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**A Market Study of Sea Transport
between China and Northern Europe**

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Abstract

Over the past months and years, the trade from China to northern Europe has boomed spectacularly. The fast development of foreign trade has not only pushed China's port industry and international shipping industry forward considerably, but also provided foreign ocean carriers and terminals opportunities and challenges. As the largest port in the Scandinavia region, the Port of Gothenburg's overall goals is to increase the number of calls made to it. Then the market study between Mainland China and northern Europe turned to be necessary and meaningful.

The purpose of this study is to analyse China's port industry and ocean shipping market in relation to trade with northern Europe. The effect brought by WTO Accession to the industry and market will also be discussed. Furthermore, this research is intended to recommend some suitable Chinese ports for cooperating with the Port of Gothenburg and to find the reason why some top shipping companies are not paying direct call to the Port of Gothenburg.

A specific study of the Chinese international shipping industry, port industry and main export regions is given mainly in the following aspects: the current situation, fact and figures, the related policy, the developing trend, and the opportunities and challenges. The shipping and port industries of China are analysed by using Porter's diamond. Two market surveys are performed, one for finding suitable Chinese ports for the Port of Gothenburg to cooperate with, and one for collecting information of using the Port of Gothenburg from several top shipping companies. In doing the market surveys, two questionnaires are adopted for information collecting and analysing.

Our final recommendation is to cooperate with Qingdao Port, Shanghai Port and Guangzhou Port. We have also concluded why several top shipping companies are not paying a direct call to the Port of Gothenburg. A brief market analysis is also offered in the chapter of conclusion and recommendation.

Key-words: transoceanic transport, Chinese port industry, Chinese shipping industry, Chinese main export regions, port cooperation

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1 Introduction

In this chapter we motivate the necessity of doing market research on the transoceanic transportation between China and Sweden. We will also present a brief background description, explore the problem and state our main purpose of the thesis.

1.1 Background

Since 1978 the real growth of GDP of China has averaged 9.3% per year and the growth rate 2002 is 7.8%. (China Statistics Bureau, 2002) The robust GDP growth has helped trade. China's membership of the WTO since November 2001 has also contributed in the country's economic development. China has become the origin of most supply chain in the world economy, a world production base and an attractive consumption market. The past two decades have seen China's amazing development in foreign trade.

The trade from China to northern Europe has boomed over the past months and years, and it is still growing spectacularly, providing ocean carriers and terminals many challenges and opportunities. The pace of westbound trade's change has caught everybody by surprise. The latest estimate provided by trade forecasting specialists Global Insight shows an increase of 11% for 2002. The westbound trade has continued to increase in leaps and bounds this year, with the FEFC reporting a staggering 20.1% increase in the first quarter, compared with the same period last year. Trade to northern Europe alone increased by 19.5%. Pure Chinese traffic alone accounted for 41.5% of total to northern Europe, up a remarkable 47%, while Hong Kong added another 12%, up by 5.5%. In other words, more than a half of all exports from Asia now come from China. (Beddow, 2003)

The fast development of foreign trade has pushed China's ocean transport forward considerably. Nowadays, Ocean transport holds a dominant position in China's waterway transport, with the ocean cargo turnover making up roughly 70% of the waterway transport cargo turnover. At least 85% of China's foreign trade goods rely on ocean transport. In 2001, the amount of China's sea freight transport in foreign trade stood at 660 million tons, with a 14.1% increase over

the previous year. The country's top 10 container ports experienced huge double-digit growth during the first half of 2002, with the only exception of Dalian in northern China. The average growth rate was 32.4%, compared to the same six-month period in 2001. (China Ministry of Communication, 2002)

China effect has been obviously marked in the global market related to ocean transport. For the whole world, the top 30 container ports increased their volumes in 2002, but the biggest gains were made by Asian ports, with some ports in China leading the way. Benefiting from China's strong economic growth, Hong Kong was once again the world's largest container port in 2002. Shanghai, Shenzhen, Qingdao, Tianjin, Guangzhou and Ningbo are also listed in the world's top 30 container ports in 2002. All of them had the phenomenal growth and are still continuing their steady climb up the ranking. Probably one in five of every container handled in year 2002 moved through a Chinese port. (Boyes, 2003) We cannot deny that China's economic growth has had an impact not only on the intra-Asia ocean transportation markets; it also has a critical impact on the trades such as eastbound transpacific and westbound Asia/Europe. And it seems likely that the China effect will continue throughout 2003 and beyond.

The ocean transport between China and Sweden shows the same trend. The relation between China and Sweden had, and is still having a sound development. The bilateral ties have made satisfying progress since May 1950, when Sweden was the first among western countries to create diplomatic ties with China. Sweden is China's No.1 trade partner in North Europe. The relations between the two countries have been progressing smoothly and steadily ever since. It was reported that China became Sweden's largest trade partner in Asia in the first three month of 2003, nudging Japan from the first slot. More and more Swedish companies have a presence in China, taking advantage of cheaper labour and start-up costs. These include many multinationals from the motor vehicle and electronics industries. Much is produced for the domestic market, but a good percentage of their cargoes are exported. It is most likely that the export from China to Sweden will increase in the following years.

Although as the largest port in the Scandinavia region, the Port of Gothenburg is not satisfied with its current situation. The port tries to strengthen its position by new ventures and extensions, and to get increased volume, increased

demand, and greater flexibility with unique customer adapted. When taking future-aimed actions to get flows toward record-breaking levels in goods traffic, it is natural for the port to give a lot of consideration in seeking potential market in China. Then the market research on transoceanic transport between China and Sweden became necessary.

When we got the thesis subject with the Port of Gothenburg AB as the principal and sponsor, we considered this a meaningful opportunity to work on an interesting case. The main idea for the research topic was to study China's port industry and transoceanic transport market. It is really meaningful because we can give an objective introduction and analysis to our mother country's terminals, shippers and carriers. We hope our thesis research can contribute in getting more people to know more about China's transoceanic transport.

1.2 The Port of Gothenburg (POG)

“We will develop and offer port and logistics services in collaboration with the transport industry and other customers and thereby confirm the Port of Gothenburg as Scandinavia's central port.”

Port of Gothenburg AB's mission

In this section, we are going to present the Port of Gothenburg AB. Most of the following part is based on information from the Annual Report of the Port of Gothenburg for 2002.

The Port of Gothenburg is the largest transoceanic port in Scandinavia and a dedicated port for unitised cargo, oil, cars and passengers. It is owned by the City of Gothenburg. Around 70% of the Nordic countries' industrial capacity is located within a 500 kilometres radius from the port. It takes six hours to reach the capitals Stockholm, Oslo and Copenhagen. The population in Scandinavia and Finland is 23 million people. One third of sea borne goods in Sweden passes through it and it controls 60% of Swedish container cargo. The maximum depth of water at berth is 19.6 metres (in oil harbours 19.6 metres; in container/ro-ro harbours 12 metres, from 2004, 15 metres).

The Port of Gothenburg has as its business concept to load and discharge cargo and develop customer-oriented transport solutions that will get direct cargo via the Port of Gothenburg. The port's unique position in the Nordic port world gives it a dual competitive environment. In the short-sea field (intra-European shipping), the port competes with other Swedish ports, notably on the west coast. In the deep-sea field, the competition comes more from the ports in the Hamburg-Antwerp range. It should be noted that the feeder vessel route between Gothenburg and the continent runs parallel with road and rail links. Consequently, competition not only includes the Port of Gothenburg trying to attract vessels but also competition between different modes of transport. (www.portgot.se)

Of the top container carriers, only Maersk Sealand and Atlantic Container line now make direct calls to the port. The rest either provide their own feeder services to the port, such as MSC and CMA CGM, or use the wide range of independent feeder companies only too willing to tailor their services to suit particular needs. Despite a relatively weak world market, the container segment of the port got the growth in volume as much as 10% in 2002. In 2002, the cargo turnover is 33.5 million tonnes; the container turnover is 756,000 TEU (flats and cassettes included); the ro/ro units are 430,000; and 2.8 million passengers and 265,000 new cars transported via the port. In order to maintain and develop direct traffic, a bilateral agreement has been signed between Sweden and the USA. The port has as the first approved Nordic port been given the CSI (CSI= Container Security Initiative) status and competitive advantage as the world's leading ports.

One of the port's overall goals is to increase the number of calls made to it (especially direct calls of oceanic ships), both for services to Europe and for transoceanic traffic. In order to improve and strengthen its position as Scandinavia's central port, the port has invested heavily in several projects. The investment portfolio currently comprises projects for more than a billion and a half kronor (SEK). There are two major projects, one is the project container terminal 2005, and the other is the project safer fairways. The investment for the container terminal project will be 410 MSEK in quays and quayside facilities in a first stage.

The project container terminal has started and will be finished in June 2006. The project will increase not only the annual capacity to 2.5 million TEU, but

also the rail capacity, productivity, flexibility and new transportation solutions. The new catheads with a 30 meter gauge will be ready for future Super Post Panamx Cranes. The project safer fairway will be performed to straighten, widen and deepen the fairway. The port will then have capacity to take in largest container vessels in the world. The project safer fairways will increase safety and capacity of the fairways for vessels sailing in/out of the port.

As the port call itself the “the Port of Scandinavia”, it want to get more direct going ocean traffic in combination with feeder traffic and rail shuttles to generate conditions for an efficient, rational system for the further transportation of goods to the rest of Scandinavia and the Baltic countries, including Russia. The analysis shows that the TEU potential for the port follows the global trend, i.e. an increase of 7-8% annually. Current volumes of about 700.000 TEUs will then be doubled during the coming 10-year period. Development in Russia and the Baltic States, and the extension of the Europe Union are other important regional factors for the port. The port’s vision is to be the natural transport hub for sea transportation in northern Europe. To ensure and develop the role of the port as the central Nordic port, several market oriented projects have been started up, included rail shuttles to and from the port, upcountry port branches, “Dry port” and projects that aim to develop local shipping. The rail distribution has developed from 45,000 units in 1999 to 105,000 units in 2003. The port’s ambition is that half of all volumes arriving should be transported by rail.

1.3 Purpose

The overall aim of this thesis is to make a study of China’s port industry and ocean shipping market in relation to trade with northern Europe. The effect brought by WTO Accession to the industry and market will also be discussed. The specific introduction of the Chinese shipping industry, port industry and main export regions will be given mainly in the following aspects: the current situation, fact and figures, the related policy, the developing trend and planning, and the opportunities and challenges. Two market surveys will be performed: one is related to using the Port of Gothenburg among several top shipping companies---- what is the main reason that they are not paying direct call to the port; the other is to find the right Chinese port to cooperate with the

Port of Gothenburg. The recommendation will be given in the final chapters of this thesis.

1.4 Problem Analysis

It is not difficult to find that the port industry is actually tightly related to the ocean shipping market. We think that there are three main actors in the shipping market: the terminal (the port), the shipper and the carrier (the shipping line). Therefore, in our thesis writing, we will focus on these three main actors. In order to have a clear frame, we set out a number of research questions to be answered by this thesis and the information need for solving the problems:

The main problem is to analyse the transoceanic transport market between Mainland China and Northern Europe (including the Scandinavia States, the Baltic States and West Russia), especially focusing on how the Port of Gothenburg can get more traffic from shipping lines originating from China for containerised cargo.

Sub-problem 1:

What are the current situation, policy and developing trend of the main ports in the Mainland China?

More specifically this means that we should study the ports in several aspects: what is the main hinterland each port cover; what is the current situation (port infrastructure and operation) of the main ports; what are the developing plans of the ports; what kind of project they are planning to perform; what will be the effect of the plan; and what is the attitude of the authority of the port. Is there a good balance between export and import; who is the main customer of the port; which shipping lines make the direct call to the port; who is the owner of the port; what is volume in TEU today and in the future. To do this we have to review and select suitable ports in Mainland China that has the possibility to act as the nodes in the route connecting China to Sweden.

Sub-problem 2:

What are the current situation, management characteristic and developing trend of the main carriers in Mainland China?

Here we mean “carriers” the main international shipping companies in Mainland China. We will try to focus on the volume of freight, types of cargo, frequency of sailings, type of vessels involved, and route of sailing. All the information we collected for solving this problem will be the base for us to solve the final sub-problem.

Sub-problem 3:

What are the current situations, main characteristics and developing trends of the main export regions in Mainland China?

China’s economy has a characteristic that it has several obvious export regions along the coastal line. Where are the main export regions; what are the main characteristics of the product being exported there; what is the characteristic of the region; which ports have the shortest distance to the related regions; and which ports do these regions use to export product?

Sub-problem 4:

Two market surveys related to using the Port of Gothenburg (POG) and finding the cooperative port in Mainland China will be performed. As one of the Port of Gothenburg’s overall goals is to increase the number of calls made to the port, then the market surveys will be necessary. The information offered by the respondents will be analysed. We will recommend the right Chinese Port to the POG for cooperation, and we will also offer the conclusion why the chosen shipping companies are not paying direct calls to the POG.

1.5 Delimitation

As regards of scope of this thesis research, some limitations and definitions seem in order here. Given the scope of our project, our limitations are mostly of technical and geographical nature. Firstly, because of the limited resource and time, we will devote most of our time to a market study of the port and

shipping industry in Mainland China, conditions in Hong Kong and Macao will not be studied in this thesis. Secondly, as to the goods flow of oceanic transport, we will only focus on the container flow; we shall not look at the other ways of transports. More specifically, we shall not consider bulk goods, passenger traffic (ferries), or any flow of cargo that is not unitised. Thirdly, in this thesis research the ports we will study will be geographically restrained to China's major coastal ports, other inland river ports will not be studied; and we will only study those aspects related to container in ports analysis.

2 Theoretical Framework

This chapter aims to provide a broad theoretical framework related to our thesis study. The presented theory enables an understanding of shipping industry. Furthermore, the theory is useful when composing questionnaire as well as guiding us to do the specific research.

2.1 Containers and Containerships

A container is a specialized box to carry freight. It appeared mainly in order to enable, in an economical way, integrated transports. Containerizations can be defined, according to The Containerization Institute, as the utilization, grouping or consolidating of multiple units into a larger container for more efficient movement. The standards of containers are established by the International Standardization Organization (ISO). The term TEU (twenty-foot-equivalent-unit) refers one container with a length of twenty feet. A container of 40 feet is expressed by 2 TEU. In accordance with ISO standards, these containers are equipped with bottom and top corner fittings. This enables them to be handled easily by cranes and lift-trucks that are equipped with a top lifting yoke. Lumsden (2002) describes the container can also be equipped with fork tunnels and grip-arm fittings, which enables it to be handled by a fork lift-truck or grip-arm equipped cranes and trucks.

The invention of containerization in the mid 1960s has really brought the most dramatic change to the industry. For the first time, it was possible to load goods somewhere in the world and transport them with different transport modes without unpacking or change in transport unit. To reach this smooth container cargo flows units are standardized to 20 or 40-foot lengths. These can easily be transported and transferred to trucks, trains or other vessels. This makes the transport process extremely efficient. Since the introduction of containers, both the world trade of goods and the number of containers have increased substantially. The following advantages are presented by Wijnoelst & Wergeland (1997) when using containers compared to transport of the pieces of cargo separately:

- Reduction the port time, loading/unloading speed increases because the units are bigger and stowing is faster;

- Less personnel is required for transshipment of the cargo;
- The cargo is better protected against damage during loading, unloading and transport as against theft.

For transport of containers, there are special container ships and special container terminals. A container ship is an ocean vessel specifically designed to carry ocean cargo containers. It is fitted with vertical cells for maximum capacity. Modern containerships are usually gearless, relying on special designed shore cranes of container terminals for the loading and unloading of containers (Lumsden, 2002). Such an operation is extremely efficient; container ships spend less time in ports and more time sailing. The number of 20-foot containers (TEUs) they can carry measures the carrying capacity of the ship.

The economic need for container ships, containers can easily be transhipped from one modality to another. The world container trade has maintained constant growth since the beginning of the 1980's. The high increases in container trade enabled the shipping companies to employ bigger ships. With bigger ships considerable can realized economies of scale based on long-distance trades, and the transportation costs can be reduced.

2.2 Theoretical Points on Port's Management

Seaports, today, are the strong points of the economy of countries possessing a coastline and they constitute the “lungs”, as it were, for their international trade. They are the compulsory transit point for the bulk of this trade, permitting the import of goods, which the country does not itself produce in sufficient quantity, and the export of its major items. This contributes heavily towards the development of national economy. Seaports are also good places for the provision of further services that add value to the products transported and thus help to meet the increasing demands of trade better.

2.2.1 Function and Role of Seaports

The role of a modern seaport can be summarized in the following UNCTAD (*United Nations Conference on Trade and Development*) definition: “Seaports are interfaces between several modes of transport, and thus they are centers for

combined transport. Furthermore, they are multi-functional markets and industrial areas where goods are not only in transit, but they are also sorted, manufactured and distributed. As a matter of fact, seaports are multi-dimensional systems, which must be integrated within logistic chains to fulfil properly their functions. An efficient seaport requires, besides infrastructure, superstructure and equipment, adequate connections to other transport modes, a motivated management, and sufficiently qualified employees.”

Ports exist as an important and fundamental part of the overall pattern of trade and transport. The range of activities in individual ports may differ greatly. But all ports have several activities in common. The basic role of an international port consists of the ownership of land, quays, piers and port surface. The port either maintains or controls these facilities itself or rents them out to other parties. The primary function of a port is to provide for efficient, low cost, intermodal and intramodal transfer, inspection, storage, form change, and control of cargo. Therefore, a port must be effective and be able to accommodate ships and vehicles of other modes of transport interfacing at the port. It should act as an integral part of a chain of transport links designed to move cargoes from place of low utility to a place of high utility - right place in right time with right technology at right cost. Ideally, ports should provide the capacity for a continuous flow between land-water, as well as water-to-water transport modes. Hence, ports are the critical links between major transportation links. According to Makhdoom (1999), the FIVE most important roles of a seaport can be summarized as follows:

1. Provision of shelter from the elements. This arises when, due to heavy seas and storm conditions prevailing, ships take shelter in the environs of a port and, thereby, seek safe anchorage or berth.
2. Cargos and Passenger Handling. A place where ships can load, or discharge their cargo, and/or passengers. This is, in fact, the prime function of a port.
3. Support Services for Ships. This includes victualing, stores, bunkering, ship repair, crew change, and so on.
4. A Base for Industrial Development. This involves the provision of industry and its infrastructure to facilitate development of trade passing through the port.

It may be a steel plant, a cement factory, an oil refinery, a sugar or grain centre, etc. It can also be a free port with Free Economic Zones.

5. A Terminal Forming Part of a Transport Chain. Such an interchange point links the shipping service with other transport modes to provide an overall trade distribution network, often under the combined transport operation concept. This involves land, air, rail or inland waterways/canal transport.

The role and function of ports is rapidly changing in recent historical development. These changes are due to: economies of scale in ship size and speed, as well as specialization of shipping and ship types; economies of physical form change of cargoes, which influence new methods of cargo handling, processing and warehousing; economies of specialization in cargo forms or types - bulk, unitized, and containerized carriage of goods.

2.2.2 Rationale for Seaport Development

The role and significance of seaports in the last two decades have radically altered. Nowadays, the seaports not only function as a link in the international transport chain, some of them are also turning into world-famous trading centers. Branch (1998) examined the following rationale and circumstances behind the seaport development during the past decades.

- a) Regional economy has focused on the integration seaport efficiency, and “brand image” of seaport is a major factor that attracts trade and developing the economies of the hinterland/ regions they serve.
- b) The large increase in the size of container vessels has profoundly affected the pattern of trade routes, which resulted in a rational seaport call.
- c) The high priority of governments and trading blocs such as ASEAN, NAFTA and the EU has been given to develop regional economics and to foster international links with other nations. Particularly seaports of a country’s infrastructure are accorded excellent investment and high technology.
- d) The free trade zone is surrounded with seaport that offers marketing benefits for international enterprise. These benefits include: unrestricted international exchange of goods, free of customs duty, excellent distribution access to the seaport’s global maritime services, low land

rents and high-tech low-cost labors, and immediate access to local markets. All of the above are difficult to find elsewhere.

- e) Seaports play an important role because of logistics as a new feature in the global distribution chain. High-tech equipments and computerized seaport resources are demanded in order to integrate with the distribution chain. Just-in-time techniques and traffic management scheme under a computerized network should be involved in seaports.
- f) Major ship-owners who operate the latest generation of high capacity containers are adopting a strategy of “one-stop ports”, they make a choice to serve one seaport in an area rather than a series of seaports, and develop trade with those seaports by feeder services.
- g) Increased competition is to be found among major seaports, as well as the development of a more marketing focused management. These also stimulated the previously state-owned seaports altered toward privatization.

2.2.3 Classification of Seaports

Ports can be classified according to different ways, including individual characteristics, the type of cargo they handle or what types of market they serve. Stockholm (Susanne Ingo) Coordinator Centre for Maritime Studies (1999) describes the following port classification is based on the business-oriented guidance to distinguish different port types from *function/trading area*.

1. Local ports with a local trading area.
2. Regional/national import and export ports with a trading area, which is larger than the local trading area and of national importance to the port's role in one or more product areas.
3. Ports for transshipment: Traditionally, this term denotes a port with direct transoceanic services. The cargo is transshipped to smaller tonnage operating in regional traffic.
4. Transit ports: Also a port of transshipment but extended to mean that the port has a hinterland larger than the country in which it is located. Both ship and road or rail can carry out transportation of transit goods.
5. The “hub and spokes” concept: The hub is a highly effective transshipment point where goods are transferred from transoceanic

tonnage to feeder tonnage or road/rail links, or between tonnage serving different routes. To be granted hub status, a port must have a strategic location in relation to routing and the major markets and be able to be involved to a much greater extent, in order to actively influence it's own volumes and those of it's customers as well as cost effectiveness. Investments in both infrastructure and supra-structure are needed.

6. Feeder traffic and feeder ports which, from the regional perspective, are links and nodes.

2.2.4 Seaport Services

Besides the provision of basic infrastructure for the transfer of goods and passengers between sea and land, there are multiple services provided by different agents at ports. These services cover all activities linked to the connection between port users and port, from the moment that a ship approaches a port until it ends all its operations. Trujillo & Nombela (1999) describe all seaport services that are summarized following:

1. Infrastructure provision
2. Berthing services that include pilotage, towing and towage. Port authorities can directly provide all these services, or private firms can also offer them.
 - Pilotage is defined as those operations required for a ship to enter and exit a port safely
 - Towing Pilots can be independent private agents in some ports, licensed by the port authority, while in other cases they are public employees.
 - Towage is the operation of moving a ship using small powerful boats (named tugs) to steer it more easily.
3. Cargo handling encompasses all activities related to the movement of cargo from/to ships and across port facilities. The process of cargo handling varies according to the type of goods involved.
 - Stevedoring
 - Terminals
 - Storage
 - Freezing (fish, others)

4. Consignees: This types of service demanded by port users are those related to administrative paperwork and permits (sanitary certificates, import/export documents, taxes, etc). These are usually performed by specialized agents or *consignees*, who are hired by shipping companies to arrange in advance the paperwork and all matters related to the use of port facilities by a ship.

- Administrative paperwork for ships and cargo
- Permits (sanitary, customers. etc)
- Service hiring

5. Ancillary services: There is a series of other ancillary services performed by different agents and firms. All supplies to ships must be included, of which fuel and water are probably the most important. There are also services to crew (medical, etc), and general common services such as cleaning, refuse collection, safety and the like. Some ports can also offer repair facilities to ships, which may involve the use of some special infrastructures.

- Supplies
- Repairs
- Cleaning, refuse collection
- Safety

In summary, there are many different services offered by a port. From the regulatory point of view, the provision of infrastructure and cargo handling are the more relevant services, since efficiency in seaports is dependent on these two services. Other services can be provided by private firms working in more or less competitive conditions.

2.2.5 Network Structure

A line system of shipping has sought to minimize costs by limiting the number of port calls. As a part of transport network, ports build one or several links to meet the demands of shippers. The network structure consist of one or several relations accordingly, each of these networks involves its fixed frequencies, capacity, handling etc.

A Single Link

Lumsden (2002) explains a single link is the simplest system of shipping line; it connects two specific ports into one relation. Using the simple link network, it

is easier to choose ship types. It is also simple to adjust the frequency and the capacity in order to adapt different demands. Because the loading/unloading always finish at every port, network operations are simplified.

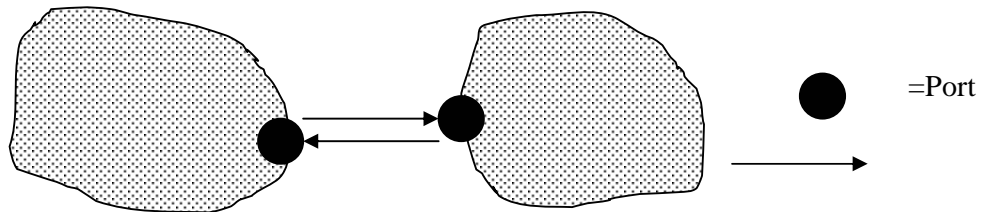


Figure 2-1: A Single Link

Several Links with Feeder Operations

Lumsden (2002) presents that the definition of several links is different from that of single link. Shipping line with several links can transport larger amounts of cargo, at the same time the frequency with one link will increase. But in a way, the cycle time of the network system will be prolonged. Thus, in order to maintain the frequency of shipping line, more ships must be used.

Ships which are connected with different continents are very large and have a high loading capacity; consequently large cargo volumes are demanded. Ports cannot find these large volumes in their own hinterland, and therefore they have to connect with other ports. The cargo must be transported from the smaller ports to the larger ship. In a word, shipping line supported by feeder operations.

The feeder networks based on major ports are organized around long-distance liner-networks. Cargos that are loaded normally from a feeder ship (or other short – sea ship), then transshipped at the port from a deep–sea ship. The network system is also an integrated part of the transport chain from door-to-door.

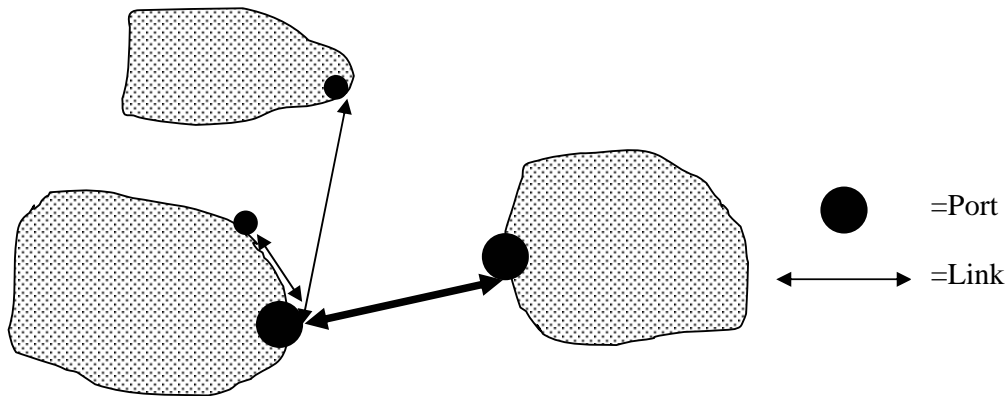


Figure 2-2: *Several Links with Feeder Operations*

2.3 Theoretical Points on Shipping Management

2.3.1 Imbalance in Shipping

Imbalances are common to all forms of transport, and are particularly difficult to overcome satisfactorily in shipping. Since ships have usually a large capacity to transport goods from one port to another. When the goods flow is different between two locations, an imbalance will occur that leads to low filling-grades for the ship. Four kinds of imbalances of sea transport are described by Lumsden (2002):

Structural imbalances

The structural imbalance is due to imbalance of in- and out- goods flow. It has been caused by industry system and cannot be changed by the sea transport system. The only remedial measure is to supply goods to the under utilized ship movement with a feeder operation system, or to convert the suitable goods by a unit load carrier.

Design dependent imbalances

Specific ships are designed to carry only one type of goods in order to make a high efficiency at the sea transport. This often leads to the fact that goods only transported in one direction. As the imbalance is due to the design of the ship, high efficiency and the existence of underlying demands from regulations or

danger for ships or surroundings at sea transport, it is needed to economically justify.

Operational imbalances

A sea transport system is often designed starting from the operator's supply of ships. An imbalance will occur as a result of how the ships are operated and how they are redirected.

Commercial imbalances

International sea transport acts upon a function of market. The commercial imbalances are mostly caused by economic, social and political factors. (Branch, 1998) There are different freight rates in different directions, therefore operators faced with a severe imbalance of trade; they may endeavour to resolve the problem by means of the price mechanism.

2.3.2 Shipping Cost

Wijnolst & Wergeland (1997) classify the costs associated with a shipping business into capital costs, operating costs, voyage costs, and cargo handling costs. In presenting the main features of each cost category, we recognize that there will be differences between countries in the treatment of items such as taxation; however, the fundamentals of costing are sufficiently generic to be applicable internationally.

Capital Costs

The capital costs of a ship cover the depreciation of the ship over its economic life, as well as the interest payments over the non-equity financing of the ship. The capital costs are the variable costs, which mainly consists of the following different factors:

- Vessel acquisition costs
- A drawdown schedule
- The effective working life of a vessel
- Residual value
- Financing arrangements
- Taxation measures
- Exchange rates
- The method of establishing the annualized cost of capital

Operating Costs

Operating costs comprise the cost items that are related to the purely operational aspects of running of the ship. The costs of ship only involves the fixed costs which enable the ship to sail, the elements are:

- Manning costs
- Repairs and maintenance
- Stores
- Hull and machinery insurance
- Administration
- Overheads
- Protection and indemnity insurance
- Annual provision for dry docking
- Victualing
- A range of industry charges

Voyage Costs

The voyage costs include the variable costs associated with the actual sailing of the ship.

These elements are:

- Bunker costs
- The harbour dues
- Pilotage
- Tugs
- Canal dues

Cargo Handling Costs

Cargo Handling Costs are the costs for loading and discharging of the cargo from ship to shore or from ship to ship. A number of elements decide the cargo handling costs:

- The type of cargo
- The quantity
- The type of ship
- The terminal and the port characteristics, etc

2.3.3 Port Selection Criteria

A modern port is no longer just a place where cargo has been loaded and discharged from ships. Ports are today a vital link in the logistic chain. Ports have to have skills in at least the three main modes of transport concerned: water, rail and road. Because of shipping is scheduled traffic with a network of fixed ports, a liner shipping company is naturally interested in building up “permanent relations” with it’s ports, something which is also an ports have to have skills in at least the three main modes of transport concerned; water, rail and road. The liner shipping company’s choice of regular port of call is based on a number of considerations. According to an independent survey done in 1999 the Scandinavian industry rates the most important criteria in the following order:

1. The port’s location. The port’s location is the fundamental point when carriers consider selecting a port. The criteria relates to the following aspects: the hinterland for potential cargo and balance between incoming and outgoing volume; other ports of call – the deviation aspect; transportation capacity to and from the port; the competitive situation, i.e. its competitors’ ports of call and catchment’s areas.
2. The port’s flexibility with respect to aspects of: handling different types of cargo; adaptation to varying arrival times; and overtime requirements
3. The cost of using the port: the port’s efficiency measured in cost per TEU/ton and time unit; the level of port entrance costs and related costs (tugs, bosuns, etc.) and the cost trend over time – low and even are an advantage; and stevedoring costs in the port according to tariffs and “real costs”
4. The brand image of the port. With most major ports developing their brand management, it is important the carrier identify the value-added benefits that flow from the brand. The brand image includes quality of service, customer care, reliability, ISO 9001 and so on.
5. The port’s technical capacity, practical maximum capacity. Particular attention should be paid to berth layout and backup facilities such as an adequate container stacking area, handling equipment, and distribution network and customers clearance.
6. The port’s information system. Modern ports today are fully computerized in all areas of the maritime industry business. It is so

essential for the port to efficiently turn round of vessels and continuous access to the port.

