Key Profitability Factors for Strategic Alliances in Shipping Industry

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Abstract. International alliances (or strategic alliances) are combinations of global agreements between linear shipping companies. These agreements were signed in the mid-1990-es, and they include ocean carriers operating the main global routes. Alliances became a crucial phenomenon in shipping in the last few decades. In the past, the cooperation of linear shipping companies stipulated the coordination of prices and volumes. In the last two decades, global alliances of competing companies appear that distribute vessels to increase their operational efficiency and expand service areas. The character of these alliances changed over this period as described in this article. Besides, the authors formulated hypotheses that justify the key determinants impacting the success and efficiency of shipping company alliances. They also provide the results of reliability studies for the data impacting alliance efficiencies, such as the cross-company coordination, organizational training, alliance costs, its duration, and company size.

1. Introduction

The current business environment in the shipping sector is changing fast and becoming extremely complex. The competition between shipping companies is increasing. Clients required services to be faster and more flexible and provided at reasonable costs. New technologies appear in shipping logistics. As a result, shipping companies have to develop and use innovative technologies to facilitate flexible responses to clients’ requests and organize cargo delivery efficiently. Active cooperation with competitors allows shipping companies to survive by forming various strategic alliances to reduce risks and costs and expand the client base, as well as the competitive advantages [1].

Specialists believe that shipping companies receive some advantages from a strategic alliance, yet only some research works focused on how shipping companies can systematically create alliances in their sector. The goal of this article is the study of the key parameters typical of successful strategic shipping company alliances through the analysis of the factors impacting alliance efficiency. These factors include cross-company coordination, organizational training, and alliance costs. In this research, we also review the restricting impacts of alliance duration on the relations between these factors and alliance efficiency.
2. Methods and materials

The short history of linear carrier alliances allows us to review the history of their appearance, development, disbanding, and new formations with higher reliability than the history of linear conferences. D. Pinder and B. Slack mention the agreement of Sea-Land and Maersk of 1991 as the first alliance. More often, researchers mention 1995 as the year when the Global Alliance of OOCL, MOL, APL, and Nedlloyd appeared. A few months later, the formation of a new Grand Alliance of P&OCL, Hapag-Lloyd, NYK, and NOL, as well as the Tricon of Hanjin, DSR-Senator, and Cho Yang was announced. By 1998, only three out of the twenty largest linear container carriers operated outside the alliance systems (Evergreen, MSC, and ZIM) [2].

The impact of containerization on global ports and the port system was as significant as its impact on the shipping industry. Containerization required onshore structures that are completely different from those that were used for a hundred years or more during the age of common passenger ships and freight liners. Intermodality required a further expansion and adaptation of the physical structures, organization, and control. [3],[4],[5],[6].

After the standardization of containers, the marine sector was upgraded, with significant investments in new vessels and port structures, after which container ships became the most widespread and economically feasible means of transporting cargo to large distances. Their appearance led to a dramatic reduction of freight transportation costs and can be viewed as one of the main drivers of globalization. Besides, marine containers offer functional compatibility as they can also be used for further transportation by trucks and railroads. Thus, the growth of globalization and container shipments impact the development of modern container terminals. Due to the high growth rates of the global container trade, every large port experiences pressures associated with the satisfaction of the expected capacity requirements. The increased dimensions of container ships require the improvement of port systems and equipment for land service and distribution. It is necessary to improve the efficiency of these systems to further reduce the operational costs of the terminal on the one hand and facilitate short lay times for ships in the port on the other hand. The leading ports are getting ready to improve their productivity to 200 movements per hour to digest 8000 TEU in less than 24 hours. The use of automation technologies in terminal operations will help improve their productivity even more through the optimization methods [7],[8],[9],[10],[11],[12].

As a result, when container ship companies experience these global economic factors and trends, they form alliances to accept challenges and adapt to the external conditions to protect their interests. Previously, alliances mostly focused on marine container lines. Today, they begin tramp navigation, e.g. The Jumbo SAL alliance combined its fleet and its freight department to improve the service area and commercial potential for project cargo. This helped them become the largest player in the heavy load and project cargo sectors [13].

Research suggests that strategic alliances help shipping companies obtain a number of advantages: increase the geography coverage for their services, i.e. increase the number of outports and diversify shipment routes, reduce costs by dividing capital investment and reducing management risks associated with partners, improve the market share through the economy of scale, and facilitate the efficient skill and knowledge exchange via cooperation.

Although research showed the importance of strategic alliances providing various benefits to shipping companies, there are still some unsolved strategic problems. For instance, can all shipping companies improve their competitive ability simply by joining strategic alliances? What companies can obtain maximum benefits from joining an alliance and improve their competitive edge and what companies cannot? What are the efficient administrative mechanisms for the maximization of strategic alliance benefits and what are the hidden costs of joining and managing these strategic alliances? Despite the importance of the issues mentioned, only a few research works focused on the empirical study of these problems using the quantitative research method. To fill this gap, this article provides the empirical study of the key factors typical of successful strategic shipping alliances. In particular, this article analyzes the factors impacting the efficiency of strategic alliances of shipping companies. These factors include both the internal aspects of specific companies within transport alliances (e.g.
the organizational training and alliance costs) and the external aspects (e.g. cross-company coordination mechanisms for other alliance members) [13], [14].

