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The research on the feasibility of N company's Chinese ports investment project

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INTERNATIOAL TRANSPORTATION AND LOGISTICS

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DECLARATION

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

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

(Signature):_____

(Date):_____

Supervised by
Professor : Wang Xuefeng
Shanghai Maritime University

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As well, I must express my thanks to all the professors who taught me in the whole process. The excellent class they gave and rich experience of them expand my horizon and enrich my knowledge.

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Finally, I am grateful to my beloved parents. It is you that taught me to be a good person. I am fortunate to have their measureless love as I go forward in my life and career.

Abstract

In a span of five years from 2004 until 2009, liner shipping companies profit greatly due to the sizzling growth in container transport capacity in areas such as Asia, Europe and the United States. N company, headquartered in Singapore, has two major transportation businesses with A company shipping and A company logistics.

Since China opened its door to the outside world and after its entry into WTO, the economic development in China has been advanced at blistering pace, which has furnished immense market space for the development of shipping and logistics industry. A company derives 35% of the shipping traffic volumes from China. However, since the upgrading of container transport capacity, namely, the large scale trend for container ships, and in the meantime issues of its negative effects have emerged accordingly, and to some extent, enormously limited the further development of the shipping industry. And the two negative issues above-mentioned are: one is the ship hold's capacity, and the other is the loading and unloading capacity of the ship. Both two aspects are still far lag behind and cannot keep up with the pace of development in the container ship transport capacity, which have worsened the congestion at ports worldwide with each passing day. Shipping companies attempt to transfer more orders and make more ships in operation to solve this problem, but in that case, the wharf for the loading and unloading capacity of the ship will be another problem, for the wharf's efficiency of loading and unloading cannot cater to the increasingly expanding trade volume of the containers.

In this paper, the probe into the feasibility of investment in China by N company will be discussed. Investigation and analysis will be launched in two ways in this essay: one is

from the perspective of strategies, and the other is from the perspective of economy and finance. Probe into some relevant aspects of documents and data has been covered in the literature review section of this essay, and in addition provided some hot issues in the shipping industry. Recalling the current backdrop of the global market and circumstances of N company in the shipping industry, thus study into what kind of strategies should be carried out by N company can be conducted. The study in this section will be elaborated in the third chapter, namely, N company will determine the long-term development objectives through strategic model. Moreover, in the fourth chapter, we will analyze investment strategies of China port, and then we can determine the choice of investment channels and means by N company from the theoretical perspective.

In the economic and financial aspects, the paper will take advantage of Event Study to probe into it. The so-called Event Study, refers to the exertion of data in the financial market to measure the influence of a specific economic events on company value. Its basic principle is: the hypothesis is that market is rational, and then the impact of the relevant incidents will be immediately reflected in securities prices. Thus, the application of the relatively short-term securities price observed can determine economic impact of an event.

Key words: Port investment, Chinese port, Port congestion, Strategy, Event Study

Content

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Chapter 1 Introduction

Port investment, as a part of the shipping study, will serve as the object of study in this essay aiming to launch a research into the necessary investment for further expansion and development from the perspective of global strategy of the N company. Probe into the feasibility of port investment in China by N company will be conducted through the four aspects, namely, review of previous relevant documents and data, research background formed in this area, N company's development strategy and data analysis.

For the time being, the average GDP growth rate in China is around 8%, and moreover, trade volume of import and export in China is still increasing by double-digit annually, which made it possible for China to hold an indispensable dominance in the international trade market. In 2009, container throughput at Shanghai Port surmounted 25 million TEU, ranking second the world over. With the rapid rise of the shipping industry, shipbuilding industry has become the major topic of concern by shipping companies and enterprises. In the light of statistics, shipping companies and ship-owners have placed more than 1,200 orders for container ships building and these ships will be delivered in succession in 2012 and put into production. Furthermore, according to the principle of scaled economies, a growing tendency for larger container ships is preferred in order to save costs. Currently, the largest one of DWT among ships being ordered in the world had reached as high as 14,000 TEU. However, given the continuously record high fuel prices, shipping companies have been unable to earn generous profit as before. Moreover, in the past few years, with the upsurge in container ships as well as the large scale trend for container ships, congestion at port has become much worse than ever before.

A company has 48 shipping routes, and besides, their right of management to operate the port is widespread all over the world. The maximum loading capacity of their container ships has come up to 8,000 TEU. A company has the right of management to operate the three ports in the United States, and in recent years these ports are facing up with much more serious congestions. With the speedy appearance of the sea-carrying trade on stage, port management has become one of the top factors determining the profitability in terms of container transport by liner shipping companies. Most liner companies are hunting for solutions to enhance the efficiency of port handling. China has the business management right to three ports, which are among the world's top 20 major ports with most beneficial results, and the Chinese Government has announced that it will put investment in more ports in the next few years to their enjoyment of the business management at ports.

In order to assess the feasibility of investment in China by N company, it is necessary for us to consider it from the perspective of global long-term development strategy by N company.

Chapter 2 Research Background

2.1 Market Review

The past two decades has witnessed the enormous changes in the shipping industry by containerized traffic. Liner shipping is a good example of application of the scaled economy principles into the transport mode. Container transportation companies are trying to expand their container transport fleet, so they can get the income brought about by economies of scale on the cost-effective basis. With the continuous improvement of ship-building technology, the size of container ships has increased from 1000 TEU to 10,000 TEU, and currently the world's largest container ship has reached 14,000TEU. In the meantime, speed of a ship has also been greatly improved. With the continuous expansion of global trade, we can see that the increased amount of global trade volume has grown to $483 billion until the end of 2008.

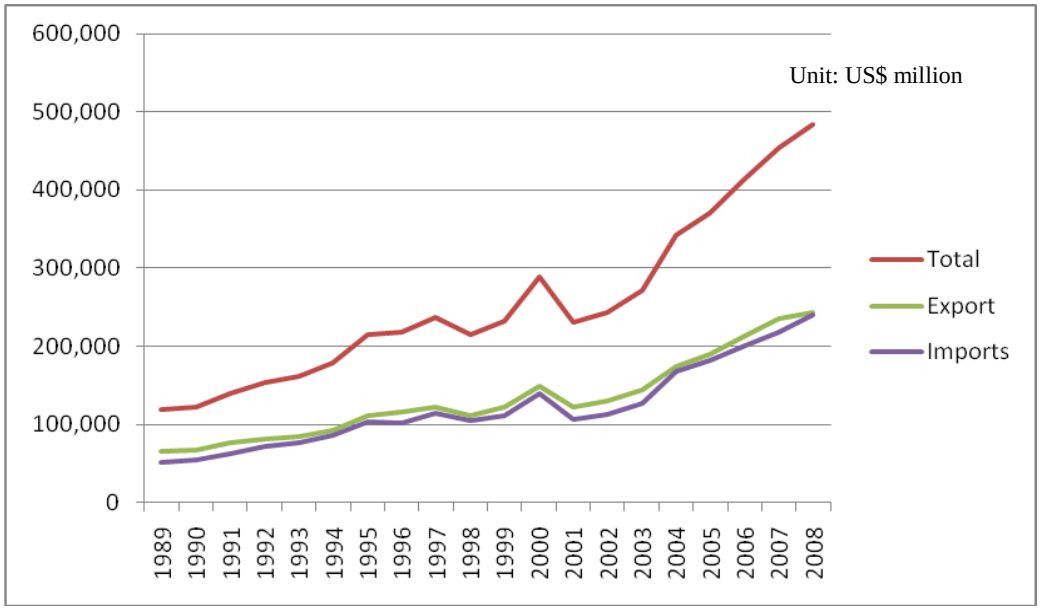

Figure 2-1: World Trade Volume

Source: Annual report of WTO 2009

Compared with 2007, the world trade volume increased by 6.6% in 2008. Starting from 2007, while the world economy was impacted by the economic crisis, but the trade volumes still maintained the growing momentum. The impact of the economic crisis began to emerge gradually in 2009, and based on the information by the WTO that world trade volume decreased by 12.2% in 2009, which is the sharpest decline in 70 years. But as the economy started to recover from the second half of 2009, the developed economies would increase the volume of trade by 7.5% in 2010, and the developing economies and the CIS countries would increase by 11% or so and the global trade volume would grow by 9.5% in 2010.

The growth of global trade has brought about the unprecedented opportunities for development of ocean shipping. In order to cater to the growth in seaborne trade, shipping companies have started their own construction of more shipping vessels. Meanwhile, some companies engaged in the container transport are also planning to foray into port operations, stockpiling of port cargoes and other inland transport operations. Thus, it is inevitable for the integration between shipping companies. Competition between ocean shipping and port, to a large extent, affected the formation of the logistics chain as well. These logistics chains connected a lot of shipping companies, ports, container yards and inland transport companies, etc, and all these factors would affect the competitiveness of the logistics chain in terms of the cost, quality of service, and the like. Since the acquisition of Sea-land and P & O Nedlloyd by Maersk shipping company, Maersk has become the largest shipping company, and there are a number of cases as to merger or acquisition occurring in the shipping world as well. In the article, there is still a case of merger to study, and this is the case, acquisition of A company by the shipping N company supported by Singapore government in 1997. Not just in the shipping industry, there are some incidents of mergers and acquisitions as well in port operations industry in the past few years. In 2005 DPA joined the CSX's international terminal business, and acquired P & O Port in 2006, following M & As (number of columns of mixed cross-border acquisition), PSA purchased a 20% of the shares from HPH. Then the

terminal that ranked the world's top four turned into PSA, APM HPH, and DPA. Figure 2-2 lists some port operators in the forefront in 2008.