7. The port's quality with respect to absence of cargo damage and ability to adhere to prearranged times and other terms of agreements.
8. The political and economic focus of the port should be considered. Political stability and sound economic growth are desirable features.
9. The provision of FTZs (Free Trade Zones), economic zones, etc., all of which add up to the port being classified as an industrial centre.
10. Weather, wind and ice conditions.

Today the role of the port becomes a key part in the whole logistic chain and faces new challenges. Modern ports must be competitive on times and prices for their services. Seaports must be integrated within logistical chains to serve their many functions. An efficient seaport requires infrastructure, superstructure, equipment, and adequate connections to other modes of transport, a well-motivated management, and qualified employees. Overall, the port selection will be market driven on a one-ship value-added basis, the ultimate decision of which ports to feature in the sailing programme is strategic, and the shipping company and will focus on the business plan's objectives.

2.3.4 Factors for Considering the Shipping Route

A larger number of factors must be considered when a shipping company plans a new sailing route, because the very large capital investment will be brought heavy financial charges for the new sailing, and the carrier must also ensure that the profitable load will be continuously realized. Branch (1998) presents the most critical factors when considering a new shipping route:

1. Liner cargo service operation is market driven and also budget driven. The marketing plan based on traffic forecasts describes the sailing schedule, it will indicate the traffic volume available for shipment every single loop and provide the shipping capacity to match it.
2. The voyage cost associates with the marketing plan and budget. The cost will be enormous and influenced by manning scales, capital repayment charges and so on.

3. The types of ship available, in particular their size (length, beam and draught), any special characteristics, such as the need for special equipment for loading and unloading cargo.
4. The volume, type and characteristics of the traffic.
5. Seasonal traffic fluctuations.
6. Maintenance of time margins where services connect. It is a critical area in liner cargo shipments as the growth of the hub and spoke system. This involves cargo transshipment continued and liner conference services.
7. The availability of crew and suitable changeover ports.
8. Arrangements for dealing with emergencies.
9. Climatic conditions. Some ports are ice-bound at certain times of the years, thus preventing the movement of shipping.
10. Competition. Competition exists today for the multi-modal service, including reliability, quality of service, frequency, degree of technology and cost etc.
11. Voyage time. This is primarily a market consideration.
12. Imbalance in trade.
13. Large container operation is increasing now and the most shipping lines are focusing on the one-stop port operation system. The system involves target of using the hub and spoke system and relies on the feeder network to serve it.

To conclude, the sailing route should be kept under constant review and the cost and revenue should be monitored constantly so that they may be modified to meet changing circumstances.

2.4 Porter's Diamond

In part five of this thesis we will analyse Chinese port industry and international Shipping industry by applying Porter's diamond model. Here we will give a brief study to Porter's Diamond. The main content of Porter's Diamond will be explained.

Michael Porter had a lasting influence on "competitive advantage" analysis with his Diamond Model on industry level and on global level. The model is widely used for industrial analysis.

The Diamond Model:

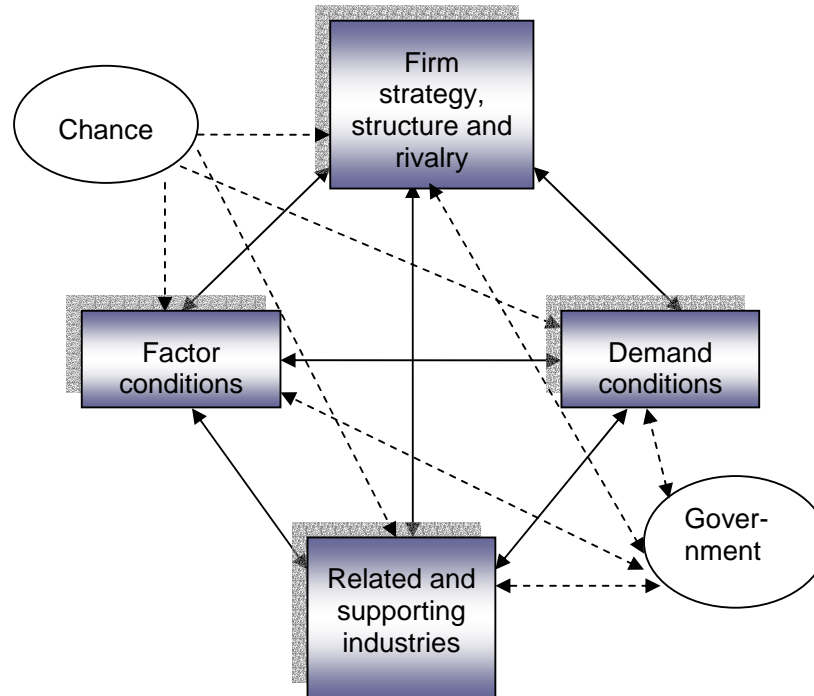


Figure 2-3: *Porter's Diamond - The Complete System*

Source: Porter, 1998, page 127.

The nature of competition and the sources of competitive advantage differ widely among industries and even industry segments. As can be seen from the figure, four attributes of a nation comprise Porter's Diamond of national advantage. They are firm strategy, structure and rivalry; factor conditions, related and supporting industries, and demand conditions. The government and chance also play an important role in Porter's diamond model.

Firm Strategy, Structure and Rivalry

The conditions in the nation governing how companies are created, organized, and managed, and the nature of domestic rivalry are described in Firm Strategy, Structure and Rivalry. The goals, strategies and ways of organizing firms vary widely among nations. National advantages are often a product of a close match between these choices and the sources of competitive advantage in a particular industry. Another important aspect is the pattern of rivalry in the home market. (Porter, 1998)

Porter argues that the best management styles vary among industries. Some countries may be oriented toward a particular style of management. Those countries will tend to be more competitive in industries for which that style of management is suited. Local conditions affect firm strategy. For example, German companies tend to be hierarchical, and Italian companies tend to be smaller and are run more like extended families. Such strategy and structure helps to determine in which types of industries a nation's firm will excel. Industries where goals and motivation are aligned with the sources of competitive advantage will most likely be successful.

Porter argues that low rivalry made an industry attractive. But he points out: "Innovation usually requires pressure, necessity, and even adversity: the fear of loss often proves more powerful than the hope of gain." while at a single time that a firm prefers low rivalry, more local rivalry is better over the long run since it put pressure on firm to innovate and improve. Domestic rivalry not only creates pressures to innovate but to innovate in ways that upgrade the competitive advantages of a nation's firms.

Factor Conditions

Factor conditions refer to inputs used as factors of production - such as labour, land, natural resources, capital and infrastructure. Porter states the traditional factor endowment argument of standard trade theory is too simplistic. He argues that the factors most important to comparative advantage are not inherited, but are created and that the broad categories of land, labour, and capital are too general.

Porter divides factors into basic and advanced, generalised and specialised. Basic factors such as natural resources, climate and un/semi-skilled labour are 'passively inherited' while advanced factors are those whose development demands large and substantial investment in human and physical capital. The distinction of generalised versus specialised is based on their ability to perform tasks. Generalised factors are available in most nations. They can be sourced on global markets and their activities can be performed at a distance from the home base, whereas specialised factors are developed with considerable investment from the generalised factors. Porter argues that the most significant and sustainable competitive advantage results when a nation possesses factors

needed for competing in a particular industry that are both advanced and specialized.

Related and Supporting Industries

Porter also argues that a set of strong related and supporting industries is important to the competitiveness of firms. This includes suppliers and related industries. When local supporting industries are competitive, firms enjoy more cost effective and innovative inputs. If there exists a close working relationship between companies within an industry an “ongoing coordinating process of innovation and upgrading will result where access to information, new ideas, insights and innovation will occur”. Also if competitive advantage exists in related industries then “opportunities abound for positive interchanges and new opportunities are continually perceived”. This effect is strengthened when the suppliers themselves are strong global competitors. (Porter, 1998)

Demand Conditions

Demand conditions are the nature of home demand for the industry’s product or service. They shape the rate and character of improvement and innovation by a nation’s firms. There are three broad attributes of the home demand that are important: the composition of home demand (nature of buyers needs); the size and pattern of growth of home demand; the mechanisms by which a nation’s domestic preferences are transmitted to foreign markets. (Porter, 1998)

Porter argues that a sophisticated domestic market is an important element to producing competitiveness. Firms that face a sophisticated domestic market are likely to sell superior products because the market demands high quality and a close proximity to such consumers enables the firm to better understand the needs and desires of the customers. Porter points out that a more demanding local market leads to national advantage and a strong, trend-setting local market helps local firms anticipate global trends. When the market for a particular product is larger locally than in foreign markets, the local firms devote more attention to that product than foreign countries, leading to a competitive advantage when the local firms begin to export the product.

The Role of Government and Chance

Government can influence and be influenced by each of the four determinants either positively or negatively. Chance events are occurrences that have little to do with circumstances in a nation and are often largely outside the power of firms to influence. For example oil shocks, major shifts in world financial markets or exchange rates, political decisions by foreign governments and wars. Porter emphasizes the role of chance in the model. Random events can either benefit or harm a firm's competitive position. (Porter, 1998)

The role of Government in Porter's model is to influence the four determinants through its policies. The role can be: encourage companies to raise their performance; stimulate early demands for advanced products; focus on specialised factor creation; and stimulate local rivalry by limiting direct cooperation and enforcing antitrust regulations. Porter argues that Government policies which artificially create a national competitive advantage and/or 'help' that removes the pressure on firms to improve and upgrade is counterproductive. He states these policies will fail because they create a competitive advantage which is unsustainable in the long run due to the pressures of the market and continuous innovation.

The Diamond as a System

The points on the diamond constitute a system in which the effect of one point depends on the others. For example, disadvantage factors will not lead firms to innovate unless there is sufficient rivalry. The diamond is also a self-reinforcing system. For example, domestic rivalry for final goods stimulates the emergence of an industry that provides specialized intermediate goods; keen domestic competition leads to more sophisticated consumers who come to expect upgrading and innovation.

3 Methods and Research Design

In this chapter, we will document our research objective, research methods, and the reasons why we choose the methods. The evaluation standard and some other theoretical points about choosing research method will be discussed. We will also explain some procedures related to our research design. In writing this chapter, we once again got the feeling that this thesis study is so useful and meaning for us. At the very beginning, like other former students, we were really stuck and confused by the similar and interchangeably used terminologies. What we did is try to understand the established norms and rules clearly and to set up an appropriate research design guided by these norms and rules.

3.1 Choice of Method for the Research

The right methodology for a project will depend on a number of factors: research objectives, the make-up of industry, and the geographic location(s) of the desired respondents. To carry out a market research defined by our thesis study, by its nature, come to include the use of multitude of methods to find and combine all the different facts and information needed. The research objective logically determines the characteristics desired in the research design. The choice of method is also critically dependent on the aim of the study.

3.1.1 Introduction of Possible Methods

The term market research means different things to different people. Donald R. Lehmann defines it as: Marketing research is the collection, processing, and analysis of information on topics relevant to marketing; it begins with problem definition and ends with a report and action recommendations. This definition seems to suit the market research we will perform best.

According to Zikmund (1999), the main types of market research can be classified as: Exploratory Research, Descriptive Research and Causal Research:

Exploratory: Problem-orientated research which is used to identify the nature of a marketing problem or sensitive issue. The exploratory research always

stems from general problem descriptions. And the study is designed to find out enough about a problem to usefully formulate hypotheses.

Descriptive: Descriptive studies are part way along the continuum from exploratory to causal. These studies always have the subjects relevant to product (or service) performance, market size, trends, market share and competitive strategies.

Causal: The causal research is more analytical than descriptive or exploratory research techniques; it always reveals the factors critical to the behaviour of customers and markets. It is the most demanding type of study.

We conclude from our reading that the market research can also be divided into the following different types:

- **Quantitative:** Information collected and expressed using a numerical measure.
- **Qualitative:** Information based on attitudes, beliefs and shades of meaning.
- **Primary:** Information collected for a specific purpose and is gathered directly from the source.
- **Secondary:** Information collected for a more general purpose. The research is conducted by utilizing information already collected by other sources.

There are many ways to study a market. The more detailed the research, the less chance there is of overlooking something important. We tried to avoid the way simply rely on a “gut feeling”, but to use sophisticated techniques such as formal statistical modelling of market trends and market share will be too great a task for us. What kind of market research should we perform?

As to the descriptive research, it is appropriate when the research objective include: identifying problems or opportunities; portraying the characteristics of a phenomenon and determining the frequency of occurrence; making predictions regarding the occurrence of a phenomena; gaining management and researcher perspective concerning the character of the problem situation. In descriptive research, the analysis of market size, trends, and share is often qualitative and less quantitative. From the above-mentioned aspects, we found

that the descriptive research is the most suitable for our thesis research. The specific methods we plan to use will be: telephone, mail-out, in-depth interviews, and online surveys. These methods are also can be divided into different categories.

3.1.2 Qualitative and Quantitative

Qualitative and quantitative researches are the two basic types of research. The former deals with less tangible data such as interview responses, individual attitudes and the outcome of group discussions, and the latter deals mostly with numerical information. Compared with qualitative research, which applies mostly in psychology and the social science, quantitative research is often used in natural science, and demanding on enough experimental data. (Lehmann, 1979)

The main objectives of qualitative market research usually involve one or more of the following: (Mike and Gill, 2002)

- **Diagnosis** – providing depth of understanding of a current situation, of why things are the way they are.
- **Prognosis** – providing guidance on likely responses to options, plans or proposals.
- **Creativity** – using respondents in qualitative market research as a source of ideas, innovation and inspiration.

What users of qualitative market research have in common is a need for understanding and sense-making. The qualitative market research aims to reveal deep and specific understanding of activities, choices and attitudes. The insights generated include an understanding of the interrelationships of issues, as well as the detail of individual issues. The qualitative market research offers a conceptual and not just descriptive view of these issues. Processes of analysis and interpretation pervade any qualitative market research project, although there is also a period of formal analysis between fieldwork and presentation of findings. (Imms and Ereaut, 2002)

There are several different types of qualitative research, including focus groups, individual depth interviews and mini-groups. The quantitative research includes several different methods of research: mystery shopping, comment cards, fax, mail out surveys, telephone, and online surveys.

3.1.3 Primary and Secondary

Primary Research

Primary research is research specifically commissioned to examine very specific factors affecting the business. In primary research, researcher tries to get information directly from customers or other sources. This type of research can employ various secondary research resources as well, but the important information is that which is gathered directly from the source. Unlike secondary research, primary research involves a considerable amount of personal involvement through interviews and consultations. The primary research, traditionally very expensive, should be customer designed specifically with the unique circumstance, exploring factors directly related to the research purpose. (Wentz, 1979)

Secondary Research

Secondary research is conducted by utilizing information already collected by other sources, such as periodicals, studies, market reports, books, surveys and statistical analyses. Many of these are available through chambers of commerce; economic development organizations; industry and trade associations; and industry publications, business contacts and partners abroad. Often it is related, but not necessarily specific to particular situation, thus it must be analyzed and interpreted, using factors relevant to specific industry and information pertaining to specific situation.

The advantage of secondary research is the cost, so long as the information is relevant to specific industry and research goals - does it provide you with the information that you need to improve your business, or does it simply give you an overview of the market in general. Excellent reports can often be purchased that provide detailed information about certain industry. This type of secondary research can often seem expensive, but for relevant and professionally gathered and reported information, these are usually much less expensive than conducting the initial primary research.

3.2 Research Process

This chapter proceeds by briefly discussing each of these seven steps in our research process (Figure 5). More detailed discussions appear in ensuing chapters.

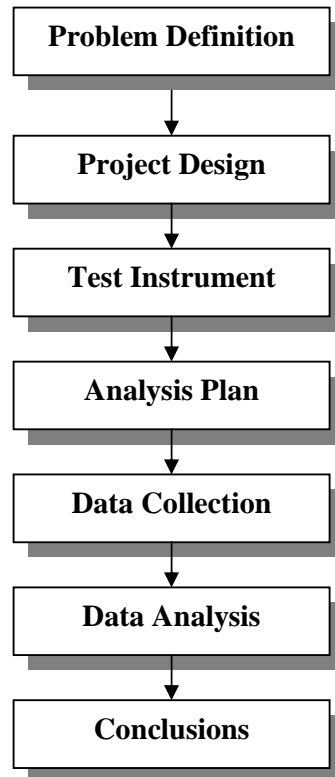


Figure 3-1: *The Research Process*

Problem Definition

The Marketing Research Committee of the American Marketing Association once stated that “if any one step in a research project can be said to be more important than the others, problem definition is that step.” The committee also claimed that “problem definition is the most creative phase of research.”

We realize that if we could not find the real problem then most of the following research would be of little or no value. We didn’t get any stated problem from the Port of Gothenburg when the port promised to be our sponsor. After several times of discussion with the marketing manager and his colleague of the port via email and in person, we visited the port, and we got some clue from the discussion and the visit. Then we tried to define some problems. During our

problem definition, we tried to reduce the problems to specific terms. And we found this is really useful, because the definition has given us a clear direction to perform the latter procedures.

Project Design

Given the problem, the researcher must devise a scheme to find a solution. The outcome is the project design. It is the plan of action for the study. The project design serves as a road map and foundation for the study. It is often called the “Research Design”----contains the objective, method, resource requirements, and timetable for the research project. (Wentz, 1979)

Our project design focus on choosing the right method of doing the market study. We have given a comparison to the possible methods: Focus groups can be an extremely effective method of gathering non-statistical impressions and perceptions of target group; Mini-groups provide an opportunity to acquire a depth of information not easily attained with more respondents; Online surveys are not as intrusive as telephone calls, can be responded to at the invitee's convenience and providing the information is as easy as a couple of clicks. But all these methods need some conditions that we cannot afford.

Limited by certain factors such as long distance from China and limited budget, we think that only email and telephone surveys are practical in our thesis research. The email survey is the most cost-effective method we can find. As to the telephone survey, there is no waiting for a survey to be mailed or faxed back, and the respondent can provide the information immediately to us.

Selection and Design of Test Instrument

Donald R. Lehmann defines the term “test instrument” as the method by which data is actually secured. In case of a survey, the questionnaire serves as the test instrument. The questions in the questionnaire can always be divided into direct and indirect questions or structured response questions and open-ended questions. The structured response questions get results which are easier for analysis, while open-ended have less measurement effect built in but tend to be dominated by the verbal respondents and those with strong positions on the issues involved.

To perform the market study, we will prepare a structured questionnaire, and then we will send it to all the respondents by email. To those who do not reply

before the deadline, we will call them and try to interview them on the phone. During the telephone interview, we can explore a respondent's information into areas that the questionnaire doesn't effectively cover. Because we are using some special telephone cards, the cost per response for this type of information would not be high. As to the questionnaire we use, we enclose it in Appendix of this thesis.

Analysis Plan

Before information is actually collected, we developed an analysis plan. Since this thesis study is done on a tight timetable, we thought that all relevant analysis should be prespecified. The analysis plan allows us to check to see how much information needed to be adequate for the form of analysis planned. It is also useful to specify in advance what levels in the results lead to what actions.

Data Collection

Data are the fuel of marketing research. Data collection is usually the first step in the execution of a research design. (Wentz, 1979) Though we have some advantages in language when studying the Chinese market, we found that most key data we needed are not readily available, we must generate our own information with survey. The specific method we use will be explained in the latter chapters.

Data Analysis

The procedure of information analysis consists of two tasks: (1) data reduction and (2) data analysis. Data reduction brings the information down to a manageable and sometimes meaningful size. Data analysis gives the critical information the research needed.

Conclusions

The final step of a research process is drawing conclusions. The conclusion chapter conveys the findings and recommendations of the study.

4 The Shipping Industry in China

In this chapter, we will focus on collection and analysis of the information about the Chinese terminals (ports) and carriers (shipping companies). The aim of this part is to briefly introduce the main actors in these two aspects and to collect the main information needed to analyse the ocean transport market in China. We will concentrate on the current situation, the policy, the facts and figures and the developing trend of the two main categories.

4.1 China's Port Industry

4.1.1 Brief Introduction

There are 1,467 ports in China, including 165 seaports and 1,302 river ports. Currently, over 90 percent of China's foreign trade and half of the country's domestic transport goes through ports. Till the end of 2002, the coastal ports have already established 3260 berths of more than thousand tons' level, including 696 deep-water berths. The whole handling capacity reached 1.5 billion tons. The port construction, especially the construction of large professional container wharfs and bulk docks, has pushed China's foreign trade and national economy forward considerably. (www.moc.gov.cn)

All the main coastal ports in China can be divided into three basic sections: the northern ports group where centered by Tianjing, Dalian, and Qingdao ports that are serviced by the ports of Yingkou, Qinhuangdao, Yantai and other ports; the central ports group centered by Shanghai port which is serviced by Ningbo, Lianyungang, Nantong, Zhangjiagang and other Yangtze River Delta ports; the southern ports group centered by Hong Kong, Guangzhou, Shenzhen ports that are serviced by other Pearl River Delta ports.

During the period of "Ninth Five-Year Plan" (from 1996 to 2000), the average annual growth rate of the main coastal ports' throughput is 9.4%, with an 11.1% increase in foreign trade throughput. Because of the robust trading growth, China is still experiencing significant and sustained growth in its port sector in the period of "Tenth Five-Year Plan" (from 2001 to 2005). In 2002,

the average annual growth rate of the main coastal ports' throughput reaches 15.2%, while the rate foreign trade throughput reaches 16.5%.

Seven ports in China have continuously exceeded 100 million tons of annual throughput since 2001. Shanghai is leader of the seven ports, followed by Ningbo, Guangzhou, Tianjin, Dalian, Qinhuangdao, and Qingdao. Shanghai, the biggest port in China, alone handled 264 million tons, which is close to that of Singapore, the second largest port in the world. Shanghai also increased its container throughput by a massive 35.8% to 861 million TEUs, overtaking Kaohsiung of Taipei to become the world's fourth largest container port. (www.peopledaily.com.cn)

The facilities and equipment in some main ports reach the world level, making the ports efficient and cost-competitive. Both hardware and software environment of the ports have been greatly improved; the procedures for customs clearance have been greatly simplified; and hinterland connection networks have been updated.

The number of containers handled by Chinese ports has maintained an annual growth rate of 30 percent in the past decade. In 2002, the number of containers handled by Chinese ports amounted to 37 million TEUs (domestic and international), about 30 times the volume of 1989. In 2002, the container throughput in main coastal ports won a 36.9% increase compared to 2001. The international container throughput reached 33.8 million TEUs in 2002, while the throughput of top eight ports (Shanghai, Shenzhen, Qingdao, Tianjin, Guangzhou, Ningbo, Xiamen, and Dalian) accounted for 29.17 million TEUs, taking 86% of the total volume. (www.zgjtb.com)

On July 29th of 2003, China formally joined the Container Security Initiative (CSI), initiating joint efforts to target and pre-screen cargo containers shipped from the ports of Shanghai and Shenzhen destined for U.S. ports. CSI is an initiative that was developed by U.S. Customs in the aftermath of the terrorist attacks of September 11th. Its purpose is to protect containerized shipping from exploitation by terrorists. Under the CSI program, a small number of U.S. Customs and Border Protection officers are deployed to work with host nation counterparts to target high-risk cargo containers. Containerized shipping is a critical component of global trade because most of the international trade

moves or is transported in containers. China's joining CSI is important to protect not only the U.S., but also the global system of trade.

4.1.2 The Historical Development

At the beginning of the reform and opening, China's ports were apparently in lack of capacity and the port berths were always congested, which had restricted the development of the national economy and foreign trade, especially in 1980's. Since the middle 1990's, the congestion of port berths has been alleviated.

China's container transport started in the seventies; it developed rapidly from the eighties. As the container vessels grow larger and larger, the main coastal ports in China began to construct the dedicated container berths. And those container berths are mainly built in Shanghai, Tianjin, Dalian, Qingdao, Ningbo, Xiamen, Shenzhen, and Guangzhou port. China invested heavily in the port construction, and the foreign capital was permitted to invest in port project. Since the middle of eighties, the port of Shanghai, Tianjin, Dalian, Qingdao, and Guangzhou began their international regular cargo ship lines. Until 1997, there are 30 ports in China that have developed the international container transport lines.

In 1999, from coasts to inland rivers, China has opened 128 ports for international water transport, including 109 first-class ports and 19 second-class ports. Most seaports along the coast handle foreign trade. Several inland river ports, mainly along the Yangtze River, Heilongjiang, Zhujiang, and Songhua River, also handle international transportation. The opening of the ports has directly promoted port development, expanded trade exchanges and enhanced the competitiveness of china's ocean-going shipping services. (People's Republic of China Yearbook, 1999)

The Port's Reform

Aiming at establishing more effective and efficient port management system, China's port management has experienced three main steps. At the beginning of the 1980s, by taking the first step, the government divided the port business from the shipping business and set up the independent port management system.

The second step began in the middle of the 1980s, trying to decentralize the responsibilities and power from the central government to the local authority where the port located. Prior to the reforms, the Ministry of Communications was directly responsible for planning, investment and day-to-day operating of all the ports. The decentralisation of responsibilities and power leads to the reconstruction: responsibility for the ports is shared with the municipalities in which they are situated. Daily management is essentially left to local authorities.

The most meaningful also the most difficult step---the third step was performed in the middle of 1990s. The objective of this step is to separate the local government's administration from the port's operation. New companies running the port were set up. Governments will merely play the role of supervision and coordination, and companies will run ports in accordance with market principles in a transparent and unbiased manner. This step was first performed among several chosen ports. Shenzhen port is the first one to have performed this reform.

The effect of decentralizing the responsibilities is obvious: there was an influx of foreign direct investment in 1990s; the hierarchy of Chinese ports has been overturned; and the competition among the ports became tenser. Inevitably, the most active ports have also been able to "accept" certain international shipping companies whose ships stop-off directly in these ports, rather than using Hong Kong as a hub for them. Prior to the reform, each port handled approximately the same volume of traffic. Henceforth, Shanghai has clearly surged into the lead, attaining 1.97 million TEUs in 1996, more than twice the level of any other ports.

The reform also can be seen in China's unblocking more ports. The number of ports that can handle international business increased rapidly. The open ports serve as direct channels for China to exchange with outside world and they created basic conditions for the opening up of port cities. They participated actively in global economic business and promoted information, technology, management and business exchanges between ports, which facilitated rapid economic development of port cities.

After the second step, there are still more than 30 ports are still under the direct charge of the Ministry of Communications. The recent reform focuses on

transferring the power from the Ministry to the local authority and separating the governmental administration from the industrial entities of the port. By transferring the administration power to the local government, the ports get fair and competitive mechanism for their development in close conjunction with the local area's development.

In June of 2003, China's top legislature, Standing Committee of the National People's Congress, passed a law on port administration to upgrade the construction, management and competitiveness of the country's sea and river ports. And this "Ports' Law" will be in effect on January 1st 2004, the law sets out new legal competencies of local governments with jurisdiction over ports and companies running ports. According to the Ministry of Communications, all China's ports have to undergo related administrative restructuring before the end of 2003. The reform will lead to one port administration system in local government and one operation company in the real market. These two systems used to be controlled by government, and it is liable to monopolise the port business. The reform has brought about the smooth environment for port development and spurred overall development of port production. Given this rapid growth trend, the ports' law will help tighten government supervision and improve port administration and operation. (www.chinadaily.com.cn)

4.1.3 Port Investment in China

According to a United Nations report, China is set to become the world's largest market for containerised cargo within eight years and will have to invest more than US\$20 bill in port-related infrastructure to serve the industry. From 1996-2000 China spent more than \$12.8 billion for the construction of ports, harbors and inland waterways. By the end of 2000, an intensive transport network has already been formed around all the major harbor areas. In 2001, along China's coastal ports 49 berths have been newly built (or extended) with the increased throughput capacity of 60.66 million tons, including 18 berths capable of accommodating 10000-tonnage vessels with an increased throughput capacity of 57.05 million tons.

The Chinese government encouraged foreign capital to participate in China's ports construction and operation. The ports were the earliest section among China's infrastructure construction open to foreign capital, with its first foreign-

founded project launched in 1979. Since China set up its first container cargo joint venture in 1987, over 180 port facility joint ventures have been set up, involving a total investment of over 20 billion Yuan (US\$2.42 billion), with 11 billion Yuan from overseas investors. Among the 1467 ports in China, 55 ports were built with foreign funds. (english.peopledaily.com.cn)

The work of accepting the foreign direct investment from the foreign governments and financial organizations took a real start in 1982. There are mainly two kinds of foreign investment: one is the loan form the international financial organization, foreign government and international securities; the other is the foreign direct investment from all kinds of foreign companies.

Up until the August of this year, there were 25 port loan projects; the total volume for the loan is USD 23.4 billion. Among all the loan projects, there are 8 projects from the World Bank, the figure for the loan is USD 745.4 million; there are four from the Asia Development Bank, the figure is USD 265 million; there are 13 from the Japanese government, the figure is USD 1.33 billion. 139 berths were built by using of these loans, 26 container berths included. There are 30 port projects that were performed by using the capital investment from all kinds of joint ventures. The total volume of investment is USD 3.27 billion, and the volume of foreign companies' investment is USD 2 billion.

The foreign direct investment had a heavy effect on the port industry in China. It helped the country to develop the port industry at a high speed. The foreign capital brought about more business for the port at the same time, e.g. more container lines brought about by the shipping companies, more channels to communicate with the foreign financial organizations. The foreign enterprises also brought about advanced technology, experts in the industry and managing methods and ideas. In short, the foreign investment played a positive part in China's port construction; it pushed the open and reform forward; it contributed to making the Chinese ports more efficient and competent. (www.people.com.cn)

The Milestones of China's Policy in Port Investment

With China's entry into the WTO and its further opening policy, the Chinese government has realized that overseas investment can be used to accelerate port construction and to improve the capacity of China's ports. China hopes to

increase the capacity of its national ports to 3 billion tons by 2010, with the number of containers to hit 100 million TEUs.

