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WORLD MARITIME UNIVERSITY

Shanghai, China

**RESEARCH ON VERTICAL ALLIANCE FORMATION BETWEEN PORTS
AND SHIPPING LINES: PROBLEMS AND SOLUTIONS**

By

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A research paper submitted to the World Maritime University in partial fulfillment of

the requirements for the award of the degree of

MASTER OF SCIENCE

in

INTERNATIONAL TRANSPORT AND LOGISTICS

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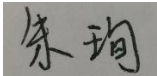
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The contents of this research paper reflect my own personal views, and are not necessarily endorsed by the University.

ZHU XUN



.....

Supervised by

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ABSTRACT

Title of Integrative paper: **Research on vertical alliance formation between ports and shipping lines: Problems and solutions**

Degree: **MSc in International Transport and Logistics**

Globalization has placed more and more countries in the global network of labor division, an area featured with boundless competition has come into being, the operation mechanism of the market economy requires that each country should open to the outside and its commodities、labor services、capital and information involved in the market system, the rapid development of the international trade provides good opportunities for the logistics industry, it could be found in every corner in the world, the logistics has become the bridge connecting the global producers and consumers and an indispensable part of the economy development. Ports and shipping companies are important parts in the logistics industry, how to make full use of the two is an urgent issue in both theory field and operation.

This paper starts with the background of the cooperation between ports and shipping companies, describes the crucial companions that the ports and shipping companies are facing with, studies the necessity of cooperation in terms of the theory, by vertical integration and trade expenses theory are adopted to study the benefits from the cooperation for both the port and shipping companies, the game theory also make the comparisons between the gains and lost before and after the cooperation. In the

following chapters, this paper has a detailed description of the history and status quo of the cooperation between the ports and shipping companies, compares the different kinds of cooperation types and analyzes the potential problems and in the cooperation, at last, the paper proposes the advices for ports shipping companies and government in the process of the cooperation, the author advised that all concerned parties should emancipate the minds and deepen the reform by a further step in the operation of the cooperation, the process should be guided by the market and carded out in an all-round way and multi-level way. Meanwhile, the gains and lost in the history should be learned to prevent the failure in the future, be prepared for the potential problems, the concrete measures should be made to deal with the difficulties, the government should also strengthen the function as guiding and creating a good atmosphere for the cooperation.

Keyword: cooperation between the ports and shipping companies, competitions, game theory, benefits, problems and solutions.

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1. Introduction

1.1 Background

1.1.1 Economy and Trade Background

The liberalization of global economy shapes the pattern that different countries depend on each other and compete with each other for their economic development, which promote the economy at a growing speed, and inject vigor into the international shipping industry that support the global trade. With the swift development of economy globalization and domestic economy, China has worn the status of global factory. The fast growth of import and export has been beneficial to the development of our logistic industry. Among many indicator in the statistics, change in cargo throughput and container throughput of harbor have well embodied the evolvement of domestic shipping and logistic industry. In 2014, the harbor above designated size completed the throughput of 11.2 billion ton, which had a year-on-year growth of 4.8%. In 2014, nationwide harbor completed the container throughput of 202 million TEU, which had an increase of 6.4% over the previous year. In 2013, the container throughput of nationwide port was 189 million TEUs, therefore, it was the first time China's exceeded 200 million TEU throughput in 2014. Our dominant position remains in the field of global cargo port and container port. Over the past decade, the major cargo throughput of China's coastal above scale port showed a steady and rapid rise. The development and maturity of above-scale coastal main ports have been driving the rapid advance of the entire shipping industry logistics chain. 2014 world's 10 largest container ports throughput statistics league tables shows that the ranking of the world's 10 largest container port in 2014, including Hong Kong harbor, China's ports made up a total of seven seats. Among the top ten ports, China's "Legion" completed container throughput accounting for 68.6%, which nearly keeps the level of 68.7% of the previous year.

1.1.2 The situation background of port and shipping industry

In recent years, the transformation and upgrading of liner companies has been making the worldwide ports unprepared and is a disaster after another for the badly profitable harbors. First of all, the liner companies continue to put large investment into the constructions of super container ships to decrease shipping cost and achieve the profit optimization. Taking the shipping order for instance, the loading capacity of the newly delivered ship in 2016 is 7500TEU to 18000TEU, even bigger, and these ships will gradually be put into use in the worldwide big ports. Secondly, with evolvement of ship's upsizing, many liner companies weed out the old ships and introduce new large ships to open up new routes. Ports around the world have complained that the size of docked ships becomes larger and larger. In order to address excess loading capacity problem caused by large-scale container ships, liner companies have formed a strategic alliance. Each league make full advantage of the new modern vessels to help the carrier to get the best lines, and minimize cost. Effect that ships' upsizing and strategic alliances of shipping companies bring to port and supply chain partners global. But, throughout the complex issues that has been brought to the entire port industry, its theme is the change and innovation issues of the port. Whenever a large ship berthing, terminal operators are filled with tension while handling the overload of containerized cargo, the tension will rapidly expand to railways, highways, set cards even warehousing, during which there will be a variety of problems. To solve these unprecedented problems, it will give rise to all kinds of dialogue and consultation between terminal operators, intermediate service providers and various clients, during this period the port will play a leading role. Port management will become the center of infrastructure and reform for the terminal operation, rail transport, ship leasing, labor market, supply chain and logistics partners. Port management team not only has the widest viewing angle in the challenges like flow of goods, but also has an important position on the table in negotiations with the major shareholders of the relevant industry. In addition, the International Port Association members share the latest information and best shipping operations program, learn from each other, strengthen the dialogue and

make joint efforts to meet challenges in dialogue with our customers and partners. In the near future, to improve the levels of innovation and efficiency in maritime trade, the port industry will be more attention from other industries and become the one who provides solutions to shipping issues.

1.2 Purpose and meaning of thesis study

Shipping Companies alliance is one of the trends of modern port shipping and logistics development, including the lateral between liner shipping companies and the vertical alliance between liner shipping companies and port enterprises, in which global alliance has become important form of horizontal cooperation alliance among the liner transportation companies. With the accelerating process of economic globalization, global shippers, especially transnational corporations have made increasing demands to liner shipping companies, hoping liner shipping companies have more extensive coverage of routes and provide more intensive flights and higher quality comprehensive logistics services. In addition, with factors like the global economic recession, overcapacity of shipping market, international oil prices going higher, It is increasingly difficult the liner shipping companies with "go it alone" operation mode to survive. Therefore, under the premise of maintaining their separate legal status, the liner shipping companies cooperate in the route set, the capacity and use of shipping space to forge shipping alliances. The essential difference between Shipping alliance and the liner conference is that members of shipping alliance carry out marketing and sales of route independently, and compared to the liner conference, it is more conducive to compete and cooperate. Portrait alliances between liner shipping companies and port enterprises have far-reaching significance to both port companies and the liner shipping companies. The port companies attract more shipping lines to be affiliated to the port through alliances with shipping companies, which speeds up the development of port enterprises; to liner shipping companies, through alliances with port companies , to build a global logistics service network and shipping companies continue to improve

their warehousing, distribution, packaging and other additional services to enhance the quality of logistics services through ports; for the whole Union, incoming integration makes port and liner shipping companies are no longer operational separately as separate logistics nodes , and the division of labor is carried out in the form of vertical alliances. They share risks, and gains.