Operate	TEU (million)	Share
PSA	41.2	9.3%
APM Termi	32.4	7.3%
Hutchison	30.8	7.0%
DP World	26.2	5.9%
Evergreen	8.1	1.8%
Cosco	7.9	1.8%
Eurogate	6.6	1.5%
HHLA	6.0	1.4%
OOCL	4.8	1.1%
APL	4.6	1.0%
Top-10	168.6	38.2%
World total	441.3	100%

Figure 2-2: The Top 10 Port Operators in 2008

Source: Containerization 2009(08)

2.2 The Current Situation of A company and N company

A company has a large fleet of more than 100 container vessels the world over, whose shipping routes are accessible to more than 100 countries, and has companies or operating agency in more than 80 countries globally. Since its first flight to China in 1867, American President Lines has always been focusing on the market in China here as a business strategy key-point and has an extensive network of sales and service. A company has set up 39 branch companies and representative offices in China, widely located in Beijing, Dalian, Fuzhou, Guangzhou, Shanghai, Shenzhen and Xiamen and the like. More than 40% of the annual turnover in A company stems from the Greater China region (Taiwan, Hong Kong and mainland China).

And meanwhile it is also one of the oldest shipping companies the world over. In 1997, it was acquired by N company, a shipping company in Singapore. The reason why N company will acquire A company is based on the idea that N company is willing to gain a foothold in the United States, which had, even now remains the world's most important market. After the acquisition of A company, all the shipping business in N company was operated by the A company, and N company will focus its efforts on development of other shipping business. Now, A company ranks the world's top 10 container shipping companies. A company Logistics can offer the point-to-point international services for its own customers. The combination of A company and A company Logistics shipping can provide customers with the door to door service in multimodal transport service.

And similar to other shipping companies, N company has gained a handsome operating profit during the shipping boom period from 2005 until 2008. The following figure 2-3 describes the annual operating income of N company from 2005 to 2009, among which it has witnessed an increase at a very high level from 2005 to 2008, and maintained a certain level of growth, which was attributed to the outstanding performance of A company's shipping as well as A company Logistics, but because of the economic crisis, N company witnessed a very substantial decline in profits in 2009 like other carriers.

For 2010, this year's first performance report in N company shows that in the first quarter of 10 years, the company's revenues has reached US $ 2,098 M, increased by 36% compared with the same period last year. This is a sign that N company will be out of the economic crisis gradually.

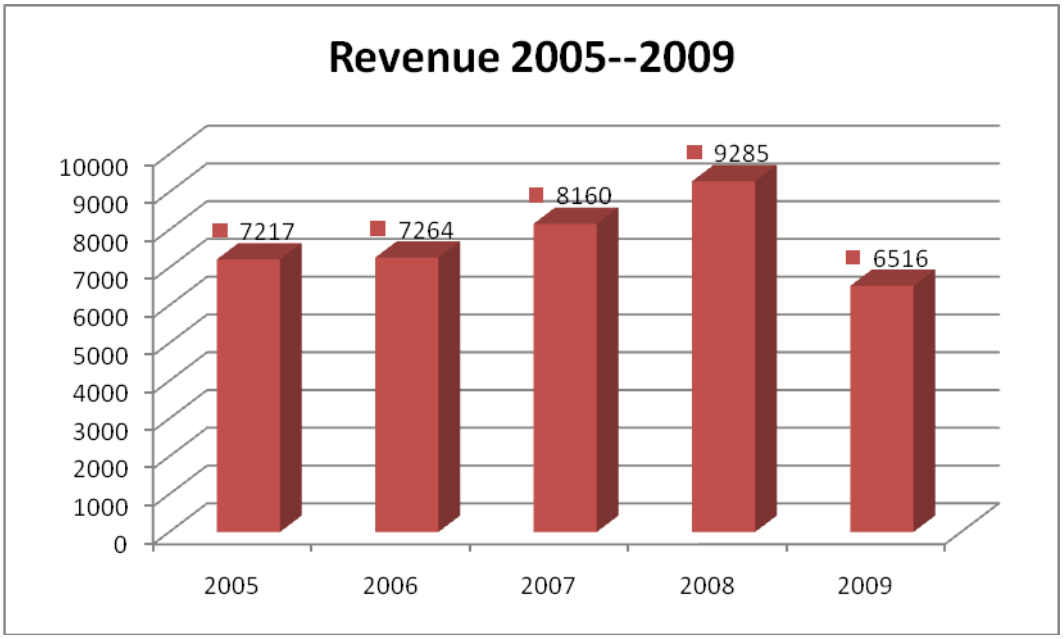

Figure 2-3: Revenue of N company (2005-2009)

Source: First performance report of NOL in 2010

2.3 The shipping line network of A company

At the present, A company is engaged in seven major shipping lines, which includes Asia-Europe, Asia-N America, Australia, Europe-N America, Intra Asia, Latin America and Middle East.

The choice of route is based on the quotas for volume of trade. Figure 2-4 shows the traffic volume of A company has exceeded 22,000 FEU, although a certain decline in traffic volume due to the impact of economic crisis in 2009, but it continues to maintain a certain rate of growth in Asia / Middle East. The traffic volume in Asia / Middle East routes tops that of all shipping lines.

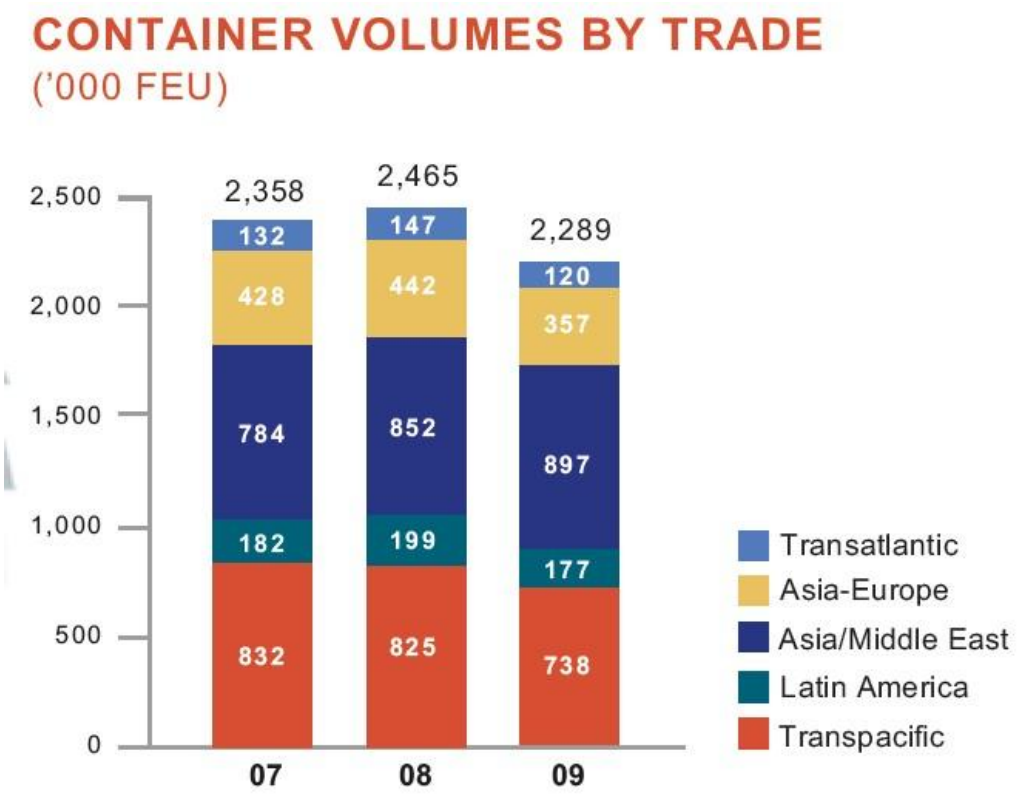

Figure 2-4 A company Traffic Volume

Source: Annual report of NOL_2010.

For year 2010, the total container volume in A company has reached 913,000 FEU (forty-foot equivalent unit) since the beginning of year up till now, which increased by 43% compared with 639,400 FEU (forty-foot equivalent unit) in the corresponding period of 2009. This growth was mainly attributed to the Pan-Asian and trans-Pacific trade.

N company pointed out in the analysis of its annual report that the growth in volume of trade mainly results from the rapid growth of container traffic in China. The growth from China's container accounts for 1 / 3 of their growth in the total increase of A company's container trade, and we can foresee that China will become the A company's major markets during a longer period of time in the future.

2.4 Fleet structure of A company

A company has 48 fleets worldwide. And their range of main navigation routes is Asia Rim route, route from Asia to South America, and route from Asia to Europe, which is the world's top ten shipping companies. Figure 2-5 shows that the majority of the fleet in N company has held the transportation capacity of 40,000 TEU to 60000TEU, but the DWT of N Company's container ships are not very great. With the sizzling growth of container output, and rising fuel costs, the application of principles of scaled economies to manage enterprise development has become a problem that has to be solved imminently. In other words, N company needs to get larger container ships to reduce its cost of the unit cost. Therefore, larger ships are ordered by N company, for instance, 8000TEU of super post-panamax, which has been delivered to use in 2007 and 2008.