The Chinese government published the foreign investment guidance in March of 2002, allowing foreign investors to take a controlling stake or to wholly own terminal facilities and their operating companies. It abolished regulations that restrict foreign companies to a minority stake in mainland port facilities. This new catalogue cancelled B-classified foreign-investment criteria for port investment, setting central government pre-clearance requirements only for projects exceeding USD 30 million. The new act was critical because it gave new assurances to foreign investors before their considering investments in port sector. But the liberalization of foreign ownership will apply only to terminals, not the ports themselves, which will remain in the hands of port authorities. (Xinhua News Agency)

The new legislation of investment guidance published in the August of 2003 opens the door even wider: foreign companies are allowed to hold controlling stakes in Chinese ports. A US company (US United Yield International) has just contracted with east China's Lianyungang port for a 51 percent share of its Xugou project this August, heralding a law change allowing foreign companies to hold controlling stakes in Chinese ports. Many Chinese ports were using foreign capital and other financial resources, and the new law on ports has for the first time given equal treatment to state-run, private and foreign-funded ports in China.

According to the Ministry of Communications, the latest investment guidance for foreign capital issued by the Chinese government has ended a regulation limiting foreign ownership of ports to less than 50 percent. The US United Yield International Limited is a 51 percent shareholder in the Xugou project, while the Lianyungang Port group and two other Chinese companies hold the remaining 49 percent. This move is expected to unleash a new tide of investment in China's ports. The investment by the US United Yield International Limited in Lianyungang is another step following the joint investment by two world shipping giants, A.P. Moller Maersk Group of Denmark and P & O of Britain, to East China's Qingdao port this year. The new investment guidance not only allows for foreign capital holding shares in China's ports construction, but also for wholly foreign-founded projects. There are some cases of foreign capital holding more than 51 percent in China's port

projects, but no reports of wholly foreign-founded port projects in China. (www.chinadaily.com.cn)

The Chinese government will issue more regulations on foreign investment in China's ports, which will help ensure the sound operation of foreign capital in China's port construction and operation. The government believes that with the expanded investment channels and improved service level, China's ports will be further opened to foreign capital in the coming years.

Specific Situation of Foreign Port Investment in China

Until this year, Hutchison Port Holdings (HPH), PSA, APM Terminals, P&O Ports, China Merchants Holdings (International), and many other top shipping companies have invested to China's port project. HPH is the earliest company investing in China, and it is also the company has the firmest foundation in the China's port investment. It has already taken part in constructing the container berth in Shanghai, Shenzhen, Ningbo, Xiamen and other ports. The group ranks first in all the container berth joint ventures in China and its container business accounts ¼ of the entire container throughput in China in 2003.

More and more shipping companies are investing in China's port. China's domestic transoceanic shipping companies like COSCO (China Ocean Shipping Company) and China Shipping (Group) Company take an active part in port investment. Other foreign shipping companies like OOCL (Orient Overseas Container Line) of Hong Kong, Evergreen, British P&O, Danish AP Moller and other top shipping companies are also competing to invest in China's ports. The main port projects in which the foreign companies take certain holdings can be found in the following table.

- Shipping Industry in China -

No.	Port	Port Project	Year	The Company taking holdings	Percentage of Holdings
1	Yantian	The Phase I of Yantian Port	1987	HPH	48%
2	Shanghai	Shanghai Container Terminal	1993	HPH	37%
3	Zhuhai	Zhuhai International Container Terminal	1993	HPH	50%
4	Nanghai	Nanghai International Container Terminal	1994	HPH	50%
5	Jiangmen	Jiangmen International Container Terminal	1995	HPH	50%
6	Yantian	The Phase II of Yantian Port	1996	HPH	48%
7	Dalian	Dalian Wan Container Wharf	1996	PSA	
8	Xiamen	Xiamen International Container Terminal	1997	HPH	49%
9	Shantou	Shantou International Container Terminal	1997	HPH	70%
10	Fuzhou	Fuzhou Container Terminal	1998	PSA	/
11	Shekou	Shekou Container Terminal	1998--2002	Modern Terminal	/
12	Qingdao	The Phase II of Qianwan Container Terminal	2000	P&O Ports	49%
13	Ningbo	The Phase II of Beilungang Project	2001	HPH	49%
14	Yantian	The Phase III of Yantian Port	2001	HPH	65%
15	Guangzhou	Guangzhou Container Port	2001	PSA	
16	Shanghai	Phase Four of Waigaoqiao Project	/	APM	49%
17	Qingdao	The Phase III of Qianwan Container Terminal	2003	P&O Ports	29%
18	Qingdao	The Phase III of Qianwan Container Terminal	2003	APM	20%
19	Lianyungang	Xugou Project in Lianyungang	2003	US United Yield International	51%

Table 4-1: The list of main port projects in which the foreign companies take holdings.

Why is Port Investment Hot in China?

A huge and sustained growth in the Chinese ports sector over the last decade shows that many ports are now ripe for expansion. And the ports in China turn to be the sole market that has the stable promising return for investment. The person or company that control the ports will directly share the advantage brought about by China's economical development.

As China moves to make itself more receptive to the outside world, its ports sector in particular offers significant opportunities to foreign investors. To reduce congestion also means that it will require heavy government investment in rail and road links to the coast area. The Chinese government appreciates new sources of investment in this area especially because the focus of aid money from institutions such as the World Bank has recently shifted away from infrastructure projects.

In the past the Chinese have proved to be extremely capable of initiating ports development without external investment. However, they recognise that the next stage of infrastructure expansion will require foreign capital and have identified container terminals as the field in most need.

At the same time, the ports in China compete tensely. The port which can grasp the golden opportunity and can develop at the highest speed will win the biggest market share. To update the technical system and port facilities needs huge investment. The foreign capital became vital when the investment from the government turns to be so limited. Some big port succeeded in being listed, but only few top ports can win this advantage. The practical and quick way to get investment turns to attract the foreign direct investment.

The final reason why the foreign companies are so interested in China's port industry is that they can get high rate of return and the risk is relatively low. It is reported that the general return rate in port industry is more than 15%. Because of the excellent return in the past years, more and more foreign capitals poured in the market, and the competition for getting better port project also turned to be tenser and tenser.

4.1.4 The Ranks of China's Ports

We are going to rank the main ports in Mainland China in this chapter. Because of the limited resource, we can only rank the ports according to their container throughput in different years.

In 2001, the container throughput of all the top ten ports reached 22.37 million TEUs; the ratio of container to the whole throughput has been raised by 1.5% compared to that in year 2000. The development of large ships brings about the reduction of the corresponding ports for mooring the ship. This trend also leads to the centralization of ports: few ports that have leading edge in hardware will become the key container ports.

Rank	1998	1999	2000	2001	2002
1	Shanghai 306.58	Shanghai 421.6	Shanghai 561.20	Shanghai 633.99	Shanghai 861
2	Shenzhen 195.2	Shenzhen 297.8	Shenzhen 395.94	Shenzhen 507.86	Shenzhen 761.37
3	Qingdao 121.3	Qingdao 154.3	Qingdao 211.63	Qingdao 263.85	Qingdao 330
4	Tianjin 101.8	Tianjin 130.2	Tianjin 170.84	Tianjin 201.10	Tianjin 240.8
5	Guangzhou 84.1	Guangzhou 117.9	Guangzhou 142.67	Guangzhou 162.83	Guangzhou 218
6	Xiamen 65.4	Xiamen 84.8	Xiamen 108.46	Xiamen 129.48	Ningbo 185.8
7	Dalian 62.6	Dalian 73.6	Dalian 100.84	Ningbo 121.31	Xiamen 175.4
8	Zhongshan 38.4	Ningbo 60.1	Ningbo 90.21	Dalian 120.89	Dalian 135.2
9	Ningbo 35.3	Zhongshan 43	Zhongshan 45.76	Zhongshan 54.64	Zhongshan 62
10	Zhuhai 26.2	Fuzhou 31.8	Fuzhou 39.98	Fuzhou 41.76	Fuzhou 48

Table 4-2: The top ten ports and their annual container throughput from 1998-2002 (Unit: ten thousand TEUs) (Source: *business.sohu.com*)

- Shipping Industry in China -

Rank	Port	Throughput (in million TEUs)	Growth (%)
1	Shanghai	6.34	13
2	Shenzhen	5.08	27
3	Qingdao	2.64	24
4	Tianjin	2.01	18
5	Guangzhou	1.73	14
6	Xiamen	1.29	19
7	Ningbo	1.21	34
8	Dalian	1.21	20
9	Zhongsan	0.55	8
10	Fuzhou	0.42	4

Table 4-3: Total Container Throughput and growth rate of the top ten Mainland ports in China in 2001: (Unit: million TEUs, the increasing ratio means the ratio compared to the throughput of 2000, Source: The 2001 Report on China's Shipping Development, P66)

Rank	Port	Throughput (in million TEUs)	Growth (%)
1	Shanghai	8.61	35.8
2	Shenzhen	7.61	50
3	Qingdao	3.41	29.2
4	Tianjin	2.41	20
5	Guangzhou	2.18	26
6	Ningbo	1.86	53.7
7	Xiamen	1.75	35.6
8	Dalian	1.35	11.5
9	Zhongsan	0.62	12.7
10	Fuzhou	0.48	14.2

Table 4-4: Total Container Throughput and growth rate of the top ten Mainland Ports in China in 2002: (Unit: million TEUs, the increasing ratio means the ratio compared to the throughput of 2001, Source: Containerisation International Yearbook 2003)

- Shipping Industry in China -

Rank	Port	Throughput (in million tons)	Growth (%)
1	Shanghai	221	8.1
2	Ningbo	128.5	11.3
3	Guangzhou	128.2	15.2
4	Tianjin	113.69	18.8
5	Qinhuangdao	113.02	16
6	Qingdao	103.98	20.4
7	Dalian	100.47	10.6
8	Shenzhen	66.42	16.6
9	Zhoushan	32.81	2.9
10	Lianyungang	30.58	13

Table 4-5: Total Cargo Throughput and growth rate of the top ten Mainland Ports in China in 2001: (Unit: million tons, the increasing ratio means the ratio compared to the throughput of 2000, Source: The 2001 Report on China's Shipping Development, P84)

From January to July 2003, container volume handled by China's major ports amounted to 25.67million TEUs, up 31.8 percent over the same period last year, according to China's Ministry of Communications. Shanghai maintained its leading position with growth of 35.6 percent to 6.18million TEUs. Ningbo remained the fastest growing container port among the top 10 with a 53.6 percent increase.

Rank	Port	Volume Handled (in million TEUs)	January-July 2003 Vs. January-July 2002 (% change)
1	Shanghai	6.18	+35.6%
2	Shenzhen	5.42	+38.7%
3	Qingdao	2.43	+27.2%
4	Tianjin	1.71	+26.1%
5	Guangzhou	1.51	+25.4%
6	Ningbo	1.48	+53.6%
7	Xiamen	1.30	+35.9%
8	Dalian	0.86	+24.8%
9	Zhongshan	0.42	+19.5%
10	Fuzhou	0.34	+23.7%

Table 4-6: China's Top 10 Container Ports for January-July 2003, Source: www.oocl.com

4.1.5 The Developing Trend

As China entering the WTO, the country's trade with the other countries will increase greatly. Vessels under foreign flags may, upon receiving port services such as use of port facilities, cargo handling, replenishment of bunkers and fresh waters, enjoy the same Chinese national treatment.

The import and export will continuously push the development of the port industry. It is popularly held that the ports will keep the high-speed expanding. At the same time, the tense competition also brings about more requirements on the infrastructure, service level, and equipments. Given the rapid growth of China's foreign trade, ports are expected to see an annual increase of 10 percent in freight volume, rising from the current 1.6 billion tons to 2 billion tons in 2005. In 2010, the cargo throughput of China's major coastal port is expected to reach 2.2—3 billion tons with the annual growth rate of 6%--7%; the container throughput will reach 100 million TEUs. (The 2001 Report on China's Shipping Development)

With the acceleration of the process of economic globalisation and the adjustment of the national economy, the port industry is facing problems as: the shortage of large deep-water berths along coastal ports, the deficiency of specialized wharves for containers in particular; insufficiency of port capacity causing overload operation in many ports; some terminals are still using the worn-out equipment; most ports are facing the contradiction between the transformation of old port districts and urban development of the city in which the port located; and the shortage of cooperation among the ports and inland transport operators.

The Ministry of Communications planned to construct more container terminals in the "tenth five-year" period. (From 2001 to 2005) The ministry will focus on constructing the Shanghai, Ningbo, Dalian, Tianjin, Qingdao, Shenzhen and Guangzhou port in this period. The fairway of port Guangzhou, Shenzhen, Tianjin, Yantai, Lianyungang and Zhanjiang will be deepened and updated, according to the plan of the Ministry.

In the future, the trend of more cooperation between the ports and the shipping companies becomes more and more popular in China. As the development of the world's economy and trade, the operator of shipping company realized the

land transportation and sea transportation is highly related: no matter how powerful they are, if they cannot get smooth, reliable inland transportation, the whole competence of the company will be affected. Therefore, many shipping companies take active part in the operation of the ports and inland transportation in China. Because the shipping companies can bring more cargo to the port, the strategy of constructing the terminal with the big shipping companies jointly was greatly welcomed by the ports in China. The Chinese Government encourage port construction and cargo handling at the public dock in the form of joint investment, allows the shipping companies to rent the port infrastructure facilities and to construct their dedicated terminals and fairways in the form of direct investment. (Doing Business in China, 2001)

4.2 China's International Shipping Industry

4.2.1 Brief Introduction

International shipping is vital to the trade-oriented economy of China, and it has been playing an important role in the national economic development. During the early 1960s, China had less than thirty ships performing the international transport. The maritime shipping capabilities increased greatly in the 1970s and 1980s. In 1985, China established eleven shipping offices and jointly-operated shipping companies in foreign countries. In 1986 China ranked ninth in world shipping with more than 600 ships and a total tonnage of 16 million, including modern roll-on and roll-off ships, container ships, large bulk carriers, refrigerator ships, oil tankers, and multipurpose ships. The fleet called at more than 400 ports in more than 100 countries. At present, there are 230,000 cargo ships with carrying capacity of over 50 million tons and a total of 87 percent of foreign trade, which forms 44 percent of the country's national economy, is transported via the sea.

Although the international shipping industry began at a rather late stage and from a low level, it has grown remarkably and become a new growth point for China's fast-developing economy. Latest statistics show China's total foreign trade volume last year surged 21.8%, reaching US\$620bn, among which exports rose 22.3% and imports 20.5%, the overall shipping tonnage kept an increase about 8-10% every year. The Chinese international maritime transportation trade increased by 14% in 2002 to 736m tons, of which imports were up by 16% to 416m tons while exports were up 13% to 320m tons.

China's shipping now ranks the fifth largest in the world with 50 million tons of handling capacity in operation -- 37 million tons in foreign trade.

The following factors can be concluded as the dominant drivers for overall growth in the Chinese international shipping industry. (www.chinadaily.com.cn)

- Organic growth where China is taking market share from other Asian locations, because of its overall competitiveness. The relocation of Japanese, South Korean and Taiwanese manufacturers is good examples.
- The enormous speed of China's economic growth is the real powerhouse for the industry.
- The alteration in the way of transport: the containerization of bulk cargo.
- The shift in transport mode from Hong Kong to South China. Because of the simple fact that it will help the shipper to reduce the transport cost greatly by shipping the goods via the mainland seaports in South China.

The significance of China's shipping is growing and the nation will continue to play a big role in the global industry, especially now that it is a member of the WTO. Since 90% of China's foreign trade volume is shipped out by sea, experts agree that, with the increase of imports and exports. China seaborne foreign trade volume is expected to increase by eight percent to ten percent, from 393 million tons in 1998 to 656 million tons in 2005. But to meet the challenges from foreign counterparts, China's shipping industry still has a long way to go.

4.2.2 International Container Transport

Since China began to perform the open and reform policy at the end of 1970s, foreign trade expanded continuously and rapidly. As the economy's development, China's foreign trade has shifted from shipping of raw materials, which are mainly moved in bulk lots, to the transport based on manufactured products, which are mostly moved in containers.

In China's shipping industry, international container shipping began relatively late (in 1978). However, it has achieved the strongest growth over the last 10 years. The average annual increase in China's total container throughput has been 20.3%, far outstripping the corresponding world average of roughly 6-8%.

By the end of 2001, the container carrying capacity was 9000 TEUs for the coastal shipping fleet, an increase of 9.2% of 700 TEUs. The international container carrying capacity is obvious expanding.

Over the past decade, China's container shipping sector has developed rapidly and continuously. There are more than 150 shipping companies involved in container liner shipping routes, with almost 1000 container vessels. Included in the figure more than 60 foreign shipping companies have opened international liner routes, which takes up over 65% of the China's market share.

Furthermore, with the continuous increase of the container throughput, the frequency of container liners has been increased to a large extent. In 2001 the top 10 ports in China offered 699 voyages per month on deep-ocean main lines, up 50.6% over the previous year. Near-ocean liner services offered 1218 voyages per month, and 702 voyages per month on inland feeder lines.

China's international marine transportation has built a relationship with more than 150 countries and regions in the world. The container ocean lines can be divided into four groups:

1. East Routes: Japan and across the Pacific to the ports of America.
2. South Routes: South East Asia, Oceanic etc.
3. West Routes: South East Asia, South Asia, West Asia, Africa and Europe.
4. North Routes: Korea, Russia and Far East

The total number of China's international trade lines maintains a steady climb. It will see a prominent increase of cargo volume in the US trade Europe service and intra-Asia trading lines. According to a forecast by China's Waterborne Transportation Association in a research report, China should become the world's largest container shipping centre around 2010, and the throughput of containers at the ports would reach 108 million TEUs, 80-85 million TEUs that would be for foreign trade.

The Domestic Feeder Services

As a kind of feeder service for the international trunk lines, the domestic feeder lines have been developed concurrently and have formed the domestic feeder

service network with great market potential to cope with the international shipping lines.

By the end of 2002, more than 50 ports in China had conducted container handling operation for domestic container feeder lines. The container feeder service was prevailing over the regions of the Yangtze River, the Bohai Bay and the East China coast, and was develop to certain extent along the coast of South China and at the Pearl River basin. The frequency of the domestic container feeder lines increased prominently and has kept high growth rate since 1999.

The domestic container feeder service along the Yangtze River is being operated with Shanghai as the hub port. Along with the construction of Shanghai international shipping center and continuous development of foreign trade in the Yangtze River basin, the transport of foreign trade containers is hopefully demanded increasingly. The coastal domestic container feeder service is mainly developed in the Bohai Bay and along the coast of East China and South China. The domestic feeder line along the coast of South China serves just as a supplementary to the Hong Kong shipping lines and has therefore a limited container volume.

4.2.3 International Shipping Service Providers

Domestic shipping companies and fleets

Currently there are 291 shipping companies registered in China and engaged in international shipping. Most of the shipping companies, except COSCO and China Shipping Group, tended to be too small, with the average carrying capacity of below ten thousand deadweight tonnage, some of them being single-ship companies. Due to small scale, they cannot achieve the scale economy and their capabilities to fend off market risks are rather weak. Meanwhile too large a proportion of single-ship companies will intensify the disordered market competition. From the viewpoint of social division, companies engaged in international shipping lack a specialized division, therefore the market competitive capabilities of the enterprises cannot be promoted effectively and no effective technical barrier to the market qualification can be formed. As a result, carriers tend to scramble for profits in the shipping market, resulting in low-level excessive rivalry.

In order to establish a modern enterprise system and improve market competitive capability of the international shipping enterprises, the Ministry of Communications put forward a series of guiding principles. The principles function as the policies to speed up structure adjustment of shipping enterprises and development of scale transport, to encourage merge of small shipping enterprises and large-sized cargo owners, to encourage alliance of shipping enterprises with powerful strength and competitive capability with assets as links; to build large-sized shipping enterprises, and groups of trans-area, trans-sector, trans-ownership and trans-nation operation; and to stimulate medium and small sized shipping enterprises through restructuring of assets, reform and reorganization, merge and alliance, share stocking.

Compared with the previous year, the total carrying capacity of China's international shipping fleets has had a small increase, but the vessel types have been changed to a certain extent. Multi-purpose vessels and container vessels have been greatly increased and the general cargo vessels decreased. Vessel investment is mainly performed by China's state-owned enterprises. More and more domestic investors become interested in the international shipping sector in China in the recent years. China Ocean Shipping Company, China Shipping Group Company and China National Foreign Trade Transportation Corporation have made large scale investment with the joint proportion exceeding 60%.

In general, the Chinese international shipping fleet accounted for 5.3 percent of the world merchant fleet and a share of 5 per cent of the world container slots. The Chinese fleet maintained its position as the world's fifth largest fleet in terms of carrying capacity.

In the future, the administration for the domestic shipping companies will be transferred from control of the number of vessels to control of the qualification, and from the system of approval to the system of registration. The carrying capacity for homogeneous cargo will be subject to change of the market so as to enhance the market adaptability of the domestic shipping companies. (The 2001 Report on China's Shipping Development)

Foreign shipping companies and fleets

The Chinese market is becoming vital for shipping lines all over the world. Chinese government authorities also encourage foreigners to invest in the maritime and logistics industries. Since the first foreign ship docked at a

Chinese port in 1984, a few major shipping liners continued to expand their businesses in China, not only increasing the service coverage and deployment of additional slot capacities, but also speeding up their investment in inland areas and river ports. By 2001, foreign shipping companies have set up 700 representative offices on the mainland of China, and there are 120 Sino-foreign founded shipping companies and 110 foreign-founded shipping companies and container shipping companies as well as their subsidiaries.

China's admission to its ports has been at a level well compared to world development. International shipping transport can fully enjoy the same treatment as China's. So far, foreign shipping companies have made up 47.5% of the near-ocean-going vessels and 70% of the ocean-going ships sailing from the ports of China every month. In China's foreign trade transport, the market share of Chinese carries has dropped down from over 60% at the end of 1980s to 40% at present and the market share of container transport has dropped down from 50% at the beginning of the 1990s to 30% by now.

It is obvious that China's international shipping service has become a widely opened and deeply competitive industry. The competition between shipping lines in China is a major advantage of the international container-shipping market, which drives down rates and increases service. Market share of major shipping lines changes each year, here are the 10 top shipping lines for China.

Name	Market Share (%) For 2000
COSCO	16
Maersk-Sealand	14
Hanjin	14
NOL-APL	10
Hyundai	9
Mitsui OSK	7
OOCL	6
K Line	5
Evergreen	4
Yangming	3
Other	12

Table 4-7: *The market share of major shipping lines in Mainland China in 2000, Source: Changing Shipping Policy Makes China Access Easier*

Nowadays China has signed with 56 countries bilateral marine transportation agreements and ships of 70 foreign container shipping companies are calling at the ports in China. China's Government will continue to expand the opening up and further enhance the opening-up level with the perfection of shipping market and soundness of legal system. (The 2001 Report on China's Shipping Development)

4.2.4 Legislations for China's International Shipping

Currently, Chinese shipping policy is becoming more regulated, open and transparent, and the legal environment of the shipping industry is improving.

In order to regulate international maritime transportation, to fulfil the commitments of China's accession to the WTO, to maintain market order within international maritime transportation, and to protect the legal rights and interests of various parties involved in international maritime transportation activities, the Chinese government has released "Regulations on International Maritime Transportation" (hereafter referred to as 'the Regulations'), which came into effect on 1 January 2002.

The law requires ocean carriers and NVOCCs (Non Vessel Owning Common Carrier) to file tariff and contract rates with the government. The law states that the ocean freight rate priced by the operators of international liner transportation business and NVOCCs should be filed in a format consistent with that set down by competent department of communication under the State Council. Failure to file rates may result in ocean carrier fines and annulment of their certificate.

Foreign shipping companies are still prohibited from engaging in domestic Chinese business and direct traffic between the Chinese mainland and Taiwan, and are still only able to take a maximum 49% stake in joint venture Chinese company (except investing in port construction). Moreover, the Chinese State Council is allowed to undertake comprehensive investigations if liner conferences carry out practices that are deemed to impair fair competition.

Several foreign shipping companies held that the regulations had a profound impact on all ocean carriers and the documents appears to continue the protection of the Chinese shipping companies from the foreign companies. However, we think that the regulations are necessary administrative regulations

accompanying Chinese maritime law, and are highly significant for Chinese international maritime transportation market management to move towards standardization and legal clarity.

Compared with previous rules, the regulations apply to a wider scope of activity, bolster administrative supervision, limit the cases where it would be necessary to adjust obligations between equal subjects, and are better suited to objective demands of the international shipping market. The law has the following characteristics:

Firstly, market access procedures are regulated, reducing administrative examination and approval items enormously (cancelling more than 10 of the original 24 examination and approval items), cancelling or reducing non-essential limitations to market access.

Secondly, all commitments related to maritime transportation services from China's accession to the WTO are presented in the Regulations, written down in the form of provisions, realizing the WTO's national treatment and public, transparent principles. The law protects the legitimate rights and interests of foreign shipping companies in China.

Thirdly, the regulations make prohibitive stipulations against unjust competition behaviour in the maritime transportation market, important for the establishment of an international maritime transportation market with national unification, fair competition and standard regulation.

Although the regulations have already been made public, and have introduced some new administrative measures to adapt to the current market situation and to meet WTO demands, what is urgently needed is close cooperation between the related government departments to realize the goal of standardizing international shipping activities, safeguarding fair competition, maintaining market order and protecting the benefits and rights of all members of the international shipping community. This is the challenging task now facing China.

4.2.5 The Developing Trends

Economic globalization will exert significant influence on world economy as well as on world shipping, which is oriented towards openness. The

development of multinationals in turn contributes to the health and well-being of world shipping. What is required of shipping corporations is to expand cross-border operation through mergers and acquisitions and to provide global shipping services. China's shipping is becoming an important link in the chain of global shipping. Liner carriers of China can launch mergers and acquisitions on a larger scale and can develop third or even fourth party logistics business. Foreign liner shipping companies will not be subject to any restrictions to set up subsidiaries in China, and they can well penetrate the Chinese market with their asset and technological advantages.

Analysis by officials of the Ministry of Communications indicates that China's international shipping industries will see the following development trends: (www.people.com.cn)

- 1) The opening of Chinese shipping market will be deepened and accelerated while more foreign capital will be allowed to enter into this market. Parts of the field inaccessible for foreign investment in the past will be gradually opened in the future, for example distribution service, international shipping agency and setting-up branches of foreign shipping companies in China.
- 2) The institutionalization process of the shipping market will be expedited. In case that the combination of Chinese shipping market with the world market will be promoted by the joining of foreign capital, China must step up the market institutionalization to impose supervision on the market entry and market behaviour of foreign companies in accordance with the Chinese laws and regulations
- 3) Chinese shipping companies will enjoy a better environment in the competition of world market. In the face of the increasingly fierce competition, some of the Chinese shipping companies will have to tap for new markets, such as to ship goods for a third party in order to optimize China's international shipping structure. Furthermore, China will be able to enjoy more initiative rights in international talks for shipping business. As foreign companies will get more benefit from the Chinese market after getting their entry permission.
- 4) Demand for shipping will be increased along with the growth of international trade volume. With China's entry into the WTO, the domestic market will be further opened with the international environment for foreign

trade improved. China will by then has more to do in the work division of the world economy with the Chinese economy depending more on the world market at the same time. All these changes will by and large promote the development of the Chinese industries with comparative advantages and help raise greatly the transport volume in international trade, thereby boosting the development of the Chinese shipping industry.

5) The market competition will be more severe. While some of the protective measures for domestic market gradually lose their functions after China's accession into the WTO, foreign capital will take more shares in the market distribution, ship agency and other fields. By then, those Chinese enterprises low in management level and service quality and weak in competition might be kicked out of the market.

5 The Industry Analysis by Using Porter Diamond

We are analysing the port industry and international shipping industry by applying the Porter's Diamond model. We will analyse the two industries respectively. Hopefully, challenges and opportunities of these two industries will be found in the industry analysis, and the competitive advantages of the industries will be explained and discussed in this chapter.

5.1 The Analysis of Port Industry

Factor Conditions

Statistics indicate that China has excellent basic and generalised factors in shipping industry: the long coastal line, several long rivers qualified for water transportation, several excellent deep-water berths and abundant labour and land. But, as Porter argues, the "key" factors of production are *created*, not inherited. China cannot take advantage in advanced factors and specialized factors such as skilled labour, capital and infrastructure. Though these two factors are expanding rapidly, it still takes time for these two factors in China to win sustainable competitive advantage, and to compete in the whole world especially in the long run.

Although China has more than one thousand ports, the country is still has shortage in several aspects. The handling capacity cannot satisfy the phenomenal growth in container throughput. The repetitive construction in inferior level is the most serious problem. This problem can be seen mainly in the construction of middle-sized ports.

Firstly, the handling equipment in many ports is not updated and the scale of many ports is too limited to achieve the economy of scale. Some old ports coastal ports and over-aged docks require urgent rebuilding. And the rebuilding needs overall planning and enough funds. When facing competition from foreign countries, many ports in China stand in a feeble position, not to mention the competitive advantage. The large professional berths are in a critical lack in China, especially for dealing with container vessels larger than the sixth generation.

Secondly, though China has a fairly good natural source in the port industry, it still lacks for large deep-water container terminals at the coastal ports. It is reported that the deep-water berths takes only 10% of the whole berths of the coastal ports and these berths handle the 90% of the total container throughput. The number of deep-water berths cannot satisfy the heavy demand. The fairways of most coastal hub ports that were built in rather earlier time have restricted the landing of large vessels due to insufficient depth. Some other ports are facing the problems of tide, and the further development for those ports is badly limited.

Demand Conditions

In Porter's diamond, the local demand is at the root of national advantage and a sophisticated domestic market is an important element to producing competitiveness. Porter himself sees this as occurring through the channel that pressure placed on service provider by all kinds of customer. The sophisticated domestic requirement provides the important opportunity for the service provider to innovate. This argument falls down in China's case on following points.

China's ever-increasing international trade offers China's port industry pressure to develop. On the one hand, China purchase large quantity of steel, oil and chemical products, iron ore, crude oil and other advanced high-tech products. On the other hand, out of the world's top 500 companies, over 400 now have a presence in China, taking advantage of cheaper labour and start-up cost. These include many multinationals from the motor vehicle and electronics industries. A good percentage of their cargoes are exported. As China opens its door wider and wider, the pressure of ocean transport brought about by the foreign trade will grow in amazing scale. (www.peopled.com.cn)

The pressure of rapid growth in cargo volume is still critical for China's ports: it is predicted that the total throughput of all the ports will reach 2 billion tons in 2005 and 3 billion tons in 2010. The annual increase rate is around 10%. With the improvement of people's living standard, their demands on medium and high-grade commodities were growing, which resulted in the increase of cargo shipping. After development of the previous five-year plans, great changes have taken place in China's coastal ports. The upsurge of throughput capacity, technical equipment, container transport conditions and management

levels has changed the long-existing situation of vessel delay and port congestion. However, the handling capacity and efficiency of China's coastal port berths is still lagging behind the market demand. Medium and small-sized port berths are comparatively surplus while large professional deep-water berths are insufficient. Comparing with the demand, the supply capability of China's port berths is generally inadequate. (Report on China's Shipping Development, 2001)

Firm Strategy, Structure and Rivalry

Due to the scale of this determinant, we will only concentrate on the component of rivalry and deal briefly with the other two. Porter argues that vigorous domestic rivalry is strongly associated with competitive advantage in an industry and that success does not grow from one or two firms experiencing economies of scale due to their dominance of the market.

