Does Partner Volatility Have Firm Value Relevance? An Empirical Analysis of Strategic Alliances

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Abstract

Purpose – Alliance members have constantly revised market strategies over time by withdrawing membership from a current alliance, joining another alliance, or constructing a new alliance. From the perspective of the signaling effect, the purpose of this study is to analyze the impacts of partner volatility (new member, old member, and new group) on firm value.

Design/methodology – To analyze the impact of partner volatility on firm value, companies in strategic alliances are classified into the three groups of new partner, existing partner, and new alliance, and the effects on company value are verified through an event study and the signaling effect analysis.

Findings – This study proved that new partners and newly formed strategic alliances have higher expectation effects than old partner company groups, and have a more positive effect on the relevant firms' stock prices. In addition, the result of the study showed the same valid results as the alliance levels, and showed that investors' expectations were higher with new partners and new alliances than with old partners.

Research Implications – A new perspective on the signaling effects of strategic alliances among shipping lines was presented in this study by grouping alliance types including new member, old member, and new group. The results provide useful insights for selecting partners and firm values of alliance announcement times.

Originality/value – This study analyzed partner volatility on relevant companies' stock prices from the perspective of investors from the global shipping conference reorganization in 2017. Strategic alliances were classified into the three categories of new partner, old partner, and new alliance, and the effects on firm value were verified.

Keywords: Maritime Shipping, Partner Volatility, Signaling Effect, Strategic Alliance
JEL Classifications: D12, F14, O53

1. Introduction

Shipping Conferences are international cartels (Wang, 2015) that make agreements or contracts on fares, shipping space, distribution of vessels, and other conditions with the purpose of maintaining mutual independence of over two liner shipping companies for specific sea routes (Lam and Wong, 2018; Slack, Comtois and Mccalla, 2002), controlling

excessive competition internally (Rau and Spinler, 2017), reinforcing monopoly power externally (Zheng, Negenborn and Zhu, 2015), and improving and maintaining the financial status of member companies (Panayides and Wiedmer, 2011). Shipping conferences among shipping companies have international characteristics, and simply banning these can cause fierce competition among shipping companies, leading to instability in shipping space and fares. Therefore, the existence of shipping conferences is acknowledged with some degree of restriction for smooth international transportation (Panayides and Wiedmer, 2011; Wang, 2015).

The number of shipping conferences has drastically increased since the 1970s, and at a point, the number reached 350. Major shipping conferences were the Trans Pacific Freight Conference of Japan/Korea (TPFCJK), the Hong Kong - Taiwan - North America West Coast Fare Conference, and the Pacific Westbound Conference (PWC). As competition in the shipping industry became fiercer after the 1980s, there were an increasing number of companies that offered services with low prices by withdrawing from conferences. Later, the number of shipping conferences steadily decreased (Slack, Comtois and Mccalla, 2002). Moreover, the EU decided not to grant the 'privilege of exemption of the Antimonopoly Act' that was granted to shipping conferences. With this decision, Far East the Freight Conference (FEFC), one of the biggest shipping conferences in the world, disbanded (Cariou, 2008; Kim Si-Hyun and Chiang Bong-Gyu, 2017; Tang and Sun, 2018).

From the end of the 20th century, the scope of shipping company services expanded due to mass transportation competition through large vessels, world trip services, and the development of multimodal freight services. The change in regulations for shipping conferences had a great effect on the structure of the liner market, the market behavior of liner shipping companies, and management (Tang and Sun, 2018), raising the importance of cooperation between shipping lines. Specifically, there was an increasing number of strategic alliances and mergers and acquisitions (M&A) between shipping companies due to the abolition of shipping conferences, and liner shipping companies that started completely free competition were significantly affected in management aspects, which led to the necessity of research on the changes of strategic alliances between shipping companies. However, prior studies that deal with the strategic alliances of shipping companies mostly focused only on the current alliance and the operational perspectives, but there were few studies on the value of shipping companies according to shipping alliance and the effect of shipping line partner volatility on the operation of shipping companies. Therefore, this study aims to research the effects of the strategic alliances of shipping companies and partner volatility on the relevant company stock prices from the perspective of investors from the case of the global shipping conference reorganization in 2017.

In this study, to analyze the impacts of partner volatility in the shipping industry, companies with strategic alliances are classified into three groups: new partner, existing partner, and new alliance. The effects on company value are verified through an event study and a signaling effect analysis, such that a new perspective is presented in the study of the strategic alliances among shipping companies. The result of the study provides implications to establish an international cooperation strategy for liner shipping companies in the future, as well as, critical implications for shipping companies entering the international stage through a strategic alliance.