Linehaul and Feeder

		Capacity	
Vessel Name	**Year Built**	**DWT**	**TEU**
APL Agate	1997	64,156	5,020
APL Alexandrite	1992	59,603	3,821
APL Almandine	1993	59,560	3,821
APL Amazonite	1993	59,499	3,821
APL Amman	2002	40,955	3,316
APL Arabia	2000	67,318	4,890
APL Argentina	2001	52,300	4,038
APL Atlanta	2008	56,464	4,730
APL Austria	2007	72,807	6,350

APL Bahrain	2009	52,316	4,308
APL Balboa	1998	10,748	713
APL Bangkok	2006	42,147	3,534
APL Beijing	2004	67,052	5,024
APL Belgium	2002	67,987	5,508
APL Bogota	2004	8,015	657
APL Brazil	2004	55,513	4,132
APL Brisbane	2006	44,239	3,388
APL Cairo	2001	33,937	2,478
APL California	2008	72,912	6,350
APL Canada	2001	68,025	5,762
APL Chicago	2007	44,239	3,388
APL Chile	2000	52,272	4,038
APL China	1995	66,520	5,108
APL Chiwan	1995	63,440	4,706
APL Colima	2007	18,700	1,296
APL Columbia	2003	57,240	4,713
APL Colorado	2009	84,550	6,966
APL Coral	1998	64,156	5,404
APL Costa Rica	1995	62,441	4,565
APL Cyprine	1997	64,156	5,404
APL Dalian	2002	33,937	2,478
APL Dallas	2008	42,147	3,534
APL Denmark	2002	68,025	5,762

APL Denver	2008	56,464	4,730
APL Doha	2010	52,316	4,308
APL Egypt	2000	67,318	4,890
APL England	2001	67,987	5,508
APL Finland	2008	90,466	8,110
APL Florida	2008	72,912	6,350
APL France	2007	90,600	8,110
APL Garnet	1995	66,647	4,553
APL Germany	2003	67,009	5,888
APL Guangzhou	2007	44,239	3,388
APL Hamburg	2009	72,665	6,350
APL Hibiscus	1991	7,843	453
APL Holland	2001	67,987	5,508
APL Hong Kong	2002	67,009	5,928
APL Illinois	2009	84,550	6,966
APL India	2002	68,025	5,762
APL Iolite	1997	62,693	5,174
APL Ireland	2003	67,009	5,928
APL Iris	1998	62,693	5,174
APL Jade	1995	66,647	4,553
APL Japan	1995	66,520	5,108
APL Jeddah	2001	33,937	2,478
APL Kaohsiung	2001	52,272	4,038
APL Kennedy	1988	54,665	4,816

APL Korea	1995	66,370	5,108
APL Liberty	1996	68,413	5,711
APL Lilac	1992	7,843	453
APL London	2008	72,982	6,350
APL Los Angeles	2008	56,464	4,730
APL Malaysia	2000	67,318	4,890
APL Managua	2006	18,700	1,296
APL Mendoza	1998	10,748	713
APL Minneapolis	2008	42,201	3,534
APL Minnesota	2008	72,912	6,350
APL New Jersey	2008	72,912	6,350
APL Norway	2007	72,807	6,350
APL Oakland	2008	56,464	4,730
APL Oman	2010	63,272	4,892
APL Orchid	1984	18,461	859
APL Oregon	2010	72,912	6,350
APL Pearl	1998	64,156	5,404
APL Peru	2002	57,240	4,713
APL Philippines	1995	66,370	5,108
APL Poland	2008	90,600	8,110
APL Pusan	2002	34,122	2,478
APL Qatar	2010	63,272	4,892
APL Riyadh	2010	52,316	4,308
APL Rotterdam	2008	72,665	6,350

APL Ruby	1988	51,534	3,502
APL Russia	2008	90,600	8,110
APL Sardonyx	1995	66,647	4,553
APL Scotland	2001	67,987	5,508
APL Seattle	2007	44,239	3,388
APL Seoul	2010	52,316	4,308
APL Sharjah	2002	40,955	3,316
APL Shenzhen	2006	42,147	3,534
APL Singapore	1995	66,370	5,108
APL Sokhna	2007	42,147	3,534
APL Spain	2004	67,009	5,888
APL Spinel	1996	66,647	4,553
APL Sweden	2002	68,025	5,762
APL Sydney	2006	42,147	3,534
APL Tennessee	2009	84,550	6,966
APL Texas	2009	85,713	6,966
APL Thailand	1995	66,520	5,108
APL Tokyo	2009	72,655	6,350
APL Topaz	1989	51,534	3,502
APL Tourmaline	1996	60,323	4,468
APL Turkey	2009	72,912	6,350
APL Turquoise	1996	60,323	4,468
APL Vietnam	2005	67,052	5,024
APL Virginia	2005	68,915	5,018

APL Washington	2009	85,760	6,966
APL Xiamen	2001	67,170	5,576
APL Zircon	1989	51,534	3,502
Buxhill	1995	23,459	1,687
Colombo	1990	6,491	319
Conti Valencia	1998	33,994	2,456
Eagle Excellence	1995	23,300	1,504
Elysee	2009	17,800	1,421
Empire	2009	20,250	1,440
Frida Schulte	2000	21,150	1,645
Gluecksburg	2008	23,351	1,710
HS Puccini	2007	17,350	1,338
Hyundai Challenger	1986	37,915	2,663
Hyundai Goodwill	2008	62,450	4,571
Ice Runner	2008	8,021	698
Jurong Bebaru	1997	10,748	713
LTC Calvin P.Titus	1985	33,625	2,191
Matthias Claudius	2006	23,685	1,732
MOL Celebration	2008	90,600	8,110
MOL Creation	2007	90,678	8,110
Mondena	1999	12,048	1,117
National Glory	2007	13,864	575
Northern Harmony	1994	20,252	1,709
Olympia	2007	37,978	2,702

Pacific Hawk	2008	13,760	1,118
President Adams	1988	54,665	4,816
President Jackson	1988	54,665	4,816
President Polk	1988	54,665	4,816
President Truman	1988	54,665	4,816
Rio Lawrence	2005	13,852	1,155
Sagamore	1996	5,280	364
SP5 Eric G. Gibson	1984	33,625	2,191
Stadt Bremen	2003	12,920	1,080
Stadt Gotha	2008	18,700	1,296
Tiger Ocean	1991	7,866	453
Tiger River	1991	6,491	319
Tiger Speed	1997	33,290	2,464
William Strait	2009	23,600	1,672
X-Press Dhaulagiri	2008	22,314	1,713

VESSELS TO BE DELIVERED

Container Vessels

Vessel Name	Delivery	Capacity (TEU)
APL Indonesia	2nd Quarter 2010	4,300
APL Sri Lanka	2nd Quarter 2010	4,300
APL Melbourne	3rd Quarter 2010	4,300
APL Shanghai	3rd Quarter 2010	4,300

Figure 2-5: Container vessels of N company

Source: Official Website of NOL

2.5 Rising fuel prices reduced the shipping company's earnings

For shipping companies, the oil price portion accounts for the largest share of the cost. Rising oil prices pushed up freight rates, and in the meantime bring about a lot of cost pressure to the shipping company. From the following chart we can see that one of the reasons to drop down net income is the rising oil prices. Starting from 2004, 380 CST bunker price has entered the rapid growth period increasing its price from U.S $ 180 per ton to U.S $ 750 per ton at its maximum. However, due to the economic crisis the fuel prices dropped little to a certain extent, but with the economic recovery, we can see from the figure that it will usher in a new round of fuel price rise. In May, 2010, 380CST bunker price has exceeded U.S $ 450 per ton. Rise in fuel prices have become a major killer to N company's profit.

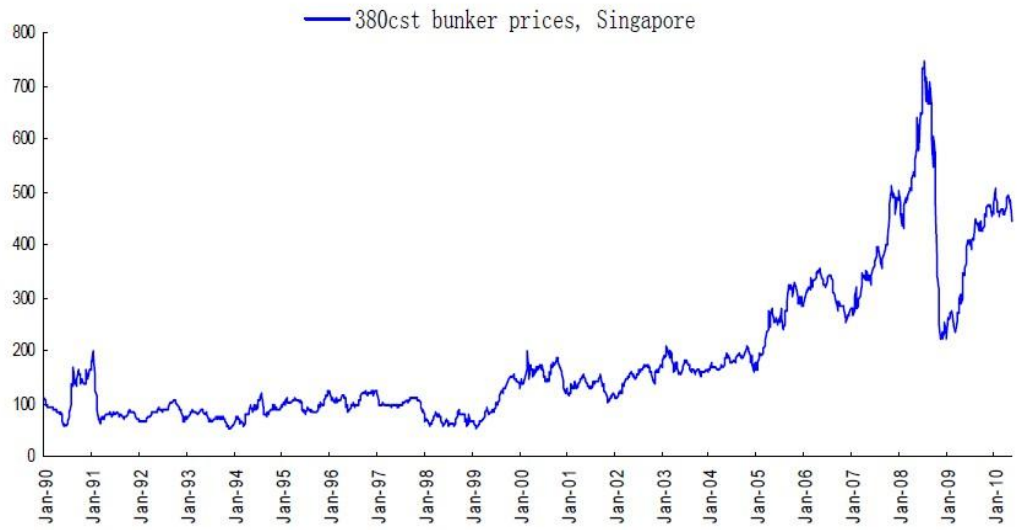

Figure 2-6：Price of Fuel

Source：Clarkson

A company's president Heldet said: "Facing a difficult operating environment, N company still maintained a stable performance, and our performance last year

reflects the drop in the average freight as well as the impact from increase in fuel costs."

