabeth Moss. Kanter, "Collaborative Advantage; The Art of Alliance", *Harvard Business Review*, July-August, 1994.
[24] H. Angle & J. Perry, "An Empirical Assessment of Organizational Commitment and Organizational Effectiveness", *Administrative Science Quarterly*, Vol. 26, 1981, pp. 1-14.
[25] Jarillo, J. C., 'On Strategic Networks', *Strategic Management Journal*, Sep. 1988, pp. 31-41.

3.1.3 Cases of Strategic Alliance

There have been a variety of successful cases of strategic alliance in business, as well as failures. It could be meaningful to look at some of these cases in order to determine the actual reasons for success or failure. For our study, we focused on several cases of strategic manufacturing alliances as well as a case of a strategic airline alliance.

There is a special case of a successful strategic alliance in the logistics field. SonicAir, which belonged to UPS as an operation division, provided a more delicate third party logistics service to professional customers that supplied valuable equipments. They had 67 warehouses and used professional software in order to maintain adequate inventory levels for individual parts at the separate warehouses. When they received an order, they then determine the best manner of transportation. Through this service, customers could maintain their service level even though they had a relatively low amount of parts. Customers were able to benefit from the reduction of cost and SonicAir also benefited in terms of high profitability. It could be seen as a case of Win-Win between customer and the logistics firm.

In the manufacturing field in the past, if companies wanted to expand their market share and margin, then it was commonly believed that they should invest in state-of-the-art facilities and R&D for the future. However, these investments required a lot of funds, so the management risk dramatically increased. Therefore, in order to reduce high risk, company started to work in hand with other companies some of which may have previously been their main competitor. For example, in 2003, Samsung and Sony founded the joint venture company, S-LCD, to produce together the 7^{th} and 8^{th} generation LDC panel. Consequently, this alliance helped both companies share capital risk at the same time as increasing the world LCD market share in Red Ocean surroundings. Taking a look at the car industry, Mercedes-Benz and BMW, who are known as the most crucial competitors in the field, decided to share in the development of a new lithium-Ion battery which is for hybrid vehicles. They also share wide strategic cooperation in terms of co-producing small car engines as well as sharing sub-contractors. As a result, they are able to increase Economies of Scale. For another example, Japanese optical and chemical producing company, Sumitomo, and American company, 3M, have maintained a strategic alliance since 1958. They founded the limited cooperation, Sumitomo-3M, which managed R&D

and production to marketing and sales. They developed the partnership in three steps. First, Sumitomo imported 3M products and just sold them to Japanese customers. Second, Sumitomo started to produce 3M products in Japan directly. Lastly, Sumitomo organized a new R&D group and developed new high-tech products fitting the demands of the Japanese market. In fact, there were several factors that contributed to their success. At first, when they initially founded the limited cooperation agreement, they clearly understood each others tasks. In addition, they respected each company's different culture and pursued customer satisfaction, as well as Japanese quality control management.

However, there are also well known cases strategic alliance in the manufacturing field failing. These include the case of LG-IBM and Hyundai-DaimlerChrysler. In the middle of 1990's, IBM, which was one of the biggest computer makers in the world, had struggled with increasing market share in South Korea. They founded an overseas branch, IBM Korea, but the market share was only just 1%. In the meantime, LG Electronics also had a tough time due to its 6% of the market share. Therefore, they decided to found a limited cooperation in 1996 which was LG-IBM in order to address the weak points of each company. At that time, IBM Korea had a low level of distribution and a limited sales network, while LG Electronics suffered from low brand loyalty during this period. LG Electronics considered IBM Korea's strong point their high technological ability, their ability to develop various products and worldwide brand loyalty. Moreover, IBM Korea considered the strong points of LG Electronics to be their wide distribution and service network and their high brand awareness and familiarity. At the beginning of the strategic alliance, their business partnership seemed to cover the weak points of each company. In 1998, in spite of the economic crisis in South Korea, the market share of LG-IBM was marked as third biggest in the computer market. Despite their success, the companies could not agree in terms of long-term strategy. On the side of IBM Korea, they were eager to expand and focus on selling server systems to companies. But, on the side of LG Electronics, they wanted to focus on the sales of personal computers and laptops. There was also another reason for the conflict, which was the brand loyalty and growth in technology of LG Electronics. In this situation, LG Electronics had the confidence that they could compete with other players by themselves. Therefore, they no longer needed IBM Korea. Finally, IBM Korea and LG Electronics announced the end of their strategic alliance in 2004. Another famous case of strategic alliance failure is the alliance between Hyundai and DaimlerChrysler.

During the end of the 1990's and the early 2000's, there were several mega-merger situations in the worldwide car industry. This affected car makers to establish their own strategic alliances. For example, DaimlerChrysler was eager to expand their sales target in an emerging market, such as Asia. They also wanted to cover their weak points, which was a lack of small model cars. From Hyundai perspective, they wanted to obtain advanced technology and entry in to the market of developed countries. Therefore, Hyundai and DaimlerChrysler started to organize a strategic alliance in 2000. At the beginning of the alliance, DaimlerChrysler could improve their line-up, especially, regarding small cars. They also initially managed to expand their sales network in an Asian market. Hyundai was able to benefit from the alliance with improved technology, especially in terms of efficient engines and platforms. However, as Hyundai improved its own technology as well as brand loyalty, their synergy effect disappeared. Hence, the strategic alliance between DaimlerChrysler and Hyundai ended in 2004. In fact, the most significant factor that contributed to the failure of this strategic alliance was the lack of trust. DaimlerChrysler requested consignment management of the factory in Brazil to Hyundai due to the management crisis, but Hyundai rejected the request. Moreover, DaimlerChrysler contracted with one of the biggest Chinese car makers without any discussion with Hyundai. Hyundai complained that DaimlerChrysler tried to lead the alliance by force, but DaimlerChrysler also complained that Hyundai just needed to obtain new technology from them and there was no longer any strategic collaboration. They finally announced the end of their strategic alliance in 2004.

It may also be useful to examine the situation of strategic alliance in the airline market, since the airline industry is another form of transportation business that provides a service to customers like the liner shipping business. The International Air Transport Association (IATA) has defined an airline alliance as an agreement established between more than three airlines participating in a commercial relationship or joint venture to provide a service based on a recognized brand.[26] Strategic alliances among airlines have taken different forms. Initially they established joint operations on certain routes, the collaboration of frequent flyer miles options and the co-usage of the airport lounge. The alliance then expanded to establishing an operation schedule together, IT integration and collaborative marketing. Their alliance also now includes a broad based marketing alliance

[26] Tae Geun, Song, *"A Study on Factors Influencing Customer Loyalty in Airline Global Alliance"*, MSc Thesis, South Korea: Mok-Po University, 2006, p.17.

excluding the interactive equity exchange or capital participation. Finally, some airlines also used M&A to successfully expand their route network by connecting with network of another airline company through strategic alliance. For example, Lufthansa and United Airlines connected both route networks through a code share agreement in 1994. Thanks to the agreement, Lufthansa could obtain 25 flight routes of United Airlines in the U.S and also United Airlines could obtain 30 flight routes of Lufthansa in Europe and the Middle East. As a result, both airline companies felt the positive effects of their huge network expansion.

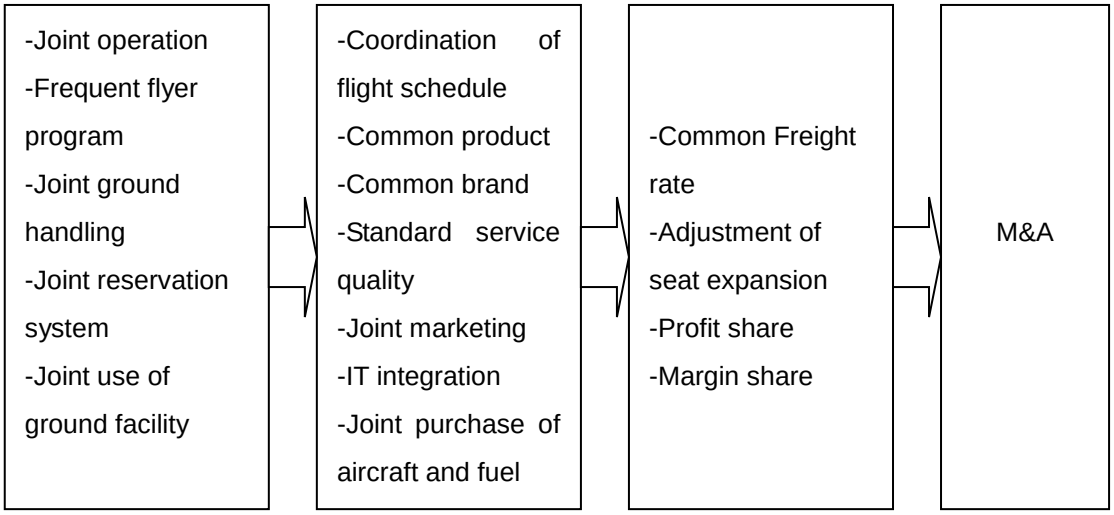

Figure 3.1 Steps of Airline Alliance

Source: Deutsche Bank, 'European Airlines, Climbing Through the Turbulence', October 12, 2000.

3.2 Trends of Liner Alliance

From the beginning of 1990's, several major world liner companies estimated that container capacities would continuously increase so they ordered a lot of new ships. However, this caused extreme over capacity and a dramatic decrease in the freight rate. With this situation, competition in the liner shipping market increased dramatically,[27] so that there was almost no difference in the service quality among

[27] Yoon Jin, Roh, *"A Study on the Performance Estimation of Liner Alliance"*, MSc Thesis, Seoul, South Korea: Chung-Ang University, 2000, p. 19.

carriers. Even though globalization and multipolarization in the liner shipping market increased, many liner companies soon realized that there was a limit to fulfilling the increasing demands of shippers, if only one carrier tried to expand the service network by itself. Therefore, they were eager to cooperate with other liner companies to share operations and facilities.

Before examining the latest trends in liner alliance, it is first necessary to understand the difference between maritime conference and liner alliance. Generally, the federation liner companies in a conference determine their management policy through marketing and freight rate agreements.[28] Under such an agreement, all of the federation liner companies maintain the same freight rate for the same kind of cargo. However, liner alliance has been able to provide the best liner shipping service through Economies of Scale and Economies of Scope.

In fact, the maritime conference was founded only for maritime transportation.[29] However, the range of service provided by the liner alliance can change based as needed on shippers' transportation requirements. In other words, it is able to provide door-to-door service through multimodality. The basic objective of the maritime conference was to establish the same freight rate. However, the liner alliance has pursued a common objective by establishing agreements among liner companies. The objective of liner alliance is to integrate an organizational structure. Hence, liner companies that belong to the alliance are expected to take on relatively more responsibility by taking charge of use of the fleet, the terminal, facilities and equipment unlike the maritime conference. Moreover, in the liner alliance, each liner company collaborates on the joint operation and inland transportation. In terms of the period of agreement, for the maritime conference, it was almost semi-permanent for all of the routes. While the term for the liner alliance was not semi-permanent but rather long-term.

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[28] Yoon Jin, Roh, *"A Study on the Performance Estimation of Liner Alliance"*, MSc Thesis, Seoul, South Korea: Chung-Ang University, 2000, p. 30.

[29] K.S.Cho, *'Structural Changes in Liner Shipping: an International Approach'*, Ph.D Thesis, University of Wales Cardiff, 1994,pp.21~40.

Table 3.6 Difference between Maritime Conference and Alliance

Section	Maritime Conference	Liner Alliance
Transportation Part	Maritime transportation	Multimodal transportation
Basic Objective	Setting the same freight rate	Integration of multimodal transportation service
Service	Using own service network	Service collaboration through connection with member liners
Term /Operation area	Semipermanent / Operation in both routes	Long-term (more than 15 years) / Integration of each liner's business strategy

Source: Yoon-Jin, Roh, 'A Study on the Performance Estimation for Liner Alliance', 2000, p.31.

3.2.1 History of Liner Alliance

During the consortium period in the liner shipping market, some operational cooperation among mega carriers did exist. However, in the early period of organizing liner alliance, a wide range of integrated global cooperation from America, Europe and Asia emerged that served the additional function of a consortium. In other words, each liner company has formed joint relationships with other liner companies providing service to different areas in order to expand their own service. The aim of liner companies participating in the alliance was to improve the quality of their transportation service by expanding their level of cooperation and an increasing the scale of their network. In 1995, due to the dramatic increase in the number of ships in the total world container fleet and the decrease of tonnage, the survival of many liner companies became threatened by the low freight rate.[30] Therefore, liner companies, in order to survive in a more competitive market started to form alliances.

[30] Yoon Jin, Roh, *"A Study on the Performance Estimation of Liner Alliance"*, MSc Thesis, Seoul, South Korea: Chung-Ang University, 2000, p. 28.

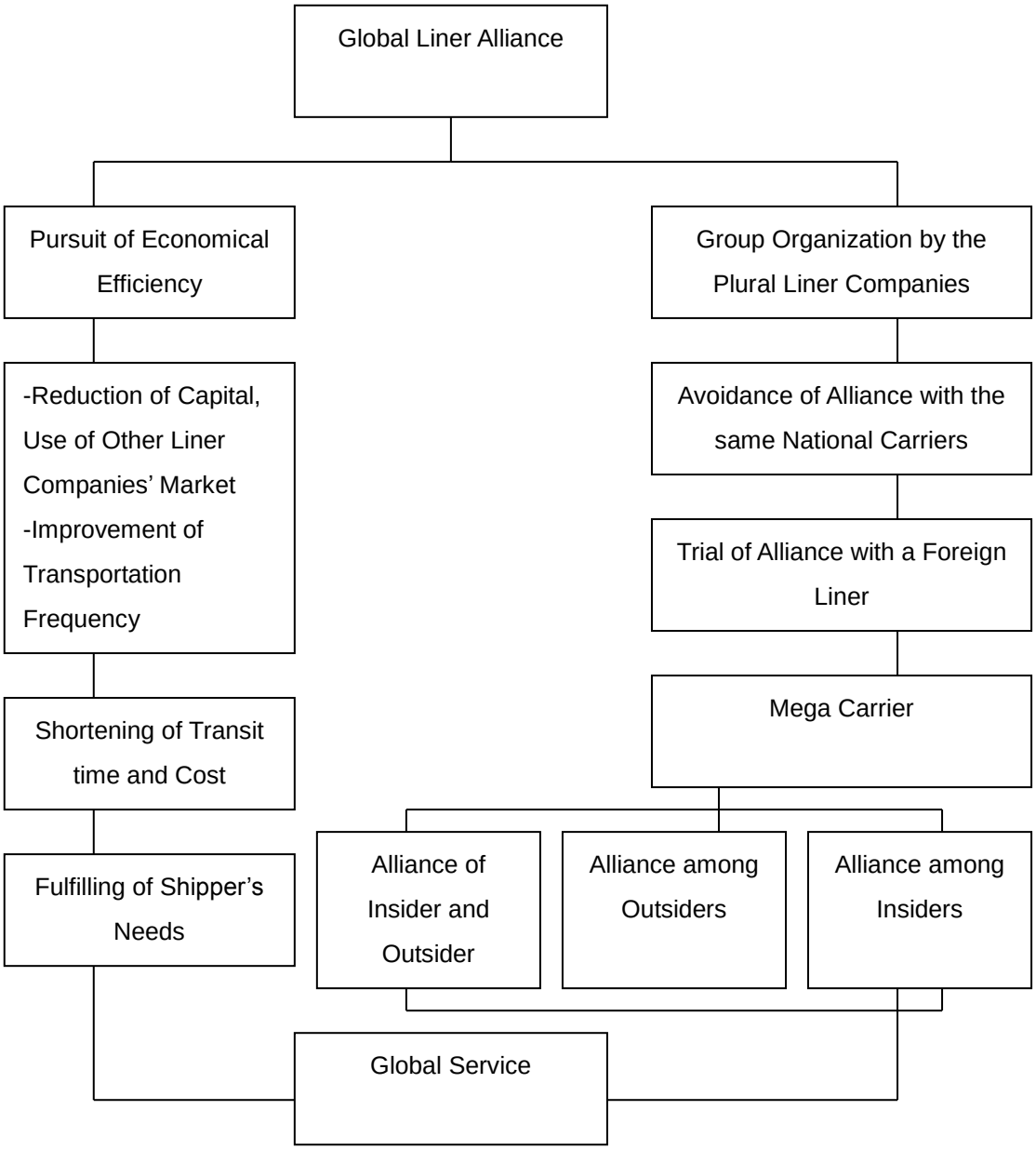

Figure 3.2 Organization of Liner Alliance

Source: Hyo Jin, Kwan, 'Trend of World Liner Alliance and Consideration of the Prospect', 2006, p.18.