2. Empirical Framework and Hypothesis

2.1. Strategic Alliances in Maritime Shipping

The shipping industry is dynamic in market condition changes, and pursues an economy

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of scale, so it has a structure for securing cost competitiveness (Song Dong-Wook and Panayides, 2002). As discussed by Rau and Spinler (2016), in the current market situation where an oligopoly phenomenon is becoming fierce, even global mega-shipping companies are competitive without belonging to alliances. Therefore, joining alliances and M&As have become an essential element for the mutual survival of global shipping companies (Kang Dal-Won and Kim Si-Hyun, 2018; Lam and Wong, 2018). Global shipping companies review their own business operation directions, along with the quality of service, level of fares, financial structure, and profits in various ways, and then they select partners matching their interests and make M&As to maximize business operation efficiency or alliances to cooperate in certain routes sharing each other's shipping space (Cullinace and Khanna, 1999; Das, 2011; Glaister and Buckly, 1996). This paper largely builds upon two strands of literature. The first relates to empirical studies on the rapid growth of Chinese exports and its consequences, particularly on export competitors whose export portfolios look similar to those of China. The second is based on the theoretical arguments and empirical findings of Hallak (2006) and Hallak and Schott (2011) which found that rich countries tend to import relatively more from countries that produce high-quality goods.

Fig. 1. Strategic Alliance Changes in 2017
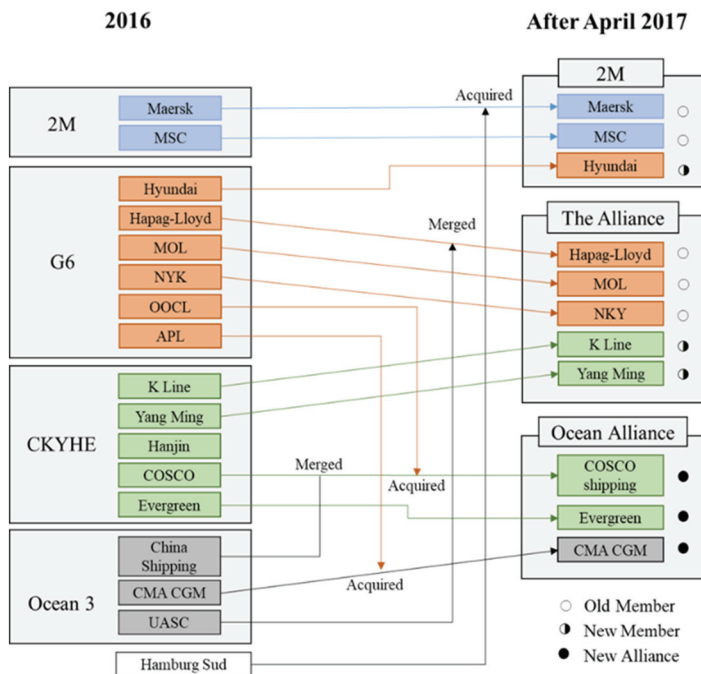
Since alliances are organizations formed under the notions of collaboration and coexistence, participating companies can secure relative stability and enhance internal and external reliability in fare competition or various risks (Lu et al., 2006; Dixit and Pindyck, 1994). Accordingly, a large amount of their stocks can be additionally listed, bringing about subsidiary profits for many parties involved with company operations (Caschili et al., 2014; Fusillo, 2006; Zheng et al., 2017).

Before April 2017, when three new alliances were established, a merger between COSCO and China Shipping and the CMA-CGM's Acquisition of occurred. After April 2017, there were 4 cases of M&A, including the Merger of Hapag-Lloyd and UASC, the establishment of a joint corporation, the Ocean Network Express, as a result of a merger of NYK, K Line, and MOL, Maersk's acquisition of Hamburg Sud., and COSCO's acquisition of OOCL. The structure of shipping alliances' competitive compositions was also reorganized from the existing 2M, G6, CKYHE, and Ocean 3 to 2M+H, The Alliance, and the Ocean Alliance, and in this process, the number of global shipping companies in shipping alliances decreased from 16 to 11. Fig. 1 illustrates the strategic alliances of shipping lines after April 2017, compared to 2016.

Regarding shipping companies that joined the newly arranged alliances, HMM joined the existing 2M Alliance (Maersk, MSC), Yang Ming and K Line joined The Alliance (Hapage-Lloyd, MOL and NYK, the amalgamated UASC), and COSCO, Evergreen, and APL, the amalgamated China Shipping and CMA-CGM that took over NOL, reorganized as the Ocean Alliance. In terms of the level of alliance between shipping lines, the conditions of organizing alliances are the purchase of freight space, which is the weakest stage, followed by the exchange of freight space and the sharing of freight space. When comparing the stages of reorganized alliances, 2M+H is currently operated under a condition of the exchange and sharing of freight space, Ocean Alliance is under a condition of the purchase and exchange of freight space, and The Alliance is operated under the condition of the purchase, exchange, and sharing of freight space.