He also pointed out: in terms of the liner business, the continued consolidation of the service network and enhancement of profitability, and successful raise in utilization rate of all the fleets, as well as the rise in fuel prices, which puts operating costs under great stress.

Chapter 3 Strategy by N company

3.1 Strategic Analysis

According to Peter Lorange (2005), N company can conduct application of strategic model for selection in the four types available for choice, which can target the market and seize the opportunities of development, the data in Figure 3-1 shows the how N company stand head and shoulders above others both in cost reductions or services in the shipping industry.

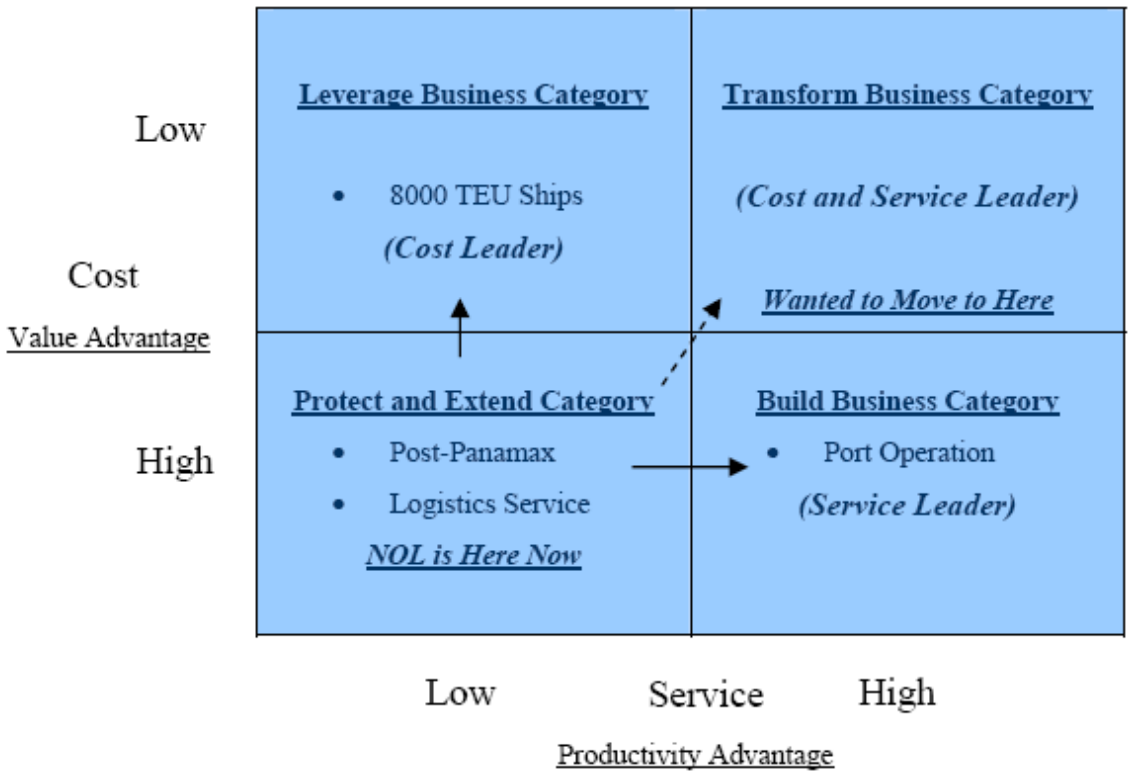

Figure 3-1: Strategy model

Source: Lorange(2005), Shipping Company Strategies-Global Management under Turbulent Conditions

1. The current state of N company is to protect and extend. N company owns 48 container ships in different routes the world over, and also account for a larger market share in the liner services. Its possession of these businesses produced its 85% of total income in 2007, which has become its core business. From its current situation, N company's strategy of protection and extension is very successful.

2. From the external announcement of N company, they will use the model of leverage business, that is to say, they buy into a larger ship based on the principle of scaled economy, so that the unit cost of vessels transportation can be reduced. This strategy is based on smooth development of the protection and extension model.

3. N company has also established port operation business in Asia, which requires the expanded scope of services as a business model after smooth development of the protection and extension model. This model of business development can push N company into the leading position in the shipping industry, but also combine N company's two major lines of businesses in shipping and logistics.

4. Finally, after successfully changed their business model, N company will become a leader in the shipping industry not only in terms of the cost management bust also in the field of service. This strategy applies to those segments that combine new technology and new market together.

Through review of the market, port blockage in the ports of liner companies gradually emerged from behind, which requires us to develop a long-term strategy aiming to address this issue after considering its priorities. One solution is the feasibility of investment in China's ports by N company, and the possibility of solution to port congestion, and whether it is suitable as a long-term investment planning. This probe into case study will be analyzed in Chapter V of this article from the perspective of finance, and will put it under test to see whether the N company's investment help to enhance its profit of shipping business.

3.2 Investment in China’s Ports

N company has purchased super post-panamax container vessels, and prepared to buy the management right of terminal to invest in inland transport, and even has been considering the feasibility of a number of acquisition issues. This strategy aims to improve productivity effect of supply chain, and the owners of A company have prepared to put investment in ports that often clogged and improve utilization ratio of assets. (J. Porter, 7th Jun 2006, Lloyd's List). The ships of 8,000 TEU that N company ordered, has been delivered for use in 2008 and 2009. However, investment in the construction of the fleet is just one of many investments planning, besides, the investment in terminals will be another major investment project. They will do investment in the terminals along the trade routes such as intra-Asia or long-haul inter-Asia, etc. This is due to A company's trade volume is mainly from these two shipping routes, whose trade volume accounted for 67% in the trade volume of A company.

With the recovery of global economy, all the researchers have predicted that the trade volume along these shipping routes will be growing steadily, and the countries along these shipping routes include the United States, Japan, China, Korea, India and Hong Kong, etc. In particular, China's trade growth will be increased with double-digit growth rate. This kind of rapid growth rate makes the port congestion has become a problem to be solved since 2004. In the West Coast of U.S., the productive capacity of the most ports are inadequate, so now a lot of shipping companies are expecting the government to figure out some countermeasures, and called on the investment by the government in the port to address port congestion, further to meet the future trade and development of shipping .

Similarly, since 2003 maritime trade has been constantly expanding in China, so the port issue has been put on the solution schedule since then. This is also the case with the other docks in Asia. To avoid delays in ports along these main routes, reduce the

utilization of fleets; N company should do its investment in ports covered by these shipping routes. But why N company only chooses to invest the ports in Asia? Because A company has already had a number of terminals in the United States, they have priority in loading and unloading rights in these terminals. Therefore, if the N company intends to have the same priority in Asian ports, avoiding delays resulted from blocking of the port to transport, and then they need to have the same operation right in these ports of Asia.

Moreover, the port investment can increase and optimize their capacity of the work network. N company owns A company's container shipping and A company logistics, which are two main factors of their entire network of supply chain. Terminals are seen as centerpiece of multimodal transport in supply chain network and links of maritime trade and inland transport. Once the terminal has become a blocking point, then it will put the entire business chain of N company into the state of bottleneck. Therefore, the terminal investment, we may say, can solve the problem of development bottlenecks N company is facing.

3.3 The role of global liner transport in China

China is the fastest growing in the developing countries. Its population accounts for a larger percentage of the world's population, and the astonishing annual growth rate of GNP as well as proper policy guidance, which makes China's faster development in foreign trade and shipping compared with that of other countries. China's development plays an important role in the development of world's shipping market. In the past few years, the rapid growth in world trade volume has brought about handsome profit to shipping companies. However, when the economic slowdown arise the world over, the shipping industry will witness an economic recession as well. Development is a cornerstone of the shipping market, which is also the premise for the shipping companies to gain unprecedented economic returns. (D. Hale and LH Hale, 2003). At present, China's import and export trade has promoted the

prosperity of the world's shipping industry.

Since the rapid expansion of maritime transport in 1995, China has played an indispensable role in the world's trade. Because of cheap labor in China, China has become the global trade generator, accordingly, China's growth in world trade volume is also running far ahead. From figure 3-2 we can see that China's import and export trade volume has ranked the world's second-place among the world's total import and export volume, among which total export volume of China ranked first in the world's total trade volume, and the data indicates that total import and export volume of China exceeded over 1 / 5 of world total volume. And furthermore China occupied 11% of the total import trade volume the world over in 2009. These data indicated that China has become the forerunner in the global trade market. In 2010, more than 400,000 international shipping vessels will berth at the port in China, and the container handling capacity will reach 140 million TEU.

Ranking	Countries and Regions	Total Trade Volume	Total Export Volume	Total Import Volume
1	USA	2,614,988	1,056,863	1,558,125
2	China	2,207,226	1,201,660	1,005,560
3	Germany	2,050,310	1,120,731	929,579
4	Japan	1,131,524	580,845	550,679
5	France	1,025,968	474,980	550,988
6	Netherlands	945,426	499,235	446,192
7	Britain	831,190	351,084	480,107
8	Italy	815,063	404,732	410,332
9	Belgium	720,880	369,891	350,989
10	South Korea	686,619	363,534	323,085

Figure 3-2: The top 10 in total trade volume of world import and export, 2009

Source: Annual report of WTO, 2010

In the 24th IAPH World Ports Conference, Chairman of Shanghai branch under the Chinese Ministry of Commerce summarized the shipping and port development trends in Shanghai:

1) Mergers between the shippers in the supply chain, shifted from the port to port transport mode to the door to door service. Container Transport makes it possible for Logistics System to change it into a reality.

2) Concentration of the large container trade flows. Several major container ports have already been formed in the global shipping system.

