Knowledge Acquisition in the Global Strategic Alliance Network

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Abstract : *This paper aims to empirically examine how shipping companies can effectively acquire knowledge from their strategic alliance partners. This paper adopts cooperative network embeddedness mechanism, such as network density and tie closeness, as a channel through which to acquire more knowledge for shipping participants within a strategic alliance network. This study also examines the moderating role of competition between alliance partners in reinforcing the effectiveness of the cooperative relationships on the knowledge acquisition. Based on the literature, hypotheses to predict the aforementioned associations between cooperative network embeddedness and knowledge acquisition and the moderating role of competition in facilitating that association are established. A quantitative research method using survey data conducted in the Korean shipping industry was employed in order to empirically test the presented hypotheses. The results show that if players in a shipping alliance network are embedded in a dense network and have close relationships with their alliance partners, this helps to facilitate a greater degree of knowledge acquisition from the partners; and the impact of network density on the knowledge acquisition would be intensified with the higher level of competition between shipping companies.*

Key words : *shipping alliance network, network density, tie closeness, knowledge acquisition, competition*

1. Introduction

Today's shipping companies have experienced very complex and dynamic business environments, such as port privatization, the entry of port terminal operators into the shipping industry, an increase in strategic shipping alliances, and multimodal logistics services (Lee and Song, 2010). As customers become more demanding and powerful, shipping companies are forced to offer quicker and more flexible shipping services with cheaper prices (Notteboom, 2006). The shipping lines are also required to be effectively integrated in the global logistics system by moving goods that are geographically scattered as efficiently as possible (Lee and Song, 2010). Inter-firm competition between shipping companies thus becomes more intense. As firms of various sizes (e.g. large, medium and small firms) co-exist in the shipping industry, the competition among firms of a similar size tends to be more intensive (Panayides and Gray, 1999). Such intense competition in the shipping company industry has facilitated inter-firm collaboration such as strategic alliances between shipping companies.

Global strategic alliances are the most popular form of the shipping companies' cooperative strategy. Existing studies have addressed that the key benefits of strategic alliances are to improve service qualities by increasing the number of ports of call, broadening the range of shipping routes, and providing a world-wide network of shipping services. Shipping companies could also realize cost saving, increase their market share, share capital investments and reduce industry risks through making use of the strategic alliances (Ryoo and Thanopoulou, 1999; Yoshida et al., 2004).

Previous literatures have highlighted the significance of knowledge acquisition in facilitating the aforementioned benefits gained from shipping alliances (Hult et al., 2007; Panayides, 2007). In particular, Song and Lee (2012) explored how maritime business operators such as shipping companies, port terminal operators and freight forwarders could acquire more knowledge, and investigated in turn how this knowledge acquisition can help maritime operators improve the value of their services, using a qualitative research method. However, despite the significance of the knowledge acquisition, few studies have yet to empirically investigate, using a quantitative research method, how shipping companies can successfully acquire knowledge from their strategic alliance partners. Furthermore, a systematic approach that defines how shipping alliance partners can effectively manage both competitive and cooperative relationships with their partners simultaneously, so as to achieve a greater knowledge acquisition has yet to be thoroughly examined. This paper aims to fill the gap by empirically examining the effective inter-firm cooperation

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and competition mechanisms within a strategic alliance network of shipping companies for effective knowledge acquisition.

This paper consists of the following contents. A literature review introduces the strategic significance of knowledge in the current shipping business environments and successful strategic alliance implementation from a strategic management perspective. Inter-firm coordination mechanism – i.e. the management of both cooperative and competitive relationships within a strategic alliance network so as to effectively acquire knowledge – will be discussed. Relevant hypotheses which show the impact of inter-firm cooperation and competition on the knowledge acquisition between strategic alliance participants are then developed. The empirical analysis and findings will be provided, and discussions and conclusions are then presented in the last section.

2. Theoretical background

2.1 Knowledge Acquisition in the Shipping Alliance Network

Knowledge is referred to as useful information or know-how for effective business management (Lee and Song 2010). There are two types of knowledge which are useful for the shipping business: market-specific and firm-specific knowledge (Berdrow and Lane, 2003). Market-specific knowledge is "organized and structured information about the market" (Li and Calantone, 1998, p. 14). Market-specific knowledge may include useful information or know- how about the customers' needs, competitors' strategies or behaviors, business practices, norms and artifacts in the market where firms operate (Berdrow and Lane, 2003). Firm - specific knowledge refers to a firm's own information or know-how that supports the firm's internal activities. This type of knowledge for a shipping company may encompass operational skill or technology in shipping business, employees' experience or expertise, and organizational know-how or problem-solving mechanisms (Berdrow and Lane, 2003).