1.3 Literature Review

Michael Potter (1997) analyzed the causes of the formation of vertical alliance from the angel of value chain. Since the vertical value chain enterprise product sales business is indivisible, any part of the supplier's economic activity will cost and profit from business operation, at the same time the enterprise economic activity will also affect the other suppliers in the supply chain. Therefore, from the vertical value chain point of view, a vertical alliance between enterprises and suppliers undoubtedly will greatly improve the stability of vertical value chain, improve the comprehensive competitiveness of enterprises, the two sides can be improved through the unfavorable factors in the value chain, to realize the win-win situation. Sporleder (1992) believes that the specific capital is another important influence factor of influence of vertical alliance. On the one hand, vertical alliance enterprise groups have to pay a big mount of specific capital to the alliance, which makes the enterprise not willing to completely cooperate; on the other hand, once the enterprises withdraw from the vertical alliance, enterprises will have to give up the special investment, in order to make up for the loss, vertical alliance enterprises also have to maintain this state until the vertical alliance cover the full investment

At present, there are many studies on the integration of port and shipping operation, and most of them focus on the system issue of integration, the necessity of cooperation and the potential problems. Peng Cuihong is the first one to describe the current financing system and policies of ports and found the problems inside. Next, she analyzed the typical financing system and policies. Then she conclude the

characteristics of overseas financing system and policies, she also and discussed on domestic financing system and policies in *On the study of port financing reform*; Fan Houming had a systematic and in-depth study on the motivation of transnational investment and operation, basic form, regional choice and investment participation form. In his *worldwide port and shipping enterprise call for accelerating the global integration*, he said in the top 10 largest port operators, half of them have shipping company background and he listed a series of examples of the integration of shipping companies and ports. Although there are many relevant studies, the analysis of the integration of ports and shipping companies, especially of the integration, potential problems and solutions in particular domestic condition is not enough.

1.4 The main content and basic thinking of Thesis

This paper takes the today's popular integration of ports and shipping companies as the foothold, the vertical integration and game theory's significance as the theoretical analysis, and retrospect the process of constructions and integration, scans and compares all the integration pattern, puts forward the potential problems in the integration. In the advice section, this thesis gives advice at the angle of ports, shipping companies and government.

2 Analysis of relevant theory about Integration of ports and shipping companies

2.1 The current situation of alliance between ports and shipping lines

Under the trend of containerization, the status of shipping company is rising constantly. In the background of the integration of ports and shipping companies, ports and shipping companies pursue cooperation actively. The main cooperation is between state-owned ports and international ports operator, and between state-owned ports and international shipping companies. The main cooperation modes between ports and shipping companies are shipping companies' participation and holding. According to incomplete statistics, the cooperation projects distributions are:

Table 2.1 the cooperation projects distributions

lines ports	COSCO	CHINA SHIPPING	HWL	C M G	PSA	DPWOR LD	NB PORT GROUP	M T L	MSC
Shenzhen	√					√		√	
Guangzhou	√	√			√				
Shanghai	√	√	√	√		√			
Ningbo	√		√	√					√
Qingdao	√			√		√			
Dalian	√	√			√				
Yingkou	√	√							
Zhanjiang		√		√					
Yantai		√				√			
Tianjin		√		√	√	√			
Shenzhen			√	√					
Xiamen			√	√					
Suzhou							√	√	

As we can see in the table, comparing with the relationship between traditional shipping companies and ports, today the relationship between partners have become much closer. The integration of ports and shipping companies have become inevitable. More and more foreign shipping companies establish the cooperation with Chinese ports, for

example: from 1996 PSA aimed at the Chinese port market, and it has so far participated in the investment and construction of 19 ports. Chinese shipping companies also establish cooperation with ports. COSCO invested 21 port projects in the world, and 11 of them are domestics. COSCO have 142 berth which is no. 5 in the world.

The integration are more and more mature. On the one hand, shipping companies have gradually transformed by the carrier to the international multimodal transport and integrated logistics operator. On the other hand, ports are not adhere to the traditional port in handling, warehousing services. Instead, ports seek to cooperate with shipping companies in many fields of capital, technology, business, etc. The cooperation can increase the ability of resist risk, bring more profits and efficiency.

2.2 Analysis on the developing trend of world famous ports

The development of modern market economy brings opportunities to the great development of ports companies and shipping companies. The economic globalization makes the logistic more complicated, the transport distance longer, domestic port industry is carried out industrial upgrading from the second to the third generation, ports and shipping companies tend to integrate the logistics business, the efficiency is increased, service level is getting better, but overall, our port and shipping industry still is facing scarce resources, both sides are face greater external competition pressure.

Through analyzing theses famous ports we can figure out what are the core competitions of these ports and how can they form vertical alliances with shipping lines.

(1) Rotterdam

Rotterdam is Europe's largest port, which has the annual throughput of 4.2 million tons and container throughput of 12 million TEUs, is the port of the world's highest levels of industrialization and processing of applications. Rotterdam includes seven port zones, more than 40 basins and can be docked by large oil tankers of 545,000 tons, and can accommodate more than 600 boats thousand-ton vessels ships and more than 30 million

inland vessels. Specific parameters are as follows:

Table 2.2 Introduction of Rotterdam port

Area of port zones	205 square kilometers; 35 square kilometers of waters; 50.4 square kilometers of industrial land;
Throughput	Average annual container throughput reached 6.5 million TEU 656
Number of berths	656
Number of dock	Container Terminal 8, the use of wharf 17, an all-weather docks, ro-ro terminal 7, 12 car dock; Station 2 seat fruits, juices docks 3, bulk terminals 20
Warehouse Area	General warehouse 4,452,505 cubic meters, 310,700 cubic meters of chemicals warehouse, cold storage 3,056,400 m ³ ;
Shoreline parameters	Seagoing vessel wharf total length 56 km, the total length of the riverboat dock 33.6 kilometers, the total length of 37 one thousand port shoreline M, harbor coastline 99 one thousand meters

Rotterdam harbor is the central transit trunk of Atlantic routes, located in northwest Europe, known as the gateway to Europe, ice-free and silt-free all year-round. Its geographical conditions and natural conditions is extremely advantageous. Port of Rotterdam connects Europe's major canals, railways, highways, oil pipelines and other Western European land transport network via the Rhine, with direct access to the entire European its continent, logistics and transportation network is very well developed. Its

direct economic hinterland includes the center of Rotterdam, Britain, France, Germany, Switzerland, more than half of the EU's major industrial countries of Western Europe continent, its indirect hinterland even extends to Russia, Eastern Europe and other inland areas. Currently, more than 65% of the cargoes in European continent are transported to sea worldwide via port of Rotterdam by shipping liners. Vast economic hinterland offers Rotterdam port plenty of transport supply and excellent trade condition. Rotterdam processes a well-developed industry, especially in petrochemicals as the core, the port of Rotterdam and the world's major oil giants have entered into long-term and stable strategic alliance of petroleum chemical industry, currently has gradually formed a large petrochemical logistics supply chain system with the port as the core.

(2) The port of Antwerp

Port of Antwerp Overview:

The port of Antwerp locates in northern Belgium which is Europe's second largest port. The port mainly runs international transport, according to net international traffic, it is the world's fourth largest port. Antwerp transportation network central locates in Europe is very developed, linking production centers across Europe by road, rail, canals, pipelines and other transportation networks. Based on convenient transportation network, multi-modal transport of Antwerp has developed rapidly, now has 960 kilometers special railway lines and 280 kilometers of Port highway evacuation lines and four multimodal marshalling yard. For the port companies, too many hinterlands may cause diseconomies of scale, the Antwerp harbor connects the transport methods of river, rail, highway, pipeline and aviation, transfer part of the transport hinterland to road, rail, which formed multimodal transport corridor inland transport network system Antwerp as endpoint. This increases, to a certain extent, the throughput of the port of Antwerp, and eliminates the ports' diseconomies of scale, relieves the possible congestion during development of ports. Antwerp's petrochemical processing industries are well developed, it is now only second to

Houston, the world's second largest petrochemical production center and distribution center.