The total freight space amount of alliances reorganized as of April 2017 were 2M+H (6 million TEU), Ocean Alliance at 5.5 million TEU, and The Alliance at 1.9 million TEU. Ocean Alliance has the greatest number of ships (323), followed by The Alliance (240) and 2M+H (193). 2M+H has the greatest market share (33.4%), followed by Ocean Alliance (26%) and The Alliance (16%). Ocean Alliance has the greatest amount of total freight space in the Pacific route (41.43%), followed by The Alliance (29%) and 2M+H (24.3%). 2M+H has the greatest amount of total freight space in Asia-Europe/the Mediterranean route (40.3%), followed by Ocean Alliance (34.86%) and The Alliance (21%). According to an Alphaliner report (2017), when considering the current market situation, the Top 7 global shipping companies (Maersk, MSC, CMA-CGM, COSCO, Hapag-Lloyd, ONE (NYK, K Line, MOL), and (EVERGREEN) account for over 70% of the world's freight space, maintaining the competitiveness of the shipping alliances that they belong to, and the oligopoly that they occupy, over 75% of the global shipping market, seems to be continuing (currently the top 7 global shipping companies occupy 93.5% of the Asia-Europe route, and 82.6% of the Asia-North America route).

2.2. The Signal Impacts of Strategic Alliances

In the capital market, interested parties have different levels of information. There is information asymmetry in that management with information superiority having different levels of information from investors with information inferiority. Due to this information asymmetry, an adverse selection and signaling effect phenomena occur.

The difference between adverse selection and signaling theory is that in the former, the party with more information conceals information, but in the latter, the party with more information tries to reveal information more actively. Adverse selection means selecting adverse objects when investors are not familiar with information that the management is aware of, and this can be found in strategic alliances. Contrary to the fact that the adverse selection occurs when information is concealed, the signaling effect reveals information

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voluntarily by bearing expenses, and it is used for partner selection as a signal that a company with superior information conveys information to investors who lack information (Su and Rao, 2011). In other words, a change of partner is used as a signal to convey to investors when a company establishes a new strategic alliance.

The strategic alliances and marketing-finance interface are already important objects of study in the marketing field. Specifically, the advertisement effect and the expansion of capacity are included in the study of future cash flows and increases in company value. Therefore, this study is intended to analyze what effects the strategic alliances of shipping companies and change of partnership between companies have on the relevant stock prices from the perspective of investors, based on the reorganization of global shipping conferences in 2017. In addition, the study presents a new perspective on strategic alliances among shipping companies by proving the effects on company value through the analysis of the signaling effect, dividing the companies that made strategic alliances into the aforementioned three categories: new partner, existing partner, and new partnership.

3. Methodology

3.1. The Signal Impacts of Strategic Alliance

The event study methodology is an empirical method to analyze the effects of a specific event on a company's value, and it is suitable to extract effects caused by a specific event of an individual company in the entirety of stock market fluctuations. The important factors in event study methodology are the selection of the event day, estimation of the excess earning rate, and establishment of a period. The event means the decision or situation that affects a company's stock prices, and the event day is the date when the event affects stock prices.

An event study using the market model was done to estimate and test the excess earning rate. First, regarding the period to estimate the excessive earning rate, the regression coefficient $(\hat{\alpha}, \hat{\beta})$ of individual company stock (i) was estimated by OLS of the formula (1) with the use of daily stock price resources from day –170 to day –6. The period from –5 to +5 was established as the event, and the change of the average abnormal return in this period was examined. The reason that 5 days before the event occurred were excluded is to exclude the effects caused by releasing cooperation products from the estimation of individual stock price (Mackinlay, 1997). In addition, there is a high possibility that the reaction of stock market on a specific event will be observed on day –1 and day 0 if the event day is accurate and there is no information leakage in advance (Hendricks and Singhal, 1997; Son In-Sung and Kim Si-Hyun, 2018).

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \qquad (1)$$

Here, is the earning rate of the individual company i on day t, $R_{m,t}$ is the earning rate of the market portfolio on day t, α_i is the inherent hazard of the individual company i, $\beta_i R_{m,t}$ is the change in the earning rate of the individual company i according to the change of the whole market, and $\varepsilon_{i,t}$ is the error term of the individual company i on day t, which is assumed to be $i \cdot i \cdot d \cdot N(0, \sigma_i^2)$, which explains the change in the earning rate of a specific company that cannot explain the whole market change. In addition, for $R_{m,t}$, the earning rate of the market portfolio, the composite price index of stocks of the relevant stock exchange was used. After a parameter of the formula (1) was estimated via the use of regression analysis,

the earning rate of the individual company i on day t is estimated as follows.