Existing literature has addressed the fact that knowledge is one of the key determinants facilitating the improvement of shipping companies' performance by enabling shipping companies to improve operational efficiency and service quality, i.e. service flexibility, responsiveness and reliability, and organizational innovation

(Song and Lee, 2012; Wu and Chou, 2007; Esper et al., 2007; Christensen et al., 2005). A strategic alliance network established between shipping companies may facilitate a greater degree of knowledge sharing between cooperating partners because it could provide many chances to get valuable knowledge and resources, and therefore facilitate the more opportunities for cooperating firms to share and transfer knowledge with each other (Nahapiet and Ghoshal 1998, Song and Lee, 2012). The knowledge acquisition advantages may vary depending upon a firm's structural and relational position in an alliance network (Rowly et al., 2000; Marouf, 2007). This is because a different position in a network brings different opportunities for a firm to be exposed to more informational flows and to achieve knowledge-based priorities (Martinex-Canas et al., 2012). There are two types of mechanisms to describe the differential knowledge-based benefits of firms within an alliance network: tie closeness and network density (Gulati, 1998). The next section will explore how shipping alliance participants could effectively acquire knowledge from their alliance partners, and the tie closeness and network density will be applied as the cooperative alliance network mechanism for the knowledge acquisition of shipping companies.

2.2 Cooperative network embeddedness and knowledge acquisition

A network density is referred to as the extent to which the ties among the actors are inter-connected in a network (Grantovetter, 1976). The network density can be calculated as "the ratio of the number of ties actually observed to the number theoretically possible, thus, the greater the interconnectedness, the higher the density. Thus, a network in which 'everyone knows everyone else' is a very dense network" (Grantovetter, 1976, p. 1288). Previous studies have argued that a dense network promotes faster and more efficient knowledge transfer within the network and enables network entities to share knowledge with each other more effectively through the many connections in the network. Consequently, an entity in a higher-density network has more opportunities to acquire knowledge from other network entities (Valente, 1995; McEvily and Zaheer, 1999). We can apply the network density approach to knowledge acquisition practices of shipping companies. For example, shipping companies which are embedded in a network with a high density would be differentially exposed

to more abundant knowledge flows because they could have more channels to access to a great deal of information and knowledge through making use of the more cooperative linkages within the network. Therefore, a higher network density would give shipping companies in their alliance network more opportunities to easily acquire knowledge.

Whilst a network density focuses on the structural aspects of network embeddedness, tie closeness involves the relational quality between cooperating alliance partners. Tie closeness is referred to as the extent of how strongly the cooperating partners are keeping their relationships. The tie closeness between partners would be affected by the extent of the amount of time of the relationships, the emotional intimacy between partners, the frequency of interaction, and their level of resource commitment to the relationship (Rowley et al., 2000). Previous literature address that close ties may promote the greater knowledge acquisition from partners within an alliance network. As alliance partners keep in close partnership with one another, they can more easily develop mutual trust, and this then further encourages the partners to open their minds and be more proactive in sharing knowledge. The knowledge which is exchanged in these close partnerships could be either proprietary or tacit, which are difficult types of knowledge to transfer and share in a weaker relationship. (Rowley et al., 2000; Uzzi, 1997; Song and Lee, 2012). These contentions can be applied to the knowledge acquisition practices of shipping companies. For instance, if inter-organizatonal relations become closer and stronger, the alliance partners in a shipping alliance regard their relationships as quite trustworthy and feel goodwill toward each other. They will therefore be more proactive in opening their knowledge in order to increase the mutual knowledge related synergy effect, and as a result they could acquire more knowledge from their alliance partners.

Having acknowledged the above, this paper suggests the following hypotheses in respect to the effectiveness of the network density and tie closeness on knowledge acquisition.

Hypothesis 1a: The greater the density of the alliance network in which a shipping company is engaged, the more knowledge the shipping company could acquire from its partners.

Hypothesis 1b: The closer relationship a shipping company has with its alliance partner, the more

knowledge the shipping company could acquire from its partners.