The first emergence of liner alliance was formed among MISC, Nedlloyd, APL and MOL because of the disorganization of TSA joint operation group in 1995. These liner companies connected the European route with the North American route through strategic alliance, so they could manage together to build a global service network. In the early years of the liner alliance, carriers simply provided space chartering or space sharing with member carriers in order to obtain the necessary

space or route service. However, as service routes, service area, the forms of service and the term of service became more long-term, the scope of cooperation within the liner alliance also grew more quickly. In terms of service route, member carriers cooperated not only on main service routes but also on feeder service routes. In regards to the service area, their range of cooperation extended to terminals, equipment and inland transportation system and sales and marketing of parts. Moreover, in terms of the type of alliance formed, they tried to share capital and investment and they established limited cooperation in order to improve common management. The period of alliance also became more long-term, in some cases for a period of 5~10 years or in other cases for an indefinite period.

Table 3.7 Development Line of Liner Alliance

Section	Development Line (Beginning -> End)
Route	1 main route -> 1 main route and feeder route -> 2~3 main and feeder route -> All routes
Range	Ship -> Terminal -> Equipment / Inland transportation -> Support task -> Sales / Marketing
Form	Space chartering / Space sharing -> Common costs -> Common capital sharing -> Limited cooperation -> M&A
Period	Short-term -> 3~4 years -> 5~10 years -> Indefinite period

Source: Bong Hoon, Koh, 'A Study on the Enhancement Scheme of the Strategic Alliance among the Container Liners in Korea-China Trades', 2007, p.49.

We can generally divide the era of liner alliance into five different periods: Period 1 (1995~1997), Period 2 (1998~2000), Period 3 (2001~2003), Period 4 (2003~2005) and Period 5 (2005~present).[31] As we have already seen, in March 1995, APL, MOL and Nedlloyd formed Global Alliance. Their agreement included joint operations, the common use of terminals, the common use of containers and equipment and the common use of the inland logistics network. MISC also participated in some parts of the operation route. Next, in January 1996, Hapag-Lloyd, NOL and NYK formed Grand Alliance and later OOCL also joined the alliance group. In June, Maersk and Sea-Land upgraded their cooperative relationship to form an active alliance. It was during this same time that P&O joined Grand Alliance. Consequently, at the beginning of the alliance era, the liner shipping market was

[31] Woo JK, 'The Effect of Merger of Maersk and Future Container Market', *KMI Global Shipping & Logistics*, Vol.248, 2005.8.

primarily separated into three alliance groups: Global Alliance, Grand Alliance and Maersk-Sealand Alliance.

However, because of continued recession in the liner shipping market, the alliance groups were forced to re-organize their members. Consequently, new group alliances appeared as the result of M&A. In January 1997, P&O engaged in a M&A of Nedlloyd and Hanjin also bought more than 70% of DSR-Senator's equity. Moreover, NOL engaged in a M&A of APL. In March 1998, due to the expiration of the initial contract period for Global Alliance, its former alliance groups were urged to re-organize as 5 alliances to form new Gland Alliance (Hapag-Lloyd, MISC, NYK, OOCL, P&O Nedlloyd), Maersk-Sealand Alliance, New World Alliance (HMM, APL, MOL), United Alliance (Hanjin, Choyang, DSR-Senator, UASC), and C-K-Y Alliance (Cosco, K-Line, Yangming). The second Asian economic crisis in 1998 had a severe negative affect on several carriers. This was especially the case for Choyang one of South Korea's largest carriers at that time which went bankrupt in 2001. This was an important trigger for the breakup of United Alliance. Initiatively, Hanjin organized the new alliance group with carriers belonging to C-K-Y Alliance. This was the beginning of CKYH which is presently the largest alliance group in the world.

In May 2005, Maersk Line announced the most surprising news in liner shipping market history, it would merge with P&O Nedlloyd had the third largest liner shipping market share. After the M&A by Maersk, there were three major liner alliances that have existed from 2005 to the present, these are the New World Alliance, the Grand Alliance and the CKYH Alliance. However, in May 2009, MISC announced that they would leave the Grand Alliance in January 2010. A lot of researchers and liner companies claimed that the reason for MISC's secession from the alliance was because of the long and significant recession in the liner shipping market. However, MISC's stated that their intent was to get out of the Asia-Europe route and concentrate on the feeder service in near seas, especially in the area of Middle East and Asia. It is expected that this effect would not be so significant. Since, MISC possesses just 6% of Grand Alliance's total capacities. However, this raises an important issue, whether changes in the formation of liner alliances may be a prospective trend in the near future of liner shipping market.

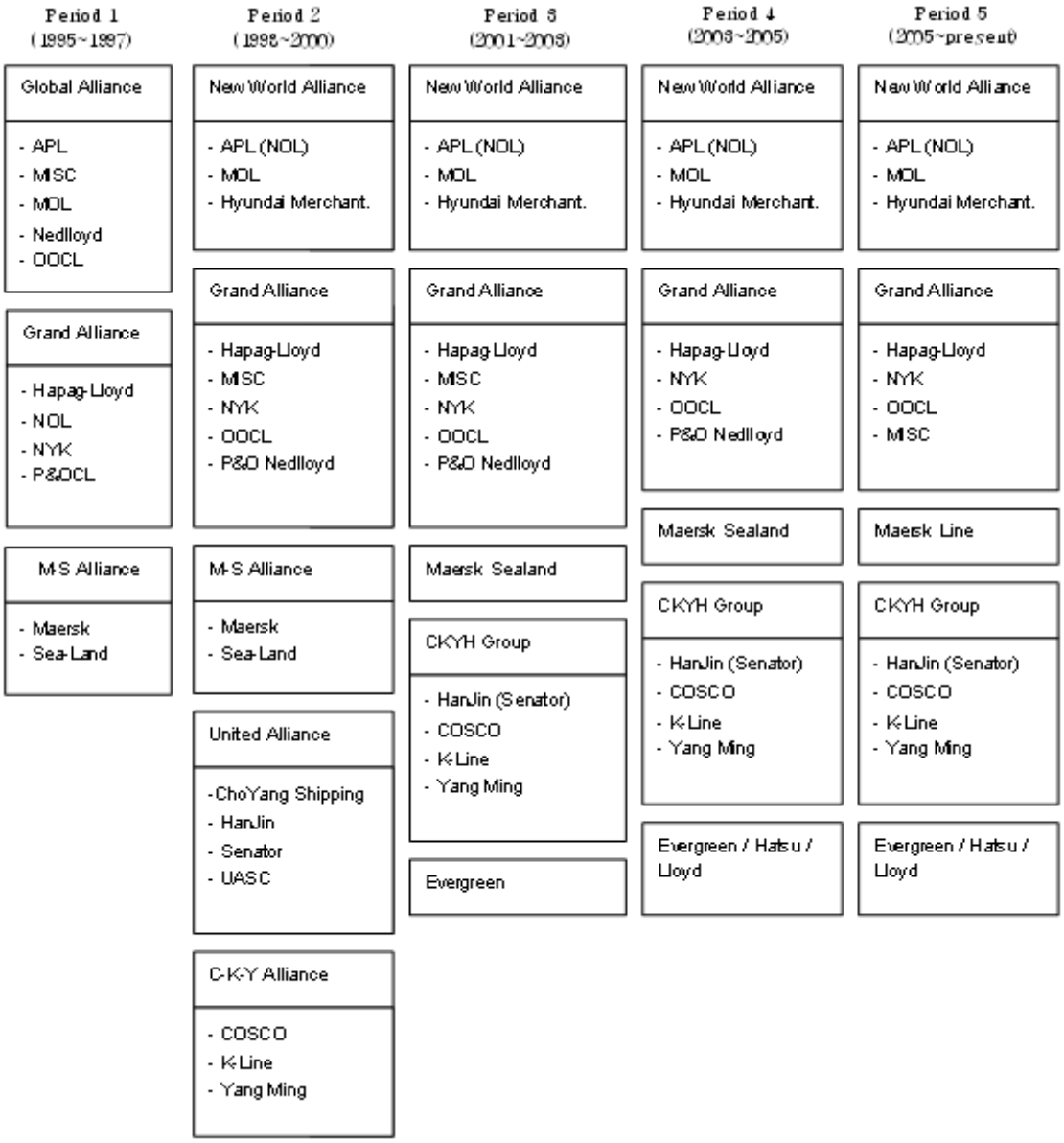

Figure 3.3 Change of Alliance Structure

Source: Woo JK, The Effect of Merger of Maersk and Future Container Market, KMI Global Shipping & Logistics, Vol.248, Aug, 2005.

3.2.2 Comparison of Major Liner Alliances

As the liner shipping market has continued to change, capacities of the three leading alliances (CKHY, Grand, New World) have also continued to change. In 1999, the capacity of the Grand Alliance was 645,748 TEU, 544,558 TEU for Maersk-Sealand, 447358 TEU for the New World Alliance, 380,689 TEU for the C-K-

Y Alliance and 342,566 for the United Alliance.

Table 3.8 Difference between Maritime Conference and Alliance

Section	September 1999	
	Number of Ships	TEU
Grand Alliance	278	645,748
Maersk-Sealand	228	544,558
New World Alliance	178	447,358
C-K-Y Alliance	207	380,689
United Alliance	152	342,566
Evergreen / LT	132	311,951
Total	1,175	2,672,870

Source: KMI, 'Forecast of World Maritime Business in 2000', December, 1999.

When taking a look at the circumstance of liner shipping market in 2001, there were not as many big changes when compared to 1999. The capacity of the New World Alliance was slightly decreased. Where as the capacity of Maersk-Sealand and the C-K-Y Alliance had been increased mostly due to alliances.

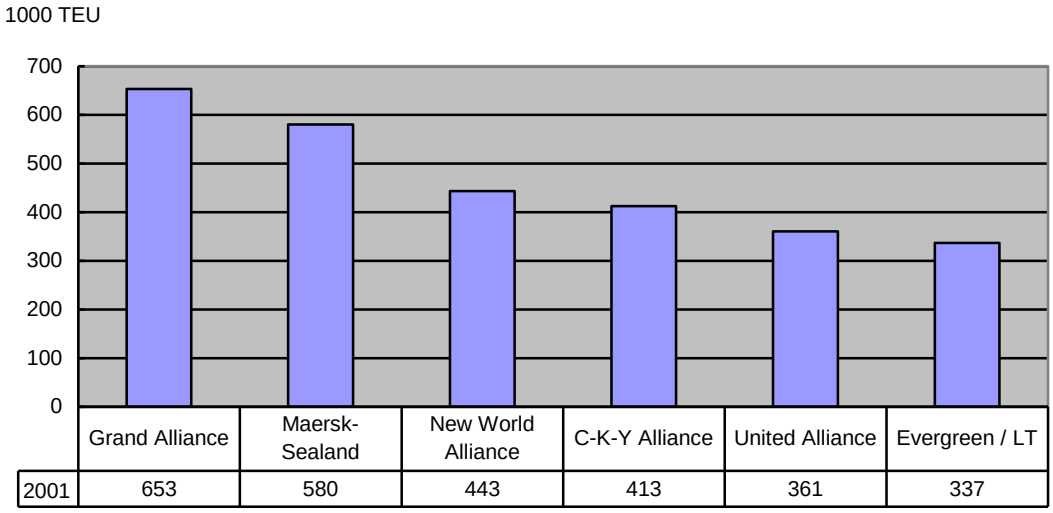

Figure 3.4 Comparisons of Fleet Capacities of Liner Alliances, 2001
Source: Joong-Hee,Choi, 'A Study on Change of Liner Alliance in Liner Shipping Market', Maritime Fisheries, Vol.203, 2001, p.32.

In 2004, after Hanjin joined the C-K-Y Alliance, the capacity of the CKYH Alliance

more than doubled compared to 2001. This put Maersk-Sealand out of the way, which had possessed the second biggest alliance in the liner shipping market at that time. While Grand Alliance still maintained the biggest alliance group.

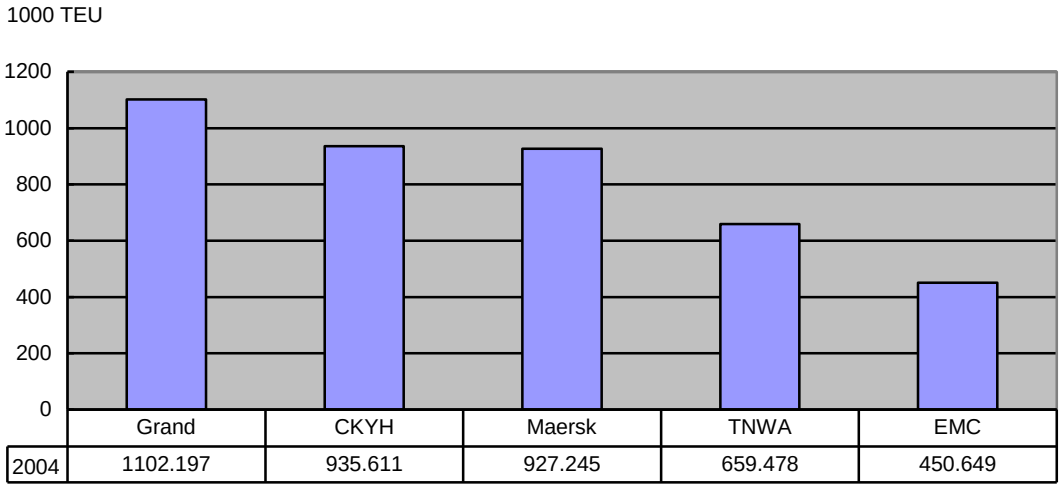

Figure 3.5 Capacities and Shares of Five Main Alliances and Mega Carriers in 2004
Source: Hua-An Lu, James Cheng, Tai-Shen Lee, 'An Evolution of Strategic Alliances in Liner Shipping – An Empirical Study of CKYH', Journal of Marine Science and Technology, Vol.14, No.4, 2006, pp.202-212.

In 2007, after Maersk merged with P&O Nedlloyd, they finally became the biggest carrier in the world when comparing all other alliances. Due to the impact of P&O Nedlloyd's secession from Grand Alliance, CKYH became the biggest liner alliance on the basis of capacity.

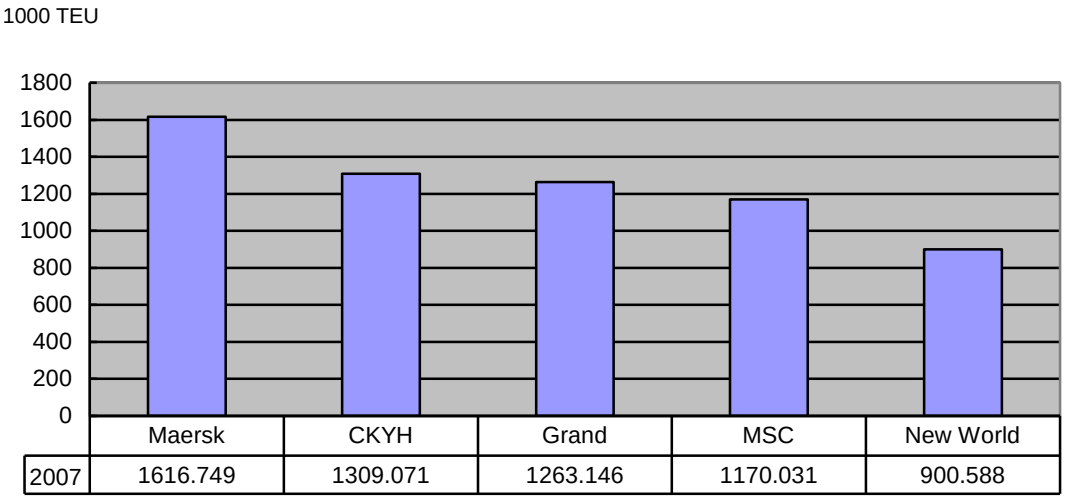

Figure 3.6 Carrier Shares of the World Fully-Cellular Containership Fleet, 2007
Source: Liner Shipping Competition Policy, APEC, 2008.