$$AR_{i,t} = R_{i,t} - \hat{\alpha}_i - \hat{\beta}_i R_{m,t} \tag{2}$$

$$\text{AAR}_t = \frac{1}{n} \sum_{i=1}^{N} AR_{i,t} \tag{3}$$

$$CAR(t_1, t_2) = \sum_{t=-5}^{5} AR_t \tag{4}$$

Here, $AR_{i,t}$ is the earning rate of the individual company i on day t, and $CAR(t_1, t_2)$ is the cumulative abnormal return (CAR) from the event day from t_1 to t_2. The average abnormal return (AAR) is the average excessive earning rate calculated per specimen, and the cumulative abnormal return is the cumulative value in the period of the average abnormal return (-5, 5). In this study, with the use of the method of Brown and Warner (1985), which assumed the independence of the statistical significance of AAR_t and $CAR(t_1, t_2)$ during the deducted event period, the test statistics during the event period are calculated with the formula (5).

$$t_{\text{AAR}_t} = \frac{\text{AAR}_t}{Var(\text{AAR}_t)} \qquad t_{CAR(t_1,t_2)} = \frac{CAR(t_1, t_2)}{Var(CAR(t_1, t_2))} \tag{5}$$

In this study, event study was adopted to analyze the effects of the strategic alliances organized in 2017. To examine the difference between the short term and annual performance of each partnership, this study carried out regression analysis. After analyzing AR (Excess earning rate) via event study, this study used ROA (Return on Assets) to examine the difference between short-term and annual performance. ROA is calculated as the ratio of the total sum of capital or total assets to operating profit, and is considered the variable that best reflects the financial performance of international strategic alliances by being scaled appropriately to the size of individual companies.

$$\text{Model 1: } AR(i,t) = \alpha + \beta_1 NP_{\text{Dummy } i,t-1} + \beta_2 LEV_{i,t-1} \tag{6}$$
$$+ \beta_3 SIZE_{i,t-1} + \beta_4 SUR_{i,t-1} + \varepsilon_{i,t}$$

$$\text{Model 2: } ROA(i,t) = \alpha + \beta_1 NP_{\text{Dummy } i,t-1} + \beta_2 LEV_{i,t-1} \tag{7}$$
$$+ \beta_3 SIZE_{i,t-1} + \beta_4 SUR_{i,t-1} + \varepsilon_{i,t}$$

Here, the dummy variable, New Partner (newly joined) equals 1, and Old Partner (last) equals 0. The control variable is the debt ratio = total debt/total asset, business scale = log (total asset), surplus returns is total surplus returns/total asset. ROA is calculated by dividing operating profit by total assets and multiplying by 100.

3.2. Sample Design and Data Collection

Each shipping company's public announcement materials were collected to analyze each alliance's new entry effects, and the resources of listed companies with financial materials available on OSIRIS were collected based on the first alliance announcement date among companies that operate shipping transportation businesses. The event day indicates the first day of the alliance announcement. CMA CGM (France), Hamburg Sud. (Germany), MSC (Swiss), and UASC (Kuwait), which are unlisted private companies with public announcement

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materials unavailable, were excluded from the analysis.

Table 1 presents the sample description. As discussed in Section 2.1, new partner type includes Hyundai Merchant Marine Co Ltd., Kawasaki Kisen Kaisha, Ltd., and Yang Ming Marine Transport Corp. AP Moeller Maersk A/S, Hapag-Lloyd, MOL plc, and Nippon Yusen Kabushiki Kaisha are grouped into old partners. In addition, Orient Overseas International Ltd., COSCO Shipping International Singapore Co Ltd., Evergreen Marine Corporation, and Apollo Global Capital Inc. classified into the new alliance.

Table 1. Sample Description

Company	Alliance	Alliance Type	Stock Code	Country	Event Day
Maersk	2M	Old Partner	CPH:MAERSK-B	Denmark	2016-12-11
Hyundai	2M	New Partner	KRX: 011200	South Korea	2016-12-11
Hapag-Lloyd	The Alliance	Old Partner	ETR: HLAG	Germany	2016-05-13
MOL	The Alliance	Old Partner	WSE:MOL	Hungary	2016-05-13
K-Line	The Alliance	New Partner	TYO:9107	Japan	2016-05-13
NYK	The Alliance	Old Partner	TYO:9101	Japan	2016-05-13
Yang Ming	The Alliance	New Partner	TPE:2609	Taiwan	2016-05-13
OOCL	Ocean Alliance	New Alliance	316:HK	Hong Kong	2016-04-20
COSCO	Ocean Alliance	New Alliance	COS:SP	Singapore	2016-04-20
Evergreen	Ocean Alliance	New Alliance	TPE:2603	Taiwan	2016-04-20
APL	Ocean Alliance	New Alliance	APL:PM	Philippines	2016-04-20

4. Data Analysis and Results

Table 2 shows the results of calculating the average abnormal return (AAR) of shipping companies in strategic alliances. The average abnormal return of the participating companies was 2.60% on the event day (0), which is a 3.26 t-value, statically significant at the 0.1% level, and has a positive effect on stock prices. The result means there was a public announcement effect, and no information leakage effect that investors expected in advance for the selection of new alliance partners. The cumulative average return (CAR) was 2.84%, but it was not statistically significant. Based on the results, it was confirmed that shipping company strategic alliances have a significant effect on average abnormal return of alliance announcements, which can be recognized as a positive signal for investment to investors.