2.3 Moderating role of competition

Although the cooperative alliance relationships, i.e. network density and tie closeness, may encourage shipping companies to successfully acquire knowledge from their competitors, the degree of effectiveness may vary depending on the extent of competition (Tsai, 2002; Lee and Song, 2010). For example, competition may promote firms with strong incentives to acquire useful information or knowledge from their competitors. If a shipping company competes intensively with one alliance partner and competes less with another partner in a network, the firm may be more enthusiastic to acquire the knowledge of the one with whom they are in a more competitive relationship, in order to quickly catch up new skills or know-hows of the competitors and to win in the battle with the competitors. The competition per se may discourage inter-organizational knowledge exchange, since intensively competing firms may hesitate to open their skills or know-how to their competitors. However, since most shipping companies are social entities and cannot operate alone as a monopolizing business, they must establish cooperative relationships with other firms directly or indirectly and thus be embedded in a cooperative social network (Lado et eal., 1997; Tsai, 2002). Therefore, shipping companies should consider the social governance mechanisms of network relationships, such as mutual gain, reciprocity and reputation effect (Coleman, 1988; Jones, Hesterly and Borgatti, 1997). The network governance mechanism is referred to as "a social mechanism – rather than authority, bureaucratic rules, standardization, or legal resource – that facilitates monitoring, coordinating, and safeguarding inter-organizational exchanges of resources or information" (Jones et al., 1997, p. 913). Those mechanisms may implicitly enforce the entities in a network to exchange information or resources with other partners or sometimes with direct competitors, in order to maximize their common interests. Actors in a network are therefore required to follow such implicit social governance rules, so as not to have any disadvantages because they didn't observe the governance mechanisms. As a result, the companies cannot completely protect their skills or know-how, but rather, they may need to inevitably share their knowledge as much as they want to get others firms' knowledge. This may

further facilitate the more vigorous knowledge sharing between competitors within a cooperative alliance network (Tsai, 2002; Song and Lee 2012).

Having acknowledged the above, it is assumed that the knowledge acquisition garnered through the cooperative alliance network relationships may be facilitated more when the competition is high (Lado et al., 1997; Tsai, 2002). The following hypotheses could be proposed accordingly:

Hypothesis 2a: The relationship between the network density and knowledge acquisition of a shipping company will be moderated by competition: the greater the competition, the stronger the positive relationship between the network density and knowledge acquisition of a shipping company.

Hypothesis 2b: The relationship between tie closeness and knowledge acquisition of a shipping company will be moderated by competition: the greater the competition, the stronger the positive relationship between tie closeness and knowledge acquisition of a shipping company.

3. Research method

A quantitative research method is adopted for this study in order to statistically test the established hypotheses. A survey method is used to collect the quantitative data. The construct operationalization to measure the variables, sampling strategy and data collection are presented in the following sections.

3.1 Operationalization and measurements

The constructs for the hypothesis testing have been operationalized for the measurement, being based on a comprehensive literature that has empirically measured and tested the relevant constructs. The network density was measured using the ego-centric approach (Scott, 1991; McEvily and Zaheer, 1999). This instrument asks "respondents (ego) to identify the five most important alliance partners and to report the extent to which these five sources know each other" (McEvily and Zaheer, 1999, p. 1146). Using this matrix, the network density score was computed as follows (Rowley et al. 2000; McEvily and Zaheer 1999):

Network Density = Actual Ties/Potential Ties
Where,
Potential Ties = the maximum number of ties that could exist among alliance partners (0 to 10), or n(n-1)/2; where, n is the total number of alliance partners listed
Actual Ties = the number of ties that do exist among advisors (0 to 10)

Tie closeness was measured as the extent of frequency of interaction in the cooperative network, and the extent of mutual financial and mental commitment in the cooperative network (Uzzi, 1997; Yli-Renko et al., 2001). Competition was measured as the following two aspects: external market competition and internal resource competition (Chen, 1996; Tsai, 2002). The external market competition refers to the extent to which the service qualities in the network are similar to each other, and the extent to which the customers in the network are similar to each other. The more similar the services and customers are, the more intensive the competition is (Chen, 1996). The internal resource competition refers to resource similarity between shipping companies; namely, the more similar the resource, the more intensive the competition (Chen, 1996). Knowledge acquisition is measured as the extent to which shipping companies acquire market- and firm- specific knowledge from their alliance partners (Berdrow and Lane, 2003). The market-specific knowledge refers to the useful information or know-how about the market and industry, and the firm-specific knowledge is measured as useful information or know-how about shipping operations and business (Berdrow and Lane, 2003).