Porter's theory can be well proved in China's port industry. We can see many cases in the industry that the intense competition spurs innovation and deficient rivalry leads to bureaucracy and low efficiency. However, we also want to point out that the inferior competition also leads to the waste of valuable social resource.

The domestic rivalry among China's ports contributes a lot for their rapid expanding. The rivalry pushes the ports to take advantage of their own superior aspects and to hold more market shares. Feeling the pressure, the ports try to win more investment from the government and foreign investor and to get more practical and scientific solutions facing modern logistics.

The first, and also the most important reason, for their competition lie in location of China's ports and their function. China's ports are highly concentrated in some regions. For example, in Bohai Circle of North China, there are more than 60 ports located within the coastal line of 5,800km. Among China's seven ports whose throughput exceeds 100 million tons, four ports lie in the circle: Tianjin, Dalian, Qinhuangdao and Qingdao port. Most ports in this area hold the principle of "To cooperate with the ports far away and to compete with the ports nearby". The rare cooperation among these ports results in the area's failing to show its integrated advantage.

The problem of insufficient cooperation among these ports is severe. Because of inadequate communication, the Area of Bohai Circle is facing the problem of unreasonable repetitive construction. Some ports have built advanced wharfs but have not got enough cargo resource; some ports expanded at a high speed, but the inland transport network and supporting handling system dragged behind.

The competition does not only exist in one single region, it also works among the port group of different areas in China. While they are competing with each other, they have to compete with other ports in the neighbour countries, such as the port of Singapore, Busan and other foreign ports.

Because of the reform of port industry in China, the strategy and structure of most ports in Mainland China has been reconstructed. Most of ports work fairly well under the marketing economy. The barriers caused by differing business cultures no longer present the same difficulties to foreign investors in China. This is particularly true of 'major' ports since these facilities tend to possess foreign affairs divisions whose members have been trained specifically in western business practices.

Related and Supporting Industries

In Porter's diamond, a set of strong related and supporting industries is important to the competitiveness of the industry of one country. If competitive advantage exists in related industries then opportunities abound for positive interchanges and new opportunities will be continually perceived. This part of Porter's argument can find strong support from China's shipping industry where 'industrial cluster' exists and a cumulative learning process is the result.

China's port industry, international shipping industry and shipbuilding industry are related to each other tightly as an obvious "industrial cluster". Each industry pushed the other industries in the cluster forward by their own expansion and feels the pressure to develop at the same time. They all get the real power from the robust trading growth in the country.

The traffic of ports in China continued to increase substantially in the past decade. The shipping companies have had a phenomenal growth and they are becoming more active in entering the international markets. China also retained

its position as the world's third largest shipbuilder for the eighth consecutive year in 2002, behind Japan and Korea. The growing foreign trade has offered abundant cargo volume for the ports and shipping companies. The positive spillover effects cause greater demand for shipbuilding. The heavy investment and the establishment of strong supply linkages in the shipping industry forces indigenous firms to become more competitive.

Government and Chances

The role of government in Porter's model is to influence the four determinants through its policies. He states these policies will fail because they create a competitive advantage that is unsustainable in the long run due to the pressures of the market and continuous innovation. Governments' role, he states, is to reinforce determinants not to create competitive advantage.

Porter also argues that there are some things that governments do that they shouldn't, and other things that they do not do but should. The Chinese Government could do much better after adopting Porter's advice, in our view, for a number of reasons.

First, China's port industry is confronted with the problem from the government's excessive supervision and administration. The procedures of customs clearance in many Chinese ports are still complicated. The ports used to be controlled directly by the central government. The port authorities always had the administrative and corporate functions at the same time; many companies in the industry cannot be operated like a real company in the market, but like a department of the government. Though China planned to perform the administrative restructuring, it is still difficult for the port to be operated independently in the market. Many ports in China do not have the right to set the price for their service. The prices set by the government are not adaptable to the real market situation. Nearly all the large companies in the shipping industry are state-owned, and many important managerial positions are occupied by the officers from the government and members from the party. Most of them are politicians who are not the right person to understand the real economy. Therefore, a lot of projects were simply performed for the political objectives not for the economical development. Some critical and valuable resource was wasted.

Lack of co-ordination is the real headache for China's port industry. These are the obvious things that the government does not do but should. The local protectionism, the unnecessary repetitive port construction and the lowly efficient port management leads to vicious circle in port competition and operation, making the ports lose the favourable opportunity of rapid growth. The inadequate warehouse and storage space causes delays and repetitive handling; inter-modal transfer of containers is restrained by the lack of facilities; and inland transport planning is poorly co-ordinated both between modes and between various levels of government.

As to the chances for the port industry, the continuous increase in foreign trade shows the most valuable chance. Entering WTO brings the opportunities and challenges at the same time.

5.2 The Analysis of International Shipping Industry

Factor Conditions

China's shipping industry has become a pillar industry for the nation and a mainstay on international markets. China has over 18,000 km of coastline and 14,000 km of island coasts with abundant maritime resources. China also has a large inland waterway network which links the whole country both from east west and north south. The Yangtze River, China's longest river, with a total of 70,000 kilometres of waterways open to shipping on its mainstream and 3,600 kilometres on its tributaries, became the nation's busiest shipping lane, carrying 72 percent of China's total waterborne traffic.

Despite China's long coastline and enormous hinterland, its transport infrastructure is weak. The shortage of transport capacity is a long-standing problem in China, there are no adequate transport links between interior regions and gateway cities. Trucking services are of low quality, partly due to the equipment but mainly to the quality of the highways, most of which were originally designed for local traffic and do not accommodate tractor trailers easily. The lack of rail capacity is the most critical element for moving cargo to and from inland destinations. Further, their service is often irregular and poor. In the inland areas, there are few container freight stations, yards and trucks.

China enjoys the competitive advantage in cheap labor. The average labor cost in China will be about five percent of those in the developed country. Also compared to other countries in the Far East area, such as Japan and South Korea, the labor cost in China is much lower and this situation will last at least two decades. On the other hand, every year at least 2.5 million college students graduate in China. They are expected to enter the country's labor market incrementally in the coming years. This high quality but relatively cheap labor force will help China's shipping industry maintain its rapid growth in the future.

Demand Conditions

With a 21% growth in exports in 2002 to a total of USD 322 billion (and being the world's largest exporter to the USA), China relies heavily on international shipping as the vehicle for the country's growth. It is estimated that more than 15 percent of China's Gross Domestic Product (GDP) can be attributed to the overall shipping industry (ship-owners, shipbuilding & shipping services). (www.marinemoney.com)

By entering WTO, China will become the world manufacture centre within 5-10 years. More than half of top 500 world enterprises have set up joint venture/mono-owned venture in China. The foreign trade volume carried by sea will increase, the trans-shipments in various trade lanes will climb up to some extent. With a 21% growth in exports in 2002 to a total of USD 322 billion, China relies heavily on international shipping as the vehicle for the country's growth. This large increase in the shipping demand will also provide an excellent opportunity for China's international shipping industry.

As China increasingly integrates in world trade, its comparative advantage will need to be based on the quality of its services, such as good order-to-door cycle time, door-to-door reliable transport, competitive transaction costs, and minimum losses in transit. However, the intermodal transport system in China is not integrated. The growth of exports and the use of containers have largely been limited to the coastal areas and associated with ocean-going shipping: Over 92 percent of seaborne containers do not travel beyond the coastal provinces, unlike the coastal cities, which have a full contingent of container freight stations, trucks and empty containers. Inland provinces lack container handling facilities and equipment. Thus, inland shippers have to wait for empty containers to be sent from the coast to the interior, which adds to the time and

costs. As a result, the benefits of container transport, as a means for door-to-door or dock-to-dock transport, have yet to be realized in these localities.

Repeated cross-border inspections for container transport also cause negative effect. Although cross-border inspections have improved since the mid-1980s, they still delay containers at points of entry. Repeated inspections by different agencies often cause frustration to exporters and importers. The inconsistent application of regulations has confused foreign shippers and delays the process. Cumbersome customs procedures for bonded transit to inland destinations discourage importers to clear their cargo at inland locations, perpetuating the practice of opening containers for customs clearance both at port areas and again at inland destinations for discharging containers.

Indeed, if an efficient inland container transport system could be developed, the price of exporting and importing goods could be reduced by 2 percent-6 percent. Although these figures appear small, they are large enough to significantly affect the exporters' competitiveness in tight markets.

Firm Strategy, Structure and Rivalry

A major trend in the recent shipping market is that the competition becomes fairly intensified between state owned enterprises and foreign shipping lines though the demand keeps expanding. The main reason is that now more and more shipping companies are intending to increase their market share, and a set of customer-oriented philosophy has been introduced. The two large state owned enterprises China Ocean Shipping Company (COSCO) and China Shipping Company, dominate almost the entire shipping industry in China. These two giant operators still largely enjoy the market share in inland market due to their nation-wide service network. There are also some medium and small size companies in the market, and they act as part of the shipping agent. So the major competition faced by these two large Chinese shipping companies are the foreign shipping lines such as Maersk, American President Line, P&O Nedlloyd, M.O.S.K, Evergreen, etc.

Followed by China's entry to the WTO, in the shipping sector, China is required to strictly abide by rules on multilateral principles such as Most Favoured Nations treatment, transparency of trade and so on. Foreign investors will get permission to establish companies for the purpose of operating a fleet

under the national flag of the PRC. Foreign service suppliers are being permitted to establish joint venture shipping companies though the share of foreign investment will not be allowed to exceed 49% of the total registered capital of the joint venture if for any reason they try to operate a vessel under the flag of the PRC. The result is the foreign shipping companies will get more and more equalization in the market and competition in the shipping market will keep on becoming intensified.

China's international shipping industry does not want to miss the boat when turning itself into a first-class player in the global arena. No significant rivalry exists among the domestic ocean shipping companies and the indigenous firms are relatively weak to compete in international market. As a result, the monopoly and superficial competition among the state-owned ocean shipping companies leads to its slow development in ocean transport.

It is urgent for the Chinese shipping companies to update ships and improve management. Information systems and other technology are also greatly important for container tracking capability and acquire excellent performance. Shippers are often uninformed about their containers' whereabouts. Shippers attribute this to the rudimentary information system and poorly trained staff, the lack of a reliable recovery system, improper practices such as the unwillingness to return empty containers (because the owners and contractual obligations are unknown), and the low priority that railways give to the treatment of empty containers. In a word, domestic carriers should learn advanced experience and technology in order to improve market competitive capability.

Related and Supporting Industries

Shipbuilding industry

The main related industry for international shipping industry is the shipbuilding industry. According to the rapid growth in the world's shipping industry, the demand for the ship has increased greatly. Among this expanding international market, China has an increasing share with its export earnings increasing year by year. China's shipbuilding industry includes the relatively developed sectors of design, ship-frame building, general assembly, necessary accessories and repair. Its techniques have reached a high level of sophistication. Its enterprises

perform ship design and key equipment manufacturing. A variety of ships have been developed -- from the bulk carrier, oil tanker and dry cargo ship to the internationally advanced processed-oil tanker, chemical carrier, roll-on-roll-off ship, large air-cooling container ship, liquefied-petroleum-gas ship and high-speed hydrofoil.

The main shipbuilding industry in China locates in several large cities such as Shanghai, Dalian, etc. These shipbuilding companies have a solid foundation for development. Their business methods, market operation, production techniques and production management are in keeping with international market practices. The products are not only facing the domestic market, but for large amount of export. There are also many ships imported to China every year, which jointly support the China's shipping industry.

In conclusion, China's shipping industry has stepped into a new period filling with opportunities and challenges. To face the ongoing fierce competition, the domestic firms should rapidly change their strategies to market-oriented, and keep on searching for a better new solution for survival.

Logistics industry

As supporting industries of international shipping industry, logistics service has become one of the most important industries and a new growth factor for China's national economy in the 21st century. In China, distribution and trading businesses are tightly knit. With the global reach of trade, extensive and high-quality logistics services networks are critically essential. China's logistics service as a newly emerging economic sector is now on a basis of rapid progress, and the Chinese government is eager to promote the growth of the industry and foreign participation is encouraged.

China's large transportation and freight forwarding companies are turning themselves into major players in logistics services, such as Sinotrans, COSCO and China Post. For example, COSCO International Freight, China Ocean Shipping Agency, Sinotrans Road Transport, Sinotrans International Multi-modal Transportation and China Goods and Materials Storage Corporation have already taken the lead in developing logistics services. COSCO now provides logistics services, including importation of raw materials, storage,

circulation, processing, packing and export of finished products for industrial trade.

With the trend toward integration of supply chain management, the shortage of global links limits domestic firms' ability to provide the entire international logistics chain. The traditional concept of distribution can no longer satisfy global logistics challenges. The strengths of the Mainland logistics companies lie in inland transportation, distribution and warehousing networks. However, a large percentage of them are inefficient in automation in warehousing. And the integration of the logistics chain is barely complete. The overall blueprint is needed for managing external logistics processes and integration between different countries.

Domestic companies in China are more familiar with the local market and able to provide low-cost operations in China, but they are not able to cope properly with strategic alliances in the supply chain, such as global multi-modal networks, high tech warehousing, services for process integration (such as JIT and processing trade), sophisticated information and communication technology, or logistics consulting.

For example, in Shanghai, although the number of distribution centers is mushrooming, only five are able to distribute more than 1,000 tones of goods a month. Amid the expectation of fierce market competition driven by the WTO entry and globalization, there is growing demand from local companies for strategic partnerships offering supply chain management, technology transfer, logistics management training and warehouse automation. (Hong Kong Trade Development Council, 2002)

Government and Chances

Recent times have seen much new legislation related to the opening of domestic markets to foreign investment and joint ventures.

Since China initiated its Open Door Policy, the old vertical command system of management has been abolished. Prior to this, the Ministry of Communications not only controlled China's key ports, it also had direct control over the country's shipping companies. Thus provincial, regional and local government administered all planning, personnel, accounting and operations. Now China's

stated policy is that of continued devolution of power to the local level in order to establish a more effective management structure in shipping industry. Furthermore, the 5 largest state-owned transport companies are no longer directly administered by the Ministry of Communications. These companies are China Ocean Shipping Group (COSCO), China Shipping Group, China Yangtze River Shipping Group, China Road and Bridge group, China Gang Wan Group. For these companies, the State Council is now in charge of personnel, the Ministry of Finance is in charge of finance and the State Economic and Trade Commission is now responsible for their overall coordination.

Currently, Chinese shipping policy is becoming more regulated, open and transparent, and the legal environment of the shipping industry is improving with promulgated continuously new regulations by the Chinese government. However government responsibilities/regulations are still uncoordinated and duplicated. Government agencies are structured along modal lines. Many deal with intermodal issues solely from their own perspective, passing laws and regulations without coordinating with the others. The result is an array of overlapping jurisdictions and fragmented legal structures. Compounding this problem is the government agencies' involvement in intermodal operations either in their own right or through their affiliate enterprises. Although efforts have been made to separate the regulatory and operational functions, quasi-collusive relationships between the state and enterprises still exist.

6 China's Leading Ports and Shipping Companies

In this Chapter, we will give a more specific introduction and deeper analysis regarding the leading container ports and shipping companies. As to these ports, we will introduce the port's location, the hinterland of each port, the port's policy, its development plan, the main transport ways among the ports and their hinterlands, the port's handling cost level, the port's handling efficiency, the ownership of the port, its cooperation with the shipping lines, and the condition of the information system of the port. In the introduction of shipping companies, we will include the shipping company's investment, its main sea route, its market position and share in China, its developing plan, the attitude of finding new transoceanic transport solutions, the shipping company's ambition, the concept of shipping line's growth and new solutions, and the way they run the shipping line, attitude toward the challenges and new ideas.

6.1 Leading Port Profiles: Shanghai

6.1.1 Brief Introduction

The Shanghai port stands as an international shipping centre in East China, serving as the most important gateway of China to the world. The port's throughput exceeded 100 million tons the first time in 1984. Traffic through the Shanghai port is growing rapidly, particularly in the field of container transport. The statistics show that the Shanghai port got an increase of over 1 million TEUs every year from 1999 to 2002. The Container throughput at the Shanghai port grew a massive 35.8% to 8.613 million TEU in 2002, accounting for 23.3% of China's total (37 million TEU). This made Shanghai the world's fourth largest container port, overtaking Kaohsiung which handled 8.49 million TEUs of containers last year. (www.people.com.cn)

Shanghai port's location contributes the most to its amazing development. The Shanghai Port enjoys the vast hinterland of Yangtze River delta area, one of China's most dynamic areas. In the middle of China's coastline, Shanghai lies in the centre of the Asia Pacific economic corridor and at the intersection of the Yangtze River and Chinese coastline. The Yangtze River links the port to inland provinces, and its central coastal position gives it convenient access to all Chinese sea ports. The Beijing - Shanghai, Shanghai - Hangzhou, Shanghai

– Chengdu, and Zhejiang - Jiangxi railways link up with the national railway system. The highways network radiates out in all directions to inland provinces.

The City of Shanghai is the most prosperous city of the Yangtze River Delta and all of China. It enjoys the highly developed economy: 50% of China's annual industrial output contributed by Shanghai and 99% of Shanghai's foreign-trade goods are handled by Shanghai port. According to Shanghai Customs statistics, Shanghai port handled US\$81.8 billion export cargo in 2002, with an increase of 20.3% over the previous year. Exports to the United States rose 24.9 percent to US\$17.5 billion in 2002, making the United States the largest destination of goods from the Shanghai port. Japan was a close second, with US\$15.9 billion, up 8.2 percent. (english.peopledaily.com.cn)

The Port of Shanghai has played a very important role in the development of the city in the hundreds of years since it began as a small fishing village, and grew into the modern metropolis it is today. All of the world's top 20 container ship companies have established representative agencies in Shanghai and China's top three ocean shipping companies have moved their headquarters to the city. Until the end of 2002, the port operates 16 international ocean shipping routes, connecting the city with more than 500 ports in nearly 200 countries and regions. (www.people.com.cn)

The high-speed development of foreign trade at Shanghai Port drove the big increase in containers' throughput. In the first half of 2003, total containers' throughput of Shanghai Port amounted to 5.219 million TEUs, up by 35.6%. Out of which containers cross-border amounted to 4.456 million TEUs, up by 35.5%. The container throughput exceeds that of Busan (the third largest port in the world) of the same period for the first time. The port has achieved 1.193 million TEUs from the January to August of 2003, with an increase of 23% compared to the same period of 2002, and the port handled more than 1 million TEUs container in the Aug. of 2003. The port has also set up a world record for handling 355.32 containers per hour in the past August. (www.eastday.com)

In January of 2003, the Shanghai municipal government took a sweeping reform of the port administrative structure. The Shanghai Municipal Port Bureau and the Shanghai International Port Group have been established in order to separate the administrative and corporate functions, which were previously handled by the same Port Authority. The original Shanghai Port

Authority lost its regulatory functions. The former Authority director Lu Haihu took the position of CEO of the Shanghai International Port Group. The reform was carried out in accordance with modern corporate systems. The reform is hoped to increase the efficiency in port administration and management, the port's competitiveness in the global shipping market, and to push forward the port's development into an international center of maritime commerce. (www.portshanghai.com.cn)

6.1.2 The Port's Development

The container business in Shanghai port started from the end of 1970s, and the container throughput was thousands of TEUs at that time. Although the container business started fairly late, it has expanded rapidly. In 1993, the port set up a joint venture---Shanghai Container Terminal Limited (SCT) with the Hutchison Port Holdings (HPH). It just took the company three years to transform five bulk berths into the container berths, adding the number of deep-water container berths up to ten and the length of the container dedicated berth to 2218 meters. The throughput capacity was also raised from 500 thousand TEUs in 1993 to 1.7 million TEUs in 1995.

In order to satisfy the market demand better, and to be suitable for the large vessels, the port has performed four phases of Waigaoqiao wharf project. Through the Waigaoqiao Phase I project, four multi-purpose terminals have been converted into three berths specifically for container cargo. Another five container berths have been constructed and put into operation in the Phases II and III projects started in 1998. The fourth phase of Waigaoqiao wharf project has been finished in 2002, with four more berths being built. The project has established 12 container berths, with the handling capacity of 3.85 million TEUs.

The Port Authority of Shanghai has also renovated some wharves along the Huangpu River so that they are also suitable for container transport. Shanghai now boasts 25 container berths. The port has already started to build a logistics center of 88 thousand square meters in Pudong. It also has planned to set up a logistics park in the port areas to support the transport service.

To maximise the operational efficiency and cost-effectiveness, Shanghai Port has invested a lot in setting up an advanced information system. The

information system provides the employees with fast and reliable access to critical applications including production management, human resource management, office automation, fixed asset management and leading enquiry systems. By facilitating application deployment and optimising network connectivity, the Port can now deploy, manage and maintain applications for its 46 offices across Shanghai from a single console, benefiting from reduced operation cost as a result of minimised manpower and resources for on-site IT support.

What will make the port a real international shipping center is the Yangshan Port Project. The port planned to invest tens of billions into this project with other investors. We will give a detailed introduction to this port project in the following part.

6.1.3 Shanghai Port's Investment

Shanghai has opened container routes to more than 120 ports around the world. At present, a freight vessel sails from Shanghai for Europe or North America every day. To maintain its status as an international shipping center, Shanghai plans to invest seven billion yuan (US\$843 million) in port construction in the 2001-2005 period. Over 80 percent of the investment will be used to build new or to expand existing container ports.

The Shanghai government has made great efforts to improve the capacity of the Shanghai Port. The port invested heavily in container terminal projects in the past 15 years. The total investment reaches 12 billion Yuan. The Shanghai Port tried to get more capacity by reclaiming land from the sea. The land reclaimed from the sea has been used to establish the deepwater docks. The project has reclaimed about 9,840 hectares land from the sea with a total investment of 1.8 billion Yuan (US\$130 million). The reclaimed land stretches from Shi Pile Port, in eastern Shanghai's Nanhui District, to the north of Hangzhou Bay in a 30-kilometre-long belt. The project has been completed in June 2002, and the port got about 38.7 square kilometres more dock land. (www.chinadaily.com.cn)

The port is also building more shipping berths to handle the growing cargo volume. The port launched a joint venture with Hutchison Port Holdings, COSCO Pacific and Shanghai Industrial Holdings at Waigaoqiao Terminal Area. The three partners invested 3 billion Yuan (US\$362 million) in the new

company, which will manage the terminal's first phase of three berths capable of handling 600,000 containers a year. The port has already finished the second phase of the terminal with three berths to handle 600,000 20-foot containers annually in 2002.

The Waigaoqiao Deepwater Project, which was started in 1993, is one of the largest port constructions in Shanghai. The goal of the project is to create a harbour area of 1.63 square kilometres with a depth of 13 meters, capable for accommodating four container ships (each carrying 4,000 TEU) at the same time. The project, however, still needs time to be completed and questions remain over the feasibility of maintaining a 13-metre depth due to the silting of the river. Under these circumstances, the construction of a mega-deepwater port became a "must" for Shanghai, providing a long-term and final solution to fulfil the goals of the city to become a key navigation hub in Asia.

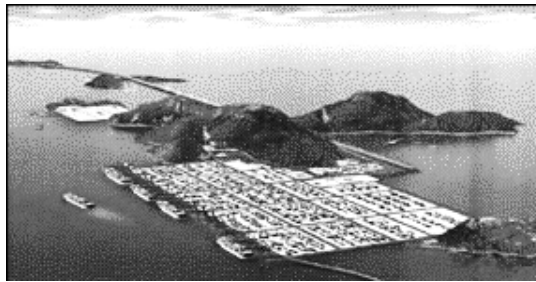


Figure 6-1: *The picture of Yangshan Port Model*

Source: www.eastday.com

Shanghai chose Big Yangshan and Small Yangshan islands to be the new deep-water container port after six years of feasibility studies. The government is investing about 100 billion yuan (RMB) to build a deepwater port in these two islands. The islands of Big Yangshan and Small Yangshan lie in the Hangzhou Bay, 27.5 kilometres from Shanghai's southern coast, and under the jurisdiction of the neighbouring Province Zhejiang. The average water depth in the area of the islands is over 15 meters. The geographic and geological structure is stable as well if compared to the sea chart of today and that of 100 years ago. (www.eastday.com)

The first phase of the Yangshan Deepwater Port construction started in the middle of 2002. It will be completed by 2005. A land area of 1.53 square

kilometres, equipped with a storage yard of 720,000 square meters and 15 container cranes will be built in the first phase. This phase will also see the first five container berths from Small Yangshan Islands to Huogaitang with a 1600-meter quay waterfront. The designed water depth of the channels will be about 15.5 meters, capable of accommodating the fifth and sixth generation of container ships. Each berth was designed to handle 440,000 TEU per year. The total annual handling capacity will therefore reach 2.2 million TEU, which should meet the fast growing demand of Shanghai Port in the mid-term future. (www.eastday.com)

According to the master plan, the whole project will be completed by 2020. At that time, the man-made area will increase to 18 square kilometres and the deepwater coastal line will reach 22 kilometres. More than 50 container berths, capable of handling the fifth and the sixth generation of container ships (5,000-6,000 TEU) will be built. The annual handling capacity of the deepwater port will increase to around 25 million TEU, probably making it the biggest - and busiest – container terminal in the world. (www.eastday.com)



Figure 6-2: *The picture of Donghai Bridge Model*

Source: www.eastday.com

The "Donghai Bridge", standing in the northern part of Hangzhou Bay, will link the deepwater port with the mainland. The bridge construction has already begun with the underwater foundations and should be finished by 2005, during the first phase of the port project. Different services like container distribution, water and power supply and communications to the island port will be provided through this bridge. According to the plan, the sea-crossing bridge will be 31.3 kilometres long and 31.5 meters wide, with six highway lanes. The bridge has one main span (a box girder cable-stayed bridge with two towers) with a 40-meter clearance for 5,000-tonnage vessels, one side span for 1,000-tonnage

vessels and 2 side spans for 500-tonnage vessels. The annual navigable capacity under the bridge will be over 5 million TEU. (www.eastday.com)

6.1.4 The Port's Yangtze River Strategy

The Yangtze River turned out to be a real golden water way after the massive Three Gorges Dam began to conserve water in June of 2003. Shanghai port grasped this opportunity to perform its "Yangtze River Strategy". The port has signed a series of cooperation contract with the inland port along the Yangtze River: Chongqing, Wuhan, Nantong, Yangzhou, Huangfu, Nanjing and other ports. Several container terminal companies, logistics companies and inland transport companies were established because of the cooperation. The port tries to include these river ports into its feeder port group, and to set up its service network ahead of other large coastal ports. The move does make Shanghai port obviously competitive. The inland container throughput raised by 18% in August of 2003.

Wuhan is a typical case of this strategy. In April of 2003, it was reported that Shanghai Port decided to directly invest in infrastructure construction of central China's Wuhan port over the next five years. Wuhan Port is the largest inland cargo port along the Yangtze River. The co-operation is the first one of its kind in mainland China. Under the recent agreement by the two ports, Shanghai Port will input an initial investment of over 10 million yuan (US\$1.2 million) later this year to renovate two berths at Wuhan Port into a 650-metre-long container berth with coverage of 200 thousand square metres. The project will help Wuhan Port to be a shipping centre in the middle reaches of the Yangtze River in the next five years, with its business covering neighbouring Chongqing Municipality and Hubei, Hunan and Sichuan provinces. (english.peopledaily.com.cn)

Besides expansion to inland areas, Shanghai Port also had invested in neighbouring ports along the coast. Shanghai Port obtained 45 per cent of the stock shares of a coastal deep-water berth in East China's Ningbo. By investing some key ports, Shanghai Port's domestic shipping network will be further expanded and strengthened in the coming years. The expanded shipping networks of Shanghai Port will attract more business from home and abroad and make the port more competitive.

6.1.5 Opportunities and Challenges

The port hopes to be able to reach the standard of a real international hub harbour by 2020. Chinese port officials forecast a throughput more than 10 million TEUs by 2005 and more than 15 million TEUs by 2010 at Shanghai Port. Efforts are also being made to build the Waigaoqiao into a procurement and distribution center in the Asia Pacific Region. The dredging of the Yangtze River to a depth of 12.5 metres is planned in order to accept 5500 TEU vessels by the year 2020.

Shanghai Port keeps an advantage of low handling charges – the estimated cost to handle one container in Shanghai is between 25%---50% of that in Hong Kong. The rapid economic growth in Shanghai and in the Yangtze River Delta in directly pushed the throughput forward greatly, especially the flourishing foreign trade following China's WTO Accession in late 2001.

The shipping market in Shanghai is the relatively mature and standardized. Shanghai Shipping Exchange (SSE) is the first shipping exchange market of national level. Approved by the State Council and co-founded by the Ministry of Communications and the Shanghai Municipal Government, SSE was officially inaugurated in November of 1996. Over the years, by centring on the three basic functions of “standardising transactions in the shipping market, regulating shipping market rates, and transmitting shipping information”, SSE has played an important role in improving the shipping market and the market service system. Authorised by the Ministry of Communications, SSE has implemented the freight filing system for international container liner services, thus standardising the market order of the shipping industry in Shanghai. Possessing many channels for gathering and disseminating information, SSE regularly compiles and publishes the China Export Container Freight Index (CCFI), which exerts a far-reaching influence upon the shipping industries both at home and abroad. (www.portshanghai.com.cn)

The port has further improved the supporting and related industry, making it more efficient and effective to use the port. Shanghai performed several projects to improve the cargo storage and inland transport. One large supporting logistics center has already been used to alleviate the pressure of expanding throughput. And the other large logistics park will be built in the near future.

But the threat of competition for the port is still very real, despite Shanghai Port looks like a shipping powerhouse in the region. Yet its growth has been constrained by several factors. Waters at the Yangtze River estuary are shallow and narrow such that larger 5th generation ships cannot come in. The Huangpu River - the Mother River of Shanghai - is narrow and quite shallow, with a depth of only about 7 meters, preventing container ships of 1,400 TEU or more from entering the port. Big boats have to wait for the up-tides to enter and leave Shanghai Port, severely hindering the competitiveness of the port in a global market.

Although Shanghai has made big progress in the field of port infrastructure, the City's container handling capacity still failed to meet the fast growing demand. According to the Shanghai Port Administration, container numbers passing through Shanghai Port have grown by an average of 27% annually over the past decade. This increase is based on the rapid development of foreign trade in the Yangtze delta area as well as the vast hinterland.