Lastly, in 2008, MSC, the second largest individual carrier, forced CKYH out of the way and Grand Alliance had been chasing CKYH. However, we are still able to forecast that in the near future the gap will likely increase due to MISC's secession in 2010 and the lack of new building orders for ships.

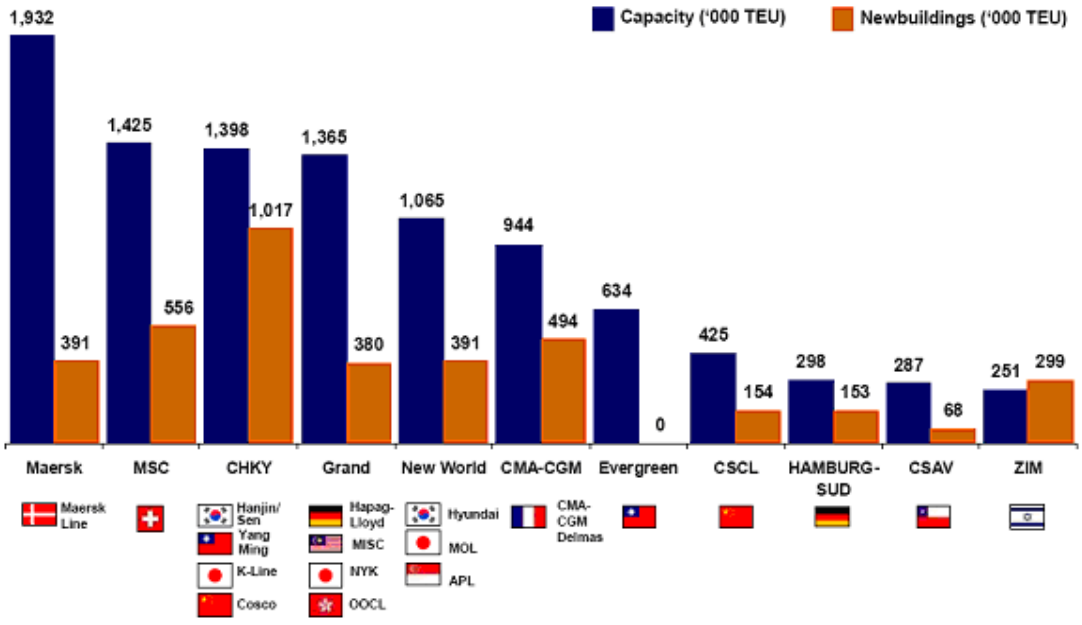

Figure 3.7 Global Players and Alliances, 2008
Source: Trends in Container Shipping amidst General Economic Recession, Hapag-Lloyd, 2009.

3.2.3 Significance of Liner Alliance

Liner alliances cover a very wide area and require worldwide transportation service, not only just for the maritime sector, but also for the multimodal transportation sector as well.[32] Due to the low growth of cargo volumes for the past several years, liner companies have had to compete with not in fact on freight rate, but on the level of transportation service provided. Therefore, given this situation, the reduction of costs has indeed become one of the most important issues facing liner companies. This also has forced liner companies to participate in alliances in order to obtain Economies of Scale and Scope.

In order to make a successful decision to participate in liner alliance, the improvement of quality in service has been a crucial factor. Member liner companies are also expected to try to improve the efficiency of their transportation.[33] In this sense, limited liner companies have been able to participate in an alliance group. Because, they had the ability to cooperate with other members. In a liner alliance, in order to provide stable service and make it easy as cheap and quick as possible, the relationship between global cooperation and the supply network is very important. Liner alliances are concerned with one-stop service from the maritime sector to the inland sector. Hence, building a good logistics network can positively affect the success of an alliance.

After joining an alliance, liner companies should be able to enjoy cost reductions and the quality improvement of transportation service at the same time. Therefore, member carriers have had to cooperate not only with joint operations in the maritime sector, but also with multimodality coordinating the use of terminals, equipment and facilities. Therefore, in general, long-term contracts among member carriers are required. .

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[32] Farthing, B., *International Shipping, 2nd ed*., Lloyd's of London Press Ltd., 1993, pp. 141~142.

[33] Hyeong_In,Jin, Hong-Ju,Jung, *'Comprehension of International Logistics'*, 2002, p. 154.

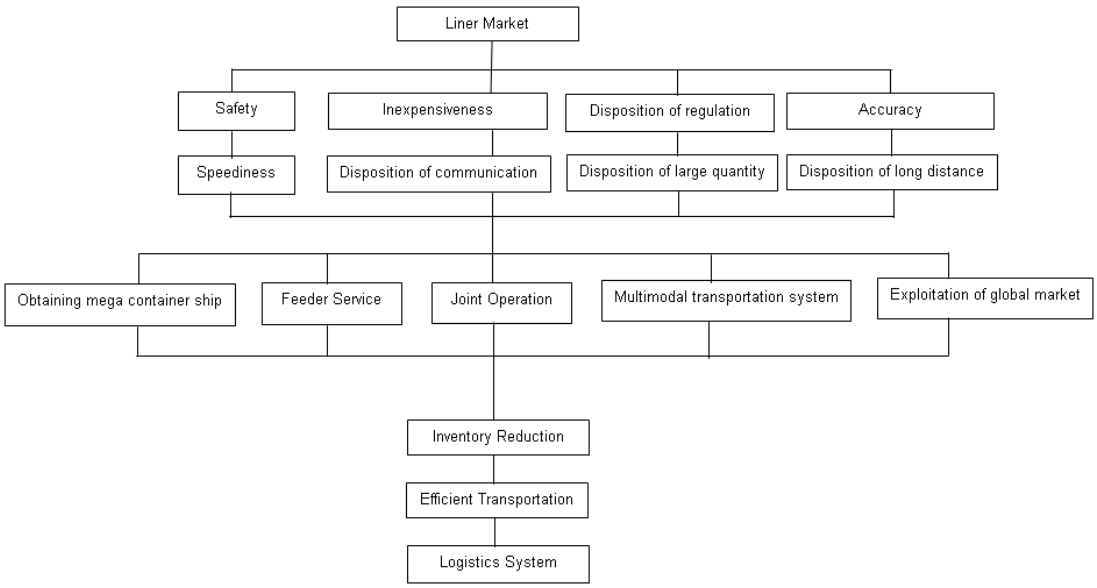


Figure 3.8 Quality Improvement of Transportation Service and Pursuit of Economical Efficiency

Source: Hyo Jin, Kwan, 'Trend of World Liner Alliance and Consideration of the Prospect', 2006, p.35.

An effective liner alliance should satisfy the following eight factors. The liner alliance should service a broad area of transportation service, provide a service which has high transportation frequency, provide a service which gives real cost reduction, construction of a Hub & Spoke system, guarantee of its own terminals, operation of mega ships, optimization of an inland transportation system and construction of a good IT system.[34] All of these required factors are definitely to satisfy shippers' speed, cost and accuracy requirements. In order to meet these requirements, companies belonging to the alliance have had to invest huge amounts.

Some alliances have sought to invest in mega container ships. There are five characteristics regarding the effects of increasing mega container ships in liner alliance, which includes the expansion of capacity among the alliance, increasing chartering rather than placing new ship orders, increasing transportation frequency by increasing fleet size, transfer old ships through obtaining mega ships and the shortening of transit time by changing calling port.[35] We could easily see these characteristics in Transpacific and Asia-Europe route. Due to the activation of cargo

[34] Containerization International, November 1996, pp. 32~40.
[35] Yoshida, S., 'Network Effects of Alliance in International Transportation', 2002, p. 9.

volumes, total capacities on these routes have been growing fast because of the increasing use of mega ships. However, it has proved difficult to fill the mega size ships with cargoes, so carriers have been eager to participate in alliance in order to cooperate with a more extensive service of operation.

By synthesizing their companies, liner alliances have seen cost reduction not only in the maritime transportation sector, but also cost reduction in the inland transportation sector. Hence, carriers should have a wide conception of international logistics, rather than just having a more limited view of maritime transportation. In this sense, the grand scale of liner alliance has become even more essential.[36] Moreover, because of some of these reasons, the liner shipping market has become more and more oligopolistic.

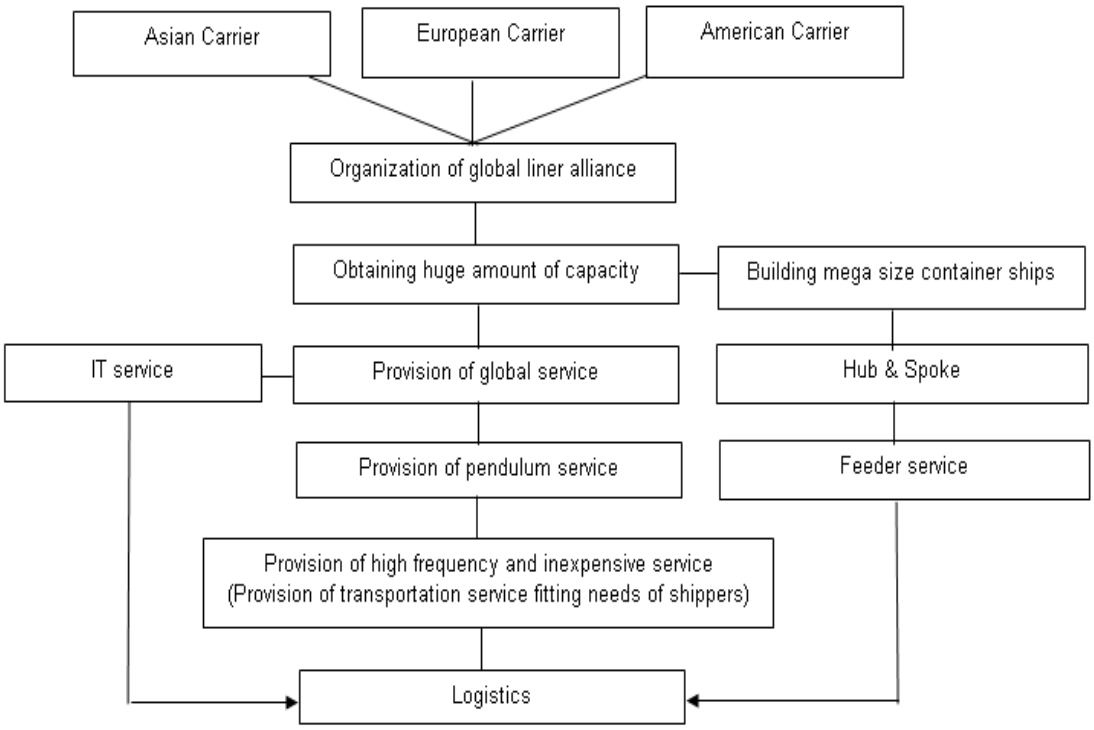


Figure 3.9 Liner Alliance and Logistics

Source: Hyo Jin, Kwan, 'Trend of World Liner Alliance and Consideration of the Prospect', 2006, p.24.

[36] Containerization International, November 1996, pp. 32~40.

3.3 Chapter Conclusion

Since the 1990's, many companies have tried to organize strategic alliances with other players in the same field in order to benefit from lower costs and sharing the burden of investments. Such alliances, generally provided companies with five benefits: the sharing of resources, the speedy expansion of market share, complementing internal ability, minimizing investments and spreading risk. However, some companies that joined these alliances also faced initial difficulties including the complexity of the new management situation and their lack of power and low level of control while maintaining the strategic alliance.

There are five types of strategic alliance which are technology alliance, supply alliance, production alliance, sales alliance and capital alliance. In order to succeed in strategic alliance, additional profits or value-added benefits should be guaranteed to both of participating companies. These benefits should also be distributed equally. There are several factors to take in to account before companies decided to participate in strategic alliance. They should indeed consider issues of culture difference, compatibility, capability and commitment. There are several cases of strategic alliance in various business fields that have been a success, but equally there have also been some failures. Those companies which successfully maintained their strategic alliance could trust each other and cooperate truly for the benefit of all of their future profits.[37] In contrast, companies which failed to maintain a strategic alliance showed a lack of trust and the eventual decline in the benefits of the strategic alliance.

The main reasons most liner companies sought to organize liner alliances was due to an excess in shipping capacity, the globalization of liner shipping routes and shippers' increasing demands for high quality logistics services. In the beginning when first organizing the liner alliance, the aim of the liner companies participating in the alliance was to reduce the operation costs in a short-term prospect. However, as alliance groups have broaden their cooperation in terms of wide service routes, the common use of terminals and inland transportation networks, the level of alliance has become more complex and the alliance period has been extended to long-term.

[37] Russel Johnston & Paul R. Lawrence, "Beyond Vertical Integration; The Rise of the Value-Adding Partnership", *Harvard Business Review*, Vol. 66, 1988, pp.94-101.

The era of liner alliance can be divided into five different periods, which are Period 1 (1995~1997), Period 2 (1998~2000), Period 3 (2001~2003), Period 4 (2003~2005) and Period 5 (2005~present). Liner alliances do not merely cover maritime transportation services, but also include inland transportation services. Hence, in order to provide consistent, quick and low cost transportation, the relationship between global cooperation and network is very important.

Chapter 4 Research Model and Determining Variables

4.1 Research Model and Method of Analysis

For this study, we would like to develop an actual model that analyzes the 10 most important factors influencing change in liner alliance in recent years. We have selected 10 factors that have most affected member carriers belonging to alliance groups at this moment in time. In other words, these factors can be seen as significant triggers which have influenced the trend toward establishing liner alliances. However, some difficulty was confronted when trying to establish the model because of the lack of logic connecting each factor. Moreover, there was a propriety problem concerning the theory to help estimate the model.

4.1.1 Establishment of Research Model

We began by assuming that each independent variable would have an affect on change in liner alliance. We also choose 10 factors for dependent variables. These 10 dependent variables include: difference of size in terms of capacities, difference of multimodality ability, range of management know-how sharing, range of internal information sharing, range of management strategy sharing, pressure for establishing policy regarding maritime pollution and security, satisfaction level regarding shippers' loyalty, the range of collecting cargo overlapping, shippers' high desire for integrated logistics service and uncertainty in world economy and liner shipping market.

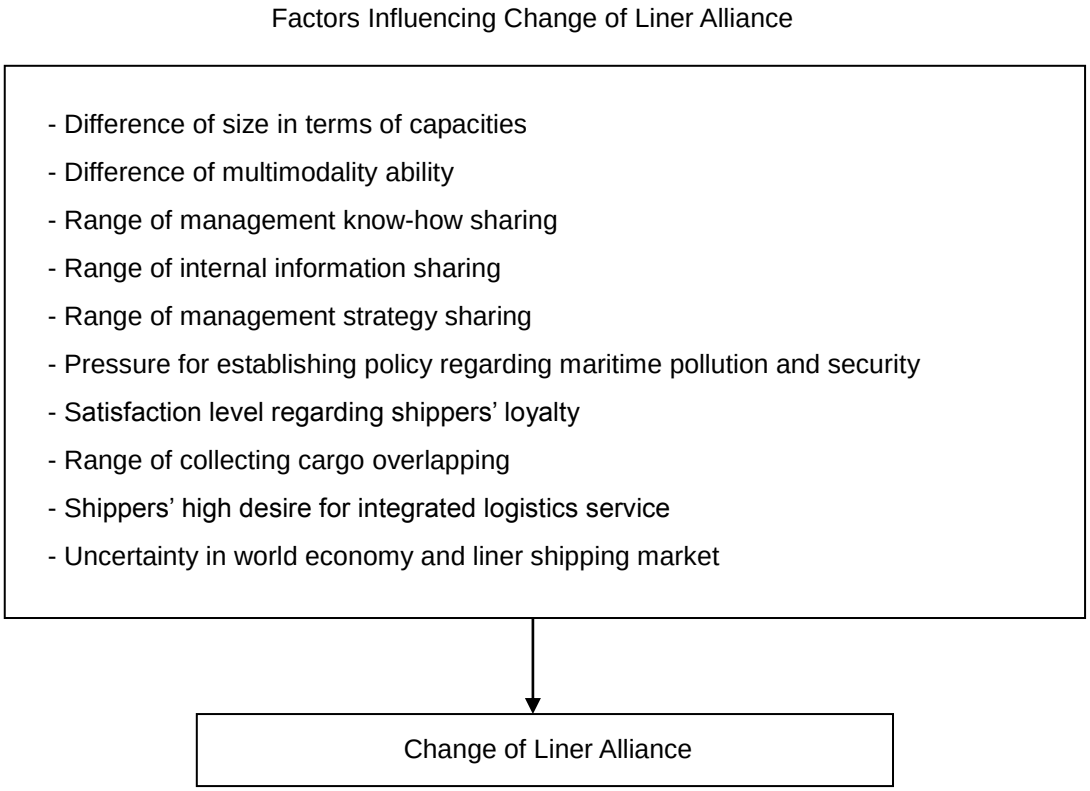


Figure 4.1 Research Model

4.1.2 Selections of Variables

Based on the close review of previous studies, a pilot study and two personal interviews with current employees at liner companies belonging to an alliance group, we have selected 10 factors which have influenced change of liner alliance.

