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WORLD MARITIME UNIVERSITY

Shanghai, China

**STRATEGIC ANALYSIS OF PORT ENTERPRISE'S
SELF-OPERATION OF FLEET**

By

SU YU

China

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

ITL

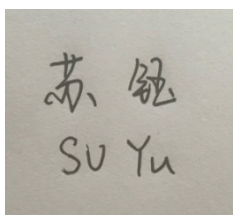
2018

Declaration

I certify that all the material in this research paper that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

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

Signature:

A rectangular box containing a handwritten signature in black ink. The signature consists of two Chinese characters, '苏' (Su) and '钰' (Yu), written in a cursive style. Below the Chinese characters, the name 'SU Yu' is written in a simple, sans-serif font.

Date: 2018-07-06

Supervised by

Professor YIN Ming

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Acknowledgement

First and foremost, I want to express my deepest appreciation to Ms. GU WeiHong and Ms. ZHANG Jie, who are in charge of this program on behalf of Shanghai Maritime University for their great and continuous contribution and support during my master study.

I feel grateful to my supervisor Prof. YIN Ming for guiding my research paper with her patience and outstanding academic spirits.

I would like to express my profound gratitude to Prof. MA Shuo and Prof. Seong-Hyeok MOON from World Maritime University for their kind help while attending exchange study in Malmo and writing my research paper.

Finally, I would like to show my indebtedness to my beloved parents and friends offered me full support and patience during my paper writing.

Abstract

Title of Research paper: **Strategic Analysis of Port Enterprise's Self-operation of Fleet**

Degree: **MSc**

The research paper is a study of analyzing the strategic significance of operating self-owned fleet for port enterprises. With the development of economy and times, nowadays some port enterprises are trying to have self-operated fleet as one part of their own business scope. This action may lead to various influences for the operation of one port enterprise. After finishing the literature review, the author found that this topic is really new and rarely have other researchers done the similar analysis, which means that this topic has research value.

In this paper, the author have discussed that the type of port enterprise that is suitable for operating fleets by them. Also, the constituent details of the fleets and routes have been put into consideration. It can be seen as one way of doing vertical integration for one port enterprise. In this study, the author mainly used Porter's five forces model, PEST and SWOT method to do analysis, and taking Guangzhou port as an illustration. In the end, the author reached out the conclusion that certain type of port enterprise can operate self-owned fleet and discussed the strategic significance. This may related to the conditions of port enterprise itself and also the external marketing competitors and environment. Meanwhile, some feasible suggestions for the operation have been given in the last part. This research may have reference value for some port enterprises which are intended to do that kind of operation.

KEYWORDS: Port Enterprise Strategy, Self-Operation of Fleet, Strategic Analysis, Vertical Integration, Market Competition

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Preface

Nowadays, more and more enterprises are expanding and developing their business scope in different kinds of ways. Diversified business modes may further tap the potential of one enterprise and make benefits. It is universally acknowledged shipping has a close relationship with ports, and they always supplement each other. With the rapid development of economy and times, the operation mode of enterprises is always keeping changing in all kinds of aspects.

In this time, some of the companies are trying to develop and expand the business function and scope, and business diversification is more or less being the keystone and development direction of one company or enterprise. This business diversification may have a profound influence on the business scope of the enterprise. From the strategic perspective, it helps the enterprise to do the vertical integration, meanwhile, the differentiation of business have the impact on attracting a great number of customers to use the product or service of the enterprise. Since the external environment is always unpredictable and uncertain, the enterprise must have the sense to take the market shares on its initiative. It is a good way to raise the core competency of the enterprise so that it can maintain its position in the competitive and changeable markets. There is a trend that more and more companies are having the attempt to coordinate its business scope and making them as one integrated part.

Actually, in shipping industry, we also have the similar story. It is regular for the shipping company to invest in terminals these days, which helps those shipping company running business smoothly. It happens in another way for those port enterprises. It can be found that, for those port enterprises, some of them already had the action to get in touch with the ships to build their own fleet for its self-operation. It is quite an interesting to be discussed. Not only it is the expansion business for the port enterprises, but also has the deep strategic meaning for the business development of the port enterprises. But not all the port enterprises are suitable for this kind of

operation model, some constraints of the port enterprise itself and external environment and competitors, which will be discussed in the following paper.

1. Introduction

1.1 Research background

In recent years, there exists a trend that more and more shipping companies are turning to develop their business diversely, we can find that some shipping companies have invested in terminals for business expansion. We may also use the similar logic in port enterprises. In other words, port enterprises may also invest in the fleet for their operation. Actually, nowadays some well-positioned enterprises have invested in ships to build the self-operating fleet for their business development. From the strategic perspective, to build a self-operating fleet may help the port enterprise for its vertical integration. Whether it is wise for the port enterprises to do such kind of investment is an issue that deserves consideration. In this paper, the author is going to have a deep discussion on the port enterprise's self-operation of fleet, and taking a further step to analyze the strategic signification of this decision.

1.2 Research objective

There are several objectives of making this research. The first one is to figure out whether it is necessary for the port enterprise to own self-operated fleet. The second one is to find out the factors that may influence the port enterprise to operate self-owned fleet, and the factors could be internal like the position of port, and it also could be external like the shipping market, competitors etc. The third one is to seek for the significance and risk for the port enterprises to operate self-owned fleet, and give the suggestions and substituted plans.

1.3 Research methodology

Since this paper is mainly to do the strategic analysis towards port enterprises of operating self-owned fleet, so in the paper, the author will mainly use PEST, SWOT method and Porter's five force model to do the analysis of this topic.

Combined with these methods mentioned above, we will have a clear picture of the reason and strategic importance of such kind of action. Not all the port enterprises are suitable for this kind of operation model, and for those who are suitable for this kind of operation model, they may also have some constraints and ways to improve or avoid the potential risks. In the end, the author shall give out the final suggestion and advice as a conclusion. In the following part, the author is going to introduce the methods that being used briefly.

- **Literature research method**

This method is being used widely in different areas, which means that getting to know the information and the current research situation after checking the relating literature. This may help the author to understand the topic directly. Before doing this study, the author has done the literature research work, and found out there are rarely some paper or thesis about this topic, which means that the topic has research value.