On the other hand, Shanghai's container-handling facilities basically remain backward. The Shanghai Port is not only short of large deep-water berths but also short of modern logistics, which provide quick, reliable, flexible and comprehensive services.

6.2 Leading Port Profiles: Shenzhen

6.2.1 The Current Situation

Through 20 years of development, the Shenzhen Port which contains ports of Shekou, Yantian, Chiwan, Mawan, Dongjiaotou, Fuyong, Xiadong, Shayuyong and Neihe has become the No. 1 port in south China. Among all those ports, Shekou, Yantian, Chiwan are the three main ports that contribute most the throughput.

The ports of Shenzhen have increased their throughput by nearly 27 times in just seven years. In 1995, the total throughput of ports in this area was a mere 284,000 TEUs. Within five years this had risen to just under 4 million TEUs, and in 2002, the combined Shenzhen ports (Yantian, Shekou and Chiwan) throughput was around 7.61 million TEUs.

The Shenzhen Port has handled containers totaling 16.5389 million TEUs with an increase speed averaging 45 percent over the past five years. The port's turnover reached RMB3.032 billion last year, and the average profit rate of its net assets reached 11.6 percent. The loading efficiency of the container wharves and operation means are up to the advanced international standard. At present, 34 well-known Chinese and foreign container shipping companies have docked at the Shenzhen Port, which has opened 69 international container-shipping routes. An average 417 ships dock at and leave the port per month. (english.peopledaily.com.cn)

According to data from the Shenzhen Municipal Port Authority, the phenomenal container throughput rose to 5.5 million TEUs, with a 40.42 % growth at Shenzhen Port in the first seven months of 2003, compared with the same period a year earlier; and growth is expected to accelerate between July and September - the peak season for Christmas order shipments.

It was learnt that during the period from January to May of 2003, a slack period in maritime traffic, the handling capacity of Shenzhen Port was increased, total handling capacity amounting to 3.7297 million TEUs, exceeding that of Kaohsiung, which was 3.649 million TEUs. It was learned that the handling capacity of Kaohsiung was 83.8 thousand TEUs more than that of Shenzhen Port in 2002. The capacity of Kaohsiung ranked No.5 and Shenzhen Port No.6 among top 30 container ports in 2002.

Further expansion is now in progress at Yantian, Shekou, and Chiwan to meet the requirements of the cargo-generating industries in their hinterland, and at least 10 additional containership berths will be constructed in Shenzhen by 2006, boosting capacity by an estimated 3.6 million TEU. (Woodbridge, 2002)

6.2.2 Shekou, Chiwan and Yantian

Terminal	Jan—July (1000 TEUs)	% Change (Year on Year)
Yantian Int. Container Terminals (YICT)	2,765	+28
Chiwan Container Terminals (CCT)	853	+41
Shekou Container Terminals (SCT)	768	+83
China Merchant Ports	462	+36
Total Throughput of Shenzhen (Incl. other small operators)	5504	+40

Table 6-1: Throughput at major Shenzhen terminals from Jan. to July in 2003. Source: the Shenzhen Municipal Port Authority

Year	Total Throughput (Incl. other small operators,1000TEUS)	SCT	CCT	YICT
1994	177.9	87.1	9.1	13.3
1995	283.6	89.9	31.4	105.7
1996	589	89.9	49.6	353.5
1997	1147.3	214.8	150.2	638.4
1998	1951.7	463.1	203.3	1038
1999	2986.5	574.1	350.1	1588.1
2000	3993.7	721	450	2146
2001	5074.5	753.6	643.7	2752.3
2002	7613.7	883.5	1544	4181

Table 6-2: Throughput at major Shenzhen terminals from 1194 to 2002. (Unit: 1000 TEUs, Source: the Shenzhen Municipal Port Authority)

Yantian

Yantian's growth, in particular, has been phenomenal in recent years. The port which only crossed the one million TEU milestone in 1998, handled 2.7 million TEUs in 2001, leaping to 4.2 million TEUs last year.

Yantian International Container Terminals (YICT) is the largest of the Shenzhen ports and run by a joint venture established by the HPH and

Shenzhen Yantian Port Group (YPG), commenced operations in mid-1994. The joint venture, Yantian International Container Terminals Limited is responsible for operating and managing Phases I, II and III of the Yantian Port. The total investment for phase I and II is HK\$7.2 billion of which HPH holds a 48% interest. These two phases consist of five 50,000-ton container berths.

HPH holds 65% of the stakes of the phase III, for which a total of HK\$6.6 billion will be invested. Phase III will include four 100,000-ton-plus berths and the necessary support facilities, occupying an area of 90 hectares. The total berth length will be 1,400 metres. To satisfy the port's development needs and accommodate the larger container vessels of the future, the project has been designed to provide a water depth of 16 metres in both waterways and at the quayside. The existing channel will be widened to 410 metres to allow two-way ship traffic for larger container vessels. Phase III will be equipped with 18 post-Panamax quay cranes with an outreach of 65 metres. (www.yict.com.cn)

The first berth of the phase III has been put in operation on 16 October 2003. According to the plan, the second berth and a yard of 200,000 sq. m will enter use at the end of 2003 while the rest two berths are due for completion by the middle and end of 2004. It is estimated that the whole project will be completed by the end of 2005, boosting annual throughput capacity by some 2 million TEUs.

At present, Dominant Yantian International Container Terminal's annual handling capacity is estimated to be around 3 million TEU. It handled around 2.8 million TEUs in the seven months to July 2003 - up 28 per cent. Since June of 2003, all the top 20 shipping companies have already called at YICT, and the new services calling at the port are still expanding. (www.southcn.com)

The port used to experience serious congestion and delays in the late of 2002, partly caused by huge transpacific cargo demand. To deal with the ever-increasing demands placed on its facilities, except performing the Phase 3 expansion, the port has instigated a number of programmes. Since August 2002, the terminal has increased its yard capacity by 25%, with the conversion of ondock warehouse into a 100,000 sq. meters. Further enhancements include the signing of an agreement with the local customs authority to permit international transshipments, and the clearance of empty containers prior to arrival to enable immediate release after discharge. The service and production levels at Yantian

have also been improved by acquiring more handling hardware. While the condition is much alleviated, the additional capacity is still badly needed.

Chiwan

Chiwan Container Terminal (CCT) in western Shenzhen was the fastest growing container port in this region in 2001 and 2002. CCT was renamed in February in 2002, having previously been called Shenzhen Kaifeng Terminal (KFT). The change was made to better “brand” the terminal, widely referred to as Chiwan. CCT is run by Chiwan Container Terminal Co., Ltd. which is jointly invested by Chiwan Wharf Holdings Limited, Kerry Holdings (HK) Limited, Hidoney Development (HK) Co., Ltd. (held by CMH and Modern Terminals) and China National Cereals, Oils and Foodstuffs Imp. & Exp. Corp. (www.cwcct.com)

CCT lies only 20 nautical miles away from Hong Kong, it is one of the gateways from the South China Sea to the Pearl River Delta area and South China hinterland. A well-developed network of waterway transportation to connect the main cities in the Pearl River Delta, such as Guangzhou, Zhuhai, Dongguan, Foshan, Zhongshan and Huizhou with ports all over the world. It is also well-connected by the GuangShen and GuangShan highway network to all the major booming cities in the area, which all fall within a distance of 150 kilometers from CCT. The Pingnan Railway, which links up with the JingGuang Railway and JingKow Railway, reaches directly to the gate of CCT. (www.cwcct.com)

The terminal has three containership berths with 1,000m of quay, equipped with eight post-panamx quayside gantry cranes. Two more 350m-long berths have already been started to build. Berth 12# will be put into use at the end of 2003, Berth 13# will be completed by the middle of 2004. It has already got the final government approval to build the quay wall. In the interim, positive steps are being taken by CCT to improve productivity at the existing berths. Landside stacking capacity has been raised with the creation of a new empty container depot, while the terminal software system purchased from the Belgian Firm --- Cosmos has been fully operational at the end of 2002. (Woodbridge, 2002)

Chiwan Container Terminals enjoyed 41 per cent growth, handling 853,000 TEUs in the first seven months in 2003. But the draught limitations in the channel may still act as a constraint.

Shekou

Shekou Container Terminals (SCT) located at the southwest of Shenzhen and on the east bank of the Pearl River Estuary. The Phase I of Shekou Container Terminals is owned by China Merchants Holdings, COSCO Ports (Shekou) Limited, P&O Ports and Swire Pacific, holding stakes of 32.5%, 17.5%, 25%, 25% respectively. In the Phase II, China Merchant Holdings took a majority 51% stake in the development, with P&O Ports, Swire Pacific and Modern Terminals taking stakes of 20%, 9.6% and 19.4% respectively. Overall investment by the four members of the new joint venture company will be USD 200 million. The phase II will add 700m of berth with a 15m water depth alongside. The first of the new berths has been operational in June 2003, and the second will be completed early in 2004. (www.sctcn.com)

China Merchants Holdings - an indirect arm of China's Ministry of Communications has a 100 per cent stake in China Merchants Port, which handled 462,000 TEUs from January to July in 2003 - up 36 per cent. (www.southcn.com)

Specifications	Phase 1	Phase 2	Total
Container Berth	2 (50,000 DWT Class)	2 (50,000 DWT Class)	4
Designed capacity	800,000 TEU	1,000,000 TEU	1,800,000 TEU
Stacking area	150,000 sq.m	244,000 sq.m	394,000 sq.m
Berth length	650 m	700 m	1,350 m
Minimum depth alongside	-14 m	-17 m	
Depth in fairway	-13 m	-14 m	
Stacking capacity	25,000 TEU	30,000 TEU	55,000 TEU

Table 6-3: Specifications of the phase I and II of SCT terminal project, Source: www.sctcn.com

SCT is equipped with container terminal management system developed by the American NAVIS Corporation. As to the transport networks, the dense river system extensively connects SCT with most major cities and towns located in the Pearl River Delta and South China; the multi-lane Harbor Highway connects SCT with the urban North Ring Road, the State Highway 107, the Guangzhou-Shenzhen expressway and Shenzhen-Shantou expressway; and the 35km Pingnan Railway, connected with Beijing-Kowloon, Beijing-Guangzhou, Guangzhou-Meizhou-Shantou, Guangzhou-Kunming and Guangzhou-Chengdu railways via the Guangzhou-Shenzhen railway, directly extends to Shekou. The cargo can be distributed efficiently to the inland cities of South, Southwest and Central China through all these inland transport system.

SCT's ambition is to extend well beyond to the South, Central and Southwest China via an integrated network interweaved with waterways, highway & railways. The Chinese government has given official approval to the construction of a further two berths, which will be built as part of a Phase 3 development. According to SCT, this project could be fast-tracked and the first berth may be operational as early as late 2004. (www.sctcn.com)

While there is considerable competition between CCT and SCT, there is also growing cooperation in order to draw containers from the western side of the Pearl River Delta to their facilities, and away from Hong Kong and Yantian. An important initiative in this context is the starting of a fixed-day Pearl River Delta shuttle barge service, jointly supported by the two terminal operators together with four barge operators. The barge services began in 2002, with varying frequencies between CCT, SCT and the river ports of Zhongshan, Shunde, Huangpu and Jiangmen. Eventually the aim is to build up sufficient volumes to justify a daily service to each of these ports, thereby meeting the requirement of carriers for a reliable and regular feeder link. (Woodbridge, 2002)

6.2.3 Advantages and problems

Shenzhen has acquired most of the advantage from the strong economic growth that is taking place in Southern China. Experts say even modest economic growth of 10% per annum in the southern China region would translate roughly to 2 million TEU per annum moving through Shenzhen and Hong Kong.

Strategically located opposite Hong Kong - still the world's busiest container port - Shenzhen's growth has been powered by the Pearl River Delta's thriving manufacturing base. All the ports in Shenzhen are well-placed to attract much of the Pearl River delta's exports, as shippers can make considerable savings (as much as 60% in some instances) on their factory to port transportation costs by opting for a Shenzhen terminal instead of Hong Kong.

The port development of the city has contributed a lot to the development of city itself: firstly, it has pushed the logistics industry forward; secondly, it also functions critical for the city to be the base area for manufacturing industry; thirdly, the port is favourable for the city to have a better "brand".

But capacity constraints have alarmed some industry watchers, who warn of increasing bottlenecks threatening to suffocate future growth. To help ease pressure on these existing Shenzhen facilities, the authorities of each port are already constructing massive new terminals; other new facilities are also being planned at Dachandao and Xiaochandao.

Keeping pace with demand has required the Chinese authorities to make a sustained and substantial investment in port infrastructure. According to the Shenzhen Municipal Port Authority, in order to accommodate the container increase, there will be a need for another three of four container berths every year in Southern China, and the especially the deep-sea container terminals must make large investment in infrastructure.

It is reported that the container berths of more than 50,000 tons takes only 10,000 ---20,000 sq. meters. Compared to the area used by the foreign ports, the area dedicated to the ports in Shenzhen is fairly limited, especially the yard area.

The efficiency of customs clearance is another problem. It takes the arrived containers only 3 days to be transported through the port in Hong Kong and Singapore, but it takes longer in the ports in Shenzhen. Though the authorities have done a lot to improve the situation, there is still a great room to improve.

6.3 Leading Port Profiles: Qingdao

6.3.1 The Current Situation

The Port of Qingdao, situated at the Jiaozhou Bay of Shandong Peninsula, bordering on the Yellow Sea and facing Japan and Korea Peninsula across the sea, is a natural deep sea port with no freezing all the year round. The Port of Qingdao, with its advantageous geological location and favourable natural conditions, is an important transit port in the Yellow River valley, and on the west coast of the Pacific Ocean, and is also a hub port for international trade and north-south sea borne transportation.

With 16000 employees, the Port of Qingdao is located at the starting point of Qingdao-Jinan Expressway and Jiaozhou-Jinan Railway convenient for cargo gathering and transporting. Besides its business coverage in the whole Shandong Province, the Port, with its vast economic hinterland, has extended its business to such provinces and regions as Henan, Hebei, Shanxi, Shaanxi, Gansu, Inner Mongolia, Xinjiang and Sichuan.

The port has seen continued growth in the past decade. The total cargo throughput in the port exceeded 100 million tons in 2001. The throughput mounted to 122 million tons in 2002, with a monthly increase of more than one million tons. It handled over 80 million tons of foreign trade goods, up 19 percent year-on-year and ranking second in the country in terms of foreign trade. In 2002, its container throughput surpassed 3.4 million TEUs, up 28.9 percent and ranking third place among coastal ports in the country; its position rose from the 19th place in the world to the 15th. The port ranked the first in handling minerals and crude oil in China. It has fulfilled the 2001-2005 programme three years ahead of schedule. (www.qdport.com)

The Qingdao Port plans to handle 126 million tons of goods and strives to handle 130 million tons in 2003, and the throughput of containers will reach four million TEUs. It will strive to handle 150 million tons of goods and 7 million TEUs by the end of 2005, and 200 million tons of goods and over 10 million TEUs by the end of 2010. (www.qdport.com)

As predicted, the port saw a phenomenal upsurge in cargo handling in the past months in 2003. According to statistics from the port administration, till the September of 2003, the port has already handled 100.05 million tons

of cargo, up 14 percent over the corresponding period of last year; the container throughput exceeded 3 million, a rise of 26 percent year on year. (www.chinadaily.com.cn)

To increase its handling capacity, Qingdao port has, over the past decade and more, expanded a century-old port area and built two modern port areas with advanced port facilities. The port achieved greatly in container terminal's construction, with 100 meters per month in 2002. The container yard was enlarged to 1.52 million sq. meters. And the port has won a super cooperation in the phase III of Qianwan container terminal's project. The port now boasts China's largest wharves for containers, crude oil, iron ore and wharves for coal and grain, of world level.

As the statistics show, after moving the container terminal for foreign trade to the new terminal, the handling efficiency was sharply improved. The port has set an objective to finish the loading and unloading of every container ship in 10 hours. From January to February of 2003, 80% of the container ships docked at the port were handled in 10 hours. It just took the port 12 hours to finish handling of some 5000 TEU ships.

6.3.2 The Port Investment

Port of Qingdao is an important window of Qingdao city's opening-up. In the past years, the port has experienced dramatic changes and fast development in port investment. The port took the lead in attracting all kinds of investment by input heavily in investment environment construction. Investors were offered rich opportunities for mutual development while enjoying top-quality services. The port has successfully established 20 joint-venture companies through co-operation with well-known shipping companies, multinational companies and top-five-hundred enterprises from foreign countries and regions including Britain, Singapore, Japan, Hong Kong and Taiwan. The port's great effort has already achieved good economic and social results.

On the one hand, in recent years, Qingdao port realized a 30 percent annual growth in its container deals. With its rapid growth, the port has been drawing more and more foreign investors. On the other hand, the port pushed forward its port investment project named "Wanguo Terminal". The name means that the terminal would be constructed and invested by several countries. Many

successful cases in the port's investment proved the project successful, especially the case of the port's cooperating with three world shipping giants in the phase III of Qianwan container terminal.

In phase III of Qianwan container terminal, the Qingdao Port (Group) Co. Ltd., signed a contract with the A.P. Moller Group (APM), P&O Ports, and the China Ocean Shipping Company (Group) (COSCO) in July of 2003, investing 887 million US dollars jointly to regroup its Qianwan container dock into the largest in China. The four companies hold stakes of 30%, 20%, 29% and 20% respectively. For each of the three investors, this project is the largest project they have invested in Asia. P&O Ports is also the investor of the phase II of Qianwan container terminal, holding 49% of stakes while the Qingdao Port holds the rest. (www.qingdaonews.com)

The jointly-run Qianwan container dock will have ten deepwater berths for container vessels along the 3,400 meter-long coastline when expansion is completed, as well as the ability to receive huge container vessels carrying 10,000 TEUs of containers, with the annual handling capacity exceeding 6.5 million TEUs. (www.qingdaonews.com)

Other foreign big enterprises were also succeeded in grasping the golden opportunity to invest in the port. In the central-port district, a bonded dock with an investment of 600 million US dollars from the China Merchants Group will be built at the end of 2003, as will eight new berths in the south-port district for which the US CSX World Terminals invested 500 million US dollars. (www.nanfangdaily.com.cn)

6.3.3 The Opportunities and Challenges

As China's major trading ports and one of the top fifteen hundred-million-ton ports in the world, this port is not only characterized by a long history of more than 100 years, but also of its open attitude to new ideas and solutions. The port co-operates closely with customers and other transport operators and maintains an ongoing improvement on port's operation and management. There is a slogan posted at a distinct position in its official website, saying: "Without customer and shipper, we will have no food to live on!" The port established the first team to getting more cargo in China. It has setup more than 30

branches all over China and opened the Sea-rail transport ways to 12 big cities in China.

Experts say that the Port of Qingdao would potentially turn itself into north China's shipping center and a hub for international containers in northeast Asia. In the past six months of 2003, at least 10 new shipping lines have been launched from Qingdao for worldwide traffic. Recently, the Maersk Group opened a direct shipping line from Europe to Qingdao Port, which is the shortest sea route between China and Europe, according to Maersk sources.

The port enjoys its favourable situation in the following aspects:

1) The port has an extremely wonderful coastline which has enough water depth for constructing the container terminals for the ever large vessels. The port has the longest coastline suitable for the container vessels. The fairways and quayside of the port has a water depth of 17.5 meters, which is enough for accepting the container vessels of 10,000 TEUs. The port also owns a yard as large as 2.25 million sq. meters and the yard still can be expanded for the ever increasing demand. The experts in the shipping industry admit that it is very rare for a harbour to possess such a wonderful and world class natural environment.

2) The port succeeded in grasping the precious time and opportunity to construct the port, taking lead of many other main coastal ports, especially in the container port's construction. The port's strategy in port's investment is to get the investor who can not only bring capital also the market and cargo resource. The port accomplished a lot by sticking to the principle. By cooperation with the top shipping companies, the port won the advantage of cargo resource for international transshipment and the international experience of operating the port.

3) The port takes advantage in operation cost, especially when compared to its near competitor---- the Busan Port in Korea. Busan was ranked third in container throughput in 2002. The statistics shows that among all the containers handled by Busan, there are more than 4 million containers come from the inland of China. The Port of Qingdao has its obvious advantage in wining these containers.

4) The port is supported by the local policy and developing plan. At present, Shandong, the province to which the port belongs, is taking steps to develop the peninsula into a northern manufacturing base in a bid to cope with the demand for industry transfer from Japan and the Republic of Korea. In addition, the opening of container trains linking Qingdao and western China, and the one-stop customs service in the port of Qingdao, make it easier and more convenient for some western Chinese cities like Lanzhou, Xi'an, and Chengdu, to do foreign trade through the port.

5) A particular opportunity for its development in China ---- northern Europe market. The Swedish Volvo Truck Co., one of the world's top truck giants has signed the contract with China National Heavy-Duty Truck Corporation (CNHDTC) to build a joint venture with a total investment of 1.6 billion yuan (193 million US dollars). CNHDTC's head office is located in Shandong, and the factory of joint venture is also located in the province, which is the most important place of the port's hinterland. The joint venture is expected to have an annual output of 10,000 Volvo trucks. This will certainly bring cargo resource for the port.

The port also has to face the following challenges:

1) The port has a relatively limited hinterland, especially when compared to those coastal ports located in Pearl River Delta. The port is located at the tip of Shandong Peninsula; its hinterland mainly covers the area along the Yellow River. But the economy in this area comparatively falls behind the Yangtze River Delta and Pearl River Delta. This makes the port fail to get enough cargo resource. It is reported that the total import and export in Shanghai in 2002 reached 72.65 billion USD, 70.29 billion USD for Jiangsu province, 221.1 billion for Guangdong province, but 83 billion USD added by all the provinces of Shandong, Henan, Shanxi, Shaanxi, Anhui, Gansu, Qinghai and Xinjiang (the Port of Qingdao's hinterland).

2) The port has to face the tense competition from both domestic and foreign ports. The port of Dalian, Qinghuangdao and Tianjin take the hinterland of North-east China and other areas in North China; the Shanghai Port and Ningbo Port take the Yangtze River Delta. There is only the Shandong Peninsula left, but just for this limited area, the close-located Port of Rizhao and Yantai are trying to get more market share.

The port's old competitor ---- Dalian is also planning to invest 12 billion Yuan to build another Dalian port of current facilities. The port of Tianjin is planned to input 27.3 billion Yuan in port construction, and to get container throughput of 10 million TEUs in 2010. The Port of Busan is also trying to lower the fees to get more traffic from China.

3) There is not much time left for the port. Experts say there are only three to five years left for the port to be strong enough to win in the competition. Before the Port of Shanghai finishes its Yangshan Port Project, the Qianwan Container Terminal of the Port of Qingdao can take the advantage of being the best in China. The competition will be spectacularly tense after five years.

6.4 Leading Port Profiles: Tianjin

6.4.1 The Current Situation

Tianjin port is composed of sea harbor and river harbor. The sea harbor situated at the estuary of the Haihe River in the west of Bohai Gulf, and the river harbor is at the lower reaches of Haihe River. Tianjin port is the largest artificial harbor in China. It is also one of the hub ports, and an important international trading port in China. It is one of the earliest ports to develop container transportation in China mainland, now it can handle the fifth-generation container ships. There are 11 container berths in operation in Tianjin port. In 2002, it handled a record of 129 million tons of goods and containers totaling 2.408 million TEUs, up 13.4 percent and 19.8 percent year-on-year.

The port is an important gateway for the capital: the distance from the port to Beijing is only one hundred and seventy km. Most import and export cargo of Tianjin, Beijing, the north and northwest China is transported through the port. The port is also the starting point of Asia -Europe continental bridge. The railways of Jingshan and Jinpu connect the port to the country's railway system, and the Jingjintang highway road connects Beijing and the port.

At present, in Tianjin Port, there are more than fifty ocean container lines, dealing with business with more than 170 countries and more than 300 ports of the world. Starting from 2002, the port added 12 navigation routes from Tianjin to the Persian Gulf, Japan, the Republic of Korea and Southeast Asia while

expanding the shipping operation in the Bohai Sea. The newly established routes have rationalized its navigation pattern and strengthened its position of being a key port in north China. (english.peopledaily.com.cn)

Its throughput of foreign goods reached 69.668 million tons in 2002, up 13.8 percent over the previous year. Over 70 percent of the goods came from central and western parts of the country. With the increase of the port throughput, the number of ships to the Tianjin Port has gone up. The port accommodated over 13,500 ships in 2002, averaging some 40 a day. The Tianjin Port has become one of the busiest ports in China.

The main trading partners of Tianjin Port are Japan, the United States and the Republic of Korea, and port's trade volumes with the three countries in the first quarter of 2003 were two billion US dollars, 1.56 billion US dollars, and 1.47 billion US dollars, up 42.7 percent, 24.9 percent and 48.3 percent respectively. (Xinhua News Agency, 2003)

The local authority plans to allocate a total investment up to 27.3 billion Yuan for its development in the next ten years, including ten construction projects and 20 matching projects, which will lead Tianjin Port to become a modern international deepwater port, a pivot port for container transportation and the biggest northern port for bulk commodities transportation. (www.coi.gov.cn)

In the first half of 2003, the Tianjin Port has handled container of 1.45 million TEUs, with a 25.9% increase compared to the same period of 2002. Also, in the first half of 2003, the foreign trade through the Port surged by 29 percent to 21 billion US dollars. The port opened a direct container shipping route to Europe in March of 2003. According to the Port official, this line is the fastest shipping liner between northern Chinese ports and Europe. (english.peopledaily.com.cn)

According to the port's authority, the port has an ambitious plan: it plans to double the cargo handling capacity in 2010, that is to reach 220 million tons; the cargo throughput is planned to be expanded to 260 million tons and container throughput 10 million TEUs in 2010 (the container throughput plan is the same to that of Qingdao Port). It is reported that the port will strive to reach its goal of accounting for 10.5 percent rather than the current 7.7 percent of the coastal cities' total handling capacity across the country by 2010. By 2010, Tianjin port will be China's second largest port, and its stated goal is to

eventually be listed among the world's top 10 or to contribute 42.8 billion Yuan (5.15 billion US dollars) to the city's GDP. (news.sina.com.cn)

6.4.2 The Port's Investment

The Port of Tianjin pledged to invest 27 billion Yuan (3.25 billion USD) from 2003 to 2010 to speed the development of Tianjin Port with a view to make it a major international port and container transport hub in Northeast Asia. According to local authority, Tianjin will complete its 14 billion Yuan (1.69 billion US dollars) investment in the port by 2005 in order to boost the port's handling capacity. By 2010, the city will invest an additional 15.4 billion Yuan (1.86 billion US dollars) to develop 10 projects, including the construction of a 200,000-ton-class navigation project and breakwater project. Tianjin will also invest nearly 11.9 billion Yuan (some 1.43 billion US dollars) to build expressways leading to the port and related infrastructure facilities. (english.peopledaily.com.cn)

Tianjin Port has started its overall construction in a bid to realize its perspective goals by the year 2010. The port will invest 1.5 billion Yuan in 2003 to increase its capacity. The money will be used to build and upgrade infrastructure, including the second-phase construction of a navigational channel for large vessels with a capacity of 100,000 tons. The projects being under construction are expected to be finished earlier than schedule. According to the statistics, over 980 million Yuan of investment have been achieved by the first half of 2003, and hopefully it will reach 2 billion Yuan for the whole year. In the March of 2003, the port has already begun to build a container logistics center which will cost 6.8 billion Yuan (about 819 million US dollars). The port plans to build four new berths and upgrade five existing ones during 2003. The port's handling capacity for containers is expected to grow by 1.5 million TEUs by the end of this year. (www.ptacn.com)

6.4.3 The Advantages of the Port

The port enjoys some advantages similar to those we have mentioned in analysing the port of Qingdao, such as the low operational cost, the local policy and the support from the local government. Except all these advantages, the port possesses the following particular advantages:

1) The Tianjin Port takes an obvious advantage of having the Tianjin Port Free Trade Zone (FTZ) located close to the port. The FTZ is the only one situated in a harbour in China. For the 11 northern Chinese provinces, autonomous regions and municipalities and the Republic of Mongolia, it is the nearest gateway to the sea. It is also the largest of its kind in north China.

The FTZ was found in May of 1991 after the approval of the State Council. As a comprehensive opening-up oriented special economic area, the zone is under the supervision of Customs, taking the advantage of being a free trade zone and in the port area, enjoying the most preferential policies granted by the country, and conducting its activities in the conformity with international practice. With its unique advantageous conditions for ocean shipping, and transportation, airway and railway transportation, the FTZ has been made into a hub for international multimode transportation. At present, 94 countries and regions all over the world, as well 25 provinces, municipalities and autonomous regions have set up their enterprises in Tianjin Free Trade Zone.

2) As the rapid development of China's economy and transoceanic shipping industry, the Northeast Asia Economical Circle which includes Korea, Japan, Russia and China is taking its shape. As the starting point of Asia -Europe continental bridge which has the shortest distance, the port will get more throughput of container transshipment.

6.4.4 The Challenges for the Port

There are several challenges forcing the port to invest and to expand quickly. The annual increasing rate of container throughput of the port is fairly lower than the annual average rate of the country's major coastal ports. Among all the containers handled by the three large north ports of Dalian, Tianjin and Qingdao, the ratio of container throughput accounted by Tianjin reduced from the 75.4% of 1985 to 33.6% of 2002. The fierce competition endangered the Port of Tianjin's position as the core hub port in the Bohai Sea rim.

The port is facing the following specific challenges for container traffic:

1) The economical development in its hinterland is relatively falling behind that of East and South China, especially those areas in northwest China. This makes insufficient cargo resource for the container transport. Under this condition, the

port has to transfer part of their input into developing the coal, ore and crude oil terminals. (www.sina.net)

2) The inland transport becomes a severe bottleneck for the port's development. The port used to have serious problem of inland distribution for arrived cargo in the 1980s, but now the inland railway and highway appear to have again become bottleneck. The Nanjiang coal terminal of the port has already won the handling capacity of 60 million tons of coal, but the railway connecting the terminal to the backbone railway of the country can only handle 20 million tons of coal. The container railways transport has a much more serious problem. Due to the development of the Tianjin City, some of the important highways that were supposed to be the specific highways serving the port have turned out to be the normal city highways for all kinds of cars and trucks now. All these conditions gravely affected the cargo distribution.

3) The port is also short of the supporting modern logistics facilities, especially the large logistics center and warehouse.

4) The port has planned to construct an international hub, but it cannot win the cooperation from the other departments of local government and the support from the central government. No official proposal was discussed to build another international hub in Bohai Sea rim, especially after the country had decided to support the Port of Shanghai in constructing the Yangshan deep-water port. Other matching industries such as insurance, international trade, financial center are not as developed as those in South and East China. The conditions of customs clearance are also heavily limited in North China.