3. Results and discussion
Shipping companies have a great opportunity for entering new markets via alliances. They could do it quickly, and the associated risks and costs were reduced for some companies. The federal maritime commission (FMC) believes that alliances are needed to maximize the utilization of all opportunities provided by cooperation. Alliance companies retain a right to conduct their own marketing policies. Alliance participants can share vessels, terminals, and other operating facilities [14].

The results of using this approach depend on several factors. They include the coordination of actions between the alliance companies, personnel readiness to solving the problems set, the scale of economic activities, including the number of vessels and their specifications, including container carrying capacity, etc., the costs of cooperation within the alliance: capital investment and current costs, and the duration of joint activities of the alliance companies.

As a result, we formulated the following assumptions.

1. The greater the cooperation between alliance companies, the higher the efficiency of the shipping company alliance.

   A strategic alliance is understood as mutual contractual relations between the companies that cooperate to receive profits and accomplish mutual goals through resource exchange or joint development of products, services, or technologies. Since a strategic alliance is manifested in official cross-company agreements, efficient management of corporate relations is crucial to the accomplishment of the original goals of the alliance. Cross-company cooperation is especially important in strategic transportation alliances in this respect. Coordination is understood as the “way companies distribute, manage, and integrate a number of interrelated problems” [15].

   Efficient coordination between partners within the alliance helps improve the cooperation and efficiency in the distribution of problems and resources. If alliance partners are well-coordinated, they can develop shared communication platforms or specialized training programs, as well as general guidelines that will help prevent wasteful or repeated actions and improve labor productivity. For instance, if shipping companies want to improve the quality of their service, they might need to negotiate and develop a shared communications system. A high level of coordination may help alliance members improve their labor productivity and efficiency and respond promptly to clients’ requests. Well-coordinated partners may also develop shared problem-solving mechanisms together that would help the companies improve their logistics indicators via the reduction of operating costs and times, and improve the quality of their transport and logistics services through increased flexibility, promptness, and reliability of service. Besides, a high level of coordination improves trust and reduces opportunism among partners. The advantages obtained due to a high level of coordination may help the company find new ways of justifying costs and accomplish the mutual goals of the alliance. Thus, the following hypothesis is developed [16].

2. Organizational training at shipping companies has a positive impact on the efficiency of its alliance.

   Many research works showed that exchanging knowledge with other alliance members may be one of the greatest advantages obtained through alliances. Information and knowledge exchanged by shipping companies include operational skills and technologies, organizational know-how, marketing knowledge, knowledge of the sector or the market, such as valuable information on suppliers, clients, cooperative partners, and the business environment [17].

   Previous research showed that companies may increase their efficiency through active training with partners from the same alliance. Organizational training has a positive impact on logistics improvement, as well as the strategic indicators (e.g. Increasing the efficiency and the quality of service, and creating new values and organizational innovations). Organizational training via shipping alliances may increase the efficiency of shipping company alliances. The knowledge received from the partners within the alliance may help the company find new ways to reduce business costs and
production cycle duration, and subsequently, improve their operational efficiency. New knowledge will help the company respond to the dynamic external business environment more properly. The company may also obtain new technological skills and know-how, develop new shipping-related technology, and keep up with the rapid development of technology and skills. Thus, the following hypothesis is developed [18], [19].

3. Alliance costs have a negative impact on the efficiency of shipping companies in the alliance.

Although strategic alliances may yield numerous advantages, these advantages are not free. Partners within the alliance have to pay the expenses associated with those advantages. Sometimes, these expenses are very high. Companies have to focus on alliance costs to maximize alliance efficiency. Otherwise, they will not be able to improve their profitability despite the higher incomes resulting from alliance membership. This research also focuses on the alliance cost factor, what it consists of and how it impacts the efficiency of shipping company alliances. From the viewpoint of transaction costs, cross-company alliances may generate additional costs to control the opportunistic behaviors of their members. This reflects the requirement to minimize the probability of opportunistic behavior, such as fraud, by alliance members. The monitoring of the improper behaviors of partners requires significant efforts and generates additional costs. Moreover, companies may require to increase their market power or political influence, which may require additional expenses, to maintain cooperation with other members of the alliance and have a stronger position in negotiations. These costs are called operational, and they are required to manage the current relations in the alliance. Apart from transaction costs, there are cooperation costs generated by alliances. These are the costs associated with the accomplishment of shared or individual alliance goals and the maintenance of partnerships through mutual trust, mutual activities and internal adjustments in response to the partner’s activity or environmental problems. If these alliance costs are excessive, they can become a burden and have a negative impact on company efficiency and profit. Since the operational costs of the company increase, its services become more expensive in a competitive market, which results in lower customer satisfaction. These costs prevent the company from investing additional funds in new services or value-creating activities. Thus, the company cannot implement innovations and may experience problems with the accomplishment of alliance goals due to the increased costs [20], [21].