- **PEST analysis**

PEST analysis is also one of the most common methods that being used in strategic analysis. PEST analysis (political, economic, socio-cultural and technological) describes a framework of macro-environmental factors used in the environmental scanning component of strategic management. It is part of an external analysis when conducting a strategic analysis or doing market research, and gives an overview of the different macro-environmental factors to be taken into consideration. It is a strategic tool for understanding market growth or decline, business position, potential and direction for operations. (Richardson, 2017) In this paper, the author also will discuss this problem from four perspectives.

- **SWOT analysis**

SWOT analysis (or SWOT matrix) is a strategic planning technique used to help a person or organization identify the strengths, weaknesses, opportunities, and threats related to business competition or project planning. It is intended to specify the objectives of the business venture or project and identify the internal and external factors that are favorable and unfavorable to achieving those objectives. Users of a SWOT analysis often ask and answer questions to generate meaningful information for each category to make the tool useful and identify their competitive advantage. (Blake & Wijetilaka, 2015)

- **Porter's five forces analysis**

Porter's Five Forces Framework is a tool for analyzing competition of a business. It draws from industrial organization (IO) economics to derive five forces that determine the competitive intensity and, therefore, the attractiveness (or lack of it) of an industry in terms of its profitability. An “unattractive” industry is one in which the effect of these five forces reduces overall profitability. The most unattractive industry would be one approaching “pure competition”, in which available profits for all firms are driven to normal profit levels. (Michael E. Porter, 1979, p. 137-145)

- **Illustration analysis**

Case study will also be used in this thesis, since there are many ports that have already invested in the self-operated fleet. One port that has the representative meaning will be used to illustrate the theory and summary that being concluded in the article. That's mainly because real example may have more sense about this topic. In reality, Guangzhou port has a mature system of running self-operated fleet, and the operation of “shuttle bus” is quite famous in Chinese shipping market. This may be more realistic as an example to illustrate.

1.4 Research significance

Self-operated fleet for the port enterprise is a realistic operating issue in the shipping industry. After done the literature review, the author found out that the topic about

port enterprises operate self-owned fleet, is quite new and rarely have other researchers done the similar research or study in this field before. If one thing exists, it must have its own reasons, which means that this topic deserves study and research. Also, in this article, the author will study on the type of port enterprises that is suitable for own self-operated fleet. The scale and operating area of those self-operated fleet will also be discussed. While implementing such kind of actions, it may bring benefits to the port enterprises, but it also exists some potential risks during the process. In that case, another significance of the paper is to figure out the strategic importance of this action, and giving some comments and advice towards it.

2. Literature Review

Literature review is one of the most important methods that being used in research studies, so the author also searched the website and went to the library for more information and data. After having done the work, the author has a general overview towards this topic.

In the *Competitive Strategy Techniques for Analyzing Industries and Competitors* (Michael E.Porter, 1980), Porter has put out that making correct strategy may help the enterprise to win the market share. Also, the core competency is quite important for one company or enterprise.

In *Feasibility study on the increasing shipping capacity for Dalian Port Group* (Zhang Meili, 2012), she has put out that to combine with the shipping capacity with port characteristics correctly will help the enterprise to develop quickly.

In *The development strategy research of Guangzhou port enterprise* (Gao Feng, 2012), it has shown that Guangzhou port has a diversification strategy, and keeps growing its capacity.

In *Wuhan shipping center's right choice is to pay attention to port, fleet and service* (Wei Zhijie, 2017), the author also put out the opinion that to develop the port service

in balance will strengthen the development of the port enterprise.

In A demonstration study on development strategic for port enterprises (Huang Yong, 2008), it demonstrated the importance of put correct strategy into practice.

Meanwhile, the author tried to choose different kinds of ports to check the detailed information, and surfing on the official website of some named ports in China, and have found some specific information.

In Xiamen port, they have already set the self-operated fleet, and they mainly focus on the feeder service based on Xiamen port. The domestic trade is the main point that the enterprise paid attention to.

In Guangzhou port, “shuttle bus” is one of the most important transport modes in that area, which is very convenient for the carriers to transport goods. This action is also one kind of self-operated fleet, attracting many customers to use this service.

In Tangshan port, the enterprise also has built a completed network for the cargo transportation. They have their own transport capacity and fleet to take the customers’ needs.

Also, some other ports in China have the similar fleet for their self-operation. Now, the author can summarize that some ports have such implementations in reality, but more detailed researches are rare. On the basis of information that the author have found, the author is going to find the deep relationship behind this action. From the strategic perspective, the author is trying to exploit the deep meaning of this action. Meanwhile, some general principles may be concluded after the research.

All in all, after the literature review, the author thought that this topic is new and fresh, rarely have other researchers written on this, so it is possible and feasible to have research on this topic.

3. Basic Model of Port Enterprise's Self-operation of Fleet

3.1 Concept of port enterprise's self-operation of Fleet

To explain the concept of port enterprise's self-operation of fleet, generally speaking, it means that for those port enterprises, except the common business that they are running day by day, they have invested some ships to establish their own fleet. Thus, they can have the capacity to transport the cargo. Meanwhile, they have put their capacity in the transportation network, and for the customers in the market, they have chances and opportunities to choose this service provided by those port enterprises. During this process, the port enterprise needs to take responsibility of all procedures of transportation.

3.2 Reason for port enterprise's self-operation of Fleet

Before port enterprises took the action of operating fleet by themselves, there must have some discussions about it, which also deserves consideration. After searching information, the author proposed that there have many reasons for one port enterprise to decide to invest in self-operation ports, which are listed as follows:

3.2.1 Financial benefits can be gained

For some of the port enterprises, investing in self-operation fleet may have brought the business benefits to them, which means that they can gain some money from this operating part. Some ports have designed a very mature network, which is very competitive in the shipping market. For instance, the "shuttle bus" service offered by Guangzhou port, have undergone many years, and it already has become one of the strong competitors in the transportation market.

3.2.2 Customer can have a wider choice

From traditional sights, port enterprises are the one who provide some services related to ports or terminals. Once they have the business part for the transportation, it must be much easier to combine the transportation and port service together. For the customers, it will be very attractive, and they have more choices. From this aspect, it is a kind of various services.