3) The upsurge of China has made it become the world's industrial reproduction, distribution and manufacturing center, and brought more and more container trade volume, in and out of China.

4) The diversification of the global supply chain has altered the framework of world trade and operators of the routes and ports must have to provide logistics services aiming to ensure their competitiveness.

In recent years, from the perspective of maritime trade, Asia has become the world's fastest growing region. In 2008, among the world's top 15 container ports rankings, 11 ports were from Asia. Among 11 ports there are seven ports: Shanghai, Hong Kong, Shenzhen, Qingdao, Ningbo, Tianjin and Guangzhou, which come from China.

Ranking	Port	Countries and Regions	2008	2007	2006
1	Singapore	Singapore	2992	2794	2479
2	Shanghai	China	2801	2615	2171
3	Hong Kong	China Hong Kong	2425	2388	2354

4	Shenzhen	China	2142	2110	1847
5	Busan	South Korea	1342	1327	1203
6	Dubai	Arab Emirates	1200	1065	892
7	Guangzhou	China	1100	926	666
8	Ningbo	China	1084	936	707
9	Rotterdam	Netherlands	1080	1079	965
10	Qingdao	China	1002	946	770
11	Kaohsiung	China Taiwan	968	1026	977
12	Hamburg	Germany	860	989	886
13	Antwerp	Belgium	860	818	702
14	Tianjin	China	850	710	595
15	Los Angeles	USA	785	836	847

Figure 3-3 Ranking of World's Major Ports

Source: Information obtained from internet

It can be seen from figure 3-3, the container port development in China is with enormous potentials, and the total throughput of Shanghai Port is expected to exceed Singapore and become No. 1 in the world. Therefore, the endless development potential of China's ports is colossal. The investment in the construction of Container Ports in China is also an important and long-term project

3.4 Investment Methods

It is very easy to do shipping in China, and China's market tended more and more to self-sufficiency. Growth in domestic demand gives much more prosperity to China's shipping industry. This, on the other hand, in fact put an increasing amount of difficulty for foreign investors who had disdained the Chinese market to enter the Chinese market. It is believed that whether to do investment in the Chinese market,

for those ship owners and decision makers of shipping companies, is a long-term investment perspective to a large extent, which can even affect that whether the company's decision is right. (P. Lorange, 2005, p 4).

Since 2004，the shipping companies have started the addition of new manufacturing orders for ships in order to meet the increasingly growing transport needs in the future. In the past two years, the transport capacity of global container fleet has been greatly improved. However, the port's handling capacity has lagged far behind the growth of transport capability, and port congestion has become a global issue that demands prompt solution. Accordingly, according to analysts' prediction, the Chinese government has proposed some scenarios in terms of improving the handling capacity of major ports as well as ameliorating the situation of congestion in the port. "The Chinese government will inject substantial funds to improve the port's handling capacity for increasingly growing demand." Executives from Association of Chinese Ministry of Communications said so. In the meantime, he also applied some of the data showing that the China's capital for the development of the logistics industry accounts for 30% of the cost of trade, 10% higher than that in developed countries. (Tracy Jia, 2006). China's three port groups were classified as within the next five-year development plan, and the three port groups, include the Bohai Bay, Yangtze River area and Pearl River Delta region. As a matter of fact, since ancient times these three regions in China has been the base for traditional manufacturing and trade development, and meanwhile the Chinese Government has been vigorously improving the capacity of foreign trade in these regions, striving to make these coastal cities become one part of the world's largest trade center. China will build more factories in these coastal areas and major river regions, thus promoting the realization of development planning.

The Chinese government is encouraging those companies with economic strength that to invest in port infrastructure construction to meet development of transport needs in the future. China Business Group is one of the largest port investors, and

they had done some port investment in Hong Kong, Shanghai, Shenzhen, Ningbo, Qingdao and Tianjin. In the past three years China Business Group has been gradually investing 3 billion U.S. dollars in port infrastructure construction. Their investment strategy is: first of all, to increase investment in the shipping center of China, for example, Shanghai, Shenzhen, Qingdao and so on, and secondly, to enhance the integration of logistics services, and finally, together with local partners to establish strategic alliances.

Not only China Business Group has started to invest in China's ports, while some other world-wide shipping groups have also been taking action to do the investment. AP Moller-Maersk Group and Hutchison Whampoa Ltd are the major foreign investment group in the second phase of the infrastructure construction of Yangshan Deep Water Port Project. They occupied 32% of the shares in the project. When Yangshan port project fully completed, it will help Shanghai to become the largest port the world over.

3.5 The optimal investment channel

We can see that China needs FDI to improve the container handling capacity based on the construction of Yangshan Deepwater port project. This requires provide a good opportunity of development for N company to expand its Chinese market. N company should also give priority consideration to this OFFER, in other words, from the perspective of N company's development in the future. There are a number of investments channels can be considered, the following are some alternative options.

- Mergers and acquisitions

N company could achieve its control of the terminal by means of mergers and acquisitions, through which N company can realize its expansion faster, as opposed

to the scale of expansion through internal expansion.

Through the purchase of terminals control it can enable N company to increase its production capacity in China's ports faster, and can take advantage of operational coordination as well as coordination and synergy in economic and financial aspects effectively.

- Holdings

N company can become the company's shareholders to realize its control of the company by way of choosing to buy the stake of a large company on condition that N company has enough shares of this company to realize its control of this company. Compared with mergers or purchase, this approach needs less money or low cost, and no additional production cost of control engendered, while N company can be a member of shareholders. However, if the N company were to become shareholders of the target company, he needs to pay additional taxes, which may also cause problems such as mistrust, etc.

- Joint venture

In a joint venture, the companies can commonly provide some resources to assist with a specific business purpose by way of signing an agreement. (P. Gaugham, 2002). N company can collaborate with a company that has controlling shares in China's ports to establish joint venture , of course, the premise is the holding company must be familiar with the knowledge and experience of the Chinese market. N company can avail itself of a good network to cooperate with the holding companies, and provide some financial support to this holding company. The joint venture will have a certain return on revenue, and that is, they will profit from distribution in accordance with pre-arranged proceeds distribution mode. The mode of joint venture is pretty popular with foreign companies planning to enter the

Chinese market.

- Strategic Alliance

Strategic alliances is one investment mode more flexible than a joint-venture investment, which refers to that some arrangements have been made between the companies aiming to facilitate the cooperation and links between the companies in different time to achieve a certain commercial purposes. (P. Gaugham, 2002), N company has two other very famous shipping industry coalitions in the New World Alliance, whose names are MOL and Hyundai. It can be said that through alliance with these two companies N company can raise a great sum of money for investment project in China's port.

Chapter 4 Methods and Modes

The objective of this article is to study the feasibility of investment in China’s terminal by N company. This will apply event study to show that if N company invest in China's ports, whether it will have a positive impact on the N company's share price.

4.1 Rationale of Event Study Methods

Economists often study the impact of a specific thing on enterprise value, and the event study is probe into one way that the impact of incident on the company's share price. In rational financial markets, the impact of an incident is quickly reflected in the stock prices and of course the impact of event can be measured through changes in stock prices in the short term.

Dolly is the first one using the event study method. In 1933, he took 95 stock split incidents of the U.S. stock market in year 1921 - 1931 as a sample, and conducted the study into the changes in the stock price caused by stock split event. He found that 57 out of 95 incidents of stock split gave rise to the appreciation in stock prices, 26 stock price decline, and other 12 other cases of no obvious response.

4.1.1 Procedures of Event Study Methods

(1). Definition of the event. First and foremost task of event study is to determine the events to be studied, and determine the time span of stock price changes caused by the event. For example, if you want to study impact of macro-policy events on changes of stock price, first of all macroeconomic policy events that meet the requirements should be selected, such as promulgation of important laws, and then

determine the exact time period before and after promulgation of information to conduct the study into the stock price changes.

(2). Criteria of sampling. After defining the incident, it is necessary to determine the criterion for sample. Sampling criteria may be subject to such limitations of data availability by Stock Exchange listed company constraints, may also be subject to special restrictions on members of the trade. During this stage, some sample characteristics were summed up (such as: company market capitalization, industry representatives, time distribution of the event release) and dated any bias that may result in by sampling, which is obviously very helpful.

(3). To establish calculation model of normal and abnormal earnings yield.
Assessment of the impact of the event needs the calculation of abnormal returns. Abnormal return is the difference between actual earnings and abnormal return over the same period prior or subsequent to events during the events of the securities, while the normal returns are the expected return in the assumption that the event does not occur. For company i, and the day t event happens, the abnormal returns are just as followed:

$$AR_{it} = R_{it} - E(R_{it} \mid X_t)$$

Among above formula, ARit, Rit, and E (Rit | Xt) t are respectively the non-normal returns, the actual earnings, normal earnings. Xt is the limited content of normal returns model. The normal earnings model are usually two kinds: the constant means return model, where Xt is a constant: the market model, where Xt is the market revenue. As the name suggests, it assumes a constant average return of securities, namely, the constant in the former model, and it assumes that there is a stable linear relationship between market earnings and stock gains in the latter model.

(4). After the determination of normal earnings model, then estimation is necessary. In defining the period for estimation, the most common is to take the period before

the events as the estimated period, for example, in the use of daily data and the event study into market model, estimated period for the market model parameters may be set n-day before the events (the size of n is determined by the researchers at their choice based on the circumstances, the general circumstance is $n \geq 30$). Typically, the period of event itself is not included in the estimation period in order that events will not affect the estimation of normal earnings model parameters. After the normal earnings model parameters are assessed, abnormal returns could be calculated.