This study also considers a control variable which could affect knowledge acquisition. This variable is the firm size of the shipping companies, since it has been argued that the varied organizational effectiveness among firms could be explained partly by firm size (Hitt et al., 1997). On the basis of the existing literature, this paper measured the firm size by the numbers of employees and the value of total sales of firms. They were calculated using a natural logarithm and were then put into the regression model for the hypotheses testing (Hitt et al., 1997; Gomes and Ramaswamy, 1999; Capar and Kotabe, 2003).

All variables presented in this section were measured by the five point scale of rating except for the control variables and network density, and the questionnaire was developed on the basis of those measurements. The

questionnaire consists of the investigation of the following three sections: alliance network embeddedness, i.e. the extent of ego-centred shipping alliance network density and tie closeness; inter-organizational competition; and knowledge acquisition. Each section consists of several questions asking respondents to indicate the extent of tie closeness, inter-organizational competition and knowledge acquisition they think of, while the extent of network density was calculated by following the ego-centred network density measurement process, which is described in the previous parts of this section. The reliability of these measurements was tested by calculating Cronbach's alpha (a) value, and the alpha(a) values of each variable were all above 0.70, which ensures the high reliability of the measurement.

3.2 Data collection

Shipping companies in Korea was selected for the target population of the survey data collection. The maritime industry in Korea has been always a key player as a main logistics center in Asia (Containerization International Yearbook 2012), and its strategic significance has steadily increased in recent years. Furthermore, it has been known that many Korean shipping companies may proactively exchange useful information and know-how with their cooperating partners (Song and Lee, 2012). These contentions may validate the reasons for why Korean shipping companies could be considered an adequate target population for this empirical research. The directories of both the Korea Shipowners' Association (KSA) and Korea Chamber of Commerce and Industry (KCCI) were used for the sample framework. A total of one hundred and eighty one companies that own ships and move container cargoes across the world were selected from the directories and used for the survey of this study. All companies are entities of an entire logistics chain that moves cargo on a global basis. The respondents consist of the presidents or general/assistant managers from each company, those who have a rich knowledge of their operations and strategies and can provide a wide range of insight into the research issues of this study. A pilot survey was performed before launching the survey, and corrected possible problems with the questionnaire. The main survey was conducted through both telephone and via an online link, sent by email, that enabled the participants to electronically complete the questionnaire by following the link. A total of sixty-three

shipping companies responded to the survey, and thus the response rate was 34.8 percent. The thirteen percent of the respondents were the companies which provide both the container shipping liner and non-regular liner shipping services, and the rest of the respondents are the companies that operate non-regular liners only, moving bulk cargoes, LNG, oil tankers, etc. The overall response rate of 34.8 percent is reasonable, given the fact that there were few systematic or notable differences between when responding and non-responding companies were contacted.

3.3 Data analysis and findings

To test the hypotheses, a moderated hierarchical regression analysis was conducted. This analytic method aims to identify the main effect of cooperative network embeddedness, i.e. network density and tie closeness, on the knowledge acquisition as well as to assess how competition moderates the relationship between cooperative network embeddedness and its effectiveness. The overall procedure for the effectiveness of network density and tie closeness on dependent variable, i.e. knowledge acquisition, were made independently although in the same manner. The moderated hierarchical regression analysis on each dependent variable was gradually processed according to the divided four steps of models. Firstly, in Model 1, the control variables (i.e. number of employees and total sales) were entered as a set to control for any extraneous effects of shipping companies. In Models 2 and 3, the degree of network density and tie closeness were gradually added to test its positive influence on knowledge acquisition. In Model 4, the competition variable was added to examine whether it may have an impact on the knowledge acquisition independently. Finally, in order to test the moderating effect of competition on the relationship between cooperating network embeddedness and knowledge acquisition, the interaction terms between network density and competition, and tie closeness and competition, were entered in Model 5 (Tsai, 2002).

Descriptive statistics and a correlation matrix are represented in Table 1.

The results for the regression analysis are presented in Table 2. Hypotheses 1a and 1b predict that a greater level of network density and tie closeness which a shipping company has within its alliance network may be positively associated with the greater knowledge acquisition of the company. Table 2 indicates that the network density has a

positive impact on knowledge acquisition, showing that the regression coefficient is plus and statistically significant, i.e. $p < 0.01$. Similarly, Table 2 also reveals a significant positive impact of tie closeness on the knowledge acquisition, i.e. $p < 0.1$. Thus, hypotheses 1a and 1b are supported.