3.2.3 Combine different business model and resources together

Traditionally, port enterprises won't have its fleet and capacity. Nowadays, with the expansion of business development, some ports decided to choose to combine the different business model and resources together.

Base on the self-operating fleet, the port enterprise can make the advantage of its geographical position and fully realize the efficiency of transportation and service. To make the combination of the port and fleet makes the service become more and more completed.

3.2.4 Diversify the industrial chain and do vertical integration

With the development of modern industrial chain, diversification of the services has already become an unavoidable trend. Generally speaking, one enterprise may choose one or more directions to expand its business scope and service area. It can be seen as one of the strategies that modern enterprises use. In the same time, it also can be seen as the expansion of industrial chain, which is also one kind of performance of vertical integration. Vertical integration is a good way to realize the economical efficiency by integrating and controlling the resources from upstream and downstream companies. In the next part, vertical integration of port enterprises will be discussed and explained in detail.

3.3 Business operation model of self-operated fleet

3.3.1 The type of enterprise that suitable for self-operated fleet

Talking about the type of enterprise that suitable for self-operated fleet, it may be related to many different factors, and the author are listed as follows:

- **Hinterland**

The hinterland of the port refers to the area of live cargo handling and passenger collection and distribution. Modern ports generally have double-direction hinterland, which are the one that is inland-facing and another one that is sea-facing. The port and the hinterland are interdependent and mutually reinforcing. The development of the port must be supported by the foundation of the hinterland and the development of the hinterland economy. The hinterland is the basis for the survival and development of the port. If one port has a good hinterland, it can attract more cargo and customers, which is suitable for investing in self-operated fleet.

- **Position in sea route network**

A sea route is a route between a ship and two or more ports that engages in the carriage of passengers and goods at sea. The shipping route is the link connecting the various elements. It plays an important role in the maritime space system. The routes of maritime transportation are distributed among the oceans, which is also the advantage of sea transportation compared to other modes of transportation. How to make the most effective use of this advantage is an important issue in system organization. The route is restricted by other factors in the system. When selecting the route, it is necessary to take into account the status of the cargo, the ship and the various elements of the port. It is a relatively passive factor to make a reasonable choice after systematically making a comprehensive assessment of the system organization. So when the port enterprise own a good position in the sea route network, it can have the advantage of own self-operated fleet.

- **International Trade market**

International trade refers to the exchange of goods, services and factors of production

between different countries (and/or regions). International trade is an international transfer of goods, services and factors of production. International trade is a manifestation of the division of labor between countries, reflecting the economic coexistence of countries around the world. International trade market may have a very close relationship with shipping market. Shipping is a derivative market of world trade. If the world trade market goes well, it will bring more cargo, and it is suitable for the port enterprise to do the self-owned fleet. We can check the research paper as reference, figure 1 shows the global trade value.

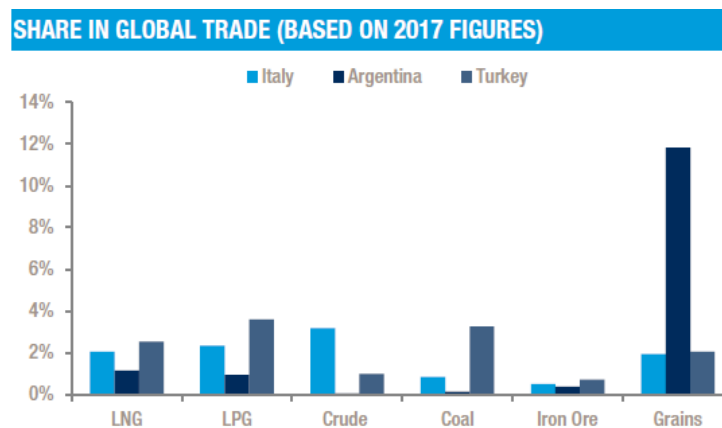


Figure 1 - Share in global trade

Source: Drewry Maritime Research

● Shipping market

The shipping market refers to the market in which the owner of the ship providing the vessels for maritime transportation to those who have needs to transport goods. Generally speaking, it can be seen as the ship and goods supply and demand trading market. If the shipping market goes well, which means the shipping supply is less than the demand, it is the time to invest in self-operated fleet. As we can find the trend in figure 2, the shipping market is undergoing a stable period.

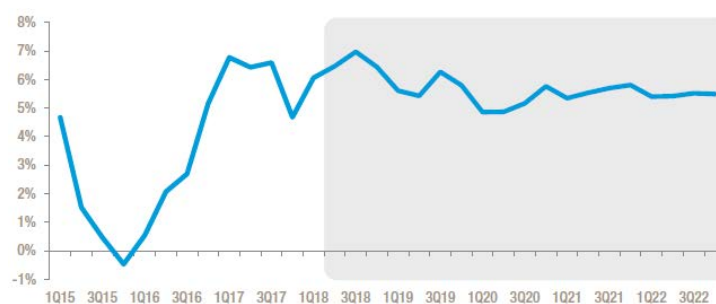


Figure 2 - Global container port throughput

Source: Drewry Maritime Research

● **External competitor**

In the shipping industry, the port enterprise may also be faced with the problem that they have much competitors in the market who offers similar services. In this time, the port enterprise should do the market investigation before taking action. This is to check out the price and the customer needs. If there are not many external competitors, then it is suitable for the investment of self-operated fleet.

3.3.2 The fleet scope will correspond to the port enterprise

Different ports have different conditions. Some of them may have a good position and a great number of cargo volumes, but some of the port enterprises may have many competitors in the market. According to the different conditions, the port enterprise may have different choices towards the fleet.

3.3.3 The function of self-operated fleet is to assist the port

Self-operated fleet is a kind of method to expand the business scope of port enterprises, but the main function is to assist the operation of the port. Since port enterprise always can have a certain amount of the cargo, so to some extent, this action can ensure that the port enterprise has certain control of the capacity. There is another thing to confirm that since the self-operated fleet is just a way to assist the development of port enterprise, the vessels will not be very big because there are still many competitors in the market. Some liners already have a mature route network, so it is hard for the port enterprises to make the face-to-face competitions with those liners. It is still feasible for the port enterprise to have a fleet of small vessels, thus taking advantage of the resources of port enterprises. Generally, the choice of routes also will be feeder, not the hub. The reason is similar to the one that has mentioned

above, the feeder service can be a supplement of port enterprise service, also avoiding the competition with mature shipping competitors in the hub route. In summary, self-operated fleet is a kind of assistance to the port enterprise.