Table 2.3 Introduction of port Antwerp

Total area of port	140 square kilometers
Container Throughput	8.483 million TEU
Number of berths	More than 500
Number of dockss	63 docks, 18container terminal
Warehouse area	all kinds of warehouses and special equipment
Shoreline parameters	a total length of about 130km of berths

(3) The Port of Hamburg

Port of Hamburg locates in Elbe River, the confluence of Alster River and the Biller River, 60 sea miles away from the North Sea. It is Germany's largest seaport, and one of the European modern ports. Port of Hamburg is the best water running water port in the European Free Trade Area, and it has regular business dealings with more than 200 ports around the world, it has 40 harbor basins and 30 river port basin, 60 Canal and its tributaries Basin, port facilities are full-edged, excellent berths, which can berth over 250 large cargo ships at the same time. Port of Hamburg has seven main port area, among which the Hamburg duty-free port accounts for more than one-third of the total area. It is the world's leading duty-free trade zone. Other Port mainly engaged in various scattered groceries, large pieces of cargo, container and ro-ro cargo loading and unloading, storage and transportation services, in recent years, Hamburg focused on the expansion of the 5th and the 6th ports that are specially built for grain, crude oil, coal. Specific parameters are as follows:

Table 2.4 Introduction to the Port of Hamburg

Total area of port	100 square meters; the waters of 37.8 square meters, 16.2 square kilometers Free port Zone
Container Throughput	7.01 million TEU

Number of berths	More than 310 berths
Number of docks	Total 63 docks, five container terminals 18
Warehouse area	Storage area of 180,000 square kilometers of the Treasury, different types of specialized warehouses and handling equipment
Shoreline parameters	total length of 270 km

Similar to Rotterdam, Antwerp, the Port of Hamburg is also connected to the European inland through developed transport modes such as waterways, railways, highways, pipelines, multimodal transport is extremely convenient. As Europe's largest railway container transshipment terminal, the Port of Hamburg railway traffic has been rising every year, multimodal transport of sea and railway is the main mode of its goods evacuation. According to statistics, in the more than 150 km long distance container transport in the hinterlands, , up to 70% volume of container transportation is done by rail. Port of Hamburg has intensive flights, adequate railway transport capacity, service quality assurance, this advantage helps Hamburg attract a large number of European supply in hinterland.

(4) New York - New Jersey Harbor

The Port of New York - New Jersey, is America's largest port, the US East Coast's largest container center and car import and export port, North America's third-largest container port, one of the world's largest natural deep-water ports. New York - New Jersey Port is located in the northeastern United States, east of the Atlantic, across the two states of New York and New Jersey. New York - New Jersey Port is the port with the largest port areas in the world, specific parameters are as follows:

Table 2.5 Introduction of New York - New Jersey Harbor

Total area of port	3800 square kilometers; water 37.8 square kilometers, 16.3 square
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	kilometers Freeport Zone
Container Throughput	5,292,000 TEU
Number of berths	more than 400 deep-water berths with depth of 9-14.6 meters
Number of docks	Container Terminal 37
Shoreline parameters	Pier 65 full-length one thousand meters

New York - New Jersey Port has excellent geographical, economic advantage, container throughput accounts for 30 percent of the US East Coast ports. It's the US East Coast's largest container port, which consists of four container terminals and a car loading zone. Currently, the world's top 20 shipping companies such as Maersk, Orient Shipping, and COSCO and have become the major long-term partner of the port.

2.3 Introduction to vertical integration

2.3.1 Description of vertical integration theory

In the production and distribution of the product, if the manufacturers are involved in more than two successive stages, it is called vertical integration, also known as vertical integration, which includes a backwards (upstream) integration and afterwards integration the (downstream). Western economists' views on vertical integration are numerous, but the most influential commentary has become systematic two schools, which are industrial organization school and transaction costs school. Industrial organization's theory is that vertical integration is one of the typical market behavior of enterprises, which is determined by certain market structure, which in turn directly affects the market structure, and formulates certain market performance. It belongs to the study of industrial organization theory. Initially, scholars sought answers of vertical integration from production technology and they thought technology dependence of the production process is the main reason for the formation of vertical integration, but in reality, many of the production stage of same enterprise are technically not closely

linked and they can be completely separated. The root of vertical integration is not the case, instead the industrial organization theory turned to analyze in terms of enterprises' monopoly motivation, industry life cycle, uncertainty; in transaction cost theory, the transaction cost theory puts forward The concept of transaction costs from the perspective of market failure, Coase published his *Nature of the Firm* in 1937, analyzes the determinants of enterprise's level of integration from the perspective of transaction cost advantages business and markets, . It noted that business and markets are two alternative mechanisms to each other, operations of the market cause transaction costs, in some cases, instead of the market the enterprises organize economic activity, may reduce the transaction costs, transaction costs led to the emergence of the enterprise. in the In internal organization, market transactions causes an extra transaction costs, which are equal to the cost of transaction on the open market or the costs of organized transaction in another firm . So far we understand the existence of vertical integration, then the existence of the enterprise; this illustrates the degree of vertical integration, it also indicates the boundaries of business and markets. The study of vertical integration occupies a very important position in the transaction costs theory.

2.3.2 Analysis of vertical integration of port and shipping companies

In the integration of ports and shipping companies, the vertical integration can be achieved through merging poring and shipping companies that provide investment or use their own product, or through internal self-expand into the production of their inputs, outputs, or use business area of their own products. Vertical integration can not only moves forward, it can also be extended backwards. For shipping groups, the industry may be considered for the implementation of the integration are: the shipbuilding that related to ships, ship repair, port and stevedoring services, shipping agents, supplies and other industries: container manufacturing, repairing and container trailer manufacture, repair industries and express delivery industry that is related to file, documents. Shipping companies invest in these industries, which helps to save operating costs, and also to promote the products and services to the markets. Thus this

can become another source of corporate profits. the shipping companies to integration can be developed for the transportation service end-users a real owner among many service industries, such as freight forwarding industry, warehousing, cargo terminal, container yard services. Before the shipping companies may also include the integration of inland container transport, goods packaging industry, air cargo, logistics services, and communication and information services and so on. The vertical integration of port and shipping companies has brought the following advantages to both of them:

(1) For container transport services, the small product differentiation, the groups that implement forward integration can directly enter the marketing field, which will be helpful to enhance service product differentiation and get rid of negative factors in price competition. In general, the bigger of the trend towards the front end consumers, the more chances to formulate differentiation there will be, the added value of transportation will be higher, which brings greater profits. In addition, forward integration also can strengthen the connection of production and marketing and is conducive to accurate real-time feedback of market information, particularly the shipping companies can do quick adjustment to enhance market adaptability according to information of many aspects like the owners' requirements of the transport services.