Table 1   Descriptive Statistics and Correlation

Variables	Mean	S.D.	1	2	3	4	5
1.Number of employees	2.806	1.294					
2.Total Sales	4.879	1.261	0.400*				
3.Network Density	.703	0.158	0.410*	0.475*			
4.Tie Closeness	3.638	0.407	0.005	0.676	0.177		
5.Competition	2.827	0.507	0.790	0.498	0.368*	0.166	
6.Knowledge Acquisition	3.706	0.526	0.026	0.376**	.682*	0.332**	0.621

Notes: * $p < 0.05$, ** $p < 0.01$

Table 2 The Effects of Cooperative Network on Knowledge Acquisition and Moderating Role of Competition

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Number of employees	.285	.072	.055	.013	.002
Total Sales	.455**	.459**	.404*	.444**	.529**
Network Density		.438*	.463**	.454*	.638***
Tie Closeness			.623**	.622**	.417*
Competition				−.325	−.742*
Competition × Network Density					1.889***
Competition × Tie Closeness					.138
R2 (Adj.R2)	.166 (.134)	.216 (.170)	.307 (.253)	.337 (.271)	.474 (.398)
F	5.272***	4.764***	5.657***	5.082***	6.192***

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

With regard to hypotheses 2a and 2b, which predict the moderating role of competition on the effectiveness of network density and tie closeness on the knowledge acquisition, the interaction terms between network density and competition and tie closeness and competition, were put into the regression. If the regression coefficients of the interaction term are plus and significant, this may ensure the positive moderate effectiveness of the competition on the aforementioned associations. In Model 5 in Table 2, whereas the competition independently has a negative impact on the knowledge acquisition ($p < 0.05$), the interaction term between network density and competition has significantly influenced the knowledge acquisition with a positive plus sign. This result indicates that knowledge acquisition throughout a network of higher density is promoted more when the competition is higher with their alliance partners. This result would imply that the competition would be the moderator variable in the association between network density and knowledge acquisition. Therefore, hypothesis 2a is supported.

Table 2 also indicates the result of the moderating role of competition on the association between tie closeness and knowledge acquisition. As shown in Model 5, the coefficient of the interaction term between competition and tie closeness is not statistically significant at the 0.05 level, indicating that the interaction term has no significant impact on the effect of tie closeness on the knowledge acquisition. This result implies that the positive effect of time closeness on the knowledge acquisition is not dependent on the level of competition. Therefore, hypothesis 2b is not confirmed.

5. Discussion

This study examines the effectiveness of cooperative relations within an alliance network, i.e. network density and tie closeness, in facilitating the greater knowledge acquisition of shipping companies; it also examined the moderating role of competition in further promoting the positive impact of the cooperative relationships on knowledge acquisition. The results show that the extent to which the shipping companies are embedded in a dense alliance network and have strong relationships with other alliance partners has a positive impact on the greater knowledge acquisition. This finding ensures that shipping companies could share more knowledge by directly and indirectly establishing a lot of cooperative alliance relations; and they also acquire more knowledge through keeping close partnerships with the cooperating partners by staying in frequent contact and further developing mutual trusts with each other. This result is consistent with the existing contentions (Uzzi, 1997; Rowley et al., 2000; Song and Lee, 2012). This similar result can be thoroughly understood by considering the practices of the Korean shipping industry. For example, Korean shipping companies have experienced many challenges such as the global economic crisis, an over-supply of ship fleets, a decrease in freight rates, etc. (Maritime Press, 2012a). Under the aforementioned dynamic

business environment, Korean shipping companies might have recognized the significance of strategic alliance and knowledge sharing between alliance partners in helping them to better understand environmental changes as well as to improve competitive advantages by offering more valuable shipping services (Maritime Press, 2012b). As revealed in the results of this paper, shipping companies might effectively acquire useful knowledge on the market and industry trends and competitors' strategy and behaviors, and other firms' operational know-hows, by being embedded in a dense alliance network as well as establishing closer partnerships in the network.