Table 4.1 Definition of Variables regarding Factors Influencing Change of Liner Alliance

Section	Variables	Explanation	Variable mark
Factors	Difference of size in terms of capacities	While making a common decision of alliance group, difference of size in terms of capacities among member carriers can be important factor for consideration.	X1
	Difference of multimodality ability	The gap of terminal and inland transportation service level among member carriers can influence decision making regarding remaining or getting out of the alliance group.	X2
	Range of management know-how sharing	While cooperating together, range of management know-how sharing can be wider. It could be an important factor for a member carrier deciding to remain or get out of the alliance group.	X3
	Range of internal information sharing	While cooperating together, range of internal information sharing can be wider. It could be an important factor for a member carrier deciding to remain or get out of the alliance group.	X4
	Range of management strategy sharing	While cooperating together, range of management strategy sharing can be wider. It could be an important factor for a member carrier deciding to remain or get out of the alliance group.	X5
	Pressure for establishing policy regarding maritime pollution and security	Due to increasing pressure from organizations which are related to maritime environment, security and	X6

		safety, carriers are being pushed to set a policy.	
	Satisfaction level regarding shippers' loyalty	As member carrier's satisfaction level regarding shippers' loyalty in the alliance group increases, a member carrier would consider remaining or getting out of the alliance group depending on the satisfaction level	X7
	Range of collecting cargo overlapping	As range of collecting cargo overlapping increases, member carrier might consider the importance of collecting cargo in overlapping region.	X8
	Shippers' high desire for integrated logistics service	As shippers' high desire for integrated logistics service increases, member carrier might consider the service level of alliance group.	X9
	Uncertainty in world economy and liner shipping market	As uncertainty from unexpected variables in world economy and the liner shipping market increases, member carrier would consider whether alliance group helps their company to survive in the liner shipping market.	X10

These 10 factors, which influence change in liner alliances, have been estimated according to the Likert 7 point Scale. (1 = Highly Negative, 2 = Negative, 3 = Relatively Negative, 4 = Normal, 5 = Relatively Positive, 6 = Positive, 7 = Highly Positive)

4.1.3 Data Collection and Analysis Method

In order to ensure the objectivity of this study, the survey method has been

adopted. The Likert 7 point Scale has been used to estimate each variable. The period of the survey was from July 20th to August 7th in 2009, and the target of the survey was liner companies belonging to alliances, other big size carriers which operate globally, logistics companies such as forwarders, 3PL providers, terminal operators and educational or research institutions.

A total of 75 surveys were sent by e-mail and 43 surveys were returned. The return rate for the survey was about 57.3%. Before conducting the data analysis, we implemented a regression analysis for hypotheses testing. Also, based on the survey results, we implemented a factor analysis in order to analyze whether the independent variables could be divided into certain groups. Next, we verified data reliability by using Cronbach's Alpha. Based on the confirmed variables and through variable calculation, we implemented a correlation analysis in order to find the correlations between the factor groups. The survey data has been analyzed by using SPSS version 13.0 and Excel 2003.

4.2 Establishment of Hypotheses

In this study, 10 factors influencing change in liner alliances have been selected. In this section, we would like to introduce a theoretical background for each factor and based on this background we have organized hypotheses for empirical verification.

Kim and Gil (2003) argue that capacity is an important management source in terms of providing transportation service in the liner shipping market. Capacities of partner carriers could be a criterion whether the alliance group can extend a global logistics service network. Hence, liner companies should consider the capacities of partner carriers while participating in a liner alliance.

According to Kim (2009), a section manager who is in charge of management planning at Hanjin Shipping, the ability of multimodality among member carriers is one of the most important factors in maintaining an alliance group. In other words, the ability of multimodality for door-to-door service for shippers could determine the

level of the alliance group. In this sense, if there was a serious gap in the level of multimodality among member carriers, it could negatively affect cooperation in the alliance.

Elmuti and Kathawala (2001) have pointed out that companies involved in strategic alliances can continuously use the management know-how of each company. Drucker (2002) has found that when valuable knowledge is combined with another valuable knowledge, then it is more likely that this will lead to the development of further more significant knowledge. In this way, we may conclude that if a certain liner alliance was able to be sustained over a long-term period, then member carriers would likely be able to improve their management skills with the help of further know-how. Hence, when cooperation is high and the range of management know-how sharing increases, member carriers are less eager to get out of the alliance group. However, when there are limits placed on sharing management know-how, then carriers are more willing to leave the alliance. Some member carriers might think that the benefit of know-how sharing is not sufficient for maintaining the alliance group. This is especially the case for member carriers which are larger and stronger than others. Such liner companies would hardly be satisfied by obtaining management advantage and know-how from smaller and weaker member carriers.

Roh (2000) argues that from the point of view of the logistics network internal information sharing among member carriers is a very important factor for liner alliances. Deviln and Bleackley (1988) also believe that sharing information is one of the most important factors for the success of liner alliance. Moreover, Kanter (1994) argues that the success of alliances among member companies could be assured, if member carriers would exchange valuable information such as long-term and short-term goals, technical data and potential conflicts or problems. If member carriers were able to share information, such as information concerning operations, specifications of financial condition and information of sales and marketing management, then it is also more likely that the scope and range of information being shared would increase. And as already been point out to above, when there was an increase in the amount and type of information shared among members in the alliance, then member carriers were less likely to leave the alliance group. However, some member carriers may not agree on establishing the range and scope of information to be shared. Due to the internal strategy of each member

carrier, some member carriers may be concerned about revealing key information about their business. Those companies concern with the outflow of core information, are less willing to share their information openly with other member carriers. This may decrease the value of the information, as well as the reliance of the information being shared.

In an interview, Song (2009), the deputy general manager in charge of Asia-North America sales management in Hyundai Merchant Marine, revealed that the joint construction and operation of terminals, the joint building of inland transportation systems and networks and the common adjustment of fleet and route optimization, are based on mid or long-term strategy of member carriers. Hence, as member carriers started to share their management strategies, it is more likely that the range of strategy sharing would increase as well to include mid and long term strategies. This could be one of the contributing factors to prevent member carriers from seceding from the alliance group. However, it is possible that the influence of the larger and stronger member carriers could be greater than then smaller and weaker member carriers while setting common strategy. And this extra influence of the larger carriers may be able to direct common strategy in an unintended direction for the smaller and weaker member carriers.

In an interview, conducted with Kim (2009), the section manager in charge of management planning at Hanjin Shipping, he revealed that liner companies, because of increasing pressure to keep the maritime area clean from international organizations, such as the International Maritime Organization (IMO), are now working on solving CO_2 problem, as well as Ballast Water problem in ports. Moreover, liner companies are being forced to pay more attention to maritime security. However, building a security and safety system for terminals and operations places incredible burdens on individual carriers. Therefore, member carriers who participate in an alliance may be able to jointly invest in systems and equipment in order to cope with both maritime pollution and potential security dangers. Carriers who participate in an alliance may also be able to lobby related organizations together. However, it is possible that some of member carriers might not be so willing to get involved in handling maritime environment and security problems through inputting costs. On the one hand, they might regard these problems as tasks that need to be addressed by the development of new technology. On the other hand, other member carriers might think that the problems should be

solved through common investments and active participation. Hence, these different approaches to the problems of facing the maritime environment and security pressures might act as a trigger for some member carriers to leave the alliance group.

According to Song (2009), who is deputy general manager in charge of Asia-North America sales management in Hyundai Merchant Marine, it is member carriers' different levels of satisfaction regarding shippers' loyalty that is the important factor for change of an alliance group. If partner carriers belonging to the alliance group maintained a high quality of service, then shippers would be more likely to trust the whole alliance group. So, it could increase the shippers' loyalty to the alliance group. Member carriers would be more likely to remain in the alliance group if this is the situation.

In their research, Kim and Gil (2003) found that overlapping cargo collection areas among member carriers was an important factor in profitability. Besides, they claimed that the overlapping of the main service route and area was a significant factor when considering whether to participate in the liner alliance. In their study, regarding selection factors of alliance group, liner companies considered whether there were member carriers which operated in overlapping areas of cargo collection.

In his work, Kwan (2006) argues that liner alliance has a strong relation with the coherence of maritime and inland transportation systems. He found that the two factors attracting shippers were speed and accurate maritime transportation service and the high quality of the inland transportation system for shortening lead time. He also claimed that liner alliance could satisfy both the reduction of inventory cost and the shortening of transit time. Therefore, shippers were easily able to adopt Just In Time (JIT) system in every required place. Due to the development of the global supply chain system, shippers have required more integrated logistics service from logistics providers much more than ever before. In this circumstance, liner companies have tried to improve the quality of their transportation services through liner alliances. In order to satisfy shippers' needs, massive amount of investments were required for the construction of terminal operation and a multimodal transportation system. Therefore, in order to share the costs of such massive investment, member carriers should implement joint investments and operations. However, certain member carriers in an alliance may find that the level of the

integrated logistics system of the alliance group is relatively low. It might even think that the possibility or ability of improvement is also low. Given this situation, member carriers are more likely to consider getting out of the alliance group.

According to Ryoo (2009), a professor in Korea Maritime University specializing in maritime management, it is the volatility of world economy and the liner shipping market trends that are important factors influencing change of liner alliance. When the world economy is booming, it is possible for individual carriers to attract enough cargoes from shippers. Moreover, if there was more cargo demand than container fleets in the liner shipping market, then individual carriers would also be able to attract enough cargoes from shippers as well. In this situation, member carriers may want to leave the alliance group and operate and manage the organization by themselves. Yet, when the world economy is in recession or there is an excess capacity in the liner shipping market, then member carriers that are not able to allocate their management resources may not be able to remain in the alliance group any more. Hence, in this situation, member carriers might consider getting out of the alliance group in order to survive in the liner shipping market by focusing on a more restricted operation route.

Based on the results of previous research, we established a set of hypotheses related to the selected factors. These are:

H1: 10 selected factors that would influence the change of liner alliance

H1-1: Difference of size in terms of capacities factor would influence positively change of liner alliance
H1-2: Difference of multimodality ability factor would influence positively change of liner alliance
H1-3: Range of management know-how sharing factor would influence negatively change of liner alliance
H1-4: Range of internal information sharing factor would influence negatively change of liner alliance
H1-5: Range of management strategy sharing factor would influence negatively change of liner alliance
H1-6: Pressure for establishing policy regarding maritime pollution and security factor would influence positively change of liner alliance

H1-7: Satisfaction level regarding shippers' loyalty factor would influence negatively change of liner alliance
H1-8: Range of collecting cargo overlapping factor would influence positively change of liner alliance
H1-9: Shippers' high desire for integrated logistics service would influence positively change of liner alliance
H1-10: Uncertainty in the world economy and the liner shipping market would influence positively change of liner alliance

4.3 Chapter Conclusion

We have selected 10 factors as independent variables that influence the dependent variable which is the change of liner alliance. Independent variables were difference of size in terms of capacities, difference of multimodality ability, range of management know-how sharing, range of internal information sharing, range of management strategy sharing, pressure for establishing policy regarding maritime pollution and security, satisfaction level regarding shippers' loyalty, range of collecting cargo overlapping, shippers' high desire for integrated logistics service and uncertainty in the world economy and the liner shipping market.

The survey method is used for empirical analysis. The chosen survey targets for this research included liner companies, logistics companies and educational or research institutions, but, mainly liner companies. The Likert 7 point Scale was used in order to estimate each variable. For the testing of the hypotheses, regression analysis is implemented. Moreover, based on the survey results, we implemented a factor analysis in order to analyze whether the independent variables classify as certain sub groups. In order to verify the reliability of the survey results, we used a reliability analysis. We also implemented a correlation analysis in order to establish any correlations between the factor groups.

Chapter 5 Empirical Analysis of Hypotheses

5.1 The Results of the Empirical Analysis

We analyze the data from the questionnaires received with the help of SPSS and the Excel program. We first look at the general information of the respondents. This offers a general picture of some of the most common characteristic of the respondents to the survey, including location and job specification or position as well. We next implement the regression analysis for the test of the hypotheses. This is followed by the factor analysis which is used in order to find out the coefficient among the selected variables. In addition, a reliability analysis is used to verify the reliability of the variables for the study. We implement the correlation analysis in order to find out the change in relation among the variables.

5.1.1 General Status of Survey

The survey respondents were separated into four general sectors according to nationality of a company, working location, working position and type of company. In response to the question what is the nationality of a company you are working for the majority of the respondents were working for companies based in Asia. 76.7% of the respondents were working for companies located in Asia. For the working location of the respondents, the majority of respondents were also working in Asia. The location of work for 86.0% of the respondents was in Asia. The reason of these results was due to the limited sampling. In terms of the working position of the respondents, most occupied the position of general manager and deputy general manager. This means that many of the respondents are decision makers in their companies, so we could say the quality of questionnaire results are relatively high. In response to the question regarding the type of companies that they were employed by, 60.5% are of respondents were working for liner companies. In fact, 100% of respondents should be from liner companies, but this could not be actualized because of the limitations of the sampling. This would affect the quality of questionnaire results negatively.

Table 5.1 The General Information of the Sample

Section		Frequency(Persons)	Percent(%)
Company Nationality	Asia	33	76.7
	Europe	7	16.3
	North America	3	7.0
Working Location	Asia	37	86.0
	Europe	3	7.0
	North America	3	7.0
Working Position	President	3	7.0
	General Manager	10	23.3
	Deputy General Manager	10	23.3
	Section Manager	5	11.6
	Assistant Manager	7	16.3
	Staff	3	7.0
	Other	5	11.6
Company Type	Liner Company	26	60.5
	Logistics Company	12	27.9
	Educational Institution	5	11.6

5.1.2 Regression Analysis

In order to test the hypotheses, we implement a regression analysis. In terms of the result, Multiple R, the correlation between the dependent variable and the independent variables, is shown as 0.785, which means that there is relatively high correlation. Also, R Square is shown as 0.616, which means that the selected factors explained the dependent variable as 61.6%. The result of Durbin-Watson is shown as 1.283, which closed to 2, not 0 or 4. So, there were no correlations among residuals and this means that the regression model was suitable. Also, every variable's P-value is under 0.5. Hence, we could say that the selected variables fit the analysis model. Regarding the result of Coefficients, variable X3 (Range of management know-how sharing), X4 (Range of internal information sharing), X5 (Range of management strategy sharing) and X7 (Satisfaction level regarding shippers' loyalty) were shown as minus value which means that those factors would have a negative influence on the dependent variable which is change of liner alliance. Other factors were shown as plus value which means those factors would

positively influence change of liner alliance. This result is exactly the same as all of the set hypotheses. Hence, we could accept it. Moreover, through collinearity diagnostics, we could check multiple collinearity. In fact, it is very important to find out the correlations among independent variables. Generally, if a value of Tolerance is below 0.1, then there is a problem with multiple collinearity.[38] However, both of the factor groups' Tolerance values are above 0.1, so there is no problem with multiple collinearity.