3.3.4 The benefit should be calculated in overview

In reality, some self-operated fleet for the port enterprise may gain losses in revenue, and there are many reasons related to it, such as the choice of vessels, the market competitors, the international trade etc. All of these can be the factors that influence the financial result of the port enterprise. But it does not mean that this action is not worthy. It can be a brand of the port enterprise and also a differentiation service of the port enterprise. If this action can bring benefits in the long run, we may foresee it and keep doing this. This is what we called strategic meaning, and it is worthy to invest in.

3.4 Vertical integration of port enterprise

3.4.1 Concept of vertical integration

Vertical integration is a strategy where a firm acquires business operations within the same production vertical. It can be forward or backward in nature. Vertical integration can help companies reduce costs and improve efficiencies by decreasing transportation expenses and reducing turnaround time, among other advantages. However, sometimes it is more effective for a company to rely on the established expertise and economies of scale of other vendors rather than trying to become vertically integrated.

Specifically, vertical integration occurs when a company assumes control over several production or distribution steps involved in the creation of its product or service in a particular market vertical. Vertical integration can be carried out in two ways: backward integration and forward integration. A company that expands backward on the production path into manufacturing is assuming backward integration, while a

company that expands forward on the production path into distribution is conducting forward integration. Take the example as the illustration, Coca Cola acquired some packer companies to improve the efficiency of sales and production, and this is what we called forward integration. Backward integration is also common in our daily life, for instance, some enterprises start to produce its own raw materials instead of using the raw materials all from the suppliers.

3.4.2 Application of vertical integration in port enterprises

The modern port nowadays is no longer a simple place for exchange, transit, and transportation of goods, but an important part of the global supply chain network. For the port enterprises nowadays, to integrate the resources from upstream and downstream enterprises in shipping industry has already become an unavoidable tendency. The development of modern supply chain will inevitably bring about changes in the development of the port enterprises. The trend is not only to meet the requirements of today's industry, but also become one of the strategic choices of those port enterprises, which means that port enterprises on the traditional transportation chain can no longer operate in isolation, and some form of the linkage of other related organizations or companies is quite necessary. After the port enterprise has developed to a certain scale, it will have to expand its space for survival and development. This inevitably requires that the port and logistics supply chain be integrated with each other. Through the integration with the shipping companies and through the integration with the major shipping companies, the port has a guaranteed supply of raw materials. After the port enterprise has developed to a certain scale, it will have to expand its space for survival and development. This inevitably requires that the port and logistics supply chain be integrated with each other. In this time, some of the port enterprises gradually start to operate its own vessels and build the fleet. This can be seen as the application of vertical integration of port enterprise, it is very smart because those enterprises can take advantage of the facility and equipment.

Meanwhile, through the integration of operating vessels by port enterprises themselves, the port has a guaranteed supply of raw materials and cargo. Generally speaking, it can bring some benefits to the port enterprises and also diversify their business scope.

3.4.3 The positive effect of vertical integration in port enterprises

After having known the concept and application of vertical integration of port enterprises, we can discuss about the pros and cons of vertical integration. There are a lot of advantages of vertical integration in port enterprises

First of all, it can reduce the cost of port enterprises. When the port enterprises start to implement the action of operating vessels by themselves, they can take use of the port facility and the internal operation to reduce the complex procedures. Since port enterprises have the strategy to do the vertical integration, the objective and development direction will reach a consensus. It will reduce the time of arrange and coordinate all kinds of internal resources, thus some potential costs can be saved to a certain degree. The costs can be shared by different functions and departments, not only taken by one certain company.

Meanwhile, carrying out vertical integration can reduce the costs of collecting certain type of market information and analyzing market insight. Through marketing monitoring mechanism, the port enterprises can easily find out the one-hand data and statistics. In that case, port enterprises can set the target customers, choose the certain vessels and plan the regulated shipping routes. Based on the acquired data and statistics, port enterprises can do the deep analysis and also forecast the development trend and tendency of future market. After that, certain adjustment and changes of shipping capacity and routes can be taken. Since the port enterprises are closely connected with self-owned fleet, the market information is becoming more transparent.

What's more, it is good for sharing resources and having economies of scale. In the

value chain of port enterprises, port and fleet can work for each other. They have built a very stable economic relationship. Thus, port enterprises can improve its operating efficiency, making the upstream and downstream team members become closer.

Secondly, it can easily ensure the supply and do adjustments according to the market performance. The relationship between shipping demand and supply is always the key initiative that port enterprises are caring about. That's mainly because it has the influence on the planning and programming of what kind of vessels will be chosen and how to assign the vessels on different routes. Port enterprises can easily monitor, calculate and forecast the demand and supply, also evaluate the marketing value. After finding out the actual demand and customer needs in the operating area, port enterprises can make a further plan of self-owned fleet operation. To make a balance between the demand and supply in the routes is of great significance because it can narrow the gap between forecast and realistic situation. Also, it can reduce the operation and human resource costs. Through this kind of business mode, a lot of uncertainties can be reduced or even eliminated. From this aspect, port enterprises can set their own business scope and operation strategy on the basis of the analysis of demand and supply. If the market is growing, port enterprises may take the action of putting more vessels in the route and increasing the overall capacity because that may bring more market share to the company; if the market is under recession, port enterprises can rearrange the overall layout and distribution of the fleet on different routes, since they need to avoid the potential losses of fund.