(2) Although the implementation of vertical integration requires enterprises to increase investment, but overall, taking into account the opportunity cost of investing in the future, such a strategy actually still can make the total operating costs decline. In terms of backward integration, domestic shipping agency industry and ship's spare parts supply industry are with low investment, highly profitable industry, and the courier industry, although profit is not high, but because of its small investment, requirements for technology are very low, it may be an effective way to settle their surplus labor and reduce administrative costs. This turns the enterprises' external transactions into internal transactions, reducing transaction costs. For forward integration, it mainly lies in the establishment of the Group's own freight forwarders, logistics center, container yard, warehousing services, etc. The centralization of these freight functions can reduce

overhead costs and reduce the marketing aspect, with better synergies effect, can improve efficiency, resulting in economy. In practice, many large domestic and foreign shipping groups have done a lot of efforts and achieved good results.

(3) The vertical integration can enhance the control of production and marketing process, avoid supply interruptions or fluctuations caused by radical changes in production and marketing, reducing competitive pressure from suppliers and buyers and obtain information that was not accessible before, which is conducive to improve the effectiveness of management, and make it easy to measure, because of the upsizing of companies , cost reduction and increased control capabilities, the barriers to entry have been increased .

(4) Through vertical integration strategy, shipping enterprises achieved the continuous extension from the land to the sea for to provide a stable and reliable integrated logistics services to the suppliers. Since the 1990s, under the influence of internationalization trend, integrated logistics services have become the focus of the shipper, whose business strategies demonstrated its transition from the production and marketing-oriented to the market service-oriented, in terms of business, the strategy of rationalization of overall logistics strategy is implemented to save distribution costs, increase productivity, to ensure a continuous smooth process of production the marketing. Thus this requires that shipping companies should not just stay only in the maritime transport, but also provide a full range of services to the shipper in the entire logistics process. Because of owner's increasingly high demand for transportation services, shipping companies began to shift attention to the entire logistics system, its business began to expand its operations through vertical diversification into all aspects of logistics systems, and their role is being transferred from a carrier at sea to integrated logistics service provider.

(5) Compared to the backward integration strategy for shipping companies, port and shipping integration is forward integration, integration of resources of ports, upstream,

and downstream businesses, development trend of network has been made a necessary requirement to ports. Modern port is no longer a simple place for exchange of goods, transit and transport properties, but an important part in the global supply chain network. The development of a network requires the ports are placed in a network, so that the direction of the ports must have multi-modal transportation of sea, road, rail, air, pipeline transportation and set the transport, storage, processing, distribution, information as a whole, implement the integration division of labor between the nodes, connecting the combination of the overall services between nodes, with a number of functions. The development of modern supply chain is bound to bring a change in the development of the port, it requires companies in traditional transport chain can no longer operate in isolation, some forms of communication is necessary and essential. After the port enterprises develop to a certain size, they must expand the room for their survival and development, which inevitably requires the ports cooperate with the forward and backward stakeholders in logistics supply chain. Through integration with major shipping companies, there is a guarantee of sources that ports live on, in the actual operation of the ports, a port can impose deadly blow to the adjacent harbor through this integration, a certain degree of supply monopoly can be achieved, from the perspective of transaction costs, it also can be understood that, in the increasingly fierce competition in the port industry, port transaction costs paid for the cargo sources will also be higher and higher, therefore, the integration can save the costs to be beneficial to both of the ports and shipping enterprises.

2.3.2(1) The Game theory and Integration of ports and shipping companies

Since the co-classic of von Neumann and Morgan Stanley "game theory and economic behavior" the game theory has gradually become the cornerstone of mainstream economics, has been widely used in many fields of economics. Now game theory is gaining acceptance and use of economic discipline throughout almost the entire microeconomics and macroeconomics. And it also has an important position in industry organization theory and environmental economics.

Game theory is the study of decision making theory for many people, particularly, it is a balanced study of decisions made by the decision-making subjects when their behaviors are interacting with each other. In the game model, based on the sum of all players' payment, it is divided into zero-sum game and non-zero-sum game. For any situation, if the sum of payment of all the players is zero, the game is called zero-sum game; otherwise a non-zero-sum game. According to whether the players are integrated, the game can be divided into integrated Game and nonintegrated Game. The main difference between them lies in the interaction of the Game of the parties, the parties can reach a protocol of integration. If two oligopolistic firms reached to a binding agreement between them; joint maximized monopoly profits, and their production is based on the agreement that is the integration game: otherwise, it is a non-integrated game. Nonintegrated Game emphasizes that individual rationality, individual optimal decisions, the results can be effective or ineffective; Integration game emphasizes a collective rationality, emphasizing efficiency, impartiality, fairness, and the results often have effect of $1 + 1 > 2$. Non-zero-sum game and Integration game theory give significant revelation to operators, who aim to achieve win-win objective and increase of their competitive advantage. They turned from zero-sum game to non-zero-sum game and strategic alliances, through effective consultation, coordinate their resources to achieve a common recognition of a binding agreement, to form alliances through a variety of bonds to share the benefits brought by the Union, so that individual rationality and group rationality can reach to consensus, hoping in the increasingly fierce competition, the competitiveness of each other or share of the market can be jointly improved.

2.3.2(2) Analysis of the ports shipping companies Integration game

Integration of enterprise is of great significance to operations of ports and shipping business. Establishing increase mutual trust between port enterprises and shipping companies to make integration become stable, and to promote their individual rationality and organization rational of the alliance reach to an agreement, which is the

key issues in the operation of the ports and shipping companies. The integration game model is applied to take the integration and competition between strategic alliances of shipping companies and as many integrated games and non-integrated process integration of the union members, it can reveal the essence of internal relations within the alliance: The building of the alliance is a complex, dynamic process the union was not set up overnight, its members are not immutable either, but for simplicity, the paper only put the logistics alliance of port business in the framework of a static game for discussion. When the companies are in relationship of market, it is the exposed the companies often did not hesitate to destroy the tendency of interdependence to pursuit the best interests, means they used for interests has often led to losses of other companies, thus they may obtain revenge, as a result, the interdependence of these logistics services will soon be broken.

Table 2.6 Companies profits envisaged table under conditions of market relations

Profits Analysis	Coordination(party A, party B)	Self-interest(party A, party B)
Coordination(party A, party B)	5, 5	2, 7
Self-interest(party A, party B)	7, 2	3, 3

According to Table 2.6, the profit volume for both sides is 5 when they adopt coordinated behaviors; If one of them adopts self-interest behaviors, it can receive temporary profits, this is a profit volume of 7, but it causes another company's loss, decreases its profit to 2, which shall lead to another company's self-interest behaviors, even revenge, resulting in losses of both sides. (Note: the data in table is envisaged relative volume). If both sides can see the bad consequences after self-interest behaviors, and they are willing to build an alliance to bind self-interest behaviors of both sides and

formulate the norms that both sides cannot adopt self-interest behaviors that damage each other, and both sides can utilize the relevant sources such as logistic facilities, information, etc. In the operation of the alliance, the logistic quality is improved through high standard coordination management, which brings new added profits P to the port companies in the alliance. When $5+P>7$, the alliance will develop stably; Otherwise, when $5+P<7$, there is possibility of self-interest behaviors for maximum profits, which means the alliance is not stable.

Table 2.7 Companies envisaged profits table under conditions of alliance

Profits Analysis	Coordination(party A, party B)	Self-interest(party A, party B)
Coordination(party A, party B)	$5+P, 5+P$	2, 7
Self-interest(party A, party B)	7, 2	3, 3

(Note: the data in table is envisaged relative volume, P is the new added profits that the alliance brought to companies.)