Table 5.2 The Result of Regression Analysis 1

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.785
R Square	0.616
Adjusted R Square	0.496
Standard Error	0.725
Observations	43

ANOVA

	df	SS	MS	F	Significance F
Regression	10	26.955	2.695	5.130	0.000
Residual	32	16.813	0.525		
Total	42	43.767			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	0.806	0.990	0.815	0.421	-1.210	2.823
Difference of size in terms of capacities	0.498	0.310	1.609	0.117	-0.132	1.129
Difference of multimodality ability	0.627	0.303	2.072	0.046	0.011	1.244
Range of management know-how sharing	-0.403	0.226	-1.787	0.083	-0.863	0.056
Range of internal information sharing	-0.183	0.208	-0.880	0.385	-0.606	0.240
Range of management strategy sharing	-0.248	0.224	-1.104	0.278	-0.705	0.209
Pressure for establishing policy regarding maritime pollution and security	0.124	0.180	0.691	0.494	-0.242	0.490
Satisfaction level regarding shippers' loyalty	-0.385	0.191	-2.015	0.052	-0.774	0.004
Range of collecting cargo overlapping	0.279	0.129	2.166	0.038	0.017	0.541
Shippers' high desire for integrated logistics service	0.202	0.182	1.109	0.276	-0.169	0.574
Uncertainty in world economy and liner shipping market	0.396	0.285	1.390	0.174	-0.184	0.975

Moreover, we could present the regression line as follows below.

$$y = 0.806 + 0.498x + 0.627x - 0.403x - 0.183x - 0.248x + 0.124x - 0.385x + 0.279x + 0.202x + 0.396x$$

We also could see the difference of influencing power on change of liner alliance among factors. The criterion generally for determining the influence of power on the dependent variable is the absolute value of standardized coefficients, Beta.[39] Based on the results, the factor concerning the differences in ability in multimodality was

[38] Ji Joon, Song, *'The Method of SPSS/AMOS Statistics Analysis for Thesis'*, 2009, p. 140.
[39] Ji Joon, Song, *'The Method of SPSS/AMOS Statistics Analysis for Thesis'*, 2009, p. 154.

the most influential on the change of liner alliance while establishing policy regarding maritime pollution and security factor was the least influential factors to effect change of liner alliance.

Table 5.3 The Result of Regression Analysis 2

Dependent Variable	Independent Variable	Beta	Tolerance
Change of Liner Alliance	Constant	-	-
	Difference of size in terms of capacities	0.455	0.150
	Difference of multimodality ability	0.503	0.203
	Range of management know-how sharing	-0.332	0.348
	Range of internal information sharing	-0.142	0.459
	Range of management strategy sharing	-0.211	0.327
	Pressure for establishing policy regarding maritime pollution and security	0.102	0.550
	Satisfaction level regarding shippers' loyalty	-0.335	0.435
	Range of collecting cargo overlapping	0.303	0.614
	Shippers' high desire for integrated logistics service	0.182	0.443
	Uncertainty in world economy and liner shipping market	0.277	0.303
Durbin-Watson = 1.283			

5.1.3 Factor and Reliability Analysis

We implemented factor analysis in order to find out the correlation among variables. We also implemented a reliability analysis in order to check whether the conception was measured correctly and consistently.

Table 5.4 The Result of Correlation Matrix

Variables	Mean	Std. Deviation	Inter-Construct Correlations									
			X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
X1	4.186	0.932	1.000	0.809	0.737	0.595	0.809	0.083	0.391	0.236	0.340	0.622
X2	4.256	0.819	0.809	1.000	0.726	0.474	0.650	0.208	0.448	0.235	0.157	0.709
X3	4.093	0.840	0.737	0.726	1.000	0.402	0.612	0.316	0.345	0.169	0.235	0.543
X4	4.186	0.794	0.595	0.474	0.402	1.000	0.503	-0.188	0.121	0.358	0.334	0.394
X5	4.047	0.872	0.809	0.650	0.612	0.503	1.000	0.039	0.320	0.217	0.261	0.434
X6	3.907	0.840	0.083	0.208	0.316	-0.188	0.039	1.000	0.198	0.086	-0.019	0.448
X7	4.302	0.887	0.391	0.448	0.345	0.121	0.320	0.198	1.000	0.406	0.577	0.479
X8	4.093	1.109	0.236	0.235	0.169	0.358	0.217	0.086	0.406	1.000	0.481	0.412
X9	4.093	0.921	0.340	0.157	0.235	0.334	0.261	-0.019	0.577	0.481	1.000	0.279
X10	4.326	0.715	0.622	0.709	0.543	0.394	0.434	0.448	0.479	0.412	0.279	1.000

For the Factor Analysis, in order to verify appropriateness of variables sampling in this research, we check the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy. Generally, we could say the selection of variables is fine if the result of KMO is higher than 0.6.[40] Based on the results, the selection of variables for factor analysis is fine for this research. Also, in terms of Bartlett's Test of Sphericity, the significance probability is shown as 0.000, which means the use of the factor analysis is suitable and also that common factors exist.

Table 5.5 The Result of KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.770
Bartlett's Test of Sphericity	Approx. Chi-Square	240.668
	df	45
	Sig.	0.000

Communality is an explained ratio through factors by sampling. Generally, if communality is below 0.4, then it is low,[41] so those factors should be eliminated. However, in terms of the results, there are no factors below 0.4, so all of selected factors should remain.

[40] Ji Joon, Song, *'The Method of SPSS/AMOS Statistics Analysis for Thesis'*, 2009, p. 63.
[41] Ji Joon, Song, *'The Method of SPSS/AMOS Statistics Analysis for Thesis'*, 2009, p. 64.

Table 5.6 The Result of Communalities

Variables	Initial	Extraction
Difference of size in terms of capacities	1.000	0.896
Difference of multimodality ability	1.000	0.830
Range of management know-how sharing	1.000	0.740
Range of internal information sharing	1.000	0.703
Range of management strategy sharing	1.000	0.728
Pressure for establishing policy regarding maritime pollution and security	1.000	0.831
Satisfaction level regarding shippers' loyalty	1.000	0.677
Range of collecting cargo overlapping	1.000	0.634
Shippers' high desire for integrated logistics service	1.000	0.753
Uncertainty in world economy and liner shipping market	1.000	0.741

Extraction Method: Principal Component Analysis

Factor loading shows the level of correlation between each variable and factor group. Variables that have a high factor loading should be tied together. Generally, the criterion of factor loading is above ±0.4.[42] Regarding Rotated Component Matrix, all factor loadings are shown as above 0.4, so all of the selected factors are valuable for the study. Moreover, it is divided as three factor groups.

[42] Ji Joon, Song, *'The Method of SPSS/AMOS Statistics Analysis for Thesis'*, 2009, p. 68.

Table 5.7 The Result of Rotated Component Matrix

Variables	Component		
	1	2	3
Difference of size in terms of capacities	0.924	0.205	0.004
Difference of multimodality ability	0.868	0.143	0.236
Range of management strategy sharing	0.838	0.141	-0.085
Range of management know-how sharing	0.807	0.096	0.283
Range of internal information sharing	0.660	0.285	-0.431
Uncertainty in world economy	0.612	0.376	0.474
Shippers' high desire for integrated logistics service	0.135	0.849	-0.119
Range of collecting cargo overlapping	0.126	0.786	0.005
Satisfaction level regarding shippers' loyalty	0.245	0.721	0.311
Pressure for establishing policy regarding maritime pollution and security	0.086	0.034	0.907

Extraction Method: Principal Component Analysis
Rotation Method: Varimax with Kaiser Normalization
Rotation converged in 4 iterations

In terms of the table of 'Total Variance Explained', Eigen-Value is 3.872 for factor group 1, 2.174 for factor group 2 and 1.486 for factor group 3. So, all of the results are above 1. We could verify that the factor group 1 is more important than other factor groups. Each ratio of Variance Explanation is 38.718% for factor group 1, 21.743% for factor group 2 and 14.862% for factor group 3.

Table 5.8 The Result of Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.696	46.956	46.956	4.696	46.956	46.956	3.872	38.718	38.718
2	1.455	14.553	61.509	1.455	14.553	61.509	2.174	21.743	60.461
3	1.381	13.813	75.323	1.381	13.813	75.323	1.486	14.862	75.323
4	0.741	7.413	82.735						
5	0.490	4.903	87.638						
6	0.418	4.177	91.816						
7	0.329	3.286	95.102						
8	0.239	2.387	97.488						
9	0.146	1.457	98.945						
10	0.105	1.055	100.000						

Extraction Method: Principal Component Analysis

Based on the results of the factor analysis, we ascertained that member carriers considered the difference of size in terms of capacities as the most important factor. We also found out that member carriers considered uncertainty in world economy and liner shipping market as the least important factor. This meant that the similarity of capacities among member carriers was the most important factor in deciding whether to remain in the alliance group or not. However, member carriers might not consider the uncertain situation of the world economy and liner shipping market as important when deciding whether to remain in the alliance group compared to the other 9 factors. In terms of the result of factor loadings, we divided them into four groups which were the group of more than 0.9 (X1, X10), the group between 0.9~0.8 (X2, X3, X4, X7), the group between 0.8~0.7 (X8, X9) and the group of less than 0.7 (X5, X6). Member carriers considered capacity size of other partners in the alliance more important than the pressure for maritime environment and security policy, since it was regarded as a more important financial issue in maintaining the alliance group. In other words, member carriers considered size difference as the most direct factor influencing their decision making regarding the alliance group. Therefore, the factor loading of X1 was shown as larger than X10. When comparing factor loading between X2 and X4, member carriers might consider the similarity of multimodality ability among partners as more important factor than the sharing of management know-how among partners. This showed that member carriers would prefer and seek the advantage from partners' terminal and inland transportation system rather than the advantage from management know-how sharing. Moreover, when comparing factor loading between X8 and X9, member carriers might consider

the overlapping areas when collecting cargo as more important than member carriers' level of satisfaction level with the alliance group regarding shippers' loyalty. This means that member carriers would consider the financial loss from cargo overlapping with partners more than the benefit from shippers' strong loyalty to the alliance group. Also, when comparing factor loading between X5 and X6, member carriers might consider internal information sharing with partners as more important than the uncertainty in the world economy and the liner shipping market. This means that member carriers would consider the benefit from internal information sharing with partners more than the difficulty or loss from uncertainty in the economy and market situation.

By comparing the factor loadings among each factor group, we could review the meanings of the result between X1~X5 and X6 in factor group 1, and between X7 and X9 in factor group 2. From X1 to X5, we could say that they were related to internal influencing factors for member carriers, but X6, which was shown as the least important factor in factor group 1, was related to an external influencing factor. This means that member carriers regarded internal factors as more important in influencing their decision making of whether to remain in the alliance group. When comparing between X7 and X9 in factor group 2, they were all related to the influence of shippers' on member carriers. The factor loading of X7 was shown as larger than X9, so this means that the member carriers might consider exiting an alliance group, if other alliance groups or liner companies can manage to provide a higher level of integrated logistics service to shippers, even when they have satisfied shippers' loyalty in their current alliance group.

Table 5.9 The Result of Factor Analysis

Section		Factor Analysis			
		Factor Group 1	Factor Group 2	Factor Group 3	Communality
X1	Difference of size in terms of capacities	0.924	-	-	0.896
X2	Difference of multimodality ability	0.868	-	-	0.830
X3	Range of management strategy sharing	0.838	-	-	0.728
X4	Range of management know-how sharing	0.807	-	-	0.740
X5	Range of internal information sharing	0.660	-	-	0.703
X6	Uncertainty in world economy and liner shipping market	0.612	-	-	0.741
X7	Shippers' high desire for integrated logistics service	-	0.849	-	0.753
X8	Range of collecting cargo overlapping	-	0.786	-	0.634
X9	Satisfaction level regarding shippers' loyalty	-	0.721	-	0.677
X10	Pressure for establishing policy regarding maritime pollution and security	-	-	0.907	0.831
Eigen-Value		3.872	2.174	1.486	-
Variance Explanation(%)		38.718	21.743	14.862	-
KMO = 0.770 Sig. = 0.000 Approx. Chi-Square = 240.668 DF = 45					

In terms of the reliability analysis, we checked Cronbach's Alpha of each factor group. For factor group 1, Cronbach's Alpha is 0.902 and for factor group 2, Cronbach's Alpha is 0.731. However, we could not implement a reliability analysis for factor group 3 because there is just one sub factor in factor group 3. Generally, if

Cronbach's Alpha is above 0.6, then it has reliability.[43] Hence, both of the factor groups have high reliability.

Table 5.10 The Result of Reliability Analysis

Section	Variable		Cronbach's Alpha
Factor Group 1	X1	Difference of size in terms of capacities	0.902
	X2	Difference of multimodality ability	
	X3	Range of management strategy sharing	
	X4	Range of management know-how sharing	
	X5	Range of internal information sharing	
	X6	Uncertainty in world economy and liner shipping market	
Factor Group 2	X7	Shippers' high desire for integrated logistics service	0.731
	X8	Range of collecting cargo overlapping	
	X9	Satisfaction level regarding shippers' loyalty	

5.1.4 Correlation Analysis

In terms of the former analyses, which were the factor and the reliability analysis, we did establish that the selected factors can be divided as three factor groups and that this had enough reliability for the study. In this way, it could be valuable to implement a correlation analysis in order to find out the level of relation among the factor groups. However, we implemented variable calculation before doing this, and this data is used for the analysis. Generally, there is a criterion of correlation strength in the social science field.

[43] Ji Joon, Song, *'The Method of SPSS/AMOS Statistics Analysis for Thesis'*, 2009, p. 95.

Table 5.11 The Criterion of Correlation Strength

Coefficient	Strength
±0.9 above	Very high correlation
±0.7~±0.9 below	High correlation
±0.4~±0.7 below	Relatively high correlation
±0.2~±0.4 below	Low correlation
±0.2 below	Rare correlation

Source: Ji Joon, Song, 'The Method of SPSS/AMOS Statistics Analysis for Thesis', 2009, p.110.

Based on this criterion, we could determine the strength of the level of correlation among factors. Generally, the level of correlation is shown between 0 and ±1. If the variables are close to ±1, then the correlation is increasing, but if the variables are close to 0, then the correlation is decreasing.[44] In terms of the results, there was relatively high correlation between factor group 1 and factor group 2. However, there was rare correlation between factor group 3 and other groups.

Table 5.12 The Result of Correlation Analysis

Section	Mean	Std. Deviation	Inter-Construct Correlations		
			Factor Group 1	Factor Group 2	Factor Group 3
Factor Group 1	21.49	3.669	1.000	0.411	0.123
Factor Group 2	9.76	1.885	0.411	1.000	0.141
Factor Group 3	3.91	0.840	0.123	0.141	1.000

5.2 Implications of the Analysis

In terms of the results of the factor analysis, all selected factors were considered important for the member carriers. However, among all the factor groups, member

[44] Ji Joon, Song, *'The Method of SPSS/AMOS Statistics Analysis for Thesis'*, 2009.p.110.

carriers regarded factor group 1 as the most important. This means that factor group 1 would influence the change of liner alliance more than other groups. As difference of size in terms of capacities, difference of multimodality ability, uncertainty in the world economy and the liner shipping market, shippers' increased desire for integrated logistics service, range of collecting cargo overlapping and pressure for establishing policy regarding maritime pollution and security increases, then the change of liner alliance would be facilitated. However, as the range of management strategy sharing, the range of management know-how sharing, the range of internal information sharing and the satisfaction level regarding shippers' loyalty increased, then the condition of liner alliance would be stable.

Regarding factor group 1, we can say that member carriers regard difference of size in terms of capacities in the alliance group as the most important factor. Member carriers belonging to alliance groups should allocate slots for other partners in order to make their joint operation more efficient. In this sense, if a certain member carrier did not have enough capacity, then it would not be helpful for its other partners and the alliance group. Hence, we can say that member carriers that have the smallest capacities in alliance groups should be concerned with increasing their capacities at least to the level of their partners.

Member carriers also regarded difference of multimodality ability as important factor in factor group 1. This shows that member carriers were concerned about acquiring an alliance with a company that has a high level of terminal management and inland transportation system. Therefore, we could say member carriers might regard the ability of multimodality as an important competitive factor against competitors. It is possible that some member carriers which were unable to satisfy their requirement for multimodality ability while belonging to one alliance group, may exit the group and organize a new alliance group with individual carriers that have relatively high multimodality ability.

Another important factor in factor group 1 is the range of management strategy sharing among member carriers. We can say that as the range of management strategy sharing among member carriers broadened, member carriers were more willing to remain as a member of the alliance group. Basically, member carriers tried to set a strategy together regarding route adjustment and optimization, capacity adjustment, terminal construction plans and operations and inland transportation

system improvement. In this sense, if a certain member carrier planed to get out of the alliance group, they would have to consider the danger of core strategy revision and outflow.