The analysis results indicate that strategic alliances had a positive effect on the short-term performance of all participating companies. However, each group had different alliance levels. In the case of 2M, all participating companies exchange ships and share shipping space equally. In the case of the Ocean Alliance, the participating companies purchase and exchange shipping space, and The Alliance purchases, exchanges and shares of shipping space. According to the level of alliance, the signal impacts of a strategic alliance can be different. Therefore, this study analyzed the signal impacts of strategic alliance by group. Table 3 presents the signal effects of shipping alliance by group. The results show that the average abnormal return of companies in 2M was 3.70% on the event day (0), the t-value was 1.96, and it is statistically significant at the 1% level. The average abnormal return of companies grouped in The Alliance was 2.96% on the event day (0), the t-value was 2.24, and it is

statistically significant at the 1% level. Ocean Alliance's average abnormal return was 1.28%, with a significant result. The average abnormal return was the highest for 2M, followed by The Alliance and Ocean Alliance. The results of the analysis can be interpreted in that strategic alliances have a positive effect on the short-term company value of the participating companies, and there is a different average abnormal return according to the level of alliance.

Table 2. Signaling Effect of Strategic Alliances

Day	Announcement of Strategic Alliance			
	AAR (%)	t-value	CAR (%)	t-value
-5	-1.30	-1.62	-1.30	-1.62
-4	0.59	0.74	-0.71	-0.63
-3	0.91	1.14	0.20	0.15
-2	-0.46	-0.58	-0.26	-0.16
-1	0.50	0.62	0.24	0.13
0	2.60	3.26***	2.84	1.46
1	-1.21	-1.52	1.63	0.77
2	-0.84	-1.05	0.80	0.35
3	0.23	0.29	1.03	0.43
4	-0.23	-0.29	0.79	0.32
5	-0.40	-0.50	0.40	0.15

Note: ***$p<0.001$.

Table 3. Signaling Effects of Shipping Alliance by Group

Day	2M				The Alliance				Ocean Alliance			
	AAR (%)	t-value	CAR (%)	t-value	AAR (%)	t-value	CAR (%)	t-value	AAR (%)	t-value	CAR (%)	t-value
-5	-1.75	-0.93	-1.75	-0.93	-2.05	-1.55	-2.05	-1.55	0.26	0.44	0.26	0.44
-4	-0.22	-0.12	-1.97	-0.74	1.69	1.28	-0.36	-0.19	-0.70	-1.17	-0.44	-0.52
-3	1.54	0.81	-0.44	-0.13	1.50	1.13	1.14	0.50	-0.49	-0.82	-0.93	-0.90
-2	-1.58	-0.84	-2.01	-0.53	-0.14	-0.11	1.00	0.38	-0.25	-0.41	-1.17	-0.99
-1	-1.12	-0.59	-3.13	-0.74	1.55	1.18	2.55	0.86	-0.18	-0.30	-1.36	-1.02
0	3.70	1.96***	0.57	0.12	2.96	2.24***	5.50	1.70	1.28	2.15***	-0.08	-0.05
1	-1.23	-0.65	-0.66	-0.13	-1.90	-1.44	3.60	1.03	-0.05	-0.08	-0.12	-0.08
2	-0.64	-0.34	-1.30	-0.24	-1.21	-0.92	2.40	0.64	-0.34	-0.58	-0.46	-0.28
3	1.21	0.64	-0.99	-0.02	-0.44	-0.33	1.96	0.49	0.70	1.17	0.23	0.13
4	-0.12	-0.06	-0.21	-0.04	-0.87	-0.66	1.09	0.26	0.74	1.25	0.98	0.52
5	-0.97	-0.52	-1.19	-0.19	-0.75	-0.57	0.33	0.08	0.58	0.98	1.56	0.79

Note: ***$p<0.001$.

After analyzing the signal impacts of strategic alliance by group, companies that joined strategic alliances were classified into three categories, and the signaling effects were analyzed to find the effects of strategic alliances and partner volatility on relevant stock prices based on the reorganization of global shipping alliances in 2017. Table 4 shows the results of calculating the average abnormal returns (AAR) of new partner, old partner, and new alliance.