The findings also ensure that the competition between shipping alliance partners may facilitate the greater acquisition of knowledge throughout the dense network in which the companies are embedded. This finding implies that although the competition per se may harm the vigorous knowledge acquisition of shipping companies from their competitors, the competition could be a strong accelerator to promote knowledge acquisition once the partners exchange knowledge with each other through a higher number of cooperative ties. This result is also in line with existing contentions (Lado et al. 1997; Tsai, 2002; Song and Lee, 2012). This would be possible in the shipping industry, as seen in the earlier part of this paper, because competition would stimulate a shipping firm's desire to acquire valuable knowledge from their partners, and therefore the firm would be more enthusiastic about acquiring knowledge from their competitors in order to win over the competitors. Furthermore, the cooperating companies might need to consider the reputation effect or implicit reciprocity governance mechanisms between cooperating partners (Coleman, 1988; Jones et al., 1997). If a shipping company does not open their knowledge but only tries to acquire other firms' knowledge egoistically, the firm would lose its trust due to the break of the governance mechanism, and would then get a bad reputation within the alliance network. As a result, other firms may hesitate to share their knowledge and the firm may no longer gain useful knowledge from their partners in the long term. Therefore, the result implies that cooperating firms need to open their knowledge as much as they wish to acquire others' knowledge (Coleman, 1988; Jones et al., 1997; Lado et al. 1997; Tsai, 2002; Song and Lee, 2012).

On the other hand, the result revealed that the competition has not facilitated the knowledge acquisition throughout close ties between alliance partners. Put differently, the association between close ties and knowledge acquisition was not significantly affected by the extent of inter-firm competition. This finding is interesting, as the result contrasts with the moderating role of competition on the association between network density and knowledge acquisition. Furthermore, this result does not even support existing findings (Lado et al. 1997; Tsai, 2002; Song and Lee, 2012). A possible reason for this insignificant association is that, the alliance partners which keep strong relationships might have already developed mutual trusts and would not hesitate to share their knowledge with the close partners, regardless of the degree of their competition. They are therefore more enthusiastic about the prospect of exchanging useful knowledge for common interests as well as for a win-win game, by not being affected by the extent of their competition. Comparing this result with the moderating role of competition on the association between network density and knowledge acquisition, we could know that the competition further promoted the knowledge exchange when a shipping company has simply many ties directly or indirectly within its alliance network in which the partners have not established mutual trusts but simply having had contractual cooperative relationships. In such relationships, the competition might further encourage the companies' willingness to acquire other competitors' knowledge, and this may then lead the greater knowledge acquisition of the companies.

6. Conclusion

This paper further advances research on the shipping management field by specifying the following new points: firstly, it identifies the significance of knowledge in the shipping industry in improving their organizational competitiveness, and examines what types of knowledge are useful in the shipping alliance network. This attempt has been based on existing renowned literature on international business and strategic management research fields. This approach may give a strategic meaningful insight to shipping companies' managers by addressing the significance of the knowledge asset in the shipping business and therefore shipping companies' managers should consider that knowledge acquisition would be one of the most important sources of competitive advantages in order to survive in today's competitive environment.

Secondly, this paper empirically investigates how shipping companies can effectively acquire knowledge from

the alliance network in which they are embedded. The structural and relational network embeddedness perspective was adopted to examine inter-firm cooperative coordination mechanisms which help shipping companies to effectively gain useful knowledge from their alliance partners. This approach is meaningful, as it is a new attempt to empirically test the cooperative network embeddedness in the shipping industry and the results also provide significant insight into how shipping companies strategically manage inter-organizational cooperative relationships both structurally and relationally in order to gain more knowledge. Finally, existing studies have relatively neglected the possibility that the competition would reinforce the knowledge acquisition throughout shipping companies' cooperative network relationship, i.e. network density in this paper. This paper, in this regard, could complement the aforementioned academic lack by drawing on the significant role of competition in moderating the association between network density and knowledge acquisition within an alliance network.

Nevertheless, there are some limitations to this paper. Although this paper addresses an important strategic consideration by examining knowledge acquisition within an alliance network, it does not empirically investigate how the acquired knowledge may positively affect the organizational performance. Empirical investigation of the impact of knowledge resource on the shipping companies' performance would also be critical for successful application of knowledge management strategy, and thus this issue should be examined further in future research agendas. Furthermore, as the sample shipping companies of the empirical study focus solely on the Korean shipping industry, it would be difficult to generalize the empirical results of this paper to worldwide cases. It is expected that future research may expand the regional scope of data collection to global leading shipping companies in other countries in order to overcome the regional limitations.

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