Another important factor among member carriers in factor group 1 is the range of management know-how sharing. As the range of management know-how sharing among member carriers expanded, then member carriers would be willing to remain as a member of the alliance group. To obtain management know-how from partner carriers could be a significant benefit for their own company. In this sense, member carriers needed to feel the management synergy effect through expanding their range of know-how sharing. Therefore, if a certain member carrier planed to get out of the alliance group, then they would also have to consider abandoning the cumulative know-how of utilizing management resources in the alliance group.

The range of internal information sharing among member carriers was also regarded as an important factor in factor group 1. We can also say that as the range of internal information sharing in the alliance group increased, then the more willing member carriers would be to remain as members in the alliance group. Basically, member carriers shared ship operation information, financial condition, shippers' management and marketing information together. In this way, if a certain member carrier planed to withdraw from the alliance group, then they would have to consider the danger of core information outflow.

In factor group 1, uncertainty in the world economy and the liner shipping market factor was also important for member carriers to cope with as external threats. As the uncertainty in world economy and liner shipping market increases, some of member carriers might consider secession from the alliance group. In fact, volatility of world economic situation directly influences the uncertainty of the liner shipping market. This might affect the profitability of member carriers. Especially, in an economic recession, if a member carrier can not manage to allocate management resources to the alliance group any more, then they might decide to focus on operating in a more restricted route. As we see with the example of MISC.

In factor group 2, member carriers regarded shippers' high desire for integrated logistics service as important factor. As shippers' desire for one-stop logistics service increases, some member carriers might consider secession from the alliance group

if it is not able to meet these demands. If a member carrier could not satisfy its needs for an integrated logistics service within their already existing alliance group, then it is likely they would try to get out of the alliance group and find another partner carrier that has a high level of integrated logistics service.

Another important factor in the factor group 2, according to member carriers is the range of overlapping areas for the collecting of cargo. As the overlap of the range of collecting cargo increases, member carriers are less willing to remain in the alliance group. In fact, collecting cargo overlapping means attracting shippers overlapping. Hence, in this situation, member carriers could compete with partner carriers regarding service sales and marketing in the overlapping area. This could cause a conflict among member carriers.

The satisfaction level regarding shippers' loyalty was also regarded as an important factor in factor group 2. As the satisfaction level shippers' loyalty regarding a certain member carrier of the alliance group increases, then the more likely member carriers will be to remain in the alliance group. Basically, shippers were willing to use more reliable and verified liner companies for logistics service. If a certain member carrier thought that partner carriers had relatively high reliability from shippers regarding their logistics service, they would expect indirect benefits from the alliance group.

Member carriers considered the pressure for establishing policy regarding maritime pollution and security as an important factor in factor group 3. As the pressure for establishing policy regarding maritime pollution and security increases, member carriers would be willing to consider getting out of the current alliance group. Member carriers felt a lot of pressure about setting a policy from maritime organizations and this has influenced member carriers to implement common management. In this situation, there might be a conflict among alliance members on how to respond to the pressure. A certain member carrier might insist on an active solution which requires financial investment in order to lobby or respond to external organizations. However, other member carriers might want to adopt a more passive solution. In other words, companies, instead of developing their own policies, may want to wait for other related technological developments.

5.3 Chapter Conclusion

Based on the results of the regression analysis, we determined that the set of hypotheses were all accepted. Moreover, in terms of multiple collinearity, it was verified that none of the selected factors had a problem. Through factor analysis, we found out that all of the selected factors were valuable for the research model. We also could verify that the selected factors divided into three groups. Through reliability analysis, we could verify that all of the selected factors were reliable for the research model. In terms of the result of the correlation analysis, there was relatively high correlation between factor group 1 and 2. However, correlation between factor group 3 and the other groups was rare. Regarding the implications of the analysis, factor group 1 would influence the change of liner alliance more than other groups. As difference of size in terms of capacities, difference of multimodality ability, uncertainty in the world economy and the liner shipping market, shippers' high desire for integrated logistics service, range of collecting cargo overlapping and pressure for establishing policy regarding maritime pollution and security increased, then member carriers would consider leaving the alliance group. This could lead to a change of circumstances in liner alliances. However, as range of management strategy sharing, range of management know-how sharing, range of internal information sharing and the satisfaction level regarding shippers' loyalty increased, then member carriers would be more willing to remain in the alliance group, so there would be a more stable situation in terms of liner alliances.

Chapter 6 Anticipated Future Trends in Liner Alliance

6.1 Short-Term Anticipated Trends in Liner Alliance

Based on the analysis conducted, we know that all of the selected factors influence change of liner alliance. In this way, we can conclude that change of liner alliance will be a prospective trend in the future liner shipping market. However, we presume that member carriers will not easily withdraw from their alliance group. There are primarily three reasons which are currently strengthening the oligopolistic situation in the liner shipping market, increasing shippers' power and excess capacity problems due to the low growth of the world economy. Regarding the first reason, it would be very possible for member carriers to exploit and expand their cooperation in order to survive in the oligopolistic circumstances of liner shipping market. This could lead to heavy competition between individual mega carriers and alliance groups. The second reason is that the increase in shippers' power in the liner shipping market has caused disorganization of liner shipping conference. Given this situation, member carriers might strengthen their level of unity, which includes the solidification of alliance cooperation. In terms of the third reason, member carriers have to cope with the excess capacity problems from the low growth of the world economy. For many years, most carriers tried to increase their capacities by ordering new ships and increasing ship size based on positive expectations for the world economy. Therefore, this could be another reason for strengthening cooperation among member carriers, but there would be possibility of M&A trials from individual mega carriers or even from member carriers belonging to the same alliance group.

In this way, we can anticipate short-term trends of liner alliance to emerge in the following four situations. These four different situations are: the strengthening of members' cooperation in a liner alliance, the increase of competition between mega carriers and liner alliances, the progress of M&A among members in liner alliance and the progress of integration among liner alliances. While member carriers remain in an existing alliance group, the level of cooperation is expected to strengthen. They can share together strategy and information, as well as individual management

know-how, and in this way they try to reduce management risk. Because of the large amount of investments and costs that are characteristic of liner shipping business, a corresponding high level of cooperation among member carriers is also essential. Moreover, they also face many outside pressures which include shippers' requirements for one-stop service and maritime organizations policy pressure. As shippers' desire for one-stop logistics service has increased, member carriers have become concerned not only about maritime transportation, but also terminal and inland transportation, which are closely related to multimodality. Therefore, they need to control the total transportation system from door to door. This means that a certain liner alliance group might compete with professional logistics providers. In order to do this, of course, they should obtain an integrated IT logistics network system and even the ability to consult. Member carriers might develop these abilities with a high level of cooperation with other companies. The other pressure member carriers face from the outside is related to maritime environment and safety and the need for setting a common policy. They would be able to found an organization in order to forge a sophisticated policy to protect the maritime environment and address safety concerns. Moreover, they could also make a common announcement to address the concerns of outside organizations. In terms of world economy volatility and mega ship trends, member carriers have to respond together in order to cope with the emerging economic variables and to enjoy Economies of Scale. In the case of world economic downturn, member carriers have tried to implement route optimization and adjustment, but, this is very difficult. Even though they implemented route optimization and adjustment together, still without enough level of cooperation this proved inefficient. It is expected the situation of increasing mega ships in the liner shipping market will force member carriers to decrease Diseconomies of Scale by increasing terminal efficiency. In fact, they used their own individual terminals together and even invested in new terminals, so joint terminal management should be necessary. In this way, without a high level of cooperation, it will be difficult for member carriers to decrease Diseconomies of Scale.

There would be a high possibility of increasing competition between mega carriers and liner alliances. In fact, mega carriers, such as Maersk Line, MSC and CMA-CGM, have tried to increase capacities in order to play the 'Chicken game' with competitors. They seem to think that if they tried to expand their capacities through new ship orders or M&A, then other competitors would follow suit in order to survive in the liner shipping market. The reason why mega carriers tried to increase ship

size was the same. In this sense, there would be increasing competition between liner alliances and mega carriers to win the ‘Chicken game’. Moreover, mega carriers and liner alliances are likely to face serious competition on the main routes, such as on the Asia-Europe and Asia-North America routes. In order to maintain possession of the main routes, mega carriers have even tried to limit cooperation with each other through Vessel Sharing Agreement (VSA). Given this situation, some alliance groups may try to cooperate with other alliance groups against mega carriers. As a matter of fact, New World Alliance group and Grand Alliance group cooperated together on the main routes, so it is also possible that CKYH Alliance group may cooperate with one of the other alliance groups.

It is also possible that among members in liner alliance further M&A will occur. In the case of member carriers belonging to the same alliance group, the consistent sharing of management resources and services would offer the opportunity to give a chance to evaluate the valuable member carriers exactly for bigger member carriers. Hence, there would be more chance to increase M&A among member carriers. In this case, probably, a relatively small number of member carriers would merge such as the Hyundai Merchant Marine in the New World Alliance group, the OOCL in the Grand Alliance group and the Yang Ming in the CKYH Alliance group. However, there may be exceptions to this scenario, such as the ‘One carrier policy’ from China. The Chinese government has recently been trying to combine each major liner company, which includes COSCO, CSCL and Sinotrans at this moment in time. There is actually evidence of this policy. COSCO is the largest Chinese liner company which belongs to the CKYH Alliance group, and CSCL is the second largest Chinese liner company that is an independent carrier. However, in 2006, they tried to cooperate such as with slot exchange. However, generally cooperation with a liner company that has the same nationality is not preferred because of the potential overlap in service routes. We expect that the liner companies prepared for the implementation of the policy. However, if situations such as these are allowed to happen, then we can expect that the situation in liner alliance would change substantially.

It is expected that among liner alliances progress of integration can be anticipated in the future liner shipping market. There are two reasons for this expectation: M&A from mega carriers and ‘One carrier policy’ from China. Regarding the first reason, there is an example of M&A that affected cooperation between liner alliances. In

2005, when Maersk Line merged P&O Nedlloyd, New World Alliance group and Grand Alliance group immediately started to cooperate on the main route. From the perspective of the New World Alliance group, such a merger made them concern about the growing market share of the Maersk Line in terms of increasing capacities. While from the perspective of the Grand Alliance group, they became concerned about the huge damage the secession of the largest member carrier would cause on its alliance group. Then MISC announced that they would withdraw from the Grand Alliance group in January 2010. In terms of capacity portion which MISC possessed in Grand Alliance group, the effect would not be so significant. However, if another member carrier merged with a certain mega carrier, then there would be the increased likelihood of the integration between the Grand Alliance group and the New World Alliance group. In terms of the second reason, if China tried to combine three carriers (COSCO, CSCL, Sinotrans) as one mega carrier, there would be the increased likelihood of the integration between the Grand Alliance group and the New World Alliance group as well. However, the problem was overlapping service routes between NYK and MOL, which share the same nationality. The CKYH Alliance group may have to decide if they want to attract another carrier as a new member to fill the vacancy left by COSCO. If they decide to attract a carrier, Hamburg-Sud, CSAV or Zim could be potential partners when taking into account capacity volumes and nationalities.

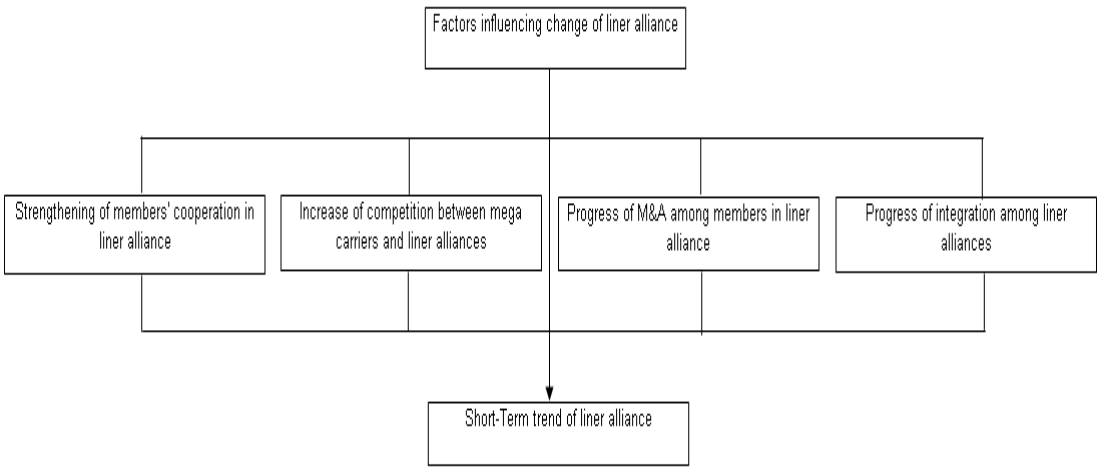


Figure 6.1 Short-Term Anticipated Trend of Liner Alliance

6.2 Long-Term Anticipated Trends in Liner Alliance

Because liner alliances have now existed for a long time, there is the good possibility of physical integration among member carriers. This can be referred to as the 'Evolution of liner alliance'. As a matter of fact, carriers are now facing more unexpected variables in world trade, as well as the liner shipping market. However, the existing form of liner alliances may not be efficient enough to deal with sudden market changes. Since they are no longer just a single company but rather belong to strategic alliances, member carriers take a relatively long time in order to decide what common counter measure they should adopt. Moreover, when making a common decision, it is also necessary to adjust for common plans or strategies due to the differences in perspective among the member carriers. This may lead some members of the liner alliance to adopt a plan or strategy that might lead them in the wrong direction in the end.

In this way, due to the increasing uncertainty in liner shipping market, we have witnessed the evolution of liner alliance over the long term. This evolution can be viewed in three steps, i.e. the organization of liner alliance and maintaining cooperation, dividing the workload on the basis of each member's strength and the physical integration as mega logistics provider from liner alliance. First, liner alliance has been organized in terms of the advantage of cost reduction. Member carriers have been able to obtain benefits from sharing slots, joint operation on the routes, sharing terminals and collaboration with inland transportation. We could regard the present circumstance of liner alliances as in the first step of the evolution. Next, member carriers try to divide their workload based on a criterion of each member's strengths and advantages. For example, if a member carrier A has comparative advantage regarding ship operation and route management, then it would take the work in the alliance group. If a member carrier B has comparative advantage regarding shippers' management and marketing, then it would take the work. Also, if a member carrier C has comparative advantage regarding multimodality system and management, then it could take on the work for the alliance group. In terms of the division of work, member carriers could focus on their core business sectors which bring high utilization of work resources and profitability. As a matter of fact, the root of this expectation is that liner companies focusing on maritime transportation will not survive in the liner shipping market in the end due to the development of a

complete logistics system and shippers' increasing desire for one-stop logistics service with low cost. In order to provide a high quality integrated logistics service to shippers compared with other competitors, a massive logistics network and system are required. In this way, only a few individual mega carriers and liner alliances can satisfy the criterion of total logistics service. Unlike with individual mega carriers, overlapping work can be found in alliance groups. This is a waste of resources and may weaken the competitiveness of the alliance group. Hence, the alliance group's focus on work specialization should be facilitated. Finally, liner alliance would change the integrated logistics provider which was one organization.

However, there is a negative variable in this plan which is the growing competition for obtaining logistics competitiveness among South Korea, China and Japan. As the Asian economic market has been growing, three countries have tried to become the logistics hub in Asia, which means becoming the most important logistics center in the world. Therefore, they are competing not only with their shipping networks, but also concerning terminals, ports and inland transportation services. In this way, liner companies could play a core role in the entire logistics competition. Hence, it is unlikely that these three Asian countries would be willing to let their national carriers merged or integrate with their competitors' member carrier. These three Asian counties' carriers possess high percentage of each liner alliance group, so if the logistics competition among the three countries is maintained or expands, then the evolution of alliance would for sure not easily happen.