What needs attentions is that: (1)when two companies build an alliance, they must make norms to punish the company that adopts self-interest behaviors, the punishment is F ; (2)If two companies both adopt coordinated behaviors, the logistic alliance will not break up immediately, so as the time goes by, the integration of alliance members are tend to be smooth, so the new added profits will grow, that is the P will grow continuously;(3)If one side adopts self-interest behaviors and the alliance is not broken, the other company will demands to increase the demands of punishment, that is the F will grow continuously, too. If the situation develop as above, with the development of the alliance, the profits that gained through self-interest behaviors will be less than that

through coordinated behaviors, that is the $7-F < 5+P$ will be the only possible end. The envisaged profits table is shown as 2.8:

Table 2.8 Companies envisaged profits table under conditions of alliance

Profits Analysis	Coordination (party A, party B)	Self-interest (party A, party B)
Coordination (party A, party B)	$5+P, 5+P$	$2, 7-F$
Self-interest (party A, party B)	$7-F, 2$	$3, 3$

(Note: the data in table is envisaged relative volume, P is the new added profits that the alliance brought to companies. F is the punishment for companies that break the contracts)

From the above analysis, we can see clearly that as long as the logistic alliance built by port companies adopts proper mechanism to regulate both sides' behaviors, as the time passes, the logistic alliance will be more and more stable. Generally speaking, the vertical theory and game theory support the rationality and necessity of ports and shipping companies' integration.

2.4 Major forms of ports and shipping companies integration

Forms of cooperation Vertical alliance between liner shipping companies and port companies include the sole proprietorship or acquisition of terminals, shipping companies and ports' development and management of joint venture terminal, shipping companies share port enterprise and ports shipping companies alliance jointly provide logistics services with third-party. Through the above four kinds of ways, ports and

shipping enterprises form vertical alliances to ensure that liner shipping companies build global shipping network and ensure ships of liner shipping companies get in and out of port fast, complete docking, loading and unloading operations, reduce dock operating costs.

(1) Shipping company's sole proprietorship or acquisition of marina

The basic strategic model of this integration is: the government or port authorities planning land and the shoreline grant, the shipping companies bid through tendering, then own, develop and construct the dock. In general, shipping companies choose this strategy mode are rich and powerful, multinational shipping companies, in order to ensure quick, smooth entering and leaving port and berthing operations on its trunk large vessels or strategic routes, it invested heavily in development and management of exclusive wharf.

(2) Ports and shipping enterprises' joint development and management of docks

The basic strategy of ports and shipping enterprises' integration mode are: ports use existing land, shoreline, as well as related facilities and other physical berths to purchase shares, and shipping companies usually provide capital investment. Then both sides jointly develop, construct and operate the docks. Compared with the above, the integration model that both sides share risks and benefit, it will have a more direct and closer guidance and regulation for long-term integration between the port and shipping. Specifically, for shipping companies, this integration model, in addition to the priority access to berths and facilities for self-operated fleet, it also contains the capital operation and shares of economic benefits, and for the port companies, this integration model, it can revitalize the existing stock, expand financing channels, introduce foreign capital for the development and construction and technical updates, even if there is some income outflow, It is may also be a good deal. Therefore, ports and shipping enterprises' joint development, construction and operation of docks, is one of the world's typical and widely integration model.

(3) Shipping company sole acquisition and operation of the existing dock

The basic strategy mode of this kind of integration is; shipping companies acquire the right to operate the dock with the corresponding facilities in a certain period through exclusive financing. For the ports, this integration approach, can help ports to obtain funds by transferring the right of terminal operation, and engage in the development of other valuable projects or renewal of equipment, and for shipping companies, then can achieve an operational efficiency and a favorable economic interests in their important transport nodes, through personalized operation strategy.

(4) Shipping companies' sole ownership or joint leasing operation of docks

The basic strategy mode of this kind of integration is: the project is funded by the shipping companies, in the name of a sole ownership or joint venture, they lease and operate the pier in a given period. Although the move does not involve transfer of dock ownership, shipping companies still can grasp the actual operations, while for the port side there is a considerable income in the same time, it can obtain permission to loose surroundings in terms of rent property control policy. Therefore, this more flexible integration model has also been widely used, including in particular the sole ownership or joint leasing. It has been favored by both ports and shipping companies.

(5) Integration in finance field

Integration in finance field is usually about ship companies investing on container docks, performing its rights as shareholder, and they do not engage in dock's operation. This kind of investment form is called pure investment. Because the pure investment does not actually realize the investment and operation objective of shipping companies, it barely can reduce shipping and it only can realize diversified investment sources and increase profits channels, according to the development trend, signs of pure investment integration of shipping companies and port are decreasing. More and more shipping companies want to really participate in the management of the marina that is the so-called investment management type. In the investment management type, shipping companies not only is shareholders to marina, but also send employees to participate in

the daily management of the pier. This investment is beneficial for the shipping companies to share resources between both sides, it is conducive to achieve the ports and shipping integration services strategy. For the shipping companies, it is beneficial for controlling dock, giving priority to company owned ship's entering and leaving docks, help the companies get preferential rates. For the docks, it is conducive to get supply and funding, and management techniques. In addition to the several integration strategic mode above, with the development of modern logistics and comprehensive services, we can also have some other new ideas. Such as the integrated development or leasing management of warehousing and distribution, multimodal transport, shipping agents, freight forwarders, port and shipping information services, and other new businesses such as trade and tourism, bonded processing. In short, strategically speaking, as long as it is conducive to reduce investment costs and risks, to increase profits and efficiency of investment, improve the management level and market competitiveness, then any kind of ports and shipping integration model is worthy of study and planning.

3 Problems and Challenges in the Integration between Ports and Shipping Companies

The efficiency of the integration between ports and shipping companies which acts a kind of integrating method may be influenced or even failed because of special

characteristics of ports and differences existing in various systems, which result from the short existing history of the cooperation and multi aspects involved by the cooperation. The condition may be worse when different countries engaging in the cooperation. Commercialization of the infrastructure serves as the premise for foreign companies and private shipping companies to directly invest the infrastructure construction at ports. Therefore, the technical and economic characteristics differentiating from other general industrial projects and public facilities projects, and unique functions and properties possessed by ports should be considered by the government and investors. Potential macro problems in ports investment are closely related with these characteristics.

3.1 Technical and Economic Characteristics and Unique Functions of Ports Facilities

3.1.1 Technical and Economic Characteristics of Ports Facilities

Firstly, port acts as an “expectant public object” which means that it is not equal to the “public object” because of volume limitation. In addition, since it is exclusive, it can go in to the market which result in cost sharing and profit distribution. Besides, service fee becomes prominent; secondly, ports have natural monopolistic feature which indicates that the supply of the port facilities cannot in a competitive market. Even though there are some competitions, they are limited. Therefore, the government should to some extent intervene in the operation of the transportation infrastructure. Thirdly, the ports must have scale effect which requires that port facilities must reach some level and stay in a normally operated transportation system so the economic efficiency of scale could be shown. If there are different level of port’s facilities and services, the cost and efficiency will present various conditions; meanwhile, port’s external results are evident which demands that the construction of port’s facilities should have impact on external systems such utilization of local lands, regional economic development,

natural environment and so on forth so that costs and profits respectively possessed by society, users and investors are different. In addition, government should also engage in to control. Infrastructure and parts services provided by the port clearly have the properties as public products. As a result, when providing these services, port should regard maximized social benefits as goal rather than maximized profits.

3.1.2 Unique Functions and Properties of Part Facilities

(1) A safe international marine channel. With the development of the economic scale and market demands, Chinese dependency on energy and raw materials such as international grain, crude oil, and iron mine continuously increase. Therefore, the development of the port must provide safe transportation for these important materials.