6.5 Leading Port Profiles: Guangzhou

6.5.1 Brief Introduction

Owning a long history more than 2000 years, the Port of Guangzhou was the starting port of Chinese ancient western foreign trade. It is situated in the estuary of the Pearl River, adjacent to Hong Kong and Macao. The Port is the combination of former Huangpu Port and Guangzhou Port, and is the biggest foreign trade port in South China and one of the coastal hub ports in China. The port has terminals along a 300km stretch of the river. The Guangzhou Port consists of 643 berths and 173km of shipping channel, including 155km of

seagoing shipping channel. There are various specialized terminals for handling containers, coal, grain, chemical fertilizer, crude oil and passenger traffic. The port railroads are connected with the national rail network by Beijing - Guangzhou, Guangzhou-Shenzhen and Guangzhou-Sanshui railroads. (www.gznet.com)

The port is surrounded by the cities of Shenzhen, Zhuhai, Dongguan, Zhongshan, Foshan and Jiangmen and is 100km from Hong Kong. As part one of China's economic and technology development zones, the port has experienced rapid growth in the past few years. It has its hinterland including Guangdong, Guangxi, Hunan, Hubei, Yunnan, Guizhou and Sichuan Province. It has links with about 300 ports in over 80 countries in the world and about 100 ports in other parts of China. Guangzhou Port became one of the 10 largest ports in the world in terms of cargo handled in 2001. In 2002, the port handled a record of 150 million tons of goods and 2.18 million TEUs of containers, a year-on-year increase of about 10% and 26% respectively. (www.gznet.com)

The transport network of the City of Guangzhou where the port locates is among the most efficient and extensive in Mainland China. It is connected to Hong Kong and Macao by an expressway system that also connects Guangzhou to all the other major centres in the Pearl River Delta region. Guangzhou also has good rail and highway links to the rest of the Chinese Mainland. The high-speed rail link takes just 55 minutes to Shenzhen and 90 minutes to Hong Kong. Singapore's PSA Corporation (PSA) took a 49% equity stake at the port in May 2001, forming a joint venture management company with the Guangzhou Harbour Bureau (GHB) which holds the remaining 51%. Together, they manage six container berths at Guangzhou Huangpu Xingang and Xisha Container Terminals. PSA's efforts to introduce EDI linkages, other IT advancements and the streamlining of operational procedures over the last year have reputedly helped increase throughput.

COSCO, Pacific International Lines (PIL), China Shipping and Regional Container Lines (RCL) have intra-Asian services calling at Guangzhou Port. The port is at the heart of the Pearl River manufacturing region, also served by Hong Kong and Shenzhen, so it is a prime area for expansion. However, draught problems at its terminals restrict container vessels larger than around 1,500 TEU. (Dekker, 2002)

The port authority predicted that by the end of 2003 the port would have achieved throughput of 170 million tons of cargo and 2.8 million TEUs of containers. The port plans to raise its container-handling capacity to 6 million TEU in 2005 and to achieve container throughput of 6 million TEU in 2010. (english. peopledaily.com.cn)

6.5.2 The Port's Investment

The Guangzhou municipal government will spend more than \$964 million over the next few years to help the port preserve its status as an important logistics centre in southern China and Asia. The investment will focus on deepening marine routes, constructing a new oil wharf and chemical dock and rebuilding three 35 000-ton container berths. (www.coi.gov.cn)

It is reported that the water depth of the fairway out for the sea is only 11.5 meters and the width of bottom 160 meters. It is only enough for vessels no bigger than 35,000 tons and large container vessels are highly limited. The phase II of the fairway project has been started in 2002, with 8 billion Yuan invested. By 2005, the port's marine fairway will be deepened from the existing 11.5 meters to 13 meters, allowing cargo ships carrying more than 50,000 tons to berth in the city. The phase III of the fairway project will deepen the water to 15—16 meters allowing the ships of 100,000 tons to dock the port.

The Guangzhou terminal is PSA's third and most recent project in China. The investor and the port authority will jointly invest 100 million US dollars to improve the New Port's handling capacity of containers through technical innovation, and establish a joint stock company to facilitate the port's operation. In December 2001, a new container inspection centre using the latest X-ray technology was opened, shortening cargo inspection times and improving customs clearance procedures. The PSA/GHB partnership hopes to enable Guangzhou to handle an anticipated throughput of 3.8 million TEU a year by 2005. (www. gct.com.cn)

According to the local government, to expand the Guangzhou Port is one of the most important infrastructure projects in the city that the government is trying to make an international metropolis. The move also aims to build Guangzhou Port into one of the world's top 10 biggest export and import ports before 2005, playing a more important role in the foreign trade sector of the economically

booming Guangdong Province, of which Guangzhou is the capital. (www.china.org.cn)

6.5.3 The Developing Trend

Located in the Pearl River Delta area, one of the most prosperous areas in China, the port has the advantage of being closer to many of the Pearl River delta's factories than either Hong Kong or Shenzhen. While the battle for containerised cargoes in and out of southern China is largely between Hong Kong and the Shenzhen ports of Yantian, Shekou and Chiwan, Guangzhou is another port which may have an increasingly important role over the next few years. (Woodbridge, 2002)

Though the port's development is constrained by extensive shallow areas and heavy siltation, after the completeness of the projects of dredging the channel down to 12.5 metres by 2005 and to 15 metres at further stages, it still has good potential for further development. The deepened access channel would make it a realistic port of call for some mainline services to Europe and North America, as well as intra-Asia destinations.

As South China's economic and industrial sectors are currently enjoying rapid growth, the volume of cargo and containers generated at Guangzhou's hinterland is large and growing rapidly. This growth generated pressure, and also advantage, pushing forward the port's development. The port's strategic location close to the fast growing Pearl River Delta region, with its strong manufacturing base, is an advantage. It is attractive option for shippers, carriers with small to medium-sized container vessels operating within the intra-Asian and Australasia trades.

By plugging into PSA's extensive global network of ports, the Port of Guangzhou can access the wide range of port and IT service from PSA. The local government is also making an effort to develop Guangzhou Port into one of the most advanced and efficient container hub ports serving the Pearl River and the Delta region: the rail networks connecting the port are to be expanded and extended. The highway system connecting the port with inland cities is also to be examined for possible expansion projects.

The port focuses its southward expansion on Nansha port construction. Nansha Port acts as the key part of Guangzhou Port, which consist of Neipian Port, Waipian Port and Nansha Port. Neipian Port take main charge of passengers' transportation; Waipian Port is mainly responsible for real storage function; while Nansha Port, boasting of its perfect deep-water advantage, is of great help in consolidating Guangzhou Port's transportation capability, enabling Guangzhou Port to be a port comprehensive in container handling and passenger transportation. The Nansha development is also intended to expand the city's port facilities "from river to sea", by including maritime port terminals adjacent to the new heavy industrial complex. The development of harbour and warehouse facilities at Nansha will further Guangzhou's role as a primary logistics centre for South China. (www.coi.gov.cn)

The supporting and related logistics infrastructure gained rapid development due to the enlarging investment in the province. A logistics park of 20,000 m² dedicated for the port's container operation will become operational in November of 2003. The park is part of a long-term plan to build logistics facilities at Huangpu, Huadu and Nansha to create an international logistics centre for southern China by 2015. The government of Guangzhou also plans to build five comprehensive logistics areas of Fangcun, Baiyun, Zengcheng, Panyu and Huadu. Some specialized metropolitan logistics centers and distributing centers will be built as well. This also contributes a lot to the port's development.

6.6 Leading Port Profiles: Ningbo

We got most of the information for this part of the thesis from the website of www.nbport.com.cn.

6.6.1 The Current Situation

The port of Ningbo is situated in the middle of the coastal area of China and on the south side of Hangzhou Bay. The port has a history of 1200 years. The Port of Ningbo is composed of five harbor areas: Beilun, Zhenhai, Ningbo, Daxie and Chuanshan. It is a multi-functional, comprehensive and modern deep-water port combining river port, estuary port and seaport. Currently, there are 35 berths of 10,000 and more tonnage. Among the largest ones, there are 250,000-tonnage terminals for crude oil, 200,000-tonnage terminals (also for ships of

300,000 tonnage) for ore discharge, the sixth generation international specialized container berth and 50,000-tonnage specialized berth for liquid chemicals (also for ships of 80,000 tonnage vessels). Up to now, Ningbo Port has the shipping links with more than 570 ports in over 90 countries and regions in the world. The top 20 shipping companies in the whole world have already docked at the port by July of 2003.

The Port of Ningbo enjoys advantaged natural conditions. The water depth of the approach channel is in general 30-100 meters enough for the entry of 200,000-300,000 tonnage gigantic ships. The Port is well situated at the strategic T-shaped intersection of China's coastal shipping line and the golden waterway of The Yangtze River, where a convenient transportation network radiates. It is within 1,000 sea miles to Hong Kong, Kaohsiung, Pusan, Osaka and Kobe. The flat and vast dockland area behind the deepwater coastline is exceptionally advantageous for development of port stockpiling, warehousing and littoral industries.

The port has a convenient distribution network of highways, railways, airway and inland river transport. It takes only 2 hours from Ningbo to Shanghai by the expressway. The extension section of Shanghai-Hangzhou-Ningbo highway to Beilun, Ningbo-Taizhou-Wenzhou, Hangzhou-Nanjing, and Ningbo-Jinhua highway connects the port to the main highways of the country. The railways, within the harbor areas directly reach the dock, link the nationwide railway net via Xiaoshan-Ningbo multiple tracks. Sea-railway combined transport service for container is under regular operation at the railway-container terminal of Beilun Harbor Area. There are four large international airports within half an hour to 3-hour ride. By means of river-sea combined transport, it may link up with the Yangtze River and the Grand Canal and thus directly cover the entire East China Area and the developed Yangtze River Delta.

It is one of the ports that have achieved most rapid growth among the main coastal ports of China's mainland. In 1949, the port's complete handling capacity was only 40 thousand tons. In 1978, Ningbo Port had only 11 berths of 500---3,000 tonnage with annual throughput of 970,000 tons and annual cargo handling capacity of 2.14 million tons. While at present, the whole port has 184 berths of all kinds, including 135 working berths of 500 tonnages (35 berths of 10,000 tonnage, and 22 berths ranging from 50,000-250,000 tonnage). The ratified handling capacity of the whole port is 101.78 million tons. In 2002, the

port's throughput was 153 million tons of cargoes and 1.859 million TEU, increasing by 19.8% and 53.3% respectively as compared with those of the previous year. The cargo throughput has ranked the second successively for three years and the increasing rate of container throughput ranked the first successively for four years among the main ports of China's mainland. By the end of September of 2003, the port has already handled 2 million of containers, with an increase of 50.6% compared to the corresponding period of previous year.

In order to speed up the construction of deepwater hub port, and main line port for international container traffic meeting the needs for developing international trade and ocean-going container transport, several super large international container terminals are planned to be constructed in Ningbo Port. By 2005, the handling capacity of the whole port will reach above 4 million TEU. By the year of 2005, the annual cargo and container throughput of the whole Ningbo Port are predicted to reach 150 million tons and over 2.5 million TEU respectively. In the meanwhile, the Port will adopt the advanced Logistics technology and develop the comprehensive logistics center of Ningbo Port. During the period from 2007 to 2010, the port will be built into a first-class international deepwater hub port. The cargo throughput of the whole port is hoped to reach 250 million tons and container throughput 10 million TEU.

6.6.2 The Development

In 20 years, a once unknown local harbor in East China has miraculously grown into one of the few large ports in the world that have an annual throughput of more than a hundred million tons.

The port took the initiative to grasp the opportunities when facing the strong trend in development of container transportation market in the "Ninth Five-year Plan" (1996--2000). The port actively sought for cargo sources and placed emphasis on international container transportation, thus putting container transportation on the track of rapid development. In the course of the "Eighth Five-year Plan" (1991--1995), there was no container shipping line in Ningbo Port, and in 1995, the whole year's container throughput was merely 160,000 TEU. Since the first international container line was started in June 1996. There were 10 container lines opened connecting Europe, the Mediterranean, American East Coast, American West Coast, the Middle East and so on.

Currently, there are already 48 container shipping lines including the feeder lines, and over 220 runs of regular ships each month. Its container shipping operation has covered 533 ports in 88 countries and regions. In 2000, and the container throughput reached 900,000 TEU, 5.6 times that of 1995.

The ratified cargo throughput capacity of Ningbo Port has exceeded 100 million tons by the end of the "Ninth Five-year Plan". In this period, the port has invested RMB 2.19 billion Yuan in berth construction and technological renovation in five years, resulting in marked increase in both berth numbers and port throughput and rapid growth of port size and berthing capacity. By the end of 1995, Beilun 200,000-tonnage import iron ore transshipment terminal (also capable of berthing 300,000-tonnage bulk cargo freighters) was built and put in use, hence the rapid increase in the bulk cargo berth capacity of the port from 100,000 ~ 150,000 tons to 300,000 tons. As a result, the port has become one of the few large ports in the world that are capable of berthing 300,000-tonnage bulk cargo freighters.

The technological renovation, also in this period on the 900m-long container terminal in Beilun Harbor Area, including the addition of six large quay cranes for containers and field gantry cranes, and expansion of storage yard, has raised the annual container throughput capacity from 200,000 to 1,000,000 TEU. The 1,238m-long large international container terminal in Beilun Harbor Area, approved by China State Councils for construction in 1999, has a natural water depth of 15m on the quayside and will be equipped with a container quay crane with of 60.5m outreach. Once built, it will fill up the gap that there is no super-size sixth generation or above container terminal in China. After the "Ninth Five-year Plan", Ningbo Port currently has 184 berths in total, and the ratified throughput capacity of service berths has increased by 76.1%, from 57 million tons by the end of the "Eighth Five-year Plan" period to the present 101,7 million tons.

In the course of the "Tenth Five-year Plan" (2001--2005), some RMB 440 million will be invested to build China's best deep-water crude oil transshipment terminal on Daxie Island. A storage tank with a volume of 2 million or so cubic meters will also be constructed, and the yearly increase in handling capacity is designed to be 20 million tons. For the phase III project of next three years (2003--2005), Ningbo Port intends to invest RMB 2.5 billion to build four sixth-generation or above large container terminals in Beilun

Harbor Area. The length of the terminals will be 1,238 meters and the container throughput capacity will increase by over 1 million TEU annually. In the phase IV project, a 1,500m-long oversized international container terminal will be constructed in Beilun Harbor Area. The early work on this terminal has already been started in 2001, and it is scheduled that one or two berths will be put in use by 2005. By then, the total container throughput capacity of the whole Ningbo Port will amount to more than 3 million TEU, enabling it to accommodate the world's largest container ship.

6.6.3 Advantages and Challenges

The port enjoys its natural advantages in terms of water depth, vastness of land area, smooth currents, free of ice and silt, light stormy waves and excellent location. The entrance channel is over 18.2 meter deep, where vessels of less than 250,000 tonnages can pass freely and super large vessels of 250,000 to 300,000 tonnages can navigate at high tide. The exploitable deepwater coastline of more than 120 km makes the future construction and development possible. The Beilun Harbor Area is naturally sheltered by Zhoushan Archipelagos in the north, therefore, to perform more port construction project will require less investment compared to other seaports.

The port's EDI center ranks among the best centers in the main coastal ports. The center was established and open in May of 1997. The 'Center' supports shipping lines and its agents, terminals, tallies, forwarding agents, cargo owners, related state supervision departments (customs) and bank insurance to realize EDI exchange, and provide high efficiency, convenience, quick and exact economical information services. The port's competence is highly enhanced in international market by this technical innovation.

The port also enjoys the obvious advantages of developed economy in hinterland – the Yangtze River Delta. But the port is also facing the serious and also obvious challenges from the development of Shanghai Port, especially the Yangshan Deepwater Port. The Yangshan Deepwater Port actually locates not in Shanghai but in the administrative area of Zhejiang province to which the Port of Ningbo belongs. The distance between these two ports is around 150 km. As the Yangshan port finished its phase I project in 2005, the competition in the future is unavoidable. How to face this challenge will be a real headache for the Ningbo Port.

6.7 Leading Port Profiles: Xiamen

6.7.1 The Current Situation

Xiamen Port is one of the major ports in China and ranks within the top 40 Container Ports of the world. The Port of Xiamen is situated in the estuary of Jiulongjiang River on the south coast of Fujian Province. The port has a harbor line of 64.5 km with an average water depth of 12 meters. At present, the port has 16 berths for 10,000 - 50,000 tonnage cargo and container ship, and 18 berths for 5,000 tonnage-ship. The port has 6 port areas, i.e. Heping, Dongdu, Haitian, Shihushan, Gaoqi and Liuwudian in Tongan. The Dayu District of the port is dedicated for large-scale container transshipment. The port serves its hinterland covering Fujian, Guangdong, Jiangxi, Zhejiang and Hunan provinces.

As the best deepwater port along the several-thousand-kilometre-long coastline between Guangzhou and Ningbo, Xiamen Port is wide and deep, ice-free, and a little silted. The 64.5 km natural coast lines around the port area maintains a depth of at least 12-meters. There are regular international and regional shipping lines between Xiamen and USA, Germany, Belgium, U.K., Netherlands, Japan, Southeast Asia, Korea, Kaohsiung and Hong Kong, etc. The setting up of the united inspection center of Xiamen Port realized the assemble service of customs, commodity inspection, frontier inspection and foreign steamer agent.

The port is one of the four ports in China with the capacity and water depth to receive the sixth-generation large container vessels. The Port of Xiamen ranks among the top ten (the seventh in container throughput in 2002) in Mainland China and has shipping routes to over 60 ports in more than 40 countries and regions. Vessels of the world top 20 shipping companies, including Maersk Sealand and MSC, are frequent visitors to Xiamen. Various big international shipping companies have opened shipping routes from Xiamen to all over the world in succession. Many well-known shipping companies have established Xiamen as their port base to explore the mainland market. (www.xicec.com)

The port attracts ocean carriers' strategic attention by its special location. Being located in the west coast of Taiwan Strait, the port is the gateway for China Mainland/Taiwan container traffic if the cross-straits trading commences.

Xiamen is among the first ports to open pilot direct cargo services with Taiwan. The well-developed highway and express highway system connects Xiamen Port with other parts of China, including regular container truck service between Xiamen, Shenzhen and Hong Kong. (www.fdi-xiamen-cn.com)

The City of Xiamen has been recognized as one of the most attractive locations for foreign investors. By the end of 2002, it had attracted 5714 foreign invested projects, with foreign capital amounting to USD20.116 billion. To date, various multinationals and financial institutions such as Kodak, Dell, GE, Coca-Cola, TAECO, Linde, Sony, Panasonic, Sanyo Electronics, Phillips, ABB, TDK, Emerson Electric, Citibank, Standard Chartered Bank, Hong Kong & Shanghai Banking Corporation Ltd., United Overseas Bank, ABN-AMRO Bank, and Credit Lyonnais have established branches in Xiamen. (www.sina.com.cn)

Xiamen Port is managed by the Xiamen Port Group Company, a multi-functional, comprehensive port enterprise engaged in passenger and cargo transportation as well as other services like stevedoring, warehousing, agency, lightering, engineering, manufacturing and repair of harbour machinery and other harbour services.

In 2001, Xiamen Port handled 20.989 million tons of cargo, including 1.293 million TEU of containers. The Port handled 1.75 million TEU of containers in 2002. In the first half of 2003, the port achieved a cargo turnover of 16.16 million tons and container throughput of 1.1 million TEU, up 25% and 37% year-on-year respectively. The port has accomplished 53% of its year's target in container throughput in this period. Xiamen Port has set up a mechanism of fair competition which effectively stimulated initiative among enterprises and invigorated market development. The port has performed well in the first six months in terms of management and marketing, according to the city's port affairs administrative department. It has opened seven domestic and international shipping lines in 2003. (ce.cei.gov.cn)

6.7.2 The Developing Trend

As an exclusive port approved by China's State Council to implement certain free port policies, Xiamen Port is striving to expand as a multi-functional, comprehensive modernised harbour with foreign trade and offshore industry as the mainstay, supplemented with tourism, passenger transport, international

transshipment, commerce and transit. The construction of "marine expressways" was coming to advanced level. The first phase of 100,000-ton waterways of Xiamen bay was completed and put into use. The construction of IT management system for ships was progressing well and laid a stable "software environment" for the around-the-clock service of Xiamen Port. As an important traditional port for direct shipping service between the mainland and Taiwan, it has broad prospects for development. (www.xm.gov.cn)

The main part of port development is to speed up the construction of bigger ports, required by the trend in world shipping industry, as vessels are becoming larger. By 2020, the productive berths of Xiamen Port will reach 114, half with handling capacity of 100,000 tons. The port has already started the construction of 10 new berths, including one that can dock container vessel of 100,000 tons. This large berth is scheduled to be finished within the next three years. In 2005, the No. 1 berth in Haichang harbor will be updated by a quayside of 17.5 meters, and the berth can accept container vessel of 100,000 tons around-the-clock. The berth takes area more than 400,000 sq meters; several world-class facilities will be used in operation. (www.eroute.com.cn)

The port worked hard to win the investment of port construction. Hai Tian Container Terminal, the largest container terminal on the southeast coast of China, is a subsidiary of Xiamen Port Group Company. It is now applying to be listed in the Hong Kong stock market. The port is also trying to attract and utilize foreign investment. It has been reported in the Chinese media that the Xiamen Port Authority confirmed both Evergreen and APM Terminals' interest in taking a future equity stake in the port's third phase of development. HPH is already a large investor at Xiamen and signed agreements in September 2001 to expand its facilities at the port. However, there are six berths still under construction that are without foreign partners. (Dekker, 2002)

As the economic relationship between the Mainland China and Taiwan is becoming more and more inseparable, the possibility of cross-strait trading is increasing rapidly. The port has been making an effort to get more cooperation with the ports in Taiwan. It is reported in July of 2003 that the local government has shown great appreciation of the Port of Taichuang's effort to be the partner port in cross-strait ocean transport. The report revealed that the local government has already done a lot to prepare for the cross-strait trading,

and the local authority welcomed the officers of the Port of Taichuang to pay a visit and discuss about the related affairs.

6.8 Leading Port Profiles: Dalian

6.8.1 The Current situation

The Port of Dalian is situated at the south end of Liaodong Peninsula and is one of the coastal hub ports in China and also the main gateway for foreign trade for Northeast China. The new and old areas of Dalian Port are located separately in Dalian Bay, Dayao Bay and Dagushan peninsula. Dalian port concentrates 85% of the sea traffic to and from the whole Northeast China, one of the most important industrial bases of the country. Facing the Shandong peninsula, Dalian Port locates on the shortest route between Northeast and South China. Its location not far from some very important economic partners of China such as Japan, Korea and Russia, makes Dalian Port a growing international transport and business hub. (Brunot, 2000)

Being a world-known deep and ice-free port, the Dalian Port has more than 70 berths; including 39 are over 10,000 DWT. The container terminal can accommodate container vessels of the 4th and 5th generation. The port connects with over 300 ports in 160 or more countries. The port also has opened 45 international cargo sea routes with the U.S.A, Japan, and India and so on. The port has started services including intermodal transport, bonded storage, logistics distribution, trade and value added information supply in order to meet the requirements of modern logistics development. The port has cooperated with various ports and transport companies both of domestic and overseas to jointly operate port business, including PSA, Maersk, COSCO, China Shipping, Jilin Cereal Group and Shenyang Railway Bureau, etc. (www.portdalian.com)

Dalian Port takes northeast China and the eastern part of Inner Mongolia as its direct hinterland and its service scope can radiate Bohai Rim economical zone through shipping network. Between the Port and hinterland, multi transportation modes including ocean, land, air and pipes have made up a solid transportation network and convenient containerisation system. Currently, there are 5 main haul services, 34 intra-region services, 3 foreign trade feeder services and 9 domestic main haul and feeder services calling at Dalian port. In average, 240 regular container vessels call at the Port per month. (Hong, 2002)

The throughput of Dalian port has been keeping a high growth rate since 1996. In 1996, the throughput was only 64.27 million tons, while in 2001 the Port handled more than 100 million tons of cargo, which has thus made the port the seventh largest in the country as far as cargo throughput is concerned. The main reasons for the rapid growth are: the proportion of the foreign trade cargo throughput maintained a certain level in the whole port; the specialization of port production played remarkable role; and the passenger transportation increased rapidly and made the port the biggest port in passenger transportation in China. (Hong, 2002)

The port is implementing CIMS&EDI projects to set up public port information platform and realize the common sharing of port information and linkage of information inside and outside the Port. Currently, the exploitation of several application systems including port deployment, commerce, materials and finance has been completed, and the port EDI has been in operation. The direct customs clearance and e-commerce between the Port, the Free Trade Zone and inland “dry ports” has started operation. (www.portdalian.com)

The port handled 1.2 million and 1.35 million TEU of containers in 2001 and 2002 respectively. The strategic orientation of Dalian Port is set as to construct a modern international comprehensive port with multi-functions and to be a regional shipping center. The port aims to raise its throughput to 120 and 150 million tons in year of 2005 and 2010 respectively, in which the container volume would be 2.3—2.5 million TEU and 4 million TEU respectively. (english.peopledaily.com.cn)

6.8.2 The Port's Investment

The Dalian Container Terminal was opened in 1996 in the form of a 49-51 joint venture between PSA and the Port of Dalian Authority. The joint venture now operates two terminals in Dalian: the Dalian Container Terminal (DCT) for international cargo and Dalian Dagang China Shipping Container Terminal (DDCT) for domestic cargo. The new harbor district of Dayao Bay has been developed as the international container terminal. Its natural 14-metre deep harbour makes it ideal for the large container vessels that ply international routes. Dayao Bay new port is close to the fast growing new Economic and Technology Development Zone and to the Free Trade Zone.

DCT now has more than 40 international services and some 220 vessels calling every month from all over the world. In 2002 the terminal handled just over 1.1 million TEUs, which was 15% more volume than 2001. The addition of three quay cranes and five yard cranes, making a total of 12 and 33 respectively, will boost DCT's annual terminal handling capacity from 1.5 million TEUs to 1.8 million TEUS by 2005. (www.psa.com.sg)

DCT has also been working on other parts of the logistics chain to ensure the smooth flow of cargo from the hinterland areas. Working with the relevant government agencies, it has succeeded in attracting four dedicated train services to ply between DCT and the cities of Harbin, Changchun, Yanji and Shenyang three times a week. (www.psa.com.sg)

The Dalian container terminals are being developed in three phases, the first of which is completed. The construction of the second and third phases will need 4.5 billion Yuan (US\$542.2 million). After the entire project completed in 2007, the Dalian container terminal can handle a total of 8 million TEUs annually. The Dalian Port Group signed a memorandum of understanding with Hong Kong port operator Modern Terminals Limited (MTL) in September of 2002 to develop the third phase of Dalian container terminals. (www.daliannews.com)

The Dalian Port Group has also reached an agreement with Nippon Yusen Kaisha (NYK) Dalian Port Corporation limited and COSCO Pacific Limited on the construction and operation of a dedicated terminal for completed automobiles at the Port of Dalian in September of 2003, with taking the stake of 40%, 30% and 30% respectively. The facility will be China's second completed automobile terminal, following the first one in Shanghai. (www.nykline.co.jp)

The Dalian Port is planning to invest 12 billion Yuan in the port construction in the next five years. The key projects to be developed include: specialized deepwater terminals of iron-ore, oil, container, grains, ro-ro and passenger transport. At the same time of new port construction, the reforming and operation adjustment of the old port would be realized gradually so as to develop port logistics industries. At present, most major projects have been started and there are around 1.19 billion Yuan has already been invested.

6.8.3 The Port's Developing Trend

The Dalian Port is trying to acquire the capability of the 3rd generation port through the integration of functions of the port and city. The Dalian port is also keen to handle more transshipment traffic from some of China's smaller ports that is now being sent to Japan and Korea for transshipment. It has made some progress in this area - it had no transshipment business when it opened in 1996, but now this makes up about 7% of its volume.

The operation arrangement of the old port will be adjusted to meet the urbanization need of the port and to develop the city logistics. The old port is located in the center of Dalian City. The expansion of port and distribution channel is restricted due to the development of the city. The old port will be reconstructed to be a central business district of the city, having functions of passenger transport, commodity, finance, tourism and residence.

The port is constructing Dayao Bay new harbor and the specialized deepwater terminal groups in Dagushan Peninsula, and the port logistics system and industrial chains of port will be formed to realize mutual development of both port and city with the Port as the center. The Dayao Bay and Dagushan Peninsula has rich resources of deepwater coast. It is also the important district to accommodate the transferring of port function adjustment in the process of old port reconstruction. (Hong, 2002)

In brief, the Dalian port does enjoy some advantages in water depth and geographical location, but it is also confronted with tense competition from the other large ports: Qingdao and Tianjin, especially when these two ports are both making plans to be the north China's shipping centers and hubs for international containers in northeast Asia. And the time for the Dalian Port to update and strengthen itself is so limited.

6.9 Leading Shipping Company Profiles: COSCO

6.9.1 Introduction

As the first international shipping company of the People's Republic of China, the China Ocean Shipping Company (COSCO) was founded on April 27, 1961.

A great number of records and firsts in China's ocean shipping history over the last half century have been accredited to COSCO. Its ships sailed numerous shipping routes that no ship of PRC flag had previously sailed and numerous foreign ports that no Chinese vessel had called at before. It is no wonder that the group is also known as the place of origin or cradle of China's modern ocean shipping industry.

COSCO owns one of the largest fleets in the world. Owned by the state, it is a diversified group whose main business is international shipping. The group has now grown mainly in the fields of shipping agency, freight forwarding, marine bunker supply, road transport, air freight transport, terminal operations, manufacturing, trade, real estate and tourism. It is one of the 56 big groups of enterprises approved by the State.

Also, as the first Chinese company entering into container transport, COSCO has experienced rapid development. At the beginning of its establishment, it had only 4 ships with a carrying capacity of 22,600 tons. However at the end of 1992, the group owned 67 container vessels and ranked fourth in terms of carrying capacity. Two years later, COSCO began to take delivery of several 3800 TEUs and 5250 vessels. In the five years to come, the group will have a shipping capacity of some 300,000 TEUs. (www.coscon.com)

Facing the increasingly fierce competition in the international shipping market, COSCO have established an enormous global business network, and is still expanding rapidly on taking bigger world market share. So far, the group has extended its shipping routes to over 1,200 ports of more than 160 countries and regions in the world, with its annual freight volume exceeding 0.15 billion tons. It has set up more than 400 representative offices abroad staffed with over 5,000 workers. It ranked the sixth in the world top shipping companies in October 2002. (www.cosco.com)

Born from the merger of COSCO Container Division with COSCO Shanghai on January of 1997 in Shanghai China, COSCO Container Lines Co., Ltd. (abbreviated as COSCON) is a key company specializing in container transport under COSCO Group. The establishment of COSCON marked a new phase of COSCO Groups container transportation due to the ever faster spectacular development of the international trade and the ever-increasing competition in the international shipping industry. The business scope of COSCON covers the

area of international and domestic container transport by sea, shipping agency, ship's trade, warehousing, multi-modal transport, and other shipping-related businesses.