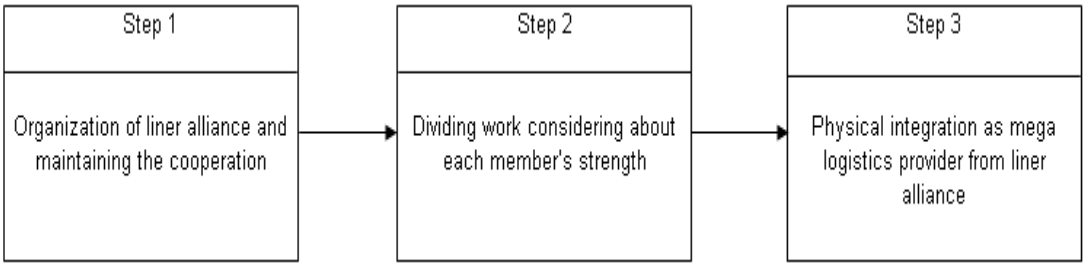


Figure 6.2 Long-Term Anticipated Trend of Liner Alliance

6.3 Chapter Conclusion

Based on the results of the analyses in this study, we found that the factors selected would influence change of liner alliance. We divided the period trend of liner alliance into short-term and long-term. Four anticipated situations regarding the short-term trends of liner alliance were discussed. These were the strengthening of members' cooperation in liner alliance, an increase of competition between mega carriers and liner alliances, progress of M&A among members in liner alliances and progress of integration among liner alliances. As member carriers shared information, strategy and management know-how, the level of alliance cooperation increased. Member carriers in an alliance could also adopt joint countermeasures to satisfy shippers' pressure regarding one-stop logistics service and policy pressure regarding maritime environment and security problems. In terms of playing the 'Chicken game' in liner shipping market, individual mega carriers have tried to increase their capacities with new ship orders and increasing their vessel size. In addition, they tried to cooperate with other mega carriers especially on the main routes through Vessel Sharing Agreements (VSA). Therefore, there could be more competition between mega carriers and alliance groups not only in order to survive in the liner shipping market, but also to expand their market power. Under such circumstances, it would even be possible to increase M&A trials among member carriers due to the continual sharing of management resources. However, other variables may also come in to play such as the 'One carrier policy' from China. It may still be possible to integrate a certain alliance group and other alliance groups for of two reasons, M&A from mega carriers and 'One carrier policy' from China.

With regard to the long-term prospects of liner alliance, the 'Evolution of liner alliance' is expected even further due to the ever increasing uncertainties in the liner shipping market and the significant risk for setting common strategy and plan among member carriers. The evolution of liner alliance can be viewed in three progressive steps, which are the organization of liner alliance and maintaining cooperation, dividing the workload based on each member's strength and the physical integration as mega logistics provider of liner alliance. During the first step, carriers tried to organize liner alliances in order to obtain cost reductions. In the second step, member carriers divided their work in ship operation and management, shippers' management and marketing and multimodality management based on the criterion

of each member’s comparative advantage. The third step in when member carriers started to integrate as one organization which is a mega logistics provider. However, there are potential negative variables that may emerge such as the competitive circumstances in the Asian logistics market among the three countries, South Korea, China and Japan. Each of these countries represent a huge percentage in each alliance group, so that if logistics competition among them increases even more, then the evolution of liner alliance will not easily be realized.

Chapter 7 Summary and Conclusion

7.1 Thesis Summary

In recent years, the liner shipping business has been confronted with low growth in the world economy and growing competition with other transportation sectors. Most of liner companies have struggled with the volatility of the economic situation, as well as shippers' increasing demands for one-stop logistics service. During this time, the liner shipping market has been experiencing a period of consolidation mainly in terms of individual mega carriers and liner alliances. In order to increase their market share, some liner companies have tried to expand their capacities by acquiring mega carriers either through M&A or placing new orders for mega container vessels, To survive in a more competitive and demanding liner shipping market, member carriers have tried to broaden their level of cooperation and expand their global shipping network by forging liner alliances.

In the middle of 1990's, the first form of liner alliance was organized primarily for cost reduction. Liner companies were required to invest a significant amount of money to expand their capacities, to maintain shipping routes and to manage terminal operations and inland transportation networks. Therefore, member carriers could obtain higher profitability by decreasing costs in terms of establishing liner alliances. Before taking a close look at the most common characteristics of liner alliances, we first examined other examples of strategic alliances in different business fields. We found companies maintained strategic alliances only when they could obtain additional profits or value-added benefits. If a certain member company thought that there were no benefits to the strategic alliance then it would be ended. There are a number of factors companies need to consider before organizing strategic alliances. Companies need to take into account issues of culture difference, as well as compatibility, capability and commitment of potential alliance partners. Strategic alliance can not be maintained without trust between member companies. Hence, we can say that trust and profitability between alliance partners were the most important factors for maintaining a successful strategic alliance. There are three main reasons that have motivated liner companies to turn to forming more

extensive alliances. Liner companies needed to solve the following three problems facing the liner market: a situation of excess capacity, the globalization of liner shipping routes and shippers' increasing demands for high quality logistics by participating in liner alliances. As the liner shipping market has become more consolidated and competitive, the range of cooperation among liner alliances has become more extensive. Member carriers have not only tried to share slots and routes, but also to share terminals and inland transportation systems. In this way, they could extend the logistics service network for shippers and managed to compete with individual mega carriers as well.

For empirical analysis, we selected 10 factors as independent variables based on the findings of previous research studies and interviews that might have an influence on the dependent variable which is change of liner alliance. The factors selected were difference of size in terms of capacities, difference of multimodality ability, range of management know-how sharing, range of internal information sharing, range of management strategy sharing, pressure for establishing policy regarding maritime pollution and security, satisfaction level regarding shippers' loyalty, range of collecting cargo overlapping, shippers' strong desire for integrated logistics service and uncertainty in the world economy and the liner shipping market. We also established 10 hypotheses. The survey method was used to gather general information from the respondents. This information has been presented and regression, factor, reliability and correlation analyses have been implemented.

In terms of the results of the regression analysis, we found that all of the set hypotheses were accepted. With the factor analysis, we realized that the selected factors were divided as three factor groups. Moreover, all of the selected factors were found to be reliable with the reliability analysis. In terms of the result of correlation analysis, it was determined that factor group 1 and 2 had relatively high correlation. Hence, based on the analysis of the results, it was clear that the selected factors would influence change in liner alliance.

We could anticipate the trends of liner alliance in both the short-term and long-term. First, in the short-term, four trends are expected. These include strengthen members' cooperation in the liner alliance, an increase of competition between mega carriers and liner alliances, an increase in M&A among members in liner alliance and an increase in integration among liner alliances. By the way, the 'One

carrier policy' adopted by the Chinese government could be a huge variable for the M&A trial among member carriers and the integration among alliance groups. And second, in the long-term, the evolution of liner alliance is anticipated. The evolution of liner alliances has progressed in three steps which are the organization of liner alliances and maintaining cooperation, dividing the workload considering each member's strength and the physical integration as mega logistics provider from liner alliance. By the way, the growing competition among the three Asian countries for 'Logistics hub in Asia' would negatively affect the future evolution of liner alliance.

7.2 Limitations of the Study and Further Plans

In spite of the effort made in this research, there are six limitations of this study. First, the number of factors that are taken into consideration should be expanded by continue the review of previous studies, as well as conducting more in-depth interviews, in order to improve the quality of this research further. Second, the enlargement of sample should be required in order to increase reliability and accuracy of the survey. It would be necessary to include all of the member carriers belonging to alliance groups in the further survey. Third, more study could be done to determine what benefits were provided to shippers by belonging to liner alliances. For this study, it would be necessary to compare between the logistics cost of shippers who used member carriers belonging to alliance groups and the logistics cost of shippers who did not use member carriers belonging to alliance groups. In terms of the analysis of the comparison result, the financial benefits of shippers from liner alliance could be verified. Fourth, by conducting a survey measuring member carriers' satisfaction with belonging to an alliance group, we could estimate further trends of liner alliance. Fifth, we also could analyze the influence of competition between the European and the Asian liner companies regarding change of liner alliance. Lastly, a further study should analyze the influence of changes in the world trade pattern by Free Trade Agreement (FTA) or economic blocks on the change of liner alliance. Consequently, with important further research, we would be able forecast the various possibilities and trends of liner alliance in the future more accurately.

Bibliography

Angle, H. and Perry, J. (1981) 'An Empirical Assessment of Organizational Commitment and Organizational Effectiveness'. *Administrative Science Quarterly,* Vol. 26, pp. 1-14.

APEC Transport Working Group (2008) *Liner Shipping Competition Policy: Non-Ratermaking Agreements Study (Stages 2 & 3).* APEC.

Bang, Hee-Seok (1999) *International Transportation.* Park-Young Press, p. 82.

Bang, Hee Seok, and Lim, Jong Sub (2004) 'A Study on the Coalition Factor of Liner Shipping Compaines'. *Korea Trade Research Association,* Vol. 29, No. 1, Feb, pp. 157-179.

Bleek, J. and Ernest, D. (1995) 'Is Your Strategic Alliance Really a Sale?'. *Harvard Business Review,* Jan-Feb.

Borys, B. and Jemison, D.B. (1989) 'Hybrid Arrangements as Strategic Alliance; Theoretical Issues in Organizational Combinations'. *Academy of Management Review,* Vol. 14, No. 2, pp. 234.

Buckley, P.J. and Casson, M. (1988) 'A Theory of Cooperation in International Business'. *Cooperative Strategies in International Business,* pp. 31-51.

Cho, K.S (1994) *Structural Changes in Liner Shipping: an International Approach.* Ph.D Thesis, United Kingdom: University of Wales Cardiff, pp. 21-40.

Choi, Joong-Hee (2001) 'A Study on Change of Liner Alliance in Liner Shipping Market'. *Maritime Fisheries Korea,* Vol. 203, pp. 18-32.

Containerization International (1996) November, pp. 32-40.

Contractor, F.J and P. Lorange (1988) 'Why Should Firms Cooperate? The Strategy and Economic Basis for Cooperative Venture', *Cooperative Strategic in International Business,* pp. 3-30.

Deutsche Bank (2000) *European Airlines, Climbing Through the Turbulence.* October 12.

Farthing, B. (1993) *International Shipping, 2nd ed.* Lloyd's of London Press Ltd., pp. 141-142.

Griffin, Ricky W. and Pusty, Micheal W. (1995) *International Business. 1st ed.* 1. pp. 413.

Gulati, Ranjay (1988) 'Alliances and Networks'. *Strategic Management Journal,* pp. 293-317.

Gulati, Ranjay (1995) 'Social Structure and Alliance Formation Patterns: A Longitudinal Analysis', *Administrative Science Quaterly*, Vol. 40, No. 5, pp. 619-652.

Hamel, G. and Prahalad, C.K. (1989) 'Strategic Intent'. *Harvard Business Review,* May-Jun, p. 127.

Han, Nak Hyun, and Jung, Joon Sik (2005) 'The Present Status and Prospect of Global Alliance in Liner Shipping Market'. *The Korea Port Economic Association,* Vol. 21, No. 3, pp. 115-147.

Hergert, M. and Morris, D. (1988) 'Trends in International Collaborative Agreements'. *Cooperative Strategic in International Business,* pp. 99-109.

Jarillo, J. C. (1988) 'On Strategic Networks'. *Strategic Management Journal,* Sep., pp. 31-41.

Jeon, Soon-Hwan (2007) *International Transportation & Logistics.* Han-Ol Press, pp. 77-78.

Jin, Hyeong In, and Jung, Hong Ju (2002) *Comprehension of International Logistics*. Park-Young Press, pp. 154.

Kanter, Rosabeth Moss (1994) 'Collaborative Advantage: The Art of Alliance'. *Harvard Business Review,* July-August.

Kim, Kwang Hee, and Shigeru, Yosida (2003) 'A Study on the Selection Factor of the Partner in Strategic Alliance of Container Shipping Company'. *The Korean Association of Shipping and Logistics,* Vol. 38, Aug, pp. 47-70.

Kim, Hyun Duk, Ahn, Ki Myoung, and Lee, Sung Yhun (2006) 'A Study on the Performances of Strategic Alliance in Liner Shipping'. *The Journal of Korean Institute of Navigation and Port Research,* Vol. 30, No. 7, pp. 579-583.

Kim, Tae Il (2006) *The Close of EU's Liner Shipping Conference and Its Influence.* Dec, Korea Maritime Institute.

KMI Researchers (2000) *Forecast of World Maritime Business in 2000.* Dec, Korea Maritime Institute.

KMI Researchers (2008) *The Change of World Fleet Structure and Its Consideration.* Korea Maritime Institute.

Koh, Bong Hoon (2007) A Study on the Enhancement Scheme of the Strategic Alliance among the Container Liners in Korea-China Trades. MSc Thesis, Seoul, South Korea: Korea Foreign University, p. 49.

Kwan, Hyo Jin (2006) *Trend of World Liner Alliance and Consideration of the Prospect.* MSc Thesis, South Korea: Kyung-Nam University.

Lim, Jong Sub (2004) 'An Empirical Study on the Selection of Liner Shipping Coalition Mode'. *Korea Logistics Review,* Vol. 14, No. 3, Nov, pp. 141-165.

Littler, Dale and Leverick, Fiona (1995) 'Joint Ventures for Product Development: Learning from Experience'. *Long Range Planning,* Vol. 28, No. 3, pp. 58-67.

Lloyd's Shipping Economist (2000) February, p. 14.

LSE (1999) 'Shipping Seeks New Global Role'. *Lloyd's Shipping Economist,* Vol. 21, No. 11, Nov, pp. 7-10.

Lu, Hua-An, Cheng, James, and Lee, Tai-Shen (2006) 'An Evolution of Strategic Alliances in Liner Shipping – An Empirical Study of CKYH'. *Journal of Marine Science and Technology,* Vol. 14, No. 4, pp. 202-212.

McGee, Jeffrey E., Dowling, Michael J. and Megginson, William L. (1995) 'Cooperative Strategy and New Venture Performance: The Role of Business Strategy and Management Experience'. *Strategic Management Journal,* Vol. 16, pp. 565-580.

Ohmae, Kenichi (1989) 'The Global Logic of Strategic Alliances'. *Harvard Business Review,* Vol. 67, No. 2, March~April, pp. 143-154.

Park, Joon Yong (2001) *The Relationship between Performance and Choice of Corporate Structure for Strategic Alliance of Venture Companies.* Ph.D Thesis. Seoul, South Korea: Hanyang University, pp. 12-13.

Ranjay Gulati (1995) 'Social Structure and Alliance Formation Patterns: A Longitudinal Analysis'. *Administrative Science Quarterly,* Vol. 40, No. 5, June, pp. 619-652.

Roh, Yoon Jin (2000) *A Study on the Performance Estimation of Liner Alliance.* MSc Thesis, Seoul, South Korea: Chung-Ang University.

Rosabeth Moss. Kanter (1994) ‘Collaborative Advantage; The Art of Alliance’. *Harvard Business Review,* July-August.

Russel Johnston and Lawrence Paul R. (1988) ‘Beyond Vertical Integration; The Rise of the Value-Adding Partnership’. *Harvard Business Review,* Vol. 66, pp. 94-101.

Ryoo, Dong Keun (2000) ‘The Role of Liner Shipping Co-operation in Business Strategy’. *Journal of the Korean Institute of Navigation. KIN Pusan Korea,* Vol. 24, No. 3, pp. 177-193.

Song, Tae Geun (2006) *A Study on Factors Influencing Customer Loyalty in Airline Global Alliance.* MSc Thesis, South Korea: Mok-Po University, pp. 17.

Song, Chae Hun, and Song, Sun Yok (2007) ‘An Empirical Analysis on the Relationship between the Determinants of Strategic Alliance and the Type Choice in the Container Liners’. *Korea Logistics Review,* Vol. 17, No. 2, June, pp. 107-135.

Song, Ji Joon (2009) *The Method of SPSS/AMOS Statistics Analysis for Thesis.* 21 Century Press.

Thissen, A. (2009) ‘Hapag-Lloyd; Trends in Container Shipping amidst general Economic Recession’. Handout. Erasmus University Rotterdam, Rotterdam, The Netherlands.

UNCTAD Secretariat (2008) *Review of Maritime Transport 2008.* United Nations, United Nations Conference on Trade and Development Geneva.

Woo, Jong Kyun (2005) ‘The Effect of Merger of Maersk and Future Container Market’. *KMI Global Shipping & Logistics,* Vol. 248.

Woo, Jong Kyun (2005) *Maersk-Sealand, Takeover P&O Nedlloyd; Influence and Implications of Policy.* May, Korea Maritime Institute.

Yoshida, S. (2002) ‘Network Effects of Alliance in International Transportation’. *The Korean Association of Shipping and Logistics,* Vol. 39, p. 9.

Appendix 1 Questionnaire

Questionnaire for Thesis

How do you do, Mr. and Ms.?