(2) Modern ports serves as an information intensive zone. The safety of information covering important materials and logistics is the lifeline of the national economy and port operation. Therefore, ports must be well controls during peaceful and war time.

(3) To attacking smuggling and drug trafficking. Serving as the front to attack organized crimes such as smuggling and drug trafficking, ports need to cooperate with departments such as customs and border defense.

(4) Faced with complex international situation and local conflicts and given emergency reactions to deal with national security, natural disasters and other special conditions, ports need to follow the united control of the country and to have ability to protect and fight terrorists. Every country pay much attention of the control and the management of the ports, because ports investments relate with problems such as national economy and safety. As to the investor selection, there must a comprehensive research result from that it not only the problem between ports and shipping companies. In addition, relevant government departments need to thoroughly study the integrating target and the integrating mode.

3.2 Potential Problems in the Integration between the Ports and Shipping Companies

3.2.1 Potential Influences on National Economy

During the cooperation between the ports and shipping companies, in order to achieve maximized profit, shipping companies more care about gain and lose of the economic profits. They would run the companies based on their developing demands. However, if some key ports monopolized by foreign investment by various form, national macro managing goal will be difficult to fulfill when conflicts commercialized actions of the companies go against the government demands, or as conflicts happen, there is no completed laws and regulations or no necessary managing methods. With the increasing foreign investing force on the Chinese container ports international ports alliance should be strengthened and to form an organic entity with international shipping alliance.

Meanwhile, the sub branch and domestic trade container ports are distributed and constructed based on the scale and demand of the regional economic development and coordinately operating with other transportation methods. If foreign transnational shipping companies choose and invest Chinese container ports according to their developing need, it not only influence distributing requirement about sub branch and domestic trade container ports asked by national economy, but also influence national sub branch and domestic transportation because Chinese shipping companies for domestic trade must adjust themselves to fit lane distribution made by foreign investors. Port company with foreign shareholding may damage benefits of Chinese party in joint-ventured port and cause the loose of Chinese tax revenue. In addition, if the managing right and price-setting right are hold by foreign investors, company profit may be reduced and directly transferred to foreign countries by decreasing price, increasing cost at foreign countries and so on forth. For an instance, the joint-ventured container

ports which is a Liner company holding port enable Liner Company gain giant profit by methods such as reducing all charging standards and transferring parts of foreign costs. However, the benefit costs of the joint-ventured has already compensated leading to the book lose so that the joint-ventured port still could enjoy the national tax preferential policy.

3.2.2 over Intervention in the Economic Decisions

Foreign shipping company may intervene in Chinese economy by over operating Chinese political resources, for an instance, MSK Group. Since most of businesses are not in Beijing, it more makes sense for them to set their headquarter in Shanghai or Shenzhen if they consider the market factor. However, the headquarter of their new holding company is situated in Beijing. As to the overall operating environment, setting the headquarter in Beijing could enable MSK in Beijing master rich governmental resources. Therefore, it is obvious to know there is political consideration in their decision. They could influence economic decisions made by local governments at all levels depending on their giant investment to Chinese ports.

3.2.3 Impacts on Chinese Logistics Industry

Impacts on Chinese logistics industry: it is more competitive for transnational shipping companies to obtain logistics outsourcing business from transnational companies. During the process of globalization, transnational companies become economic subjects in the world. Worldwide resource allocation, production and sale encourage the coming of the age of the international carrier. Basing on the “following customers strategy”, the global distribution of transnational shipping companies’ businesses is decided by the trend of big customers. As to producing-type multinational companies, they have already built a good strategical alliances relationship with many service-type companies which provide services for those multinational companies. According to the Demand Survey of Logistic Service Asked by Multinational Companies in China

published by the *International Business Daily*, logistics outsourcing demand of multinational companies in China reaches over 90%. The survey also showed that the third party logistics companies chosen by multinational companies are foreign-owned companies. The foreign shipping companies who have good cooperation with those multinational manufacturing companies have dominant advantages.

3.2.4 Potential Risk in the Selection of Integrating Mode

The disadvantages of wrongly selecting integrating mode by port enterprises: there are disadvantages for ports using pier infrastructure as share to invest. Ports can only gain profit basing on their participation. However, as time goes by, port resources would be controlled by foreign investors. The best integrating method is to rent prior to joint-ventured companies and only joint venture on the management right of the piers. Therefore, ports not only can get participation in profit but also can get rents. But, under the condition of relative shortage of funds, and more fierce competition for capital, and incorrect analysis about current industrial situation, some port enterprises always turn asset into shares in order to get more capital flow.

3.2.5 Lessons in the Process of Port Investments

Problems happening in the integration is mainly caused by the opacity in the bidding process and non-opened competition. For an example, Montevideo, the capital of Uruguay, since transparent and opened bidding process was not designed firstly, the bidding failed. The government had to pronounce that securities exchange would openly auction the port. Actually, bidding document could clearly explicate object, bidding process, standards for choosing and granting franchise rights and scope of responsibilities of the government and franchise enterprises after the integration. Meanwhile, it must assure that each bidder has a same invitation for bid. Meanwhile, the bidder must provide commercial planning (containing quantitative performance index and market developing goal, etc.) as a part of the contract which would be

restrained by laws. In China, because of uncompleted system, there are many factors influencing the port investment. Therefore, transparent and opened bidding process also cannot go smoothly.

3.2.6 Monopoly, Anti-Competition Behaviors and Regulation after the Cooperation between Ports and Shipping Companies

Monopoly behavior that shipping companies controlling ports companies may damage middle and small shipping enterprises and port enterprises: basing on the market structure, port market serves as a typical oligopoly market in the mainland. Wharf enterprises, particularly container piers enterprises have a strong ability to control market trend. In order to achieve a maximized profit, multinational enterprises would “integrate” with related shipping alliances to squeeze non alliance member, specially Chinese small shipping companies out by monopolistic behaviors such as price discrimination and tied sales by using economic advantages, because the piers operation managed by Chinese shipping companies still at a primary stage. Wharf, act as a rare resource, would be hardly reallocated if it is controlled by multinational shipping enterprises. Since Chinese main port junctions are operated by multinational shipping holding companies, the development of Chinese shipping companies at container wharf would be limited. Given that these shipping companies do not have enough goods supply, they are not powerful enough to bargain with port enterprises which would lead to that these companies would be played by multinational companies or even be squeeze out by strong competition of foreign shipping enterprises; as to port enterprises, with the increasing entrance of foreign investors, a more fierce competition of port industry would appear when the port marketization is encouraged. When Chinese enterprises are in a weak position because of the monopoly system, hidden unemployment would sharply become prominent which would worsen the conflict between the ports development and social security under the condition of lacking completed social security system. Theory repeatedly proves that private departments are more powerful than public departments to form a monopolistic market by catching all market energy.

Meanwhile, the case of government regulation indicates that the difficulty to destroy this monopoly. The technical and economic characteristics lead to a high concentration of the port industry. A horizontal merge or a share acquisition may happen in a same market to achieve the scale economy. It is worth to note that market strength could be increased by horizontal merges to more conveniently implement anti-competitive behaviors. Facing with the trend of the combination of big enterprises and the shortage of Chinese enterprise's scale, we need to learn regulate that foreign enterprises monopoly Chinese market by using economic advantages.