The AAR of new partner is 5.45% on the event day, which is statistically significant at the 0.1% level, and has a positive effect on relevant stock prices (t-value=2.71). The AAR of old partner is 1.46% on the event day, but is not statistically significant. However, the AAR of new alliance is 1.28% on the event day, which is statistically significant at the 0.1% level, and has a

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Table 4. Signaling Effects of Shipping Alliance by Type

Day	New Partner				Old Partner				New Alliance			
	AAR (%)	t-value	CAR (%)	t-value	AAR (%)	t-value	CAR (%)	t-value	AAR (%)	t-value	CAR (%)	t-value
-5	-2.28	-1.43	-2.28	-1.43	-1.28	-1.08	-1.28	-1.08	0.26	0.44	0.26	0.44
-4	2.07	1.03	-0.80	0.28	0.45	0.38	-0.83	-0.50	-0.70	-1.17	-.44	-0.52
-3	2.07	1.03	1.27	0.36	1.08	0.92	0.25	0.12	-0.49	-0.82	-0.93	-0.90
-2	-0.96	-0.48	0.31	0.08	-0.25	-0.21	0.00	0.00	-0.25	-0.41	-1.17	-0.99
-1	0.05	0.02	0.36	0.08	1.35	1.14	1.35	0.51	-0.18	-0.30	-1.36	-1.02
0	5.45	2.71***	5.81	1.18	1.46	1.23	2.81	0.97	1.28	2.15***	-0.08	-0.05
1	-1.81	-0.90	4.00	0.75	-1.63	-1.38	1.17	0.38	-0.05	-0.08	-0.12	-0.08
2	-1.81	-0.90	2.19	0.38	-0.47	-0.40	0.70	0.21	-0.34	-0.58	-0.46	-0.28
3	-0.55	-0.27	1.64	0.27	0.47	0.39	1.17	0.33	0.70	1.17	0.23	0.13
4	-1.82	-0.90	-0.18	-0.03	0.22	0.19	1.39	0.37	0.74	1.25	0.98	0.52
5	-0.15	-0.08	0.34	-0.05	-1.31	-1.11	0.08	0.02	0.58	0.98	1.56	0.79

Note: ***$p<0.001$.

Table 5. Regression Analysis in Comparing New Partner Effects

Variable	Model 1 (AR)	Model 2 (ROA)
NP_Dummy	0.523***	0.382***
	(2.92)	(2.52)
LEV	1.227	1.562
	(1.37)	(1.53)
SIZE	1.048***	1.523***
	(3.23)	(3.85)
SUR	1.132***	1.056***
	(3.12)	(2.47)
Adj_R2	0.192	0.352
F-Value	5.480***	7.250

Note: 1. The t-statistics are in parentheses.
2. ***$p<0.001$.

positive effect on the relevant companies' stock prices (t-value=2.15). This indicates that new partner and new alliance have a greater expectation effect than old partner, and have a more positive effect on relevant stock prices. This result also indicates that there is no significant effect on stock price before the event day, which means there is no information leakage effect, but there is an announcement effect. In the case of the old partner, the expectation effect according to the reorganization of strategic alliance groups was not statistically significant on the event day (0), but the cumulative average return (CAR) according to participating alliance continuity had a positive effect compared to a new partner and new alliance groups.

In addition, to compare the event results of a new partnership and the annual performance, this study employed regression analysis adopting ROA. Table 5 presents the results of regression analysis for new partner effects. In comparing AR and ROA as the dependent variables, the coefficient of the new partner's dummy showed a positive (+) direction, which was significant at the 1% and 5% levels, respectively. This result can be interpreted in that the newly joined company had a more positive effect than the old partner on short-term and annual corporate performance.

5. Discussion and Implications

In this study, shipping companies were categorized according to strategic alliance volatility (new partner, old partner, and new alliance), and an event study was performed based on the announcement time of the strategic alliance. The event study was done to find whether partner volatility affected the excess earning rate of the alliance announcement day. The companies categorized as new partners are Hyundai Merchant Marine Co Ltd., Kawasaki Kisen Kaisha, Ltd., and Yang Ming Marine Transport Corporation, the AAR is statistically significant on the event day (0), and there was a positive effect on relevant stock prices. The AAR of old partner is not statistically significant on the event day. The AAR of new alliance was 1.28% on the event day, it is statistically significant at the 1% level, and it had a positive effect on relevant stock prices. This indicates that new partner and new alliance have a higher expectation effect than old partner, and a more positive effect on relevant stock prices.