I would first like to express my appreciating to you for giving your time to complete this survey. My name is Hyeong Sun, Yun and I am a Masters student at the Maritime Economics & Logistics program (MEL), at Erasmus University Rotterdam in the Netherlands.

The results of this survey will be used in my research thesis study on the 'Liner Alliance: the Future of the Liner Shipping Industry?'. I have no other intent that to use the data obtained in this questionnaire other that for this study. Based on the survey results, I will analyze 10 selected factors which are expected to influence change of liner alliance. Furthermore, I will look at anticipated future trends of liner alliance on both a short-term and long-term basis. With the results of my research, I would like to help set strategy not only for those liner companies that currently belong to alliance groups, but also other liner companies which are considering or preparing to join a liner alliance.

Again, I kindly inform you that these survey results will only be used for my thesis analyses. If you have any questions or concerns regarding this questionnaire, please use my contact information below.

I thank you very much for your sincere help.

Address:

Telephone Number:

E-Mail:

- This questionnaire is composed of 19 questions separated into 4 total parts. Please mark the most appropriate answer with **Bold**, *Using Italics* or underline so that I can easily identify your mark. I would really appreciate it if you answer questions as accurately as possible. -

PART 1: The General Information of Questionnaire Respondents

1. What is the local nationality of the company which you belong to? (Head office basis)

1) Asia 2) Europe 3) North America 4) South America 5) Oceania
6) Africa 7) Other ( )

2. At which location do you work?

1) Asia 2) Europe 3) North America 4) South America 5) Oceania
6) Africa 7) Other ( )

3. What is your work position?

1) President of a company (Chief Executive Officer) 2) Director and related
3) General manager 4) Deputy general manager 5) Section manager
6) Assistant manager 7) Staff 8) Other ( )

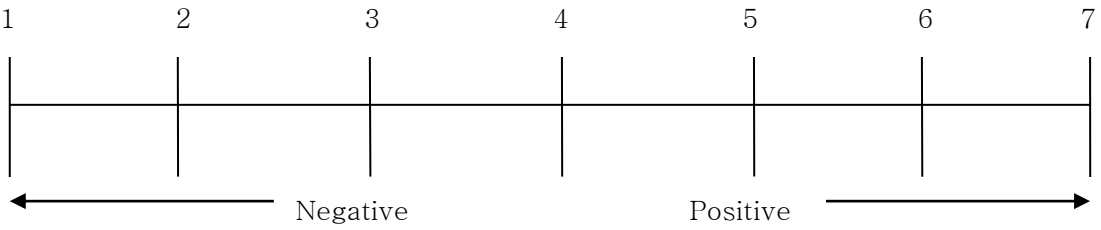
4. What kind of company do you work for?

1) Liner company 2) Logistics company (Forwarding, 3PL, Transporter, Terminal operator, etc) 3) Educational Institution 4) Research Institution
5) Government 6) Other ( )

PART 2: Questions regarding the possibility of Change in Liner Alliance

As moving to the right side, more positive, as moving to the left side, more negative.

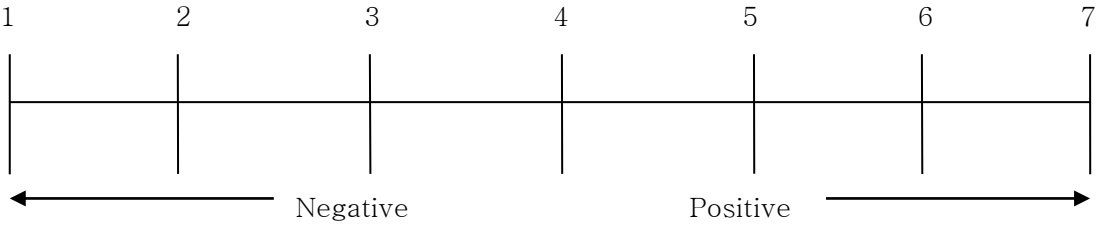
5. Do you think that change of liner alliance will be processed in the future?



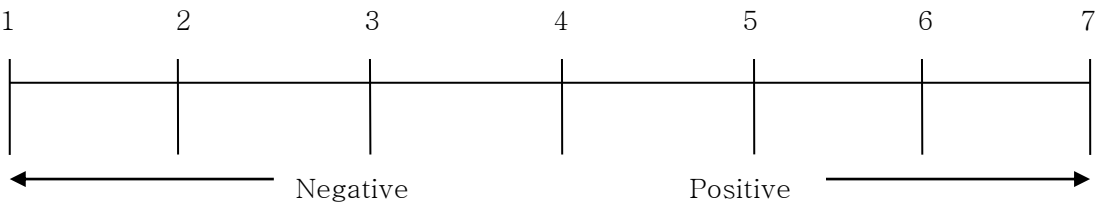
PART 3: Questions for 10 Factors Influencing Change of Liner Alliance

- Do you think that below factors influence change of liner alliance? -

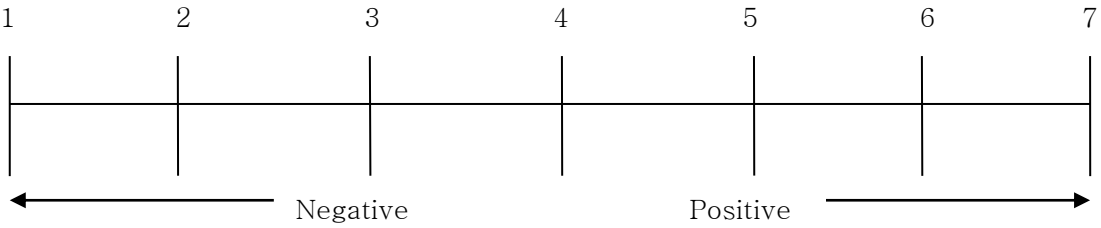
6. Broadening range of management know-how sharing among member carriers



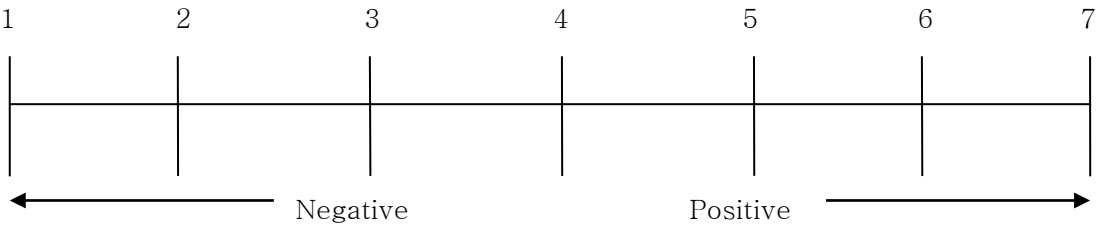
7. Broadening range of management strategy sharing among member carriers



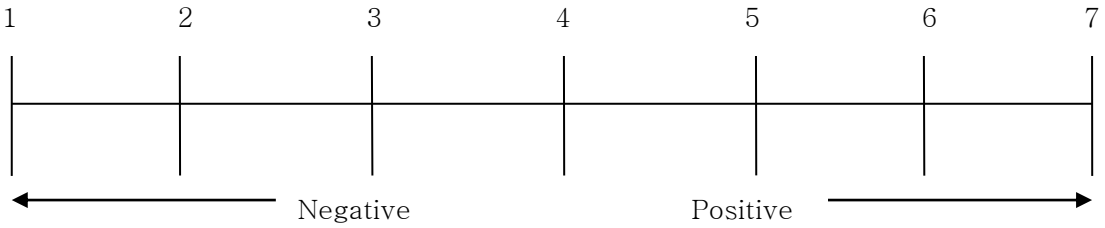
8. Broadening range of internal information sharing among member carriers



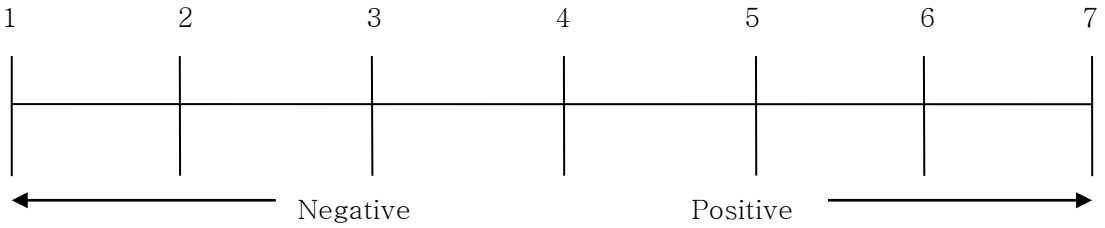
9. Difference of size in terms of capacities among member carriers



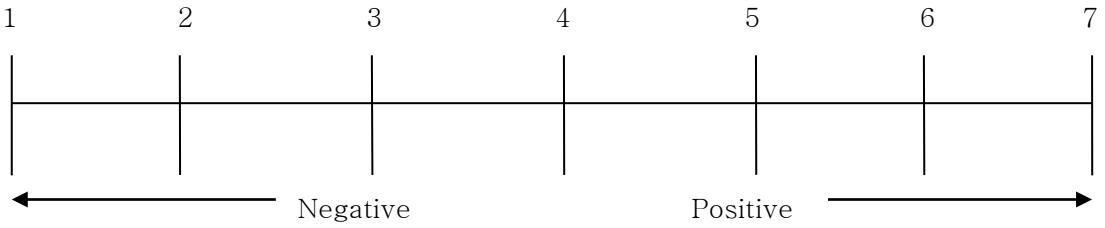
10. Difference of multimodality ability among member carriers



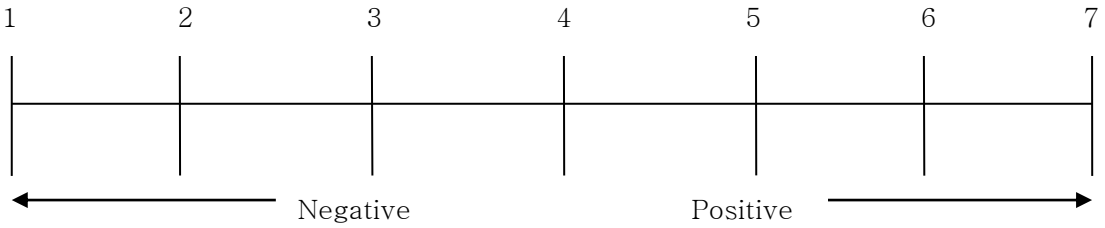
11. Shippers' increasing high desire for integrated logistics service



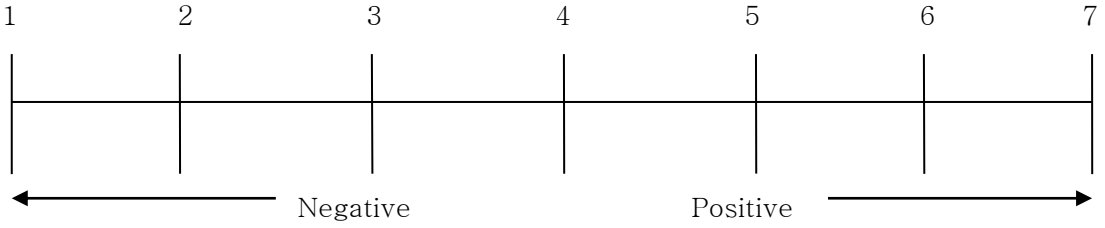
12. Increasing pressure for establishing policy regarding maritime pollution and security



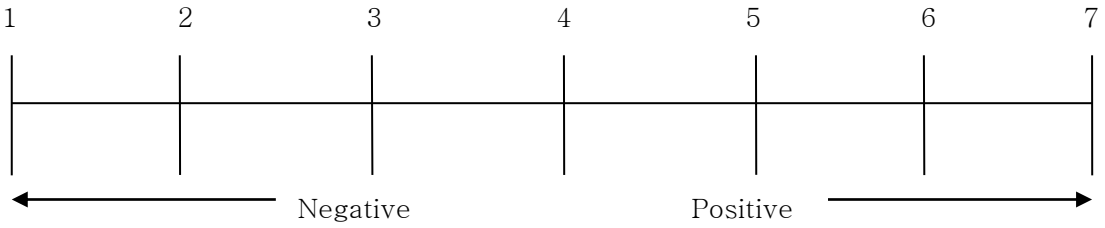
13. Increasing uncertainty in the world economy and the liner shipping market



14. Broadening range of collecting cargo overlapping among member carriers



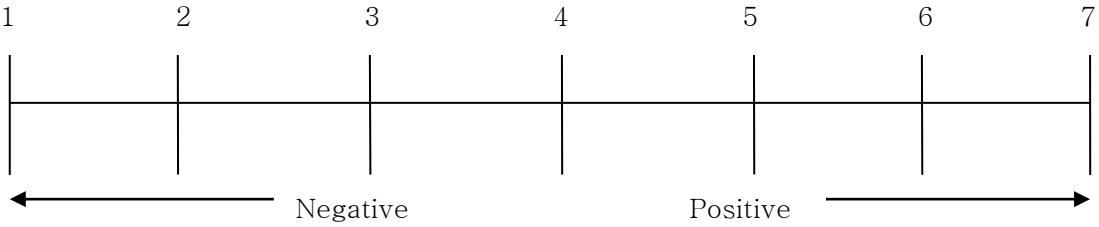
15. Increasing satisfaction level of member carrier regarding shippers' loyalty in the alliance group belonged to



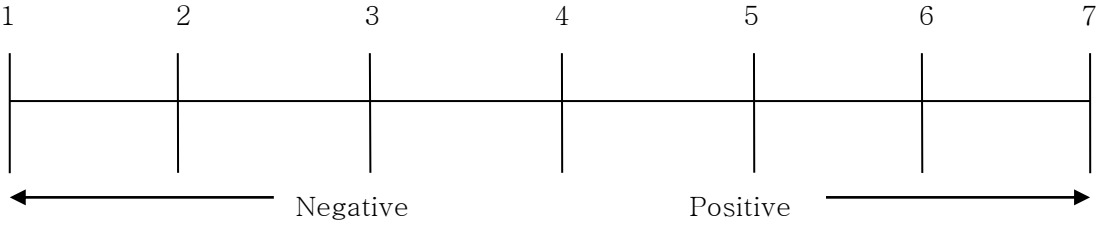
PART 4: Questions for Expected Variables Influencing Change of Liner Alliance

- Do you think that type of change in liner alliance listed below could possibly happen? -

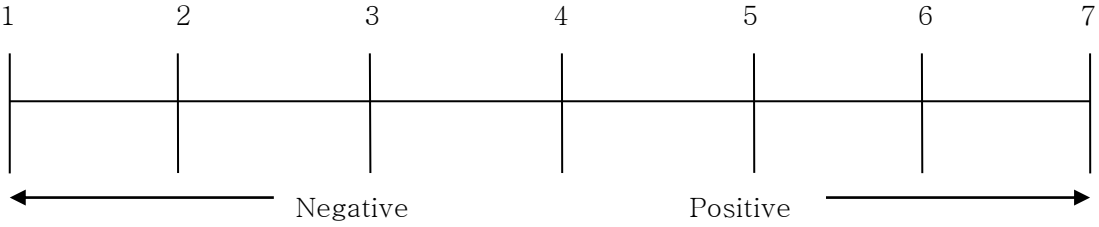
16. Change of liner alliance due to increase of M&A among liner companies



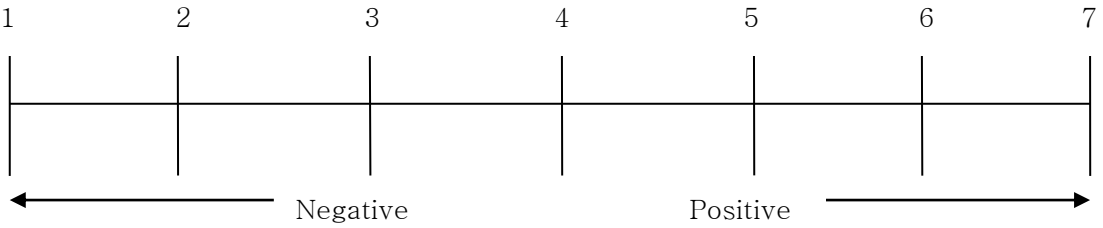
17. Change of liner alliance due to the ‘One Carrier Policy’ from China



18. Change of liner alliance due to the integration between alliance groups.



19. Change of liner alliance due to appearance of new alliance group



You have completed the Questionnaire.

Thank you very much for responding.