3.2.7 Failures Caused by Uncompleted Law Framework and Uncertain Factors

In many countries, uncompleted law framework is the main reason to cause the failure of integration. For an instance, Port Klang, the integration process was blocked by the lack of necessary law frameworks. Meanwhile, because there is no clear definition for anti-monopoly behaviors, the government need to repeatedly consult and negotiate with lawyers. In addition, many uncertain factors also could cause that the goal of the integration is failed. In China, limited by the system of old days, cooperation between the ports and shipping companies is not popular. Therefore, the ability of Chinese companies to deal with uncertain factors in the process of integration is poor. At the same time, when a problem happen during the integration, the party which violates the agreement of integration cannot be effectively punished because of the uncompleted lay system.

3.2.8 Potential Difficulties Faced by Shipping Companies When Investing Ports

As to shipping companies which wish to invest foreign ports, they are still staying at exploring stage since they have few experiences. Therefore, potential difficulties faced by shipping companies when investing ports are:

(1) In many countries, the opening degree of ports are very low, and the ports are

controlled by the governments. For an example: American ports are currently controlled by the government. These ports usually are financially supported and managed by state governments. Then, the state government would rent container ports to shipping companies. Therefore, the productivity of American container ports is not fully developed. In addition, American uncompleted management mechanism, severe shortage of investment and over intervention of the government at newly built or expended ports lead to the lack of the labor and unstable labor-capital relationship and so on forth.

(2) In many western countries, particularly in developed countries, complicated decision-making process and long decision-making period involving port investment cause a low efficient of decision-making. The biggest feature of Asian ports is to develop without seeing blockage. However, for developed countries, such as Netherlands, when investing a port, the project need to be discussed and approved by city council, and evaluated from prospective of environment protection, safety, local employment, relevant industrial influences, social harmony and so on forth, and argued by many parties before the real practices. The period of this kind of decision-making would take 3-10 years.

Barriers created by law and policy. Barriers are mainly coming from two aspect. On the one hand, many western countries have anti-monopoly law and more and more strict requirement about environment protection and safety. The Green Port become a consensus for numerous countries. On the other hand, in many countries, especially in developed countries, there are complex power of national labor union and labor-capital relationship. If the law of invested or merged countries is not well understood, the process of internationalization will be failed.

4 Suggestions for the Integration between the Ports and Shipping Companies

In the cooperation between the ports and shipping companies, since ports and shipping companies are major participating parties, it is important for them to have careful investigation and choose a partner before the cooperation. Meanwhile, the government also should continuously improve executive function to assure the smooth operation at

each step of the integration. Based on above mentioned potential problems, this chapter propose suggestions for the cooperation from perspective of ports, shipping companies and government.

4.1 Strategies for Port Companies

As to many port companies, which are reformed from old systems, should fully understand the opportunities and challenges they faced with. In respect of opportunities, Law of Ports regulates that ports should be directly managed by local government and perform administrative managing system that separates government functions from enterprise management to assure port enterprises have enough space to operate in the market. In addition, in recent years, shipping industry is in a rapid developing period. Because of the change of market environment, shipping enterprises have already realize the significant function of shipping in a business chain. Therefore, ports should develop a sensitive market awareness and search information from the market, and have insight to demands of cooperating partners and the stake with them.

4.1.1 To straighten out managing mechanism and system and follow demands asked by international strategy

Although port enterprises almost finish the separation between government and enterprise, the managing system and the regulations used by modern enterprise have not built yet. In the real process of the cooperation between the ports and shipping companies, if there is not standard operation mode, it is hard to control and manage the invested or merged enterprises, even more difficult to fulfill the goal set by the cooperation. By being listed or other methods, port enterprises could continuously straighten out and standardize the managing system, build a transparent operating mode, strengthen the transparency of the enterprises, and establish a managing standard and a system on a global scale by unceasing practices. Because some port enterprises which

wanted to cooperate with shipping enterprises were not familiar with international matters and lacked experiences to deal with similar events, and were not good at using international conventions and rules, and using national methods to deal with the cooperation, misunderstandings of the integrated party caused and investment also was not easy to gain success. Therefore, the training and learning of this aspect are necessary.

4.1.2 To Choose an Investment Partner

Specifically, during the partner selecting stage, candidates should be thoroughly investigated. Ports should hire a team which is familiar with shipping companies to investigate investing motive, industrial strength, experiences for investing past ports, global network of the shipping enterprises. Meanwhile, the investigating team should present a scientific argument about the long-term development of the port to assure that the expectation of the cooperating partner would confirm with the orientation and developing direction of the ports. In order to fully utilize the port and shipping companies after the integration, following problems should be paid attention which choosing a partner: port with high technical content would have large investments and a long payback period. When considering the scale of the investment, it also need to consider the introduction of advanced technologies. Compared with the investment with a same fund, technology would have lasting influences; high quality shipping company should be selected, which means that shipping company which could bring new market, new technology and new managing method should be selected. In addition, investors who could bring advanced managing method and experiences should be preferred, because they could quickly and effectively improve the managing level of the port; to fully bring the initiative of investors into play: under the market economy, the importance of an investor is depended on the amount of his share. Similarly, the initiative of an investor also is decided by his shareholding. Investor with special ability could is allowed to get wholly-owned holding so that his managing initiative could fully encouraged and his advanced management could be used. As to the operating aspect, inducing the instruction of technology by helping competitors in order to prevent

monopoly in a port or in a port group. The container business of the port must be operated by two or more enterprises with different stake holders. The activity of a port largely depends on the activity of port enterprises. Monopoly would cause enterprises to lose their activity. Therefore, health development of ports can be assured by taking advantage of the competitive system. When there are two or more joint-ventured companies with different stakeholders respectively in a same zone, strategic managing problem would appear. From perspectives of the sustainable development of port industry and competitive power which nurtured through market competition, it is better to help rivals to guide technology introduction so that the port industry could be well combined. The best way is to cultivate our won port enterprises with controlling force. By digesting and absorbing advance technologies brought by foreign investment, core technologies belong to ourselves could be formed. It not only can integrate industry with a low cost but also could encourage Chinese port enterprises have their own core technologies. Meanwhile, the degree of competition could be controlled by policy and law guidance and price limitation.

4.1.3 Supervision of Integration Process

Since it is long time for the completion of the cooperation between the ports and shipping companies, at the primary stage, confirmation of the integration is just the first step. Particularly for port enterprises which first time to try the cooperation between the ports and shipping companies, there are a lot of things need they do: during the integration, operating condition of the port need to be focused in order to assure that the real practices are as same as the rule set by the integration; meanwhile, operating problem need to be timely observed and emergency system need to be established; at ordinary times, it is necessary to consult with people at home or abroad in the same industry, experts with professional knowledge. As to the entire port enterprises, if possible, experience seminar could be built to discuss and solve common or special problems.

4.2 Strategies for Shipping Companies to Invest Ports

Chinese shipping companies which wish to invest and cooperate with foreign ports should make a clear international strategy: after looking through the developing history of multinational enterprises, especially for western enterprises with more than 100 years' history, the secret for them becoming powerful enterprises is strategic planning. With a clear strategic planning, enterprises would determinedly keep pursuing their goal instead of caring about temporary success or lose. As container port enterprises, they should divide various zone on the global level. Basing on features of different regions such as economic condition, culture and law, enterprises should make distinctive planning and invest properly at different phase for different zone (South Asia, Northeast Asia, North and Central America, South America, East Africa, South Africa, North Africa, South Europe, West Europe, North Europe, Oceania, etc.)

4.2.1 International Talents Strategy to Fasten the Construction of Managing Team

Through the internalization of container enterprises, it is people that fulfill the goals set by the internationalization. The talent shortage causes Chinese ports urgently need comprehensive talents who are familiar with international shipping system and rules after attending the WTO. Besides, cooperation with international container port enterprises should be improved, talents with international vision and thinking mode should be nurtured, team construction should be fastened with accumulated experiences so that managing team not only understand management, language, international conventions and cultures but also well know businesses and familiarize with own managing characteristics and culture. Therefore, requirement asked by internationalized strategic goal could be achieved.

4.2.2 To Create Managing Software to a Lay Solid Foundation for Internationalized Strategy

There are few Chinese container port enterprises not only have independent intellectual property rights but also create a container operating software with market standard. There are two major software companies in the world, COSMOS and NAVIS. These two kind of software have already formed a big market size. Specially, they cooperate with shipping companies. By the help of their global distribution, these two companies market their products to global container port and hold some market share in Chinese container ports. Huang Port continuously promote its own created managing software during the internationalization. The application of software could enable enterprises positively blend in local culture during the internationalization to reduce risks as well as could encourage the expansion of the container business, reinforce the controlling force of the investors. It also could help to output the managing mode when output capital.

4.2.3 To Strengthen Capital Operation of Accumulate Experiences for Internationalization

Nowadays, shipping companies mainly apply backward integration strategy which means that when shipping companies invest ports to meet demands of developing scale economy, they have higher requirement for port enterprises. As container port enterprises, they can not only depend on absorbing funds. They should pay more attention of invest foreign market. When condition allow, they could apply forward integration strategy which indicates that invest shipping companies in order to let shipping companies rely on their own ports.

4.2.4 To Improve Communication with Governments

Currently, many developing countries wish China could help them to develop container ports. After 10 years development, Chinese container port enterprises have already developed a completed industry chain which starts from container manufacture, to the

construction of a container port, to the operation and the management of a container port, and to a multi type transport system. Chinese shipping enterprises, such as COSCO and CSDC, create conditions for the internationalization of the container ports.

4.2.5 Be Careful about Risk Control

(1) Commercial risks. Foreign exchange risk may serve as the biggest commercial risk faced by Chinese enterprises. With the increase of RMB exchange rate, the ability of Chinese enterprises to do foreign investment improve, but the value of assets stock of oversea subsidiary, which is calculated by foreign currency, shrinks when it is evaluated by RMB in Chinese parent company.

(2) Political risks. There are misunderstanding and bias existing when Chinese enterprises merge foreign enterprises, which become a big negative factor for Chinese enterprises walking out the nation. For an example, some people believe that there is political planning when state-owned enterprises perform oversea merge and acquisition that China want to control natural resources of other countries, or Chinese enterprises containing private enterprises are closely related with the government.

(3) Risk of public opinion. In America, before official publication, the plan of merge and acquisition is the highest secret of the company. In order to avoid noticed by other and trace of journalists, the meeting and negotiation need to be set at an unknown place.

4.3 The Improvement and Optimization of the Government Function

The integration between the ports and shipping companies need to be supported by government functions. During the process of commercialization, because of the special economic characteristics of the industry, the invalidation of market is inevitable. Therefore, the responsibility for government to protect market efficiency, interest and

justice is prominent. The function of the government is to focus on macro-control rather than involve in the micromanagement which means that government should create an effective big environment for project constructions and the development of economy and society. Central and local governments should make competition rule for introducing foreign investment in order to maintain a good competition order and environment, and encourage the coordinating development of the port industry and the shipping industry.

4.3.1 To Provide a Good Investing Environment

Investing environment is the key element to attract foreign investments which contains regional politic, economy, policy, laws, market, resources and so on forth. It reflects profitable opportunity and operating conditions and risks. Currently, relatively completed legal environment would make law more stable which could help to mitigate risks and improve confidence of foreign investors. As to the integration of the ports, following points need to be further understood: status and behavior regulation of the government and foreign investors; ownership, transformation and termination of the “franchise”; registered capital of project company; utilization of lands and interest distribution of appreciation of land value; utilization of other resources and equipment; avoid various risks; various tax and favorable terms; services price standard of port facilities; maintenance and rebuilding of facilities; depreciation of facilities and assets evaluation; environmental problem caused by construction and management; problem solving and arbitration.

4.3.2 To Complete Laws System about Ports and Related Industries to Protect Multi Parties' Interests

As to port industry, when the countries, which once practiced investment barriers, relax investing limitations, corresponding law and regulation system need to be adjusted to redefine the responsibilities, obligations and rights of foreign investors. When the

interests of foreign investors, responsibilities, obligations and rights of rare resources occupants in order to stimulate the sustainable development of the port industry.

4.3.3 To Establish Information Publication System to Strengthen Transparency

If competition policy work properly, after foreign investments being introduced, they would care about channel construction of port and collecting and distributing. Investing environment which extents these two parts would play a key role for attracting foreign investors. The premises of foreign investment are risk evaluation, establishment of information publication system, improvement of transparency, which are good for creating an investing environment confirming with international conventions. Competition among international port operators would be intensified as the increase of opening degree. In next few years, Chinese port enterprises would arise combination among port enterprises and vertical integration along port logistics chain. Therefore, it is necessary to make effort to investigate the integrating trend after largely introducing foreign investments and to guide these trend by policy to form a developing direction which is helpful for the cultivation of core ability of Chinese port enterprises.

4.3.4 To Coordinate and Protect Interests

Since government function is performed by related policy, laws, contract management and special departments, risks sharing and interests distribution are the core problems. In order to share risks, government needs to protect the big environment rather than take all market risks; interests' distribution should be based on the "fair-efficiency" principle and look at the long-term development of society and economy, and the improvement of social interests. When legal interests gained from the market are protected, the interests of the society and users also need to be protected.

5 Conclusion

Economic globalization gradually involve more and more countries into the global network which regards international division of labor as foundation. As the coming of age with borderless international competition, operating mechanism of market economy objectively require each country open its market and let products, labors, capital and information engage into the global market system. Rapid development of the international trade bring good opportunities for international logistics. International logistics has permeated into each corner of each country. Logistics activity play a significant role to connect customers from various countries to producers from various countries and become an important part for the economic development. Ports and shipping enterprises serve as key points of the entire logistics chain. The method to maximize the functions of these two parts become the focuses in the academic world and in real practice. By viewing the integration between the ports and shipping companies, the presented paper describes the cruel competitive environment faced by port enterprises and shipping enterprises, theoretically elaborate the necessity to integrate the ports and shipping enterprises, vertical integration theory, benefits for the ports and shipping companies caused by the integration from the perspective of monopoly motives and transaction expenses. Besides, profits gained under the non-integrating condition and the alliance condition are compared by game theory so that the profits brought by the integration are noticed. Then, the paper detail demonstrates the current situation of the integration, and compare different type of integrating modes, and selectively analyzes potential problem and risks of the integration. Finally, the paper proposes suggestions and advises for port enterprises, shipping enterprises, and the government. In conclusion, integration between the ports and shipping companies has already become a fundamental strategy to survive and develop in the fierce competition. Confronted with more intense port developing environment and shipping competitive environment and in order to deal with the more open and rough integration of the international market, Chinese shipping industry should further emancipate their

mind, deepen the reformation, use market mechanism as the method, and practice an all-round and multilevel strategy at home or abroad to integrate the ports and shipping companies when shipping enterprises design and apply their integrating plan. Meanwhile, preparation should be made to solve potential problems by learning lessons from foreign integrating experiences. At the start of the integration, coping measures should be made. As to this aspect, macro guidance of the government should be reinforced to create a good environment for the integration between the ports and shipping companies.

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