Thirdly, it can have the preponderance of management. To some extent, vertical integration of port enterprises is quite good for administrative work and managing diversified resources. This can effectively protect the internal information of enterprise, which is also one of the competitive advantages of port enterprises. Port enterprises can directly control the fleet, and finish management. They can solve the current problems by strengthen the management and improve the service quality, and finally reach the objective of better serving the customers. Under vertical integration of port enterprises, management may be related to all kinds of perspectives like staff

management, fleet management, port management etc. All the functions and methods may directly lead to one outcome, that's to strengthen the discipline of the group of enterprises in the value chain. This action has a huge profound importance. If the internal management work runs well, the external service will be more standardized and competitive, which will become more attractive to the customers. Excellent management will lead to the incredible business benefit and great reputation to port enterprises, which is also a kind of positive feedback and virtuous circle.

3.4.4 The negative effect of vertical integration in port enterprises

Every coin has two sides. After having discussed the advantages of vertical integration in port enterprises, we should also take an eye on the negative effect of vertical integration in port enterprises.

In the beginning, port enterprises need to input more during vertical integration. To own the vessels and build a qualified fleet by themselves, a great number of investments are quite necessary. It is not easy because port enterprises must have the sense to set one reasonable goal. Purchasing vessels, hiring staff and operating vessels are the basic initial costs of implementing vertical integration. This will inevitably increase the fixed costs of port enterprises. In that case, port enterprises should overcome the mobility barriers and also increase their operation leverage. Every element in the industrial chain may influence the operating revenue of port enterprises, which also may become one of the operation risks of port enterprises. As I have talked before, to operate self-owned vessels needs a quite huge number of money investment, and this may lead to decrease the liquidity of the assets. Since the operation performance of different parts in one vertical chain are more or less rely on each other, so sometimes port enterprises may have no choice but to maintain some certain parts instead of distributing the capital into different parts to avoid the potential risks. Furthermore, it also takes time for port enterprises and its fleet to find the right method and suitable method to operate. This can be seen as the time costs.

In the second place, it may strengthen the reliability of port enterprises towards the market. We all know that international trade has a very close relationship with transportation industry. If there are not enough cargo in the market, port enterprises may find that the capacity is overmuch, and they cannot make money by carrying goods. This shows that it is hard for port enterprises to get rid of the depressed situation through adjusting the business and operation strategy. When the external market changes, port enterprises may not have a quick response to that since they already have many constraints and done the investment in the capital pool. It is difficult for them to face and accept the big challenges of market barriers for the reason that they cannot collect all the resources in a very short period of time and capture the new chance and opportunity in the quick-changing market.

In the third place, this action does reduce the potential and flexibility of port enterprises. The slight changes of the management, the wrong direction of strategy or the unpredictable external environment and market may all lead to the failure of vertical integration. To cover those costs that have been put in, port enterprises should have enough cargo to transport, completed regulation to follow, well-organized team to operate. All these factors are quite important so that the vertical integration might not be successful in any point of the vertical chain.

Basically, the vertical integration can bring benefits to the port enterprises, but it also has many potential risks that lead to failure. We should consider the vertical integration of port enterprises dialectically. From the aspect of realistic operation, all factors in the vertical chain are linked with each other, so it deserves careful thinking before taking the action. From the perspective of strategic consideration, it is an effective way to expand its business scope and enrich its strategic goals.

4. Strategic Analysis

4.1 Strategic significance

Whenever making a decision about the business part, one enterprise must have some concern about it. For the port enterprises, to invest in the self-operation has a great significance on the enterprise's vertical integration. Vertical integration is a strategy where a company expands its business operations into different steps on the same production path. It is quite important for one company to have such kind of integration, and one enterprise will gain many benefits from it.

Firstly, the port can quickly lower its transaction costs, since port has a very close relationship with the fleet which transports cargos. The port can take its own initiative and position advantage to do the transportation. The internal costs can be reduced since they share the certain resources together.

Secondly, self-operation of fleet is a good way to lower the uncertainty of follow-up services. The shipping service part can directly be linked with port, in that case, the port can arrange the goods in time instead of waiting passively. In this time, port enterprises can integrate its own facility resources and make full use of it to provide more convenience to its self-owned fleet.

Thirdly, operating self-owned fleet for port enterprises may bring strategic significance to them, it is as one of the forms of vertical integration. Expand and diversify the business scope may bring both financial benefits and more completed industrial layout to the port enterprises.

4.2 PEST analysis of self-owned fleet by port enterprises

4.2.1 Concept of PEST analysis

PEST analysis is also one of the most common methods that being used in strategic analysis. PEST analysis (political, economic, socio-cultural and technological) describes a framework of macro-environmental factors used in the environmental

scanning component of strategic management. It is part of an external analysis when conducting a strategic analysis or doing market research, and gives an overview of the different macro-environmental factors to be taken into consideration. It is a strategic tool for understanding market growth or decline, business position, potential and direction for operations. (Richardson, 2017)

4.2.2 PEST analysis of port enterprise's self-operation of fleet

- **Political factors**

Politics can have a significant impact on corporate governance, spending power, and other business-related activities. The political system, principles and policies, laws and regulations of a country or region often restrict and affect the business behavior of the company, especially affecting the longer-term investment behavior of the enterprise. If the political environment is stable, then it is suitable for investment.

- **Economic factors**

This refers to the general overview of the development of the national economy, the international and domestic economic forms and economic development trends, the industrial environment and the competitive environment faced by enterprises. If the economy goes well, it is good for further investment.

- **Social and cultural factors**

It means the general state of social development in a certain period of time. It mainly includes social morality, cultural traditions, demographic trends, cultural education, values, and social structure. The influence of the society and culture of different countries on enterprises is not always the same. In port enterprises, we may need to hire qualified staff to do the management.

- **Technological factors**

It refers to the overall level and trend of social technology, technological changes, the impact of technological breakthroughs on enterprises, and the performance of technology on the interaction between politics and economic and social environment. Technology is not only the driving force of globalization, but also the competitive

advantage of enterprises. If the port enterprise owns good facility, it shall be fantastic to attract customers.

4.2 SWOT analysis of self-owned fleet by port enterprises

4.2.1 Concept of SWOT analysis

SWOT analysis (or SWOT matrix) is a strategic planning technique used to help a person or organization identify the Strengths, Weaknesses, Opportunities, and Threats related to business competition or project planning. It is intended to specify the objectives of the business venture or project and identify the internal and external factors that are favorable and unfavorable to achieving those objectives. Users of a SWOT analysis often ask and answer questions to generate meaningful information for each category to make the tool useful and identify their competitive advantage.