COSCON is by far the largest container operator in China. It currently owns a fleet of 131 container ships with a capacity of 238,498 TEUS, including 9 post-panamax full container vessels with 5400 TEUs each that are among the most advanced in the world. The company operates over 20 major trade routes, linking over 100 key ports around the world. The annual turnover is up to 4 million TEUS, accounting for 4.2% of the total global share.

In Mainland China, the service web of COSCON is composed of more than 300 freight organizations, covering all the railway hubs, international airports and major coastal ports. COSCON is the first shipping line in China that has acquired the ISO 9002 certifications from CCS and DNV. Beyond China, it has more than 1000 agencies outside Mainland China, which constitute a huge global container service network, with almost all the global transport hubs and dynamic economic areas being involved. Thus a transactional operational network has taken shape, with Shanghai being situated at the centre and throughout Europe, America, Asia, Africa and Australia in order to enhance its multi-modal transport network.

6.9.2 Current Situation of the Group

COSCO develops remarkably over past 4 decades as the main line of business. At present, its asset is over 15 billion U.S. dollars. The group achieved excellent performance in the first six months of 2003. The total seaborne trade volumes during this period recorded up to more than 100 million tons, accounting for 66 percent over the planned figure. The group also carried out 61.1 percent of its ration on road transportation sector and 55.5 percent of its air cargo transportation plan respectively.

Investment

COSCO had a good grip on the Chinese market, but in order to remain at the forefront of the liner shipping community, the group invests large amount of capital in infrastructure, shipyards, fleet, vessel equipment and containers, also ports and terminals.

COSCO has terminal investment at Shanghai, Kobe, Hong Kong and Long Beach, and future investments have been mooted for Taipei (Taiwan). The group has built contracts with a number of possible partners, including domestic and foreign rivals. Recently, Joint Venture agreement signed between COSCO and PSA Corporation Ltd (PSA). The two companies will join hands to establish the COSCO-PSA Terminal Private Limited ("COSCO-PSA") and COSCO will hold 49% interest.

COSCON is introducing new ships to improve its occupancy of shipping space and coverage rate of global shipping lines network. The company recently purchased eight 5400-TEU-container vessels last year, which will benefit its position on the shipping market. After the company signed an agreement for rent five container ships with 7500 TEUs in 2002, again ordered three 5576 TEUs container ships this year. It is going to introduce a number of large container ships with a transportation capacity of 7,000 TEUs in the coming several years. In 2005, the company's transport capability will reach in about 300,000 TEUs after eight container ships have been delivered, it will fill the demands of American and European shipping lines and maintain its competitive power in main liners.

Restructuring of the Group

COSCO has launched an all-round restructuring in order to enhance competitiveness. The group will transform itself into a profit-driven business conglomerate covering a number of business lines, including transportation, logistics, trading, fuels, real estate and finance. But the backbone will still be its marine shipping transportation services.

The group succeeded in consolidating its numerous business unit by restructuring its 600-ship fleets into smaller units of different subsidiaries with different business focuses. The group's fleet was originally based in big cities in coastal areas from South China to North China, making centralized management and resource sharing difficult. In order to solve the problem, the original marketing, finance and operations departments of COSCO have been disbanded, and separate trade divisions for the America, Europe, Transpacific and Sino-Japan have been set up in their place.

Enforcing enterprise management

COSCO always supports and abides by the safety and environment protection regulations issued by the International Maritime Organization. The group and all of its shipping subsidiaries have been awarded both ISM and ISO 9000 certificates two years before. As a part of its push to go global, the group has established an integrated quality, environment and safety-management system. The group is the first Chinese company to be awarded management system standards ISO9001, environmental management system ISO1400 and occupational-hygiene management system OHSMS 18001. It has always attached great importance to risk management and, in particular, to protecting the safety of people and the environment. The certificates, awarded by CCS and DNV, will help give it access to the international market.

6.9.3 Global Shipping Routes

COSCON has grown rapidly in the past decade; it has woven a huge global service network consisting of more than 1000 agencies, spanning almost all of the global transport hubs. Overall its shipping schedule accuracy has consistently been 95% or higher since 1998. In particular, its US trade and Australia trade have maintained 100% schedule accuracy, becoming key features of the company's trading services. The company has been expanding its liner service routes into a new area. The expansion is aimed at integrating its global network of container transportation to enhance its competitiveness in the world market.

The company has the largest market coverage amongst the Chinese ocean carriers; it offers traditionally reliable and efficient container transportation with modern full-container ships. The high transport capacity makes the company one of the strongest providers on its connection, and most of liner service is popular with customers for quick and punctual delivery. It is very much committed to intra-Asian services; feeder vessels carry the goods from and to virtually every port in the Asian region. The following are the introduction of the company's global shipping routes. (www.coscon.com)

- ***Between Asia and Europe:*** The China-North West Europe route and the new Far East-Mediterranean route trade provide expedient direct call service. These lines are Northwest Europe Weekly Express Service,

COSCO KL/YM Asia/Europe weekly service and Europe/Asia/USWC service.

It is more than 35 years since COSCO started Far East/ Europe route. Currently, COSCON has launched seven new 5400 TEUs vessels into Europe route in order to increase competitive ability of the route. Its Europe route called a serious of ports of Europe: Felixstowe, Rotterdam, Hamburg, Antwerp, Le Havre and Valencia.

- ***Across the Atlantic Ocean:*** COSCON has four jointly operated services shuttling between Europe and America. The company's transatlantic service provides weekly express services between North-West Europe and America's Gulf coast / East Coast with modern full-container vessels.
- ***In the North Pacific,*** COSCON currently operates three trade services from China to the U.S. West Coast and one to the U.S. East Coast. On this liner service, the transit time from Hong Kong to Long Beach is only 13 days. The transit time on the Far East-US East Coast service from Hong Kong to New York is 27 days via the Panama Canal.
- ***In the South Pacific,*** the newly adjusted Sino-Australia service and Japan-Hong Kong-New Zealand trade provide quality service with new vessels and new rotations.
- ***In Asia:*** The company operates services in the South Pacific Ocean as well as its "short sea trading lanes" between china, Japan, Korea, South East Asia, South & West Asia.

COSCON GLOBAL SERVICE PROFILE			
Trade Route	No of service	Frequency	Major partners/agreements
Asia/USWC	8	Weekly	Yang Ming, K Line, Hanjin, Senator
Asia/USEC	1	Weekly	Yang Ming, K Line, Hanjin, Senator
Asia/Europe	4	Weekly	Yang Ming, K Line, Hanjin, Senator
Asia/Med	2	Weekly	K Line, Yang Ming, Zim
Asia/Med, India, USWC	1	Weekly	China Shipping, Norasia, Zim
Transatlantic	3	Weekly	K Line, Yang Ming
Med/USEC	1	10 Days	
China/Mid-East	1	Weekly	Uniglory
Asia/Mid-East	1	Weekly	Uniglory
Asia/South Africa, SAEC	1	Weekly	Everygreen, Yang Ming, Hamburg-Sud
Med/USEC, Caribbean, Asia	1	Weekly	Zim
Med/West Africa	1	Weekly	
Asia/Australia, New Zealand	4	Weekly	Everygreen, Hanjin, RCL, MOL, NYK, P&ON
Intra-Asia	24	Weekly	China Shipping, Sinotrans, PIL, OOCL
Notes: USWC=US West Coast, USEC=US East Coast, SAEC=South America East C.			

Table 6-4: *The profile of COSCON global services, including current number of services, frequency and major partners. Source: Containerisation International*

The above table reflects some geographical gaps in the company's service profile. Recently, most major ocean carriers have been reducing capacity in both Asia/Europe and transpacific services. However, in COSCON's case, 5×5,250 TEUS newbuildings and a number of 5,400 TEUS ships have been introduced into its Asia/Europe and transpacific services.

6.9.4 Strategies

COSCO states its mission as: "To be a world leader in shipping and logistics service by maintaining trustworthy relationships with our customers, employees and partners, yielding best returns for shareholders, society and environment."

The group is staying in the process of implementing an aggressive strategy, which mainly focuses on quality, cost-efficiency, IT and logistics. It is revealed that COSCO is aiming to further enhance its overall competitiveness in the international shipping industry, gradually broadening logistics-service activities, optimizing its organizational structure and making better use of its global shipping and logistics resources. To be more specific, the group's strategy will be explained in the following aspects. (Gao, 2002)

To enhance the core business

The group will concentrate on developing container-shipping business, meanwhile strengthening dry bulk shipping and expanding liquid bulk and specialized shipping businesses. It plans to optimize the value chains of all their shipping businesses, covering areas such as fleet structure, service network, information technology, and port infrastructure facilities and marketing and sales systems.

The group is trying to raise the ratio of chartered vessels. The number of vessels operated by the group will fluctuate greatly according to the market. The ratio of the chartered vessels will be raised through controlling the demand that the company's own capacity can not satisfy. To get more effective resource utilization, the shipping line will be adjusted and the strategy of hub ports be performed further.

In the marketing perspective, the group will focus on providing differentiated and value-added services to acquire long-term contracts and life-long customers. As a result, the group is aiming to be a world-class global shipping service provider with high efficiency and high quality service.

After years' adjustment, COSCO has shaped the structure of "one industry as the pillar, and three industries as the support". On the one hand, shipping is still the core of the group, while on the other and, land-based industries such as ship repair, real estate and finance are the supporting industries. Those land-base industries have made great contributions to the group especially after years of world economic recession. They have effectively shouldered the shipping risk, and some of them have become fairly strong.

To develop modern logistics

Similar to many of the larger ocean carriers, the group sees logistics as the way to enhance the group's future profitability. In 2002, COSCO Logistics was established in the Beijing, aiming to meet the challenges of China's entry into the WTO and help carry out the group's strategic plans of becoming a global logistics service provider from current status of one of the major global carriers.

COSCO Logistics turned to one of the main powerful logistics service provider when it was established. The group will make full use of its advantages to win more market shares through extended service of logistics, and provide better services for prospected customers both in home and abroad in a variety of fields.

To integrate network construction

Information technology innovation strategy is the currently core task of the group. To stay at the forefront of global cargo shipment development, the group enhanced its systems and operations to place more focus on customer satisfaction and better customer services. It is also aiming to optimize its current physical network and to integrate it by the establishment of the advanced network, basing on the Internet platform and connecting the physical networks more closely. The updated network will offer more efficient allocation of its shipping and logistics resources across the globe.

The group has an improved EDI system thus having better connectivity with all of their agents world wide as well as overseas customers. In January 2001, the group signed a licensing agreement with OOCL for the use of IRIS-2 (Integrated Regional Information System). This system enables the employees to communicate more conveniently, which will enhance the service levels and reduce the operational costs greatly. Following this IT momentum, the group signed up as a member of the OOCL-launched Cargo Smart portal in September 2001. This project use Sybase ASE and Replication Server database systems, which offers all functions include collection, storage, conversion, process and analysis for data. The new system helps COSCO manage its cargo shipment tracking system. The efficiency of the container consumption rate has been significantly improved, which has helped to enhance the overall business operation.

To seek for strategic alliance

COSCO's marketing strategy focus on providing differentiated products; hence it is also important for the group to establish a long-term strategic cooperation with their business partner in order to provide better services for their customers.

The group signed an alliance agreement with K Line, Yang Ming, Hanjin and Senator Lines, in September 2001. This becomes even more important in terms of sharing costs and resources. As the well-known international shipping companies, NYK and COSCO have been seeking the opportunities to cooperate in various fields; they signed an agreement Car Carrier Shipping last year. These successful operation of alliances enormously reduces the group's cost on the one hand, greatly improve its service quality and extend the service scope on the other.

6.9.5 Opportunities and Challenges

China's membership in the WTO will greatly stimulate its foreign trade and will also fuel changes in the domestic shipping industry. And it also has brought a golden chance for home carriers. As the largest shipping company in China, COSCO will see the growth of transport demands and the increasing supply of cargo. The trend of the economy globalization worldwide causes the significant increase of the total international trade volume; also bring giant business opportunity for the group.

Perhaps part of COSCO's success can be attributed to the fact that it is a national carrier. In Mainland China, the group takes the advantage of home base knowledge, language, culture and relationships with higher authorities, the group stays in an advantageous position in the mainland to develop shipping and other related businesses. As its top officer explained, COSCO is a Chinese company and it is very close to the customer, they know the Chinese market.

COSCO consider that it has the best range of services, which is very important for the group. The group has good reputation in the international market, it possesses of stable customers and market share. It also enjoys the advantages of rapid expansion. The ongoing fleets have been increased and renewed. It has established its huge and mature logistics network in China, which can offer

value-added service and gain the competitive advantages when competing with its main competitors. The group has established an Asia Pacific and European information network, an integrated regional information system, which will help it make better use of its resources and become more competitive.

The group has a strong financial base. It is one of the Chinese companies that have entered the global capital market according to international regulations. Following the involvement in the commercial banks and insurance companies, COSCO broadened its capital base through financial operations and finance leasing, both at home and overseas.

The tense competition in the international shipping industry will be the most obvious challenge for COSCO. The Chinese door will be more open for all the foreign shipping companies. After China's WTO entry, all shipping companies will have an equal chance to establish themselves in China. Comparing with other giants in the industry, although COSCO know the shipping market, it does lack of certain level of experience. In some fields the group has the limited capacity to provide complete service.

Currently, China's domestic service network of logistic industry is not enough. To a certain extent, present infrastructure capabilities have input some limit on the group's development. It has not yet established its IT globally, and it is also very difficult to test how effective the system is. To train the employees and keep the networks updated also require time and huge investment.

COSCO has become a huge organization that could be difficult to manage. Inflexibility and ineffective communication can be critical weaknesses. There are some problems remaining due to the influence from the legacy corporation configuration, which was originally caused by China's planned economy. These problems consist of inefficient work process, inflexible adaptability, poor management, lack of employee's motivation, unable to keep professionals etc.

Most of the group's shipping service is related to the Chinese mainland. Comparing to international transport companies, such as Maersk, APL etc, its most business sticks on certain area of Mainland China, especially the focus on Asia-Pacific regions. There is always a learning curve in the beginning when expanding a company's market.

6.9.6 Developing Trends

As an international shipping company, COSCO will continue to contribute to shipping both inside and outside China, especially after China's accession to WTO. COSCON is planning a major restructuring intended to place it among the world's top three shipping lines. The company will enhance its co-operation with foreign cargo shippers, which should lead to lower freight costs and better services. It also tries to improve its after-sales service, currently a weak point. By improving service standard and promoting market competitiveness, the group are confident that it will become a world first-class shipping concern.

6.10 Leading Shipping Company Profiles: China Shipping

6.10.1 Brief Introduction

China Shipping Group was founded on July 1, 1997 in Shanghai. It is one of the big state-owned enterprises under the direct administration of the Central Government. China Shipping has established more than 30 overseas subsidiaries. There are five specialized shipping fleets in the group: oil tankers, tramps, passenger ships, container vessels and special cargo ships. It also operates the diversified businesses of integrated logistics, terminal management, finance and investment, engineering and labour service, trading, and information technology.

China Shipping Container Lines (CSCL) is the key company specializing in container transport under China Shipping Group. The company offers other relative services as well, such as storage, transshipment, and customs clearance. CSCL ranks among the world's 20 largest container carriers. The group's income of 2003 will reach 27 billion Yuan in expected, profit will more than 2.5 billion Yuan, among of container business accounts more than 50 percent.

Starting the business in 1997 only with a few small feeder ships, the company grew phenomenally. During the past few years, it has made rapid strides in container shipping. In 2002, the TEUs capacity and the revenue of the company became 7.2 and 6 times more than that of three years ago respectively. Its

container fleet is currently composed of over 100 vessels, with a total capacity of approximately 170,000 TEUs. More than 40 shipping routes are being operated, including main-haul and feeder services, to cater for the needs of both domestic and international trade. The domestic coastal transportation is covering 11 ports from South China to North China, international container liner services is operating from China to Japan, Korea, Southeast Asia, Australia, Europe, Mediterranean, North America, West Africa and Middle-East. (www.cnshipping.com)

6.10.2 Current Situations

Modernized fleet

China Shipping Group is the second largest ship owner in China. In June 2000, China Shipping placed an order for building 8 x 5600 TEUS container ships in both Hudong Shipyard and Dalian New Shipyard. "Xin Lianyungang" is one of eight container ships; the 5,600TEUS post-panamax container ship has entered the Europe-Asia Service. Heretofore, there are six new giant container ships launched Far East-Europe services since the first of the eight 5,600TEUS container ships "Xin Da Lian" is ordered by China Shipping Group.

Container transport is a significant industry for strategic development of China Shipping Group. CSCL signed a contract to reorder five 5,688TEUs container ships with Hudong Shipyard this year. These ships will launch for pan-pacific services in 2005. An order for a 9000 TEUs containership is also in the pipeline. In addition, thirteen giant container ships have been built in all for the group. It believed that these orders are part of a modernisation programme for China Marine.

However, CSCL is still in the stage of development, and lacks of the competence on resisting risks. In 2001, its international container transport was affected by the slowdown of world economy, the prices in the main lines are greatly cut down, and serious industry loss occurred. Moreover, 9.11 events aggravated the bad situation on container shipping industry. As a result, the company could not avoid the big loss in the last half year of 2001.

The group also succeeded in winning heavy support from the banks in China. China Shipping signed an agreement with China Bank this year in shanghai, it

has received a 10 billion Yuan (US\$1.21 billion) credit line from China Bank to upgrade its fleet and enhance its competitiveness in the international shipping industry.

With the China accession of WTO and the recover of world economy, the company enjoys the advantage of increasing demand of international transport and cargo supply. The group is joining the top league at an amazing speed, according to report of the BRS consulting company, CSCL ranked the fifteenth in the world top container liner companies in 2001. Its total container lifting is 2.8 million TEUs in 2002, increasing 34.4% than previous year. At the same time, it shared 53% market in inland container transport.

Building information system

The China Shipping Group succeeded in constructing its own information system. While the extending of the container business, domestic and international agents increase quickly and the volume of transported containers rise rapidly. Therefore it is very important for the group to develop its information system. The Group started to establish "China Shipping Container Administer System" (CSCAS) in 1998. CSCAS bases on Trade Ship (TS) system software and consists of four parts: Application System Software, System Network, Network Server and System Database. The administration system can operate at the global scope and real-time running, carry out data exchange among customs, terminals and agents by EDI, also provide a large number of functions such as order ship, containers tracing, and statistics etc.

The group reinforced its competitiveness by providing best service for its customers. In the end of 1999, China Shipping Group put CSCAS into operation formally. At present, this system runs well. With most sophisticated software system, China Shipping Group have materialized all the "on-line Service", which consists of e-Booking, e-B/L Signing, e-Feedback, e-Container Pickup. All this brings great benefit for China Shipping. Not only the running cost is reduced but also the work efficiency is improved, hence the management has been improved.

Developing terminal business

China Shipping Terminal Development Company was founded in 2001. It is an important step for China Shipping to implement its development strategy in the long run: to build it into a world first class shipping company and to diversify its businesses. As one of the first level subsidiaries of the group, the Company has registered capital of 1 billion RMB Yuan. It mainly undertakes for China Shipping the terminal planning, investment and development, operation and management and other related businesses at home and abroad; it also provides stevedoring service for all shipping lines.

To become a world first class shipping company, the group is taking an active part in the terminal business at home and abroad. It has set up several joint ventures container terminal companies in coastal ports such as Dalian, Lianyungang, Shanghai and Zhanjiang. China Shipping signed the lease agreement for pier 100 and 102 at Los Angeles in the United States for a period of 25 years. The first berth of over 350 meters long and the container yard of 75 acres constructed in the first stage were put into use at the end of 2002.

It is reported that the group will develop its container terminal businesses actively in North America, Mediterranean, Europe, Southeast Asia by various ways such as share holding, share cooperation, long term lease etc; meantime it will find more partners along the coast of the mainland China, enhance the development of container terminal along the coast of south China, east China and north China, to expand the coverage of China Shipping terminal business. It is predicted that the group's terminal business at home and abroad will achieve a certain scale; the throughput is expected to reach 3 million TEUS. (www.people.com.cn)

6.10.3. Global Shipping Routes

In the past, the main fleets of China Shipping were bulk carrier and oil tanker, however, in recent two years the container fleets have reached rapid growth. Its domestic coastal transportation covers 11 ports from South China to North China, providing most economical, efficient and rapid service to the customer. Based on this advantage, China Shipping is trending to enhance the development of international shipping.

CSCL has kept expanding its shipping lines in the past four years. Currently, its service has already expanded to Australia, Europe, Japan, Mediterranean, North

America, and South-West Africa. There are more than 30 foreign trade line connecting 75 ports in 20 countries. The company owns the most shipping lines and also the largest shipping capacity from Europe and the Mediterranean to Mainland China.

Far East-Europe/Mediterranean Line

CSCL's Europe/Mediterranean line was started from April 1999, and now is serving almost all china base ports. The company is the biggest shipping company of Far East-Europe/Mediterranean line in China, with the largest capacity and the most direct call ports as compared with other carriers.

Currently, CSCL operated six new 5668 TEUs post-panamax container ships between Asia and Europe by early 2003, replaced nine smaller units of around 4,000 TEUS capacities in service. These new ships are bigger and faster. The move greatly reduced the delivery time from any ports of the Far East to the Mediterranean region. As an example, the time merely needs 21 days from Shanghai to Genoa, and only 16 days from Hong Kong to Genoa. Thereby, the market competitiveness and the overall strength of CSCL are further improved.

The Far East-Europe/Mediterranean lines arrive mostly of European and Mediterranean ports, they are Port Kelang, Malta, Genoa, Valencia, Felixstowe, Zeebrugge, Hamburg, Rotterdam and Antwerp.

The company also offers weekly sailings now to Middle East/India/Pakistan-destinations, with its ships calling at Salalah. With feeder service it can offer on-carriage to Dubai, Bandar Abbas, Karachi, Kandla and Nhava Sheva. (chinashipping.nl)

Far East-North America Line

From 1997, CSCL has offered reliable service between Asia and North America. Today, its "Far East-North America" lines cover 8 base ports and over 40 inland points of North America, with 11 vessels in operation.

CSCL opened two new Far East-North America lines this year in Qingdao port. They will launch 5 container ships with capability of 4050 TEUS to offer express services for North America.

Other Lines

CSCL has formed a network covering the main ports of world. Asia Line was opened at the initial stages of China Shipping's foundation. A setup has been made with densely allocated sailings to Japan, South Korea and the major ports in Southeast Asia. The lines have enough space and operate with benefiting price.

The company's global routes expanded quickly. Far East-Aus Line was run in March 1999. Feeder and transshipment are available along the Yangtze River and coastal ports to Australia, with the improvement of capability and speed of shipment. Additionally, the company has also put new operation into India and West Africa lines with adequate space and competitive price.

6.10.4 Developing Trends

China Shipping has a big plan in expanding its fleet's capacity. The group and CMA-CGM has jointly ordered 5 by far the biggest container vessels in the world with capability of 9180 TEUs. It is reported that these vessels will be delivered in 2004 and used in American Line jointly. The group owns three of these vessels. By using giant container vessels, the cost of every container will decreased because of the economy of scale. Experts predict that the group will get more competitive power and higher profit.

CSCL have the long-stated ambition of becoming a world top five container carriers in capacity terms. The company plans to expand continuously its worldwide liner services and provide more value-added service to customer.

CSCL's coastal service in the domestic trade has always been the market leader. Its foreign trade services have been stable and sure. Especially, the company has put the largest capacity in Euro-Mediterranean service. It reduced the frequency of its recently introduced trans-Pacific service from weekly to fortnightly in October 2002, on what it called a temporary basis. The move is due to an expected downturn in volumes in the slack season post-Chinese New Year. But it is also being seen as a possible indication that the China/Europe trade offers more market potential for the company.

CSCL plans to expand in Europe and increases its exposure in northern Europe with a second container service. Its new service will concentrate on ports in northern China using eight 5,500-TEUS containerships which now are being built at Hudong Shipyard in Shanghai. The service will begin in time for the peak season next year. The company also indicates it will launch a new transatlantic service from northern Europe around the same time. Details on this new service are scarce but industry observers expect it will begin as a slot-buying agreement with one or more established transatlantic players.

China Shipping is widely regarded as the most ambitious Chinese maritime player. According to the report of the group, by the end of 2005 the carrying capacity will be expanded beyond 14 million tons, container capacity will reach 320,000 TEUs. Its main ocean fleet will consist of 40 ships and an average space for container capacity of 5200 TEUs. With the advanced equipment, high technology and good management, the group will surely lead to a bright future, and achieve its goal as one of leading carriers in the shipping industry.

7 China's Main Export Regions

We will, in this section, give a brief introduction of the main export regions in China. The introduction will include the following aspects: Where are they? What is the characteristic of the product being exported there? What is the characteristic of the region? Which ports have the shortest distance to the related regions? Which ports do these regions use to export product? Which region does the main Chinese cargo exported to Northern Europe come from? Which region has the most import of cargo from Northern Europe?



Figure 7-1: The Map of East China, Source: <http://www.chinapage.com>

7.1 Brief introduction of the regions

There are several large important economic regions formed during China's economic development in the past two decades. The economic regions lie in the east and south are the most important ones according to their GDP and export value. These regions are: the Bohai Sea Rim (BSR), the Pearl River Delta (PRD) and the Yangtze River Delta (YRD). The Statistics of the country show that the three regions produced 61.2% of the whole country's GDP, 58.3% of the industrial output and 86.5% of the total export volume. (China State Statistic Bureau, 2002)

The three regions are described as the three main powerhouses of China, with different focus in business respectively. The administrative area limit was broken in these regions; the cities in the regions succeeded in dividing the work effectively; and the competitive industrial system was established through different cities, including the public infrastructure, the mature market for human resource. These areas kept their regional characteristic while they developed their market at home and globally.

Economic competition in China today is now based on industrial interactions instead of administrative divisions. The PRD in the south and the YRD in the east have both established modes of co-operative development, and are advancing with concerted regional efforts. While the BSR falls behind in many ways, but it still has huge growth prospect. Experts believe that if its potential is fully tapped, the BSR could become a major economic engine of the country and an economic center in northeast Asia by 2010.

7.2 The Bohai Sea Rim

Definition of the Area

Facing Japan and the Republic of Korea, the Bohai Sea opens to the Pacific Ocean in the east, and surrounded by Liaoning, Hebei and Shandong provinces as well as the Tianjin Municipality, which is an hour's drive from Beijing, the nation's capital. Bohai Economic Rim is the economic area encircling the Bohai Sea, covering the southern part of Liaoning, eastern part of Hebei, northern part of Shandong, Beijing and Tianjin. (See figure 7-2) (english.peopledaily.com.cn)

But economically, it can further expand to a much larger area to embrace Shanxi Province and the Inner Mongolia Autonomous Region, accounting for 12 per cent of the country's territory and 20% of the nation's 1.3 billion population.

The area is an important bridge connecting China with other countries in north-eastern Asia, such as Japan and South Korea, etc. provided with the advantage of port cities of Tianjin, Dalian, Qingdao, Yantai, Weihai and Qinhuangdao. It is a solid hi-tech industrial development base with the number of its scientific research institutions, education organizations and talented human resource ranked top of the whole country. The area also has some advantages in aspects such as information, policies and culture owing to Beijing, the capital of China, being included in its scope. (www.dzwww.com)



Figure 7-2: *The Bohai Sea Rim in China*
(Source: www.cadz.org.cn)

The Region's Development

As a traditional industrial base, the area has the country's biggest steel and oil industries, and over the past 20 years, it has become a major manufacturing center after the PRD and YRD. The area has become the most heavily invested area by foreign businesses in north China. High-tech industries such as electronics, information processing, biological pharmaceuticals and new materials are also developing rapidly in the area.

This area holds China's most successful development zone, its most renowned high-tech park, its best group of private ventures, the densest intellectual resources, and the country's strongest established industrial base. In addition, it includes China's centre of politics and culture, high-ranking ports, rich natural resources, and abundant cheap labour and skilled workers.

To date, more than 40 percent of the research centers set up by over 80 multinational companies in China are based in Beijing. Tianjin is home to more than 10,000 foreign-funded businesses, while Liaoning's port city of Dalian has nearly 8,000 such enterprises.

As the neighbouring area of Japan and the Republic of Korea (ROK), the Bohai area is rich in natural resources, especially in energy and mineral resources, and it also has abundant cheap labour and skilled workers. But Japan and ROK have comparative disadvantages in these regards. Japan has listed its western coast as a focus in its development strategy for the 21st Century, while the ROK regards China as its second market and will also give priority to developing its western coastal region.

Official statistics confirmed that investment in the area from Japan, and the ROK was constantly rising. In Tianjin alone, nearly 1,400 Japanese enterprises had gained a foothold in the port city by the end of March 2003, involving 2.87 billion US dollars in contracted investment. Last year, trade volume between Tianjin and Japan reached 4.5 billion dollars, ranking Japan the second biggest business partner of Tianjin. Meanwhile, businesses from the ROK also increased their investment in the city. In the first five months of 2003, ROK businesses ranked top in terms of the number of enterprises set up in Tianjin by foreign investors.

The Challenge

First conceived in 1986, the concept of a Bohai Sea rim economic circle was once highly thought of by the government and experts. It involved a relatively complete economic system and good conditions for regional co-operation; the coastal area would be focused on export-orientated processing and trade, while the inland area had developed heavy industry and a manufacturing base. Abundant energy and mineral resources had made the region even stronger.

Yet this concept gradually faded from sight as the country's southern and eastern regions experienced eye-catching economic growth in the 1980s and 1990s. While the wellsprings of China's phenomenal recent economic growth clustered in PRD and YRD, the Bohai Sea rim area has thus fallen behind in the round of resource relocation and conformation. Even Beijing's successful bidding to host the 2008 Olympic Games has not yet been promoted within the Bohai Sea rim area as a whole.

The area faces obstacles in its development, including too much governmental interference in economic life because of the high percentage of state-owned enterprises in the area and a strong concept of planned economy. The Beijing-Tianjin-Hebei region, which has the strongest economic strength in the rim area, is now facing a slowdown in economic growth.

The second largest city in this region ---- the City of Tianjin is a major coastal city and has opened up to the outside world, but despite this profile, it is not well-known enough yet. The city was the model for city development in China during the early and mid-1980s. But it is now desperate to play catch-up with cities like Beijing, Shanghai and Guangzhou, especially in developing tertiary industries such as tourism and financial services. (www.chinadaily.com.cn)

The Reason behind the Challenges

The problem of administrative structure is the most critical one. Different administrative divisions in this area are not currently complementary to each other in terms of industry and economy, due to various regional barriers. Research indicates that the sluggish economic integration process has become a bottleneck for the region's present development. Experts believe that a strong concept of planned economy is the major factor behind the differences between

the development of the Bohai Sea rim area and that of the other two delta areas of PRD and YRD.

There is also too much government interference in economic development because of a high percentage of State-owned enterprises in the area. The government has forceful control over various resources and an economy with strong political connections has been bred in this area. People here have a strong political perception yet less of a concept of market economy. A healthy market mechanism has not been cultivated yet.