3.1. Economies of scale

Containerization made linear shipping more standardized, which resulted in a large-scale business model. Standardization resulted in a reduction of transportation costs and made linear shipping more versatile, which, in its turn, reduced the costs through economies of scale. This is manifested in a significant increase of container ship dimensions, while all types of vessels became bigger over the last 2 decades. The second factor for the use of large ships after deployment (expansion) is the reduction of transportation costs for one container.

It is believed that alliances can be an optimization instrument resulting in the economies of scale effect. They provide shipping companies with an opportunity to buy new large vessels together and distribute their vessels to ensure the shipload factor necessary to achieve benefits from the economies of scale. In other words, significant cost reductions can be achieved if partner companies are willing to cooperate [22].

3.2. Economies of volume (diversification economies / operation scale growth economies / coverage effect)

Alliances could also help shipping companies improve the offering of their services to clients. More importantly, alliances could help them offer a comprehensive global shipping network.

Coverage expansion and offering a greater range of services are the key motivations for joining a strategic alliance according to the surveyor’s study carried out by container carrier representatives. Many shipping companies have stronger positions in specific regions due to their extensive experience and the availability of local clients. Alliances with shipping companies operating in different regions could be useful for the provision of services to a greater client network [22].
4. The impact of cross-company coordination, organizational training, and alliance costs on alliance efficiency can be mitigated by the duration of the alliance.

The positive and negative impacts of the three variables (cross-company coordination, organizational training, and alliance costs) on alliance efficiency vary depending on the age of the alliance. Gradually, alliance companies become familiar with each other’s business systems or communication styles and use their experience to adapt to different situations and communication errors when solving different problems together. Although alliances may seem well-coordinated, at the initial stages, partners might have to invest a lot of time, resources, and efforts to accomplish shared goals. If partners have been maintaining the alliance for some time, they may coordinate their actions more efficiently. The coordination effect improves as alliance age increases. As for the correlation between organizational training and alliance efficiency, alliance duration may also shift it towards positive effects. Since companies accumulate cooperation experience and learn how to manage cross-company relations more efficiently to obtain knowledge, long alliance duration may help provide organization training to alliance partners. Alliance duration may also mitigate the negative impacts of alliance costs on the results of its activities. First of all, long alliance duration may reduce the operational costs of its members. Mutual trust appears as a result of intensive interactions between the partners, and it can reduce the potential risks of their opportunistic behavior and improve the transaction results. The exchange of experience within the alliance may also mitigate the negative impact of costs on cooperation. These benefits of a long-term alliance may reduce the negative impact of alliance costs on alliance efficiency even further. Taking into account the abovementioned arguments, we developed the following hypothesis about the restricting role of the alliance age [23], [24].

The suggested conceptualization is shown in the chart in Figure 1.

Table 1 presents the results of the reliability and validity research of the factors impacting alliance efficiency.

![Figure 1. The conceptual model of an alliance](chart.png)
Table 1. Reliability and validity of the factors impacting alliance efficiency

| Variables                      | Measurements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cross-company coordination    | - The availability of shared goals that the members of the alliance are willing to pursue throughout the alliance duration;  
- The availability of mutually developed cooperation procedures;  
- The readiness to adjust the operational methods to facilitate partners’ needs;  
- Active cooperation in solving the problems related to alliance matters.  
- The readiness to share useful information or shipping know-hows, clients’ needs for shipping services, working skills, planning, and information technologies used in shipping within the alliance;                                                                                   |
| Organizational training       | - Organizational and administrative personnel management skills;  
- Marketing know-hows (e.g. promotions, client relation costs, and management).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Alliance costs                | The costs comprise the following:  
- Solving large and complex problems (geographic, market, hierarchic, or technological aspects of shared problems);  
- Differences in social and cognitive parameters of the companies in the alliance (different cultures, management styles, priorities, operational logic, etc.);  
- The risks associated with the opportunistic activities of partners in the alliance can damage the company.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Alliance duration             | The number of years that the alliance exists.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Alliance performance          | **Logistics performance:** expansion stipulating the following terms:  
- The operational costs of companies and service prices are low;  
- The lead times are short and punctual;  
- Companies respond flexibly to the needs of their unstable clients;  
- Companies adjust their services to satisfy various clients;  
- Companies provide exact information to their clients;  
- Companies provide safe services.  
**Strategic efficiency:** a degree to which:  
- The alliance can help companies create new opportunities as an important source of cooperation value;  
- The company is satisfied with the alliance in accomplishing the initial goals of cooperation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Company size                  | Personnel count, overall sales volume.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
4. Conclusion
The research shows that alliance efficiency is impacted by such factors as cross-company coordination, organizational training, alliance costs, alliance duration, alliance performance (a combination of logistics performance and strategic efficiency), and company size.

The results of this research show that cross-company coordination and organizational training have a positive impact on alliance efficiency, while alliance costs have a negative impact. Besides, alliance duration has a moderate impact on the relationships between these three factors and alliance efficiency.

This gives us an idea of how shipping companies can manage transport alliances with their partners by simultaneously considering internal and external, positive and negative factors impacting the efficiency of their alliance.

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