(5). Inspection process. Next, design of the framework for non-normal income test is necessary. What need to focus on here are the null hypothesis, and define the consolidated method of calculating abnormal returns.

(6). Empirical results. The empirical results have a direct link with the econometric methods used. In addition to describing the most basic empirical results, the diagnostic instructions are also extremely useful. Sometimes, especially when the number of events to be probed is very limited, one or two events may have great impact on the whole empirical results. Paying attention to this point is essential for the evaluation of empirical results.

(7). Interpretations and conclusions. The ideal conditions are the empirical results can derive on the reasons how stock prices affected by the relevant events. Besides, you can add some other illustrations to compare their own analysis with similar analysis by other people.

4.1.2 Establishment of Event Study Method and Mode

(1) Determine the time span of the event and inspection

In this analysis of this essay, the first trading day after the date macro policy is released will be defined as "policy event days", and the time before and after the

event is divided into two sections: estimation period and event period, event period was divided into pre-test inspection period and postmortem inspection period, estimation period is taken 40 trading days prior to examination date of the event, and the first 20 trading days before the release of the policy is the examination period prior to the event, and likewise the later 20 trading days after the release of the policy is the examination period after the event. Time interval for testing is set as $T_1 \sim T_2$, among which 20 trading days before the event, that is, $T_1 \sim 0$ is the examination period prior to the event, 20 trading days, namely, $0 \sim T_2$, after the event serve is taken as a time period of test; 40 trading days prior to the examination period, namely, $T_0 \sim T_1$, is taken as the estimation period.

(2) Calculation of the return rate

Event study method is not directly used to investigate the impact of the event on stock price fluctuations, but to judge the impact of the events on stock price fluctuations by examining the change in accumulative abnormal rate of return before and after the events. First, the daily return rate during the test needs to be calculated. Suppose we look at the impact of N policy event on the stock market to, P_{it}、P_{it-1} respectively indicate the closing price index of event i on the day t and $t-1$ of (0 indicates policy event days), then the stock price index logarithm return R_{it} on the day of t may indicate the daily return of stock index on the day of t, namely:

$$R_{it} = \ln(P_{it}) - \ln(P_{it-1})$$

(3) Determine statistical model and estimate normal rate of return

In this paper, the model of average fixed returns is used to study the impact of macroeconomic policies.

$$R_{it} = u_i + \varepsilon_{it}$$

$$E(\varepsilon_{it}) = 0, \quad D(\varepsilon_{it}) = \sigma_{\varepsilon i}^2$$

The fixed average earning model assumes that there is no case of policy event, the average rate of return in the stock market is constant in terms of time.

For an event i, this paper takes data of daily returns rates of 40 trading days during estimation period ($T_0 \sim T_1$)as a sample, and do the regressions of average earnings model of stock prices, and obtained estimation value $\hat{u}_i$ of u_i . This is the normal rate of returns, which shows that the expected rates of returns in the stock market on the premise that event do not occur.

(4) Calculation of abnormal returns rates and cumulative abnormal returns rates

After the estimation of the normal rate of returns, you can figure out the abnormal returns rate. Abnormal rate of returns refers to the difference between the actual rate of returns and the normal rate of returns on the trading day t of an event i. The formula is $AR_{it} = R_{it} - \hat{u}_i$

Based on the formula above, first find out non-normal rate AR_{it} of return every day of the event i during 40 trading days, and then do calculation of cumulative abnormal returns CAR_{it} on t day during the event period one by one，the formula is

$$CAR_{i-20} = AR_{i-20}$$

$$CAR_{it} = CAR_{it-1} + AR_{it}, \quad t = -19,-18,\ldots,0,\ldots 19,20$$

Finally, the cumulative average abnormal returns rate on the day t of during all of N policy events is:

$$\overline{CAR_t} = \frac{1}{N}\sum_{i=1}^{N} CAR_{it}$$

(5)According to the results of data processing, the statistical test should be conducted on the existence of macro policies effect on the stock market

The concrete method is

H_0: No conspicuous impact of policy event on stock price

H_1: Conspicuous impact of policy event on stock price

Build the statistics of testing $$J = \frac{\overline{CAR_0}}{\left[\frac{1}{N^2}\sum_{i=1}^{N}(\frac{2}{t-2} RRS_i)\right]^{\frac{1}{2}}}$$

Among which，$\overline{CAR_0}$ is the average cumulative abnormal rate of returns on the day of policy event，N is the number of events to be inspected，RRS_i is the residual sum of squares of event i during the estimation period，T is the time length of the estimation period, namely, 40.

Statistic quantity J approximately obeys the standard normal distribution, taking the significance level α = 0.05, and the critical value is 1.96 at this time, therefore, when the absolute value of J is greater than 1.96, the original hypothesis will be rejected, which shows that the policy events have a significant effect on stock prices.

From the perspective of cumulative average abnormal returns, we can directly determine whether the policy events will affect stock prices:

1). In an efficient stock market, the average cumulative abnormal rate of returns should be fluctuated randomly around zero.

2). If the macroeconomic policy does not affect the stock market, then on the day of policy event, the cumulative abnormal rate of returns in stock market should remain unchanged, showing random fluctuations.

3). If the macroeconomic policies have a significant impact on the stock market, then, the cumulative average abnormal rate of returns will increase or decrease when the policy event occurs or before and after the testing date, showing the rise or fall in cumulative abnormal yield rate curve. Under normal circumstances, if it is good policy events, the cumulative average abnormal rate of returns will increase with rising curve; If it is bad policy events, the cumulative average abnormal returns rate of decline with falling curve.

Against the backdrop that the stock market is under the influence of the macroeconomic policies effect, characteristics and efficiency of macroeconomic policies effects in stock market can also be tested. And the basic principles for judgment are just as followed:

(1). if the macro-policy event occurs, and average cumulative abnormal rates of return appears to increase (decrease)on the day of the good (bad) policy event, but abnormal returns is no longer in existence after the test date in succession to the event date, namely, cumulative abnormal returns remained unchanged, after the test it showed graphically that the cumulative average abnormal yield curve quickly restored to the level of random fluctuations in the state, which indicates that the response of stock market to policy information is ample, then as far as the policy case is concerned, the stock market reached efficiency of semi-strength shape.

(2). When the macro-policy event occurs, an accumulated average abnormal returns increase (decrease) if on the day of good (bad) policy event, but there is still positive (negative) abnormal returns in existence during the test period after the

event date, namely, the cumulative average abnormal returns will continue to increase (decrease) which shows continued trend of increase (decrease)of cumulative average abnormal yield curve after testing period of event in the graphics, which indicates that the reaction of stock market to policy information is not sufficient, in other words, that "inadequate response" exists in the market leading to the "delayed effect" in the market, so as for the policy event, the stock market has not yet reached the state of semi-strength efficiency.

(3). Before the occurrence of the macro policy event, if significant changes occurs in stock prices, for example, the marked increase in the share price before the introduction of good news, or shares dropped significantly before the advent of bad news, which indicates the existence of problem "information leakage", some investors, who are accessible to "an insider news " conducted the deal in the stock sale ahead of schedule, which drives the changes in the price in advance.

4.1.3 Result of Statistical Testing

The volatility of the null hypothesis true or false will be determined based on the selected events and then the average cumulative abnormal returns.

4.2 Testing of Event Study

Event study method has been used as research methods of a mathematical model by many specific businesses and the whole economy. Event study is based on those research models that can quickly respond to new changes in the market. The purpose of the event study method referenced in this paper is to verify that investments in terminals by the large shipping companies can affect the stock price of their companies. If these samples selected could make a positive response on their stock

price, so you can verify that the financial markets and prospects of investment in the company by investors are very optimistic. This can encourage investors to invest in the terminal.

The main problem of the event study method lies in the accurate time. If the event is the estimated value based on market, then the company's stock price may have already been affected before the event. In addition, the assumption of distribution effect has already been ample enough for the model of continuous average benefits, the market model will soon be specialized, and those assessors and data experts were allowed to precisely defined for the development of samples distribution conclusion of (Campbell, Lo and Mackinlay, 1997). Also, the trade volume of market is colossal, so that the effect the sample produces can be reflected in its share price.

4.2.1 Assumptions

The purpose of this study in this paper is to verify whether the investment in port will have an impact on the market value of the shipping business; in the short term, this effect will be effectively reflected within the financial markets.

Null hypothesis: also known as the original assumptions, which is Terms of mathematical statistics. Pre-established assumptions while statistical test. When zero assumption does hold water, the relevant statistics should be subject to an already known distribution of probability. When the calculated values of the statistics fall into the negative domain, we can see a small probability event occur, then we should negate the original hypothesis.

The result we have anticipated is "Investment in port is influential for the shipping companies", that is to say, this is an original hypothesis studied in the paper, for it has already been given a reasonable nature in the market, and for the role of port investment in the enterprise's assets will be quickly verified.

4.2.2 Definition of case and designation of event windows

What this paper focuses on is that the impact on company's stock price when a shipping company pumps a fund for investment in ports.

Definition of events: the so-called events in this article refer to investment in China's port by N company, Yangshan Deepwater Port Phase III Project. Here the investment approach we use is controlling interest.

Designation of the event window: the so-called event window refers to time span of the probe into the company’s stock price which the incident is involved. In this article the event window refers to the time span of three months to invest in Yangshan Port Phase III construction by N company.