The results of the study show that in 2M, an old alliance, the excess earning rate had a more positive signaling effect on newly selected companies than on re-selected companies in partner volatility, and it had a negative signaling effect on the excess earning rate of old partner companies. In addition, the intensity of the signaling effect was the highest in 2M (shipping space exchange and sharing), followed by The Alliance (purchase, exchange and sharing of shipping space) and Ocean Alliance (purchase and exchange of shipping space). Compared to The Alliance, Hyundai Merchant Marine has lower negotiation power than 2M and belongs to the 2M Alliance under the condition of 'purchase and exchange of shipping space', so the signaling effect of 2M is higher than The Alliance. The intensity of the top 3 global shipping companies' signaling effects per type is the highest for new partner, followed by new alliance and old partner, and investors have a bigger expectation effect for new partner and new alliance.

New Partner: Hyundai Merchant Marine, K-Line, and Yang Ming are new members of an existing alliance. Hyundai Merchant Marine, a new partner in 2M, gained the additional benefits explained in Table 5. This also greatly reduced business losses to -406.8 billion won, which is a 51.2 % improvement compared to the loss in 2016. In addition, the company secured accessibility to 2M network in the European line, which has high competitiveness in fares, and reinforced competitiveness in the America West Coast route, where the company was already competitive, establishing a foundation for stable earnings improvement through an economy of scale and scope.

In addition, K Line and Yang Ming, new partners of The Alliance, belonged to the CKYHE Alliance together with Hanjin Shipping before the reorganization of alliances. Hanjin Shipping faced a situation in which continuing management was not possible due to various financial factors, and the company went bankrupt in August 2016. Finally, around 100 of Hanjin Shipping ships, approximately 500,000 TEU(Lam and Wong, 2018), lost their destinations, and K Line, Yang Ming, COSCO and Evergreen, who utilized Hanjin Shipping's shipping space took a great hit. Moreover, Yang Ming had more debt than capital than the company that owned it at that time. When total sales and net profit between 2016 and 2017 were compared for the management results of 2016, total sales were 115.4 billion TWD, and the net profit was -14.912 billion TWD. After joining The Alliance, the company turned a profit to 131.078 billion TWD of total sales and 321 million TWD of net profit in 2017 through the improvement of the marine transportation network and the improvement of vessel operations, such as route expansions to Korea, China, Malaysia, the Red Sea South East Asia, and the Gulf of Pohai. K Line also recorded 519 billion yen in operating revenue and -31.5 billion of net profit in 2016 after joining The Alliance, but in 2017, operating revenue was 599 billion yen and net profit was 0.5 billion yen, turning a profit.

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New Alliance: Ocean Alliance is a new alliance formed by COSCO and Evergreen, which previously belonged to the CKYHE Alliance, and CMA CGM, which belonged to the Ocean3 Alliance. Before the Ocean Alliance was organized, CMA CGM tried to establish an intermodal network in Europe, America, Central and South America, Africa, and Asia. After Ocean Alliance, under the lead of CMA CGM, was able to provide intermodal service to customers on the Asia-America, Asia-Europe, and America-Europe routes beyond marine transportation. Specifically, CMA CGM expanded 11 lines of the Asia-America route to total 20 routes, greatly expanding service provision.

COSCO and Evergreen also made the operation of vessels efficient and expanded marine transportation service scope through the formation of the Ocean Alliance. COSCO Shipping Ports Limited (CSP), an affiliated terminal operation corporation of COSCO Shipping, accounted for 44% of the transported volume of the Ocean Alliance in 2017(Lam and Wong, 2018). As a result, CSP has made investments to expand existing global terminal networks through Ocean Alliance, which its parent company COSCO belongs to. Considering the strategy of marine transportation network expansion as a balance between COSCO and CSP's Node and Link, there is an implication that additional strategic synergy effects can be accomplished based on the interconnectivity between the shipping industry and terminal industry, along with the main purpose of global shipping companies that intend to organize alliances.

Old Partner: After the reorganization of alliances, Maersk and MSC continued the 2M Alliance, and approved a conditional strategic alliance with Hyundai Merchant Marine until 2019. 2M made the operation of vessels efficient by a concluding shipping space sharing agreement with Hyundai Merchant Marine for routes that pass the Pacific, in which Hyundai Merchant Marine was already competitive. Maersk recorded 56.4 billion US dollars of total sales and NOPAT of -55 million US dollars in 2016, but in 2017, total sales were 116 million USD with a NOPAT of 330 million USD. Since MSC is an unlisted company, it was difficult to acquire financial statements, but the company stands firm as a top 2 global shipping company.