Another factor is that although there are two municipalities directly under the central jurisdiction in this region, namely Beijing and Tianjin, there is none playing a leading role in terms of regional economy. Experts of the central government point out that these two municipalities have strong motives for economic competition instead of complementary co-operation. There has not been enough co-ordination in industrial development, but rather constant disputes over interests and competition over limited regional resources.

Besides, there is no obvious regional division of labour. Lacking integrated regional planning, many cities engage in similar industrial structures. Competition among the 60-odd ports has even caused a large waste of resources.

Other issues hindering regional co-operation include a poorly-managed flow of human resources, inconvenient traffic network and serious regional barriers. There are actually three independent economic subdivisions in the Bohai Sea rim area: The Liaodong Peninsula with Dalian as its open port and Northeast China as its hinterland; the Beijing-Tianjin-Hebei section, with Tianjin as the principal port; and Shandong Peninsula, with Qingdao as its major port and the peninsular area and part of East China as its hinterland.

Each subdivision is trying to develop into an independent economic circle, yet the integral strength of the whole region would thus be weakened. A typical example was reported: A 300,000-ton ethylene project was once planned in this area, and several cities came up to bid for it. It turned out that the project was divided into three 100,000-ton projects, due to egalitarianism.

When foreign ethylene projects normally get to be 600,000 tons in scale, none felt any particular advantage in production, and all eventually expanded to become 300,000-ton ventures later. But this still duplicated construction at a rather low level. (english.peopledaily.com.cn)

The Developing Trend

The Bohai Sea rim economic circle is believed to become a new economic engine for the country in the near future. Experts say that the Bohai rim area is greater than PRD from the perspective of potential competitiveness and it has broader space for development. But its potential needs to be further tapped for an integral development of the area.

After China joined the World Trade Organization, its power as a traditional industrial base of China was brought into greater play. The Olympic Games to be held in Beijing in 2008 is expected to give additional impetus to economic growth in the region, as in Beijing alone, some 200 billion Yuan (24 billion US dollars) will be spent on urban infrastructure to prepare for the games.

The improved regional planning and unified implementation above the administrative division is urgently needed for the overall development of the Bohai Sea rim area. Experts proposed that a greater Beijing city circle should be developed first, as Beijing enhances the functions of business, finance, information and technology in the area while Tianjin can further develop its functions as a port and manufacturing base. Once this integration is sorted out, there can be a core, or leader, in the Bohai Sea rim area that will be able to promote economic integration with the Liaodong and Shandong peninsulas.

To promote regional economic development, market forces instead of government, should play a leading role. The government should loose its control while cultivating market mechanism and market concept in the area.

The regional cooperation in the area could start from among the 60 ports in the region, of which four can handle over 100 million tons of cargo annually. The regional networks for traffic and information resources should be developed, while division of labour directed by market forces should be furthered.

It is reported repeatedly in the country's important media that the BSR will overtake the PRD and the YRD in the next ten years with its potential fully tapped. We are not so sure about this assertion, but we believe that those strategies mentioned above, if successful, could have a significant positive impact on economic development throughout the region and beyond.

7.3 The Yangtze River Delta

Definition of the Region

To define the Yangtze River Delta region is a little problematic while there has not been a single official definition for the region until recently. As a result, many analysts take the 'Yangtze River Delta region' to include Shanghai plus all of the provinces of Jiangsu and Zhejiang. This is clearly inappropriate in that it includes an area far wider than the Delta. The definition of the Yangtze River Delta region adopted by Chinese Statistical Bureau is that in China's Yangtze River Economic Belt, edited by Zhai Ligong. This source defines the 'Yangtze River Delta Economic Zone' as covering the areas of 15 cities and municipalities, including Shanghai municipality; the Jiangsu Province cities of Nanjing, Zhenjiang, Yangzhou, Suzhou, Wuxi, Changzhou, Nantong, and Taizhou; and the Zhejiang Province cities of Hangzhou, Jiaxing, Huzhou, Ningbo, Shaoxing, and Zhoushan. This corresponds to the orange area of the map below. (See Figure 7-3) (www.investhk.gov.hk)

The Yangtze River Delta is described as China's "dragonhead". According to Chinese experts, the delta is internationally recognized as the sixth largest city grouping in the world. With a population of slightly less than 80m, about 6 per cent of the national total, the region also boasts an industrial corridor covering iron, steel, petro-chemical, automobile and electric power industries which contributes about 20 percent of China's GDP from a land area of 1 percent of China in 2001. In the same year, the region also contributes 35% of the Country's export and accounts for 50.6% of the foreign investment. (www.ft.com)

- China's Main Export Regions -

Main Industry	Percentage of total China's Output
Steel	45%
Automobile	47%
Petro-chemical	40%
Agriculture	40%
Textile & Garment	>50%
Electric Power	-

Table 7-1: Main Industries in the Yangtze River Delta



Figure 7-3: The Yangtze River Delta. Source: www.investhk.gov.hk

The Current Situation

The Yangtze River Delta Region is Developing Rapidly into a major Powerhouse of China. There are 10 of the 35 richest cities of China are in the region, of China's 100 most developed cities, a half lie in the region. The region's per capita GDP figure given by the Jiangsu Statistical Bureau is 22,537 Yuan (US\$2,722) in 2001. The Gross industrial output in the region was 2,322.96 billion Yuan (US\$280.6 billion) in 2001. It is reported that during the

first eight months of 2003, the 15 cities in the region have attracted the foreign investment of 19.52 billion USD, more than half of the total volume of the country. There are five cities that have won more than 1 billion USD: Shanghai, Suzhou, Wuxi, Nanjing and Ningbo. There are two cities that have an increasing ratio more than 100 per cent: Zhoushan and Nantong. (www.eastday.com)

According to survey results cited by a researcher of Wisconsin University at an economic forum in Zhejiang, in terms of investment environment, the top 11 cities of Mainland China are all in the delta and the top three were Wujiang in Jiangsu Province, Ningbo and Hangzhou, in Zhejiang Province. The survey was based on research of the natural environment, infrastructure construction, public establishment, social environment, politics and law environment. The survey indicated that the delta had become the first choice for most overseas investors because of its steady investment environment and quick profit returns.

A big group of economic giants has emerged in the Delta, which features a number of cities with gross domestic product (GDP) above 50 billion Yuan (6 billion US dollars) or even 100 billion Yuan (12 billion dollars). Among these cities, Shanghai recorded GDP of 495 billion Yuan (about 59.64 billion dollars) in 2001, topping the GDP chart for Chinese cities. Three other delta cities, Suzhou, Hangzhou and Wuxi also rated in the top 10. Thousands of China's top enterprises have settled in this area; multi-national companies are keenly aware of the trend and to date more than 400 of the Fortune 500 enterprises have invested here. Contractual foreign investment in the area has approached 150 billion US dollars. (english.peopledaily.com.cn)

The region is now considered mature enough for improved economic cooperation. The governments of the municipality and provinces have reached an agreement on the region's development, and established regular symposiums as mechanism for better economic cooperation. The cities in the region now are taking the opportunity offered by the 2010 Exposition to speed up co-operation with each other. An agreement on using the opportunities provided by the 2010 Expo to accelerate co-operative development of the cities in the region was signed by the delegates in August of 2003. According to this agreement, all the cities should work together in six main strategies, including the joint establishing of some organizations especially for the 2010 Expo; to strengthen inter-communication and co-ordination in the development of

construction plans; to build a modern, comprehensive network of transportation infrastructure; to protect the ecological environment and to improve the image of the 16 cities together. (www.chinadaily.com.cn)

A next-generation broadband information network in the region was planned to set up before 2005 by the country. As a project under Program 863, a state-funded high-technology development plan, it would serve as a pilot for a proposed national network. The operational high-performance broadband information network will support interactive multi-media and other services.

The region is really successful in constructing the development zones. Shanghai has been very successful in attracting foreign companies with its world famous investment zones, such as Waigaoqiao Free Trade Zone and Zhangjiang Hi-tech Industrial Development Zone. Development zones outside Shanghai offer significant cost advantages. Labour regulations such as social security benefits and minimum wage levels also differ from city to city, and thereby further increase the investor's choice of investment locations.

The Region's Characteristics

The Yangtze Delta offers a number of advantages which include regulatory and administrative structures which are better able to accommodate economic growth than many other parts of China. The region is also undergoing rapid infrastructure development, including express highways along key corridors, express rail services, housing and services, and a supplier and service industry base for foreign joint ventures.

The Yangtze River Delta has the following unique advantages in terms of economic development (except the first one, the others can be regarded as its characteristics):

Firstly, the Yangtze River system is by far the largest inland waterway offering access to inland markets and facilities. Offering facilities and infrastructure for investment and a rapidly advancing transport and logistics network – the Yangtze River is recognised as the hub for business both to inland markets, and access to export markets. With less than 10% of the Yangtze's navigation capacity being utilised, experts predicted that cargo transportation on the

Yangtze will reach 300 million tons annually in 2010. Container transportation and several other modes are also expected to increase sharply.

Secondly, the region has the highest rate of private-property ownership in the country, a genuinely revolutionary change for China that is now spreading to other coastal cities. The textile and clothing industry, once a pillar of the state sector in the region, is now almost entirely in the hands of private entrepreneurs or shareholding companies. Private enterprises in the Delta are playing an important role in the local economy. Many private enterprises in the Delta have grown into multinational companies, with some even purchasing foreign enterprises.

Thirdly, the region enjoys the more regulated environment and the high quality of its workforce. Numerous top universities in Shanghai and Nanjing, in particular, offer graduates to help in the economic expansion. Fourthly, the region, unlike the PRD, is viewed as the best jumping-off point from which to exploit China's home market. Domestic sales account for more than two-thirds of the region's economic output, against only a quarter of PRD's. The Port of Shanghai is regarded as the critical window on the hinterland. The prospect of tapping into domestic demand is even drawing some investments away from the PRD. (Jonquieres, 2003)

Fifthly, for historical reasons, Shanghai has a stronger base and more potential as a financial center. With a stronger traditional presence in industries such as chemical and financial services, the region is focused more on capital and research-intensive activities, which have been drawn there partly by its universities and reputation for high educational standards.

Finally, Shanghai is expected to be one of the first cities to open direct flights to Taiwan when mainland and Taiwan reach a consensus on a direct line. The region has successfully drawn in high-quality tech companies from Taiwan. As many as 400,000 Taiwanese have either settled or are working in Yangtze Delta, nearly 2 per cent of Taiwan's population. Eventual establishment of direct transport and communication links between Taiwan and the mainland would make the Yangtze region even more attractive to Taiwanese investors.

Along with most parts of China, the area has several problems to manage. High unemployment; accentuated by a tide of migrant workers; rising property prices

which put housing out of the range of ordinary people; the displacement of tens of thousands of people from both farmland and inner-urban areas marked for re-development; the poor rail network and its roads; and the protectionism towards local producers. There are also some enviable problems of growth and success: for skilled labour in Shanghai has pushed up professional salaries five-fold since 1994, while at the same time, they have come down in Hong Kong. (McGregor, 2003)

7.4 The Pearl River Delta

Definition of the Delta

According to the definition of the 'Pearl River Delta Economic Zone' set forth by Guangdong Province in 1994, this Zone is officially defined as covering Guangzhou, Shenzhen, Zhuhai, Foshan, Jiangmen, Dongguan, Zhongshan, parts of Huizhou (the urban district of Huizhou, Huiyang County, Huidong County, and Boluo County), and parts of Zhaoqing (the urban district of Zhaoqing, Gaoyao, and Sihui). Some analysts use data for the whole of Guangdong Province to represent the 'Pearl River Delta' instead of the proper. The differences in main aggregates under the two different definitions of the PRD region can be substantial. (See Figure 7-4)



Figure 7-4: *Guangdong Province and the Pearl River Delta Economic Zone. Source: www.investhk.gov.hk*

The Greater Pearl River Delta includes the Hong Kong Special Administrative Region, the Macao Special Administrative Region, and the Pearl River Delta Economic Zone portion of Guangdong Province. (See Figure 7-5)



Figure 7-5: *Main Jurisdictions in the Greater Pearl River Delta Region*
Source: www.investhk.gov.hk

The Current Situation (www.investhk.gov.hk)

As China's first Special Economic Zone, the Pearl River Delta is one of the vibrant centers of industrial activities which have proved magnets both for foreign direct investment and for millions of footloose Chinese from more backward regions in search of better jobs and higher living standards. In China's Top 200 exporters 2002 published, there are 61 Guangdong enterprises. Among them were state-owned foreign trade companies, private enterprises and foreign investment enterprises.

In the past 25 years, many Hong Kong manufacturers have moved operations into the Pearl River Delta region of southern China. This shift has fuelled massive economic growth in the PRD, as well as creating a huge pool of wealthy consumers. Many overseas businesses rely on the combination of Hong Kong and PRD to source, sell and manufacture their products competitively and efficiently.

Population of the region is the area in which there appears to be the most discrepancy between different statistical sources. The "registered population" is

defined as population with official police registration. "Census population" is the population actually resident in a location at the time of the national census. The annual series 'registered population' figure was 23.07 million for the Pearl River Delta region in 2000 and 23.37 million in 2001. These figures differ dramatically from the 'Census population' of the region, which was 40.77 million in 2000. The main reason for the difference is that the latter figure includes the migrant and floating populations and the former does not. (www.investhk.gov.hk)

The GDP of the Pearl River Delta Economic Zone in 2001 was 836.39 billion Yuan (US\$101.01 billion). The GDP of Guangdong Province was 1,064.77 billion Yuan (US\$128.60 billion). That of the Chinese Mainland was 9,593.3 billion Yuan (US\$1,158.61 billion). The GDP of the Yangtze River Delta region in 2001 was 1,698.10 billion Yuan (US\$205.08 billion). The Pearl River Delta Economic Zone accounted for 8.72 percent of the total GDP of the Chinese Mainland. The Yangtze River Delta region accounted for 17.70 percent of the total GDP of the Chinese Mainland. When we incorporate Hong Kong and Macao into a Greater Pearl River Delta region, the results change substantially. The Greater Pearl River Delta region had a GDP of US\$273.43 billion in 2001, 33 percent higher than that of the Yangtze River Delta region.

The "official per capita GDP" of the Pearl River Delta region in 2001 given as a specific line item in the 2002 Guangdong Statistical Yearbook was 31,040 Yuan (US\$3,749). According to the 2002 Guangdong Statistical Yearbook, the gross industrial output (GIO) of the region for enterprises with annual sales revenue in excess of 5 million Yuan was 1,201.23 billion Yuan (US\$145.1 billion) in 2001. Adding the contribution of Hong Kong and Macao brings these figures up to US\$182.25 billion and US\$170.95 billion, respectively. The Pearl River Delta region accounted for 12.59 percent of the gross industrial output of the Chinese Mainland. The Yangtze River Delta region accounted for 24.34 percent of the gross industrial output of the Chinese Mainland.

According to the 2002 Guangdong Statistical Yearbook, the total imports and exports for the Pearl River Delta region in 2001 were reported as US\$77.63 billion and US\$90.83 billion respectively; the "amount of foreign capital actually utilised" in 2001 in the Pearl River Delta region was US\$14.19 billion. The Pearl River Delta region accounted for 28.57 percent of the utilised foreign capital in the Chinese Mainland in 2001, while the Yangtze River Delta region

accounted for 32.33. Even though the cumulative foreign investment in the Pearl River Delta Economic Zone still exceeds that of the Yangtze River Delta region, the latter is now the leader in terms of inward capital flows in the Chinese Mainland.

The foreign investment into the Greater Pearl River Delta region from outside Hong Kong, Macao, and the Chinese Mainland was in the order of US\$22 billion in 2001, while that into the Yangtze River Delta from locations outside of Hong Kong, Macao, and the Chinese Mainland was in the order of US\$11 billion.

By giving a breakdown of the region's economies in the different sectors, electronic and telecommunication equipment, and electrical equipment and machinery, account for more than a third of the gross industrial output of the Pearl River Delta region. The largest single service sector group is transportation, storage, post, and telecommunications. This is not surprising given the infrastructure nature of some of the components and the burgeoning transportation and logistics associated with the region's trade. This grouping is followed by wholesale and retail trade and catering, social services, and finance and insurance.

A steady increase in trade between the ports of the region and EU appears in the first five months of 2003. According to statistics, trade between Shenzhen and EU were US\$ 4.93 billion with an increase of 39.3%. Of which exports were US\$ 3.54 billion with an increase of 50%; imports US\$ 1.39 billion, increased by 1.7%; Trade surplus were US\$ 2.15 billion. Imports and exports of private enterprises were US\$ 448 million with an increase of 1.59 times. Imports were mainly from Germany, Italy, France, Britain and Holland, with total value of US\$ 1.1 billion, up by 1.6%, accounting for 80% in total imports from EU. (english.peopledaily.com.cn)

The Region's Characteristics

The Pearl River Delta's proximity to Hong Kong contributed a lot to the region's development. It is the first region to develop, propelled by a flood of manufacturing investments, initially mainly from Hong Kong and Taiwan. 25 years ago, the PRD was dominated by arable farming and small rural villages. Hong Kong investment has turned the region into the mainland's economic

powerhouse. Hong Kong companies now employ 11 million workers in their PRD operations. Operations in the PRD also benefit from the value-adding services easily available in Hong Kong's. Companies can source or manufacture competitively in the PRD and use Hong Kong's logistical, financial, legal, design and marketing services to export their products to the world.

The stable and plentiful workforce, extremely low labour costs and skilled managers make up the most important attraction for international and domestic investors. Migrant workers ensure a ready and stable supply of labour. Many companies use Hong Kong managers, or Hong Kong-trained managers to run their operations. In many cases, notably in the textiles and clothing industries, production has simply been transplanted to Guangdong from Hong Kong and Taiwan.

Industry in the Pearl River Delta is also strongly export-oriented. According to official Chinese statistics, almost three-quarters of the region's production is exported, much of it shipped through Hong Kong, where it is sometimes undergoes further processing, in transit to foreign destinations. (Jonquieres, 2003)

The region enjoys the world-class factories. Regarded as the China's top manufacturing and export region, the region is full of world's top manufacturer and exporter of watches, telephones, radios, toys, footwear and clothing. Major PRD cities are developing world class manufacturing facilities, manned by a skilled workforce with strong quality control. Most factories are foreign, or Hong Kong-owned.

Guangdong moves fast and reacts to market conditions. Most PRD cities have consistent double-digit annual GDP growth. The local governments are the most market-oriented in Mainland China and they are business-friendly. Most businesses in this region benefit from specialising in contract manufacturing and other activities geared to rapidly changing markets.

The region also has the advanced nationwide distribution. Many foreign-owned companies use Hong Kong and the PRD as their distribution base for selling into China. PRD consumers also provide a strong bell-weather for testing overseas products on the domestic Chinese market. Improved road and rail

links - including a bridge linking Hong Kong with the western side of the PRD - are planned to open up this area.

The region is boosted as the area of the biggest and richest consumers. The PRD is home to more than 24 million permanent residents (this does not include the migrant labour force). Rapid economic development in the region has made them the mainland's biggest consumers.

7.5 Summary Tables

As we can see, all the three regions take the advantage of economic globalization which has helped transform the region into a manufacturing base. Economic globalization has created opportunities for China's manufacturing industry. About 30 to 40 million manufacturing jobs will be created in China over the coming years, according to Fan Gang, a leading Chinese economist. The three regions, especially YRD and PRD have seized the opportunity offered by the shift of global industry and developed all fields of manufacturing, including traditional manufacturing.

In order to give the comparison of the regions (unfortunately, because of limited time and resources, we were unable to get statistics information about the Bohai Sea Rim.), we have made a table for some selected indicators for the regions of PRD, Greater PRD, YRD and Mainland China, basing on the information from the website of www.investhk.gov.hk and some other official websites.

- China's Main Export Regions -

	PRD	Greater PRD (PRD+HK+MA)	YRD	Mainland China
Land Area (sq. km)	41,698	42,824	100,113	9,597,000
Registered Population (2001, mn persons)	23.37	-----	74.94	1,276.27
Census Population (2000, mn persons) (a)	40.77	47.93	82.28	1,265.83
GDP (1990, bn USD)	18.23	96.18	47.10	387.77
GDP (2001, bn USD)	101.01	273.43	205.08	1,158.61
% in Primary Industry (d)	5.3%	2.0%	6.4%	15.2%
% in Secondary Industry (e)	49.5%	27.3%	51.5%	51.1%
% in Tertiary Industry(f)	45.2%	70.8%	42.2%	33.6%
GDP per capita (USD,2001)	3,794	-----	2,722	911
GDP Annual Growth (1990-2001, current USD)	16.8%	9.9%	14.3%	10.5%
Gross Industrial Output (b) (bn USD)	(c)145.1	(c)182.25	280.6	1,152.8
Exports (2001, bn USD)	(c)90.83	-----	73.6	266.2
Utilised foreign capital (2001, bn USD)	(c)14.19	(c,g)37.15	16.06	46.8

Table 7-2: *The Summary Table for the Main Export Regions with Selected Indicators*

Notes:

(a) The Fifth National Census for the Chinese Mainland was carried out in 2000.

(b) For Chinese Mainland jurisdictions figures are for firms with > 5 million RMB in sales.

(c) Gross industrial output, exports, and inward utilised foreign capital figures for Pearl River Delta region reported in Guangdong Statistical Yearbook include all of Huizhou and Zhaoqing.

(d) GDP figures are broken down into GDP from primary, secondary, and tertiary sectors. The 'primary sector' includes farming, forestry, animal husbandry, fisheries, natural resource extraction, and other similar industries.

(e) The 'secondary sector' includes manufacturing, construction, mining, water supply, electricity supply, gas supply, steam supply, and hot water supply.

(f) The 'tertiary sector' includes all industries not included in the 'primary' and 'secondary' sectors.

(g) Total utilised foreign capital for Mainland Chinese jurisdictions, foreign direct investment for Hong Kong and Macao.

- China's Main Export Regions -

(h) The exchange rates used in the table are 2001: US\$1 = HK\$7.8 = RMB 8.28 = MOP 8.034 and 1990: US\$1 = HK\$7.8 = 4.78 RMB = 8.02 MOP.

Data Sources: Statistical Yearbooks of China, Guangdong, Shanghai, Zhejiang, Jiangsu, and local jurisdictions in Guangdong, Zhejiang, and Jiangsu. China Statistics Bureau, Jiangsu Statistics Bureau, Census and Statistics of Hong Kong, Census and Statistics of Macao, Hong Kong Trade Development Council.

8 Analysis

In previous parts of this study, we have actually already done some specific analysis concerning the leading container ports, two shipping companies, and the main export regions in Mainland China. In this chapter we will analyze the information that we gathered from the interviews and the answered questionnaire. The information we got from other sources will also be used in the analysis. All the analysis will then form the base for the conclusion of this study.

In doing the following analysis, we set up a premise that the respondent was able to represent the company he or she works for. We tried to identify the obvious subjective or personal opinion, and then worked hard to reduce its affect on our analysis. This is also the reason why we input certain time and energy in finding the right person who is able to answer our questions before doing the survey.

8.1 The Consideration of Port Cooperation

The market survey among the top container ports was carried out in three steps: The first step is to choose the objective ports. After discussion with our sponsor, we decided to choose the top ten container ports in Mainland China. In the second step, we called the ports one by one, trying to get the right contact -- person who would be able to answer the questionnaire. In the third step, we sent the questionnaire to them by email. Unfortunately, we only got one reply until the last day of receiving the answered questionnaire. In the fourth step, we called the related contact persons in the other nine ports. Surprisingly, they responded fairly well: they were willing to answer the questions listed in the questionnaire by phone. Finally, we got the questionnaire answered and obtained the critical information we need.

From the survey, we found that all the ten ports had already cooperated with some foreign ports. Generally, the cooperation was called establishing sisterhood ties. Six respondents thought that the cooperation between two ports can affect the shipping companies' decision on starting the traffic, but the effect is rather limited, unless the cooperative ports can offer the shipping company a unique and especially favourable solution. More than half of the total

respondents felt that the significance of ports' cooperation could only be seen in communication and learning from each other. The shipping companies always make the decision by themselves.

The main factors affecting the cooperation between seaports, according to survey, are the ports' business plan, the trade connection, the political relationship, and the management team's attitude. All the respondents admitted that the competition among top Chinese container ports is getting fiercer, and the ports focus more on cooperation with the carriers. 8 respondents hold that the Port of Gothenburg (POG) is one of the critical ports in northern Europe, and 2 other respondents are not familiar with POG. All respondents from the top 5 ports expressed that their ports would like to cooperate with POG, of course, at different levels. (The Port of Shanghai has already cooperated with POG.)

To choose the right Chinese port to cooperate with cannot be described as easy. Mainland China has a long coastal line; to cooperate with only one port cannot satisfy the ever-increasing market demand. Considering of the geographical and geopolitical characteristics of the main export regions, we got the solution that to cooperate with three ports in Mainland China, one in the north, one in the central, and one in the south. We already have the port of Shanghai that locates in the very middle of Mainland China's coastal line. Therefore, we just have to make a decision on the north and south port.

To make the final decision which port should be chosen, we have to do a comparison among several ports, especially the north ports of Tianjin, Qingdao and Dalian. When considering of Dalian, the main obstacle is its geographical location. The port locates far North-East of China. Suppose there was a shipping line takes a loop that contains the POG, the port of Dalian, and some other ports in South China, the transit time for the loop would be very much longer than the typical transit time between Asia and northern Europe, that is around 25 days. We do not think it is reasonable to choose Dalian Port.

As to the ports of Qingdao and Tianjin, it is obvious that the Port of Qingdao has more advantages in the natural conditions, the base for future development, and the port's policy and management. The Port of Qingdao will be the largest container port in Mainland China. The port enjoys rarely wonderful natural conditions. Its cooperation with A.P. Moller Group (APM), P&O Ports, and

COSCO wins the port not only the well-known brand also the prosperous future. It can be considered as a world class port also because the port's management level and development policy, especially the port's management team's capability and attitude. The most important factor lies in the cooperation between Volvo Truck Co. and China National Heavy-Duty Truck. The corporation will certainly bring more goods flow between the Port of Qingdao and POG. (More specific analysis is available in the chapter of 6.3 and 6.4.)

The Port of Guangzhou is the one we choose in South China. We made the decision mainly depending on the ports' will. To the south ports of Chiwan, Shekou, Yantian and Guangzhou, some of the ports are not interested in cooperating with POG. The Guangzhou Port can be the most suitable port to cooperate with: It was the starting port of Chinese ancient western foreign trade, and the local authority also thinks highly of the possible cooperation with POG.

8.2 The feedback from shipping companies

As to the market survey among the shipping companies, this was carried out through the same procedures as when doing the survey among the ports. However, we only got the meaningful information from 6 shipping companies. We have to point out that we have made some changes from the prepared questionnaire during the telephone interview with the shipping companies. We asked the questions mostly in two aspects: Firstly, what do they think about the transoceanic market between Mainland China and northern Europe, Scandinavia Area, and Sweden respectively; Secondly, what are the main reasons for them not to pay a direct call to POG. Fortunately, the information we got was enough for us to do the analysis.

All respondents from the shipping companies admitted that China's economy and the trade between China and northern Europe is enjoying an obvious and stable increase, and the trend will be kept for several more years. Some respondents mentioned that China's overall rapid growth has brought the ever-increasing transport demand. The spectacular development of container transport in China offers the carriers more containerised cargo supply. The improved inland transportation makes it easier for carriers to offer more flexible solutions for their customers. They believe that the trade volume

between China and northern Europe is growing. Most respondents said the goods volume would become attractive for paying a direct call to POG when goods flow to Sweden is coordinated with Denmark, Norway, Finland, and some Baltic states.

Several obstacles were put forward by the respondents as the main reasons why their shipping companies are not making direct calls to POG. The first problem, also the most mentioned, tends to be the small cargo volume. The Swedish market does not have enough volumes for direct traffic, especially for those shipping companies that do not have much cargo supply in Mainland China. Most respondents say that the goods flow to Sweden is too small to be profitable.

The second problem is the question of money and resource: respondents said that under the current conditions, for small cargo volume, the feeder traffic is more profitable than direct traffic. The high railway transport cost in inland Sweden is the main obstacle for the shipping companies to use POG as the transit port. It makes the direct traffic to POG then transshipping the cargo to other Scandinavia countries by rail more costly than the feeder traffic from a European port to the ports in Sweden and other Scandinavia countries. Several respondents mentioned that to start direct traffic is very costly. Sometimes, setting up a new direct link means transfer from some other European ports; and ships would need to be rearranged, which requires a lot of money and resource.

The third problem focuses on the transit time. Most respondents said that the quicker service is becoming more and more important in winning the market. But calling POG means at least one and half extra days up from mainland Europe, 8—10 hours of loading and reloading, and one and a half days back. Nearly all respondents agree that POG has a geographical disadvantage when compared to some top northern European ports.

The fourth problem, according some respondents, comes from China's rapid growth. As China's economy develops at a high speed, more and more business opportunities emerge in Chinese ports. In order to grasp the golden opportunities and to get a larger market share, the shipping companies have to transfer their focus to the Chinese market and call more Chinese ports. Under

these conditions, sacrifice has to be made in the plan of calling more European ports.

The final problem is related to the shipping companies' attitude in development and its management style. This obstacle is mentioned only by two respondents. They said that the feeder traffic is working fine nowadays. They further pointed out that sometimes when the current situation is running fairly well and people just get accustomed to the old route, and then nobody wants to take the trouble of changing it. Even when someone gets a new and better solution, they finally find it extremely difficult to reform and they give up.

8.3 The market analysis

In order to win a more clear understanding, we visited POG (Port of Gothenburg) and attended some meetings during which we got more specific information about the POG and transoceanic market between Asia and northern Europe. Corresponding to the feedback we got from the respondents, we will make the market analysis through three aspects: cargo volume, transit time, and transit cost.

The total cargo volume between Mainland China and Sweden is enough for two shipping companies to pay the direct call to POG. Currently in the deep-sea liner service for this market, only Maersk Sealand is making direct calls to POG, and several other top container carriers are using independent feeder vessels. The total cargo volume transported by feeder traffic is more than enough for a top carrier to take the direct traffic.

The developing trend of the cargo volume is also promising. Spurred on WTO Accession, China enjoys a phenomenal growth in exports. Instead of purchasing and manufacturing products locally, more and more companies in the Scandinavian region have since been substituting buying finished goods from China or producing products in China. According to figures recently released by the Far Eastern Freight Conference, trade from Asia to the Europe is booming. During the first quarter of 2003, its westbound traffic increased by a remarkable 32.7%, compared with the same period last year. In the much larger trade between Asia and northern Europe, more and more shipping

companies have started new weekly service, such as Yang Ming/K Line, Maersk Sealand, MOL, Hyundai Merchant Marine, and the Grand Alliance.

When considering the transit time, we can not deny that it does take extra time from mainland Europe to POG, but we have found that using the