This is because the event window is usually three months time before and after the deal was announced, because the completion of the transaction, the expecting effect of investment will affect the stock prices of shipping company, and then during a few months after completion of the transaction, the number of other new information will be released in public, and the same influence will affect the stock. Therefore, in order to enhance impact of port investments on the investors, this incident we elected should be quarantined and seen to the only factor affects the share price in a given period. We need to do precise calculations on time period of incidents happening from the beginning until the end. If interval for sampling is shorter, the effectiveness of the events can be better reflected on the data. Change in the sampling methods by reducing the variance of abnormal returns, the revenue can be increased.

4.2.3 Selection of Samples

Based on statistical data from Bloomberg, the first step of case study is the selection of the data.

Principles of samples collected are just as the following:

(1). Transactions of merger and acquisition must be about the terminal or mergers and acquisitions of the terminal controlling company.

(2). Those companies must be liner shipping companies or its main business linking with the shipping.

(3). As opposed to the market value of company, the transaction must involve substantial amount of money, for only a lot of money in the transaction can greatly impact the company's stock price

(4). In the three months before and after completion of the transaction, there are no other major incidents. Setting the principle of the sampling is aimed to determine that the changes in company's stock price are caused by changes in the sample selected.

After the completion of setting these principles, only three companies were chosen as our sample in this article.

4.2.4 Calculation of share price proceeds

4.2.4.1 Monthly income

First of all, straighten out trading revenue of each company in the first 12 months before and after the transaction by the following formula.

Equation 1： Monthly income

$$\mathrm{R}_{\mathrm{it}} = \ln\left(P_{it}\right) - \ln\left(P_{it-1}\right) \qquad (1)$$

The definition of parameters is just as following:

R_{it} **refers to the returns of stock price i during time t.**

P_{it} **refers to the price of stock i during time t.**

P_{it-1} **refers to price of stock I during time t-1.**

4.2.4.2 Normal Returns

Market model is used to measure the normal remuneration. Market model is a statistical model that combines a specific stock earnings and the market portfolio. (Campbell, Lo and Mackinlay. 1997). Through the market model the effect of the incident can be better observed, something unforeseen can be reduced on abnormal return on the market revenue. Application of the equation is just as following:

Equation 2 Market Mode

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \qquad (2)$$

$$E\left[\varepsilon_{it}\right] = 0 \qquad Var\left[\varepsilon_{it}\right] = \sigma_{\varepsilon}^2$$

R_{it} and R_{mt} are the respective proceeds of company i and market combination during period of t. ε_{it} is a zero mean disturbance term. α_i, β_i, $\sigma_{\varepsilon i}^2$ are all parameters of market model. In the case study, S & P 500 is a yardstick, for the S & P 500 is the yardstick commonly given by 500 securities in New York Stock Exchange. (S&P 500，Standard & Poor's 500 index is the stock price index calculated from 500 stocks shares(of which 78% for industrial stocks, 12% for the utilities sector, 2% for the transport sector and 8% for the financial sector) in the New York

Stock Exchange which were selected by Standard & Poor's Corporation in 1982. And for the 500 companies are widespread in all walks of life, then the total market value accounts for some 80% in the total value of New York Stock Exchange, and the calculation of the index was applied with market value method of weighting, and the index has always been considered an index to measure their return of investment portfolio by professional investors, which is most representative of the stocks market in U.S.. S & P500 index, the stock index with longest and dynamic exchange hours in Chicago Mercantile Exchange. S & P companies design and maintain the S & P 500 Index, making it an accurate mark of diversified securities investment portfolio. The index includes the stock price in New York Stock Exchange, American Stock Exchange and the 500 companies with high market shares in NASDAQ National Market System.

The index includes the leading companies of major industries in U.S. economy, including the forerunners in financial, health care, energy and industrial sectors. It is a big market value index, but the S & P 500 Index is not to select or remove listed companies merely based on their size. A complete list of stocks in S & P 500 Index can be seen at this website: www.spglobal.com.

The unit of Futures trading is 250 U.S. dollars multiplied by the S & P index price. If the index trades at 1,000 points, then the contract value is USD 250,000. Changes of 10 base points in the contract are equal to 25 dollars. Therefore, an integral point, or 10 base points, changes in S & P 500 index contracts, then the value is 250 U.S. dollars), which can reflect the market of NYSE largely. S & P 500's monthly income can represent the total of all normal proceeds in the market until the end of month. This will be used for the calculation of abnormal return in a single unit for each sample in 5.1.4.3.

4.2.4.3 Abnormal Proceeds

Abnormal return refers to the difference between the actual earnings of the securities prior to or after events and normal earnings of the securities during the same period in the span of the events. From a logical point of view, the port investment will change the market value of enterprises, therefore, what we want to see is that how it can and to what extent it can have impact on the market, positive or negative impact on the market, etc.

Equation 3： Abnormal proceeds

$$AR_{it} = R_{it} - R_{mt} \qquad (3)$$

The definition of parameters is just as followed:

AR_{it} refers to the abnormal returns of stock I during time t.

R_{it} refers to the returns of stock I during time t.

R_{mt} refers to the market returns derived from S&P 500 index during time t.

4.2.5 Testing of the abnormal earnings

The introduction of the cumulative abnormal returns is aimed at adjusting the length of time span between the different samples in case windows, and the entire process of calculation is based on the following formula:

Equation 4： Accumulated value of the abnormal earnings

$$CAR_i(\tau_1, \tau_2) = \sum_{t=\tau_1}^{\tau_2} AR_{it} \qquad (4)$$

According to the original hypothesis, we can learn that events have not had the impact on the value of the average earnings of or income variance, and it should obey the normal distribution:

$CAR_{i(\tau_1,\tau_2)} \sim N\left(0,\sigma_i^2(\tau_1,\tau_2)\right)$。

The average of total abnormal return $\overline{CAR}$ can be calculated through the following equation 5:

Equation 5 ： The total average of abnormal return

$$\overline{CAR} = \frac{1}{N}\sum_{i=1}^{N} CAR_i \qquad (5)$$

The meaning of the various functions is just as the following:

(1). $\overline{CAR}$ refers to average value of the total abnormal return of all the company
(2). N represents the number of company

The variance of $\overline{CAR}$ can be calculated by the following formula:

Equation 6: The calculation of the variance for average value of the total abnormal return

$$Var(\overline{CAR}) = \frac{1}{N^2}\sum_{t=\tau_1}^{\tau_2} \sigma^2(\tau_1,\tau_2) \qquad (6)$$

Finally, in order to test the given original hypothesis H_0，for the size of the sample is 3(less than 30)，therefore the application of t distribution hypothesis testing methods will be applied.

Equation 7： T statistical testing method

$$t_{-stat} = \frac{\overline{CAR}}{\sqrt{Var(\overline{CAR})}} \qquad (7)$$

Since the statistic value of T distribution testing has been calculated, it can be compared with critical value which is corresponding to a significant level at 0.95, then whether the original assumptions is true can be drawn.

The case study results may indicate investment in port will yield huge returns for shipping enterprises, but also it can be validated in its financial markets immediately.

Chapter 5 Calculation and Analysis

5.1 Analysis of conclusion drawn from the research of the case

Through the model of applied case study, three shipping lines were finally chosen for our research samples (three shipping companies were Maersk, NYK, APL, the sample is in the appendix). All the test results of the samples show that it indeed did have a positive impact on company's stock prices before and after mergers and acquisitions. Figure 5-1 lists the average value of the total abnormal returns after observation in the past 24 months, and it can be seen that the company's stock price rise quickly in the three months prior to purchase and merger, and the company's stock price will rise to climax after the completion of the purchase and merger transactions. Nine months after completion of merger transactions purchase by the company, the company's stock price will fall back to the average range of the normal market fluctuations. If the company has other bullish announcement, then the stock prices will be changed again.

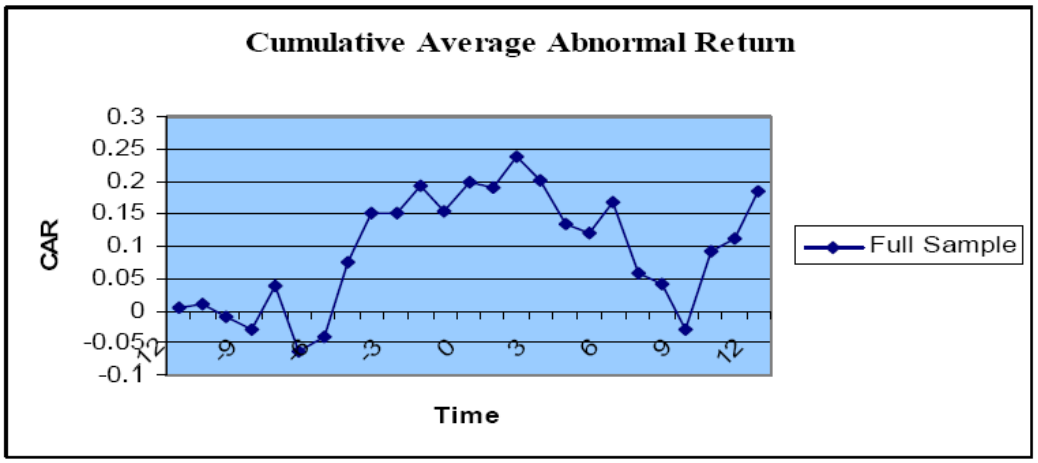

Figure 5-1: The average cumulative abnormal return

Because the size of sample we have chosen is less than 30, then the total average results of abnormal return is supposed to differ from allocation results. Therefore, the test for null hypothesis should be applied in t-distribution hypothesis method. In T distribution test method, the critical value found is 2.920 when the sample size is 3 and the significance level is 0.95; when the t test statistic value is greater than the critical value found, then the null hypothesis or the original hypothesis will be rejected or denied. That is to say, investment in ports has a significant impact on the market value of the port. And the fact that the company's stock price has undergone great changes in the three months after merger and acquisition transactions is described in Figure 5-2. If the significance level is 0.90, and the critical value will become 1.886, then the conclusion drawn from the research will show the impact of the investment in ports on the stock prices of enterprises will last a longer period of time.