Strengths and Weakness are frequently internally-related, while Opportunities and Threats commonly focus on environmental placement.

- **Strengths:** characteristics of the business or project that give it an advantage over others.
- **Weaknesses:** characteristics of the business that place the business or project at a disadvantage relative to others.
- **Opportunities:** elements in the environment that the business or project could exploit to its advantage.
- **Threats:** elements in the environment that could cause trouble for the business or project.

SWOT ANALYSIS



Figure 3 - SWOT Analysis

The degree to which the internal environment of the firm matches with the external environment is expressed by the concept of strategic fit. Identification of SWOTs is important because they can inform later steps in planning to achieve the objective. First, decision-makers should consider whether the objective is attainable, given the SWOTs. If the objective is not attainable, they must select a different objective and repeat the process.

4.2.2 SWOT analysis of port enterprise's self-operation of fleet

SWOT analysis is a useful method to analyze the strategy of one enterprise. Using this method, we can conduct a comprehensive, systematic, and accurate study of the objective. Meanwhile, we can formulate corresponding development strategies, plans, and countermeasures based on the research results. SWOT analysis is often used to formulate group development strategies and analyze competitors. It is one of the most commonly used methods in strategic analysis.

Talking about port enterprise's self-operation of fleet, the author tends to discuss it from four perspectives, which are strengths, weaknesses, opportunities and threats.

● **Strength**

Generally speaking, for the port enterprises, they always have great and excellent geographical location. This may bring sufficient cargos to the port, which can be seen as one of the advantages of port. Also, ports are always built in the places which are in

good economic condition, so it is easy for the port enterprises to take use of nearby area's economic radiation to accelerate its own economic development. In the same time, it is more efficient to manage the port and self-owned fleet, and they have the priority to make use of the internal resources.

● **Weakness**

For the port enterprises, they may have less experience of choosing vessels and build its own fleet. Since there must exist very mature and competitive shipping companies in the routes, for the port enterprises, they may lack practical sense of management and operation. Meanwhile, the extensive development mode of port and shipping related industries and the lack of innovative driving force have seriously constrained the healthy and sustainable development of port enterprises. There is a lack of cooperation mechanisms between port and shipping related industries, and aggressive bidding is fierce.

● **Opportunities**

Since it is quite new for the port enterprises to run self-operation of fleet, it can be very competitive in the transportation market. Ports can provide certain resources to their own fleet, in the same time, the inner operation of fleet can have the priority. This also can be seen as the effective integration of resources and make their respective advantages complementary to each other. In the transportation market, we usually find that traditional shipping company may be the leader and controller of different routes.

● **Threats**

Many shipping companies already have very complex and completed shipping route and network system in the area, which means it is more competitive for the new comers, cause the service of shipping companies may be more diversified and familiar to the customers. To some extent, it increases the barrier for the port enterprises to enter the industry. Port enterprises may also face the threat from the same trade. The entanglement of interests between the ports has caused the phenomenon of competing for berths on the wharf and arbitrarily occupying the shoreline, and there have even

been instances of malicious reduction of port charges to secure supply. The threat of the rise of international port logistics companies also cannot be ignored. Since China's reforming and opening up, the port logistics industry has faced a competitive threat from international port logistics companies that have strong financial strength, advanced transportation infrastructure equipment, and modern management advantages.

After figuring out the four perspectives of the issue, the author also is trying to put out four corresponding strategies as reference. Port enterprises can carry out the strategies in four different kinds of situations:

- **SO Strategy**

SO strategy is a strategy to develop internal advantages and use external opportunities. It is an ideal strategic model. This strategy can be adopted when the company has certain aspects of advantages and the external environment provides favorable opportunities for this advantage. For example, if the port enterprises have good market prospects, complete team of self-owned fleet, and external conditions such as the financial crisis of competitors like shipping companies, together with the internal advantages of the increase in the market share of enterprises, all of these conditions can be favorable conditions for companies to acquire competitors and expand production scale.

- **WO Strategy**

WO strategy is a strategy that uses external opportunities to make up for internal weaknesses and enables companies to take advantage of weaknesses. There exist external opportunities, but sometimes companies have some internal weaknesses that prevent them from taking advantage of opportunities, in this time, they can take steps to overcome these weaknesses first. Towards port enterprises, if the port enterprises have the problem of operating vessels and fleet, in the same time, they have the customers in the market. In this time, port enterprises should hire some experienced staff and build a professional team to run the business. Also, the port enterprises should maintain the customers and try to do some actions to capture more potential

customers in the market. By overcoming these weaknesses, companies may further use various external opportunities, obtain initial advantages, and ultimately gain competitive advantage.

- **ST Strategy**

ST strategy refers to companies that use their own strengths to avoid or mitigate the effects of external threats. For port enterprises, the strength is that they have full experience of operating port, but the threat is also very obvious that many external competitors may distribute the market share with port enterprises. If the port enterprises can take its own advantage to simplify the procedures and lead time of port services, it may become one of the competitive advantages in the market cause the service is quite unique. At the same time, they can improve the quality of transportation services and thus avoid the influence of external threats.

- **WT Strategy**

WT strategy is a defensive technology designed to reduce internal weaknesses and avoid external environmental threats. When a port enterprise has internal and external problems, it often faces a crisis of survival. Lowering costs may become the main measure to change the disadvantages. When the capital of the port enterprise deteriorates, the supply of shipping service is insufficient, the cargo transportation needs are not enough, scale benefits cannot be achieved, and the equipment is aging, which makes it difficult for the port enterprise to have a large benefit. This will force the port enterprise to adopt a target aggregation strategy or differentiation strategy to avoid costs.

4.3 Porter's five forces framework applied in port enterprise's self-operation of fleet

4.3.1 Concept of Porter's five forces framework

Porter's Five Forces Framework is a tool for analyzing competition of a business. It draws from industrial organization (IO) economics to derive five forces that

determine the competitive intensity and, therefore, the attractiveness (or lack of it) of an industry in terms of its profitability. An “unattractive” industry is one in which the effect of these five forces reduces overall profitability. The most unattractive industry would be one approaching “pure competition”, in which available profits for all firms are driven to normal profit levels.