Meanwhile, as APL and OOCL, who belonged to the G6 Alliance, were taken over by other shipping companies, and Hyundai Merchant Marine belonged to the 2M Alliance, Hapag Lloyd, NYK, and MOL, who belonged to the G6 Alliance along with APL, OOCL, and Hyundai Merchant Marine, organized The Alliance together with K Line and Yang Ming, which are new partners. Hapag Lloyd suffered from a deficit of 8.546 billion US dollars in total sales and -102.9 million US dollars of net profit in 2016. In 2017, the deficit changed to a profit of 11 billion, with 288 million US dollars of total sales and 566 million US dollars of net profit through the reorganization of alliances and a merger with UASC (Tang and Sun, 2018). NYK had a deficit of 4 trillion and 737.5 billion yen in total sales and -736.2 yen in net profit in 2016. In 2017, total sales were 5 trillion with 388.5 billion yen, and net profits were 39.3 billion yen based on the efficiency of management resources through the reorganization of alliances. MOL's total sales were 1 trillion and 81.4 billion yen, and net profit was -736.2 billion yen between April 1 and December 31, 2016. Between April 1 and December 31, 2017, total sales were 1 trillion and 239.6 billion yen, with net profits of 29.2 billion yen based on the efficiency of management resources through the reorganization of alliances.

As mentioned above, alliances formed in the shipping industry provide global shipping companies with benefits such as the expansion of marine transportation networks, fare competitiveness, and the effective utilization of container vessels. However, the case of COSCO indicates that there can be synergy effects among national businesses with interconnectivity, or among affiliated corporations in a group through alliances with other shipping companies. The marine industry has developed mutual organic influences in various

industries such as shipping, shipbuilding and port operations. Therefore, when the existing big 3 alliance system is reorganized in the future, various synergy effects of benefits will appear in the national marine industry if global shipping companies reflect the internal and external environments in the process of forming alliances in a long-term and comprehensive perspective.

Lastly, various factors such as the dimension, competitiveness, and finance play important roles in regulating cooperative relations to form alliances. However, in the strategic alliance relation that companies share some parts of their competences with one another and promote mutual interests, the dimension of a company is not an absolute condition; if the intention to form a partnership and the interest relation are same, a strategic alliance can be organized. To survive in the shipping industry, where the dimensions of ships have rapidly expanded and more fierce competition is expected, shipping companies of middle standing, should organize staged strategic alliance relations and expand their own ship dimensions so they can belong to alliances of the same status through negotiation of equal status.

6. Conclusion

A strategic alliance is different from M&A in that it is formed among companies who have similar conditions in partial competence to create synergy effects. Each shipping company forms and maintains strategic alliances in various ways, such as distributing ships jointly and chartering another shipping company's ships in order to provide shippers with more diverse shipping services by expanding the other's networks in the dynamic structure of the current shipping market.

In this study, a cross-sectional study was done by adopting the event study methodology to find the effects of shipping company strategic alliances and partner volatility on relevant stock prices based on the reorganization of global shipping alliances in 2017. Companies that joined strategic alliances were classified into three categories, new partner, old partner, and new alliance, and effects on firm value were verified by the analysis of signaling effects through the event study methodology, so a new perspective on the signaling effects of strategic alliances among shipping lines could be presented in this study. The results of the study provides implications that are useful for selecting partners for shipping companies, such as shipping company strategic alliances and the firm value of alliance announcement time.

In this study, an event study was done based on the announcement period with shipping lines classified according to strategic alliance partner volatility (new partner, old partner, and new alliance). The result of the study proved that new partner companies and newly formed strategic alliances have higher expectation effects than old partner company groups, and have a more positive effect on relevant stock prices. In addition, the result of the study showed the same valid results as the alliance levels of each alliance, and showed that investor expectations were higher for new partners and new alliances than old partners. However, the study was done over a short-term period of alliances, so it lacks verification of whether short-term performance affects long-term performances. In addition, due to the difficulty of gaining financial information for unlisted companies, they were excluded from the study. Therefore, it is necessary to use a longitudinal approach with time series resources on the signaling effects maintained in alliances based on accumulated performance and financial materials of companies.

Furthermore, International Maritime Organization (IMO) recently announced that the regulations on the discharge of sulfur oxides will be implemented from 2020 (Cha Sang-Hyun and Noh Chang-Kyun, 2019; Kim Si-Hyun and Chiang Bong-Gyu, 2018), but global shipping companies currently continue to place orders for mega container vessels to expand their ship

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dimensions with the purpose of securing market dominating power and individual competitiveness. As of February 12, 2018, the residual order quantity of the top 10 global shipping companies was at 1.5 million TEU, in which Evergreen had 505,400 TEU (47 ships), followed by COSCO with 443,800 TEU (25 ships), MSC with 332,000 TEU (18 ships), CMA-CGM with 305,500 TEU (23 ships), and Maersk with 167,500 TEU (16 ships). Due to the continuing supply of shipping space, the balance between demand and supply is collapsing. The reason this tendency continues is that the total quantity of shipping space is a basic competitiveness of individual shipping companies, and at the same time, an important variable for joining alliances. Therefore, it is necessary to pay attention to how global shipping companies will cope with the regulations on the discharge of sulfur oxides, which is a trade-off relationship with the increasing ship space quantity, and how the result will change the alliance system.

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