Time	**——** ***CAR***	**t-stat**	**95%**	**90%**
-12	0.004015	0.061927	Accepted	Accepted
-11	0.00863	0.133125	Accepted	Accepted
-10	-0.01117	-0.17236	Accepted	Accepted
-9	-0.02893	-0.44621	Accepted	Accepted
-8	0.037986	0.585962	Accepted	Accepted
-7	-0.0622	-0.95947	Accepted	Accepted
-6	-0.03976	-0.6134	Accept	Accep

			ed	ted
-5	0.07367	1.136426	Accepted	Accepted
-4	0.151056	2.330171	Accepted	***Rejected***
-3	0.150522	2.321932	Accepted	***Rejected***
-2	0.19416	2.995093	***Rejected***	***Rejected***
-1	0.153071	2.361259	Accepted	***Rejected***
0	0.198261	3.058353	***Rejected***	***Rejected***
1	0.189325	2.92051	***Rejected***	***Rejected***
2	0.237152	3.658271	***Rejected***	***Rejected***
3	0.2007	3.095976	***Rejected***	***Rejected***
4	0.132827	2.048975	Accepted	***Rejected***
5	0.120946	1.865702	Accepted	Accepted
6	0.168697	2.602303	Accepted	***Rejected***
7	0.057877	0.892798	Accepted	Accepted
8	0.041863	0.645766	Accepted	Accepted

9	-0.03071	-0.47374	Accepted	Accepted
10	0.090778	1.400331	Accepted	Accepted
11	0.110421	1.70334	Accepted	Accepted
12	0.183273	2.827148	Accepted	***Rejected***

Figure 5-2: T-Distribution Testing Results

The case study proves that when the shipping company invests in port or a holding company in port, which will have a positive impact on the company's market value, but this impact is only effective in the short term (3 to 6 months).

Investment in port is supposed to be a long-term project for the shipping enterprises. The benefits as a result of investments in port may not be immediate. However, through the hypothesis testing of t distribution, the benefits of this investment will be valid and effective for a short period of time, in other words, the optimistic attitude investors and market participants holding on the investment cannot be ruled out the possibility of some radical behavior or psychological factor of speculation.

The shortcomings of the case study lies in that the capacity of our selected sample is excessively small, therefore there is not enough significance of persuasion and representation for the same case study.

Through this case study of financial markets, a common phenomenon may be reflected, that is, it certainly will be able to bring about a positive impact on the shipping companies on condition that investment in port is smooth. Moreover, it may prove investment in port projects in itself is a lucrative one as well. So N company should invest in the China’s ports, which beyond doubt can bring big profits for the

N company.

5.2 Suggestion drawn from the research of the case

Event Study provides a feasible basis for investment in China's ports by the N company. All data in the process of calculation by this method are based on the data that had been figured out already. If you want to study this aspect further, then the following are some suggestions that will be valuable.

First of all, after a deeper level of analysis, what kind of coordination methods to be taken will be known. If the N company has planned to do investment in the China's port, then the problems like how to reduce the cost in the process of investment, how to manage his own new business, how to combine the three main business to achieve maximum profit will be the main item on the agenda of N company.

Second, based on the fleet owned by N company and the sailing routes of the fleet, N company can explore more ports that is worthy of being invested. This will reduce the scope of its own research, the idea or proposal is of important significance to the N company.

Finally, combining the financial statements of N company, we are supposed to select an appropriate method of financing to further elect the optimal way which enables N company to invest better in Chinese ports. Cooperation with PSA should be a good strategic approach that N company expands port investment project.

Chapter 6 Conclusion

This article's objective is to verify that whether the N company and its branch A company should do the port investment in China. In this paper, a conclusion was made finally both from a strategic and financial study.

On the current through the probe into strategy adopted based on N company’s status in the container liner transport, logistics services, port operations, and the study for whether N company should invest in China's ports will be conducted.

Strategically speaking, A company's core business is in China, and the shipping route A company covered is mainly in intra-Asia, Trans-Pacific and Asia-Europe. 35% of A company’s total trade volume comes from China. Just as N company said, in 2005, they pointed out in their annual financial report that they will further do investment in the ports of multimodal transport, thus enhancing their service capabilities and cost advantages. There are a good many investment strategies that can be applied, for instance, mergers and acquisitions, stock control, joint ventures and strategic alliances and so on. Use of scaled effect of economies, access to financial and coordinated synergies is a long-term strategy of investment in Chinese ports by N company.

From an economic point of view, the author uses mathematics methodology of case study to investigate what kind of results on enterprises brought about by the mergers and acquisitions of container terminals. Case studies include hypothesis testing, which can give statistical simulation; for non-normal returns stock price analysis will be applied, T distribution hypothesis testing reflected that the mergers and acquisitions of ports will exert a positive impact on stock prices of enterprises within the three months starting from the date of mergers and acquisitions.

Overall, this article has successfully reached the following conclusions: investment by N company and A company in China's port is worthwhile. Analysis from the perspective of economy and time is merely one of many analytical methods, and this paper provides the initial platform for the further investigation and research of port investment for the liner company like N company.

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Appendix

Appendix I：Normal returns

Return	Maersk	NYK	APL
-12	-0.14668	0.121978	-0.087647
-11	-0.02553	-0.15216	0.0664451
-10	0	0.095563	-0.018019
-9	-0.11886	0.051799	-0.010969
-8	0.274981	0.011948	-0.108634
-7	0.039051	-0.00715	-0.309782
-6	-0.14474	0.023642	0.1109316
-5	0.108634	0.061174	0.1222176
-4	0.162519	-0.09685	0.1591948
-3	0.181279	-0.0702	-0.103266
-2	0.025735	-0.04788	0.1439373
-1	0.056311	0.0886	-0.182322
0	0.219101	-0.09956	-0.017544
1	0.018349	0.045768	-0.022372
2	0.117783	0.051293	0.0783009
3	-0.14077	-0.01258	0.0041754
4	-0.03792	0.084899	-0.195407
5	0.083382	-0.04763	-0.070296
6	0.039221	-0.01722	0.2055992
7	-0.03258	-0.04569	-0.188357
8	-0.07089	0.195225	-0.114184
9	-0.10221	-0.14212	0.0248387
10	0.03101	0.171591	0.1534829
11	0.066445	-0.0889	0.0927564
12	0	0.059423	0.1754487

Appendix Ⅱ： Abnormal returns

AR	MSK	NYK	APL
-12	-0.07495	0.209534	-0.12254
-11	0.065167	-0.19508	0.143763
-10	-0.03489	0.054184	-0.0787
-9	-0.04154	0.035838	-0.04755
-8	0.214294	0.034748	-0.04831
-7	0.002468	-0.01565	-0.28737
-6	-0.08441	0.010685	0.141032
-5	0.131047	0.114998	0.094258
-4	0.192619	-0.0538	0.093338
-3	0.15332	0.001522	-0.15644
-2	-0.04012	0.042818	0.128219
-1	0.003133	0.05371	-0.18011
0	0.203382	-0.02224	-0.04557
1	0.020561	-0.01492	-0.03245
2	0.089755	0.01471	0.039013
3	-0.15085	0.047748	-0.00625
4	-0.07721	0.107312	-0.23372
5	0.072955	-0.01753	-0.09107
6	0.000903	-0.04518	0.18753
7	-0.05335	-0.11155	-0.16756
8	-0.08896	0.142047	-0.10113
9	-0.08141	-0.15783	0.021524
10	0.044061	0.173802	0.146603
11	0.063131	-0.11693	0.112725
12	-0.00688	0.049346	0.17609

Appendix III：The cumulative abnormal returns

CAR	MSK	NYK	APL
-12	-0.07495	0.209533684	-0.1225367
-11	-0.00979	0.014449999	0.021226685
-10	-0.04468	0.068634392	-0.05747818
-9	-0.08622	0.104472039	-0.10503008
-8	0.128075	0.13921955	-0.15333754
-7	0.130543	0.123567579	-0.44070703
-6	0.04613	0.134252245	-0.29967521
-5	0.177177	0.249250475	-0.2054168
-4	0.369796	0.195451008	-0.11207882
-3	0.523116	0.196973024	-0.26852336
-2	0.482994	0.239791497	-0.14030468
-1	0.486127	0.293501686	-0.32041473
0	0.689509	0.271261376	-0.36598679
1	0.71007	0.256343431	-0.398437
2	0.799825	0.271053858	-0.3594241
3	0.648975	0.318801463	-0.36567557
4	0.571768	0.426113835	-0.59939982
5	0.644722	0.408586045	-0.69046964
6	0.645626	0.363406218	-0.50293987
7	0.592276	0.251856147	-0.67050228
8	0.50332	0.39390284	-0.77163499
9	0.421909	0.236069078	-0.75011078
10	0.46597	0.409871533	-0.60350747
11	0.529101	0.292944546	-0.49078229
12	0.522221	0.342290052	-0.31469182