Porter's five forces include three forces from ‘horizontal’ competition, the threat of substitute products or services, the threat of established rivals, and the threat of new entrants; and two others from ‘vertical’ competition, the bargaining power of suppliers and the bargaining power of customers. Porter's five-forces framework is based on the structure-conduct-performance paradigm in industrial organizational economics. It has been applied to try to address a diverse range of problems, from helping businesses become more profitable to helping governments stabilize industries

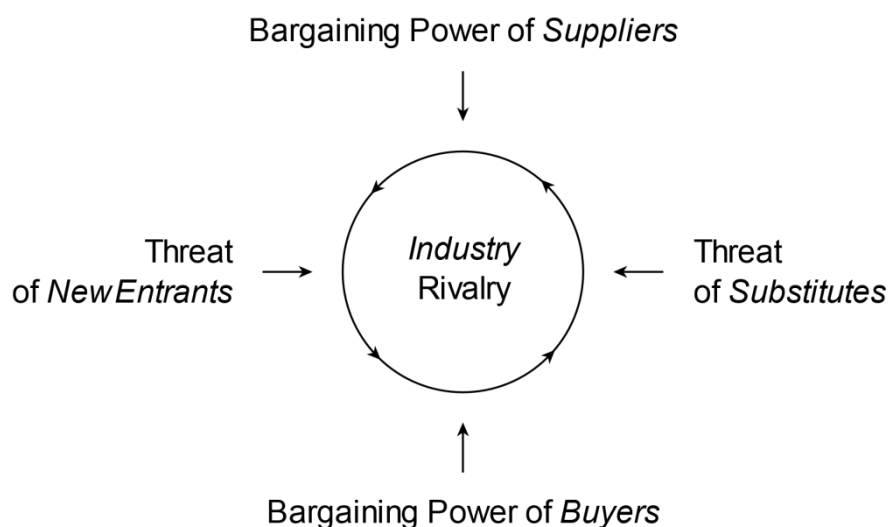


Figure 4 - Porter's five forces framework

4.3.2 Analysis of port enterprise's self-operation of fleet by Porter theory

As we have mentioned above that Porters five forces framework mainly contains five aspects, and they are threat of new entrants, threat of substitutes, bargaining power of customers, bargaining power of suppliers and industry rivalry. The author will discuss

port enterprise's self-operation of fleet from five aspects in Porter's five forces theory.

- **Threat of new entrants**

Potential entrants are an important force for industry competition. On the one hand, the new entrants will bring about an increase in production capacity, bring about market share requirements, and cause fierce competition with existing companies. On the other hand, new entrants will have to obtain resources for production, which may lead to industrial production costs. These factors will lead to a decline in the profitability of the industry, which will pose a great threat to the industry, and its ability to enter will depend on “entry barriers”. The “entry barriers” of the port logistics industry mainly include: economies of scale, such as the economic environment in the hinterland, regional environment such as regional trade volume, service networks and learning curve effects of port logistics companies; capital needs, such as the scale and construction of port facilities investment cycles; logistics company service differences and customer switching costs; government actions and policies, such as port operations permit, safety production management system; port collection and transportation system and port natural conditions.

- **Threat of substitutes:**

The supplier mainly influences the profitability and competitiveness of existing enterprises in the industry by increasing the price of input factors and reducing unit value. The power of the supplier mainly depends on the extent to which the value of the input element provided by the supplier affects the total cost of the buyer, the production process, or the quality of the product. Many shipping companies may offer transportation service on the same routes, this also can be seen as the threat of substitutes.

- **Bargaining power of customers:**

According to Porter's competitiveness model, the user's bargaining power mainly depends on the quantity, quality and price of the products required by the user and the conversion cost. Different port enterprises may have different situations, so it needs to analyze one case by one case.

- **Bargaining power of suppliers**

Substitutes refer to products that have mutual replacement properties. The existence of substitutes will make the price substitutes for products in the industry refer to products that have the nature of mutual substitution. The existence of substitutes will make the price ceiling of products in the industry more relevant. In general, the strength of substitution ability of substitutes can be described by examining the sales growth rate of substitute products, the production capacity of substitute manufacturers, and profit expansion.

- **Industry rivalry**

The existing competitors of port logistics mainly exist in the competition of nearby hinterland. For the port enterprise, they need to figure out whether there are competitors provide similar services and the prices they offered.

5. Empirical Study of Guangzhou Port

5.1 Introduction of Guangzhou port

Guangzhou Port is located at the mouth of the Pearl River and is on the verge of the South China Sea. East River, West River and North River flow into the sea. Through the Pearl River Delta water network, Guangzhou and the major cities of the Pearl River Delta and Hong Kong and Macao through, from the West River in contact with the southwest of China, after the Shaoyang ocean shipping channel and China's coastal and world port connected.



Figure 5 - Overview of Guangzhou port

Guangzhou Port and Port Area is located on the Pearl River coast or waters of Guangzhou, Dongguan, Zhongshan, Zhuhai and other cities. It enters the port from the Pearl River Estuary, followed by the four major port areas of Humen Port, Xinsha Port, Huangpu Port, and Guangzhou Inner Harbor Port. With more than 300 ports in more than 80 countries and regions, and connecting with more than 100 domestic ports, Guangzhou Port International Shipping is the largest foreign trade port in South China. Table 1 shows that Guangzhou port has ranked top three in Chinese port.

Table 1 - Chinese Port Cargo Throughput Volume Rank in 2017

No.	Port Name	2017 Total (Million Tons)
1	Ningbo-Zhoushan	100,711
2	Shanghai	70,563
3	Guangzhou	56,619
4	Tangshan	56,540
5	Qingdao	50,799

Source: China Port Website

5.2 Illustration: Shuttle Bus of Guangzhou port

5.2.1 Shuttle bus business of Guangzhou port

Guangzhou Port is located in the center of the Pearl River Delta region where China's

export-oriented economy is most active. It can be connected to the hinterland of the Pearl River Delta through the dense Pearl River water system and highway and railway networks, and the hinterland of the Pearl River Delta, Guangdong Province and even southern China.

In waterway, Guangzhou Port Co., Ltd. relies on the developed Pearl River water network to provide efficient, high-quality, convenient, and economical water transportation services. It has opened a shuttle bus service in Guangzhou Port and is operated by subordinate shipping companies. The Nansha Port area is the collection and distribution center provides customers with fixed-point, fixed-class and pricing barge transport services. It currently covers major small and medium sized piers in the Pearl River Delta, and connects China's Guangxi, Hainan, Yunnan, and Guizhou via the Pearl River water system. The number of foreign trade branches reaches 39, There are 17 trade lines. At the same time, the shipping company also provides lifting water transfer (reduction) business, has nearly 20 years of rich work experience and safe and reliable floating crane operating procedures, has long been engaged in Sanmen Island, Lantau Island, Shajiao and outside the terminal. The loading and unloading operations of the stalls can provide all-round anchorage load shedding services for all types of large bulk carriers at anchorages around the clock.

5.2.2 Analysis of the business mode of shuttle bus

To figure out whether a port enterprise is suitable to run the business of self-operation of fleet may be influenced by different kind of factors. On the one hand, the port has the commonality of enterprise competition. At the same time, due to the special status and role of the port in the market economy, the development of the port is also affected by the external environment and the internal environment. The comprehensive performance evaluation index system of a port is an organic system consisting of a series of interrelated, interacting, interacting and indispensable elements of the port economy.

In general, the factors that influence the comprehensive competitiveness of a port from the manifestation, formation and structure of the port's comprehensive competitiveness, and the internal and external environments. The factors that affect the overall competitiveness of a port consist of several components: the port's macroeconomic environment, location conditions, hinterland resources and ports, hardware and software facilities, operational efficiency, potential competitors, market environment.

The shuttle bus is also one of the forms of self-operation fleet by port enterprises. The reason that shuttle bus of Guangzhou port can runs well rely on different kinds of aspects. Guangzhou port has a very excellent location, and the geographical condition is quite good. Also it has sufficient cargos, and complete network, which makes it more convenient for the port to do the self-operation fleet.

5.2.3 Improvement of Guangzhou port in operation

The development of the industry is inseparable from the construction of infrastructure. Guangzhou has a well-developed network of transportation roads. It has an integrated transportation system that connects the world and radiates across the country. However, the construction of port infrastructure does not match the rapid development of the port, especially in Nansha port, which is yet to be developed.

The development of the industry cannot be separated from the support of talents. Guangzhou has created an international shipping center and developed port industry clusters. The lack of shipping talent has become a major shortcoming.

The development of the industry in Guangzhou is generally precarious with large categories and large scale but lacking a “leader”. Although it also owns several hundred billion industrial clusters such as automobile manufacturing, it lacks large and strong enterprise groups. With the exception of a few port-related industries, most of the port industries are concentrated in the shipping downstream industry characterized by low cost and low prices, and their industrial added value is low.

Although it occupies a certain proportion in the national market, due to the lack of technology and high-quality talents, industrial innovation and transition are difficult, and it is difficult to obtain sustained development under the situation where the layout of ports in different regions converges.

All the problems that mentioned can be deeply improved and make further adjustment, thus, Guangzhou port may enhance its competitiveness in the shipping market.

6. Advice and Suggestion towards Port Enterprise's Self-operation of Fleet

6.1 Actively play the role of government in promoting the business mode

The formation mechanism of industrial clusters is complicated, but proper use of the role of the government can effectively promote the development of the cluster. The city of Guangzhou should make a good plan for the development of the port industry. The planning of the port should be effectively linked with the urban development plan, and be displaced with the surrounding port cities such as Shenzhen and Hong Kong. The construction of the port industry cluster can be based on the construction of the park as a carrier.

The formulation of corresponding land use policies, environmental protection policies, taxation policies, and other guiding elements was transferred to the port area. Optimize the soft and hard environment, increase the construction of related infrastructure such as ports and transportation systems, develop integrated logistics, and formulate policies for scientific and technological innovation and talent cultivation to provide intellectual support for the development of the port industry.

6.2 Plan the layout and fleet of the port industry rationally

The port is not an isolated node, and the port forms a local system with companies, institutions, and logistics that rely on it. The layout of the port industry should not only meet the requirements of intensive development, but also protect the environment and realize the benign interaction between industrial agglomeration and circular economy. Guangzhou's development of port industrial clusters should draw on the experience of foreign port industry parks. Optimize the industrial layout, and introduce a complete recycling industry chain by integrating upstream and downstream companies. Recycling of energy, raw materials, products, industrial waste, and pollutants to reduce district consumption and emissions promote the transformation of industrial clusters to resource conservation and eco-environmental protection.

6.3 Upgrade existing port industry clusters and make innovation

The transformation and upgrading of industries has become the consensus in the context of the new normal state of China's economy. The upgrade is not to abandon the original industry, but to improve the level of the entire industry and eliminate backward production capacity. To establish a modern industrial center, pay attention to the role of social capital and talent elements in promoting transformation and upgrading, and upgrade the existing port industry clusters through the dual integration of technology introduction and independent innovation, and increase the intensity of industrial integration to make traditional industries high-tech and new. High-tech industrialization will promote the clustered development of manufacturing and modern service industries.

7. Conclusion

For the port enterprises, it is a double-edged sword to operate self-operation, we need

to be figure out that this action do have the significance of strategic meaning. This may be an effective way to expand the business scope. From the business insight, it is also a kind of vertical integration. To integrate the upstream and downstream enterprises, is also one of the performances of make full use of the internal resources. What the author wants to figure out is that not all the port enterprises all suitable for this kind of business mode. As the instance of Guangzhou port, it contains many different outstanding conditions, such as geography, inland conditions, market competitors etc. Always thinking before action.

If one port enterprise decides to invest in self-owned fleet, it must should consider the external environment, forecasting the market trend and competitors. For example, don't put too much capacity on small routes. To foresee the risk should be put into priority. If the risks goes too much, we may take the way of cooperate with liners to have a second plan. This might be a method to lower the risks.

All in all, operating self-owned fleet by port enterprises is feasible, but also should take constraints into consideration. Make full investigation before implementing, it is optional due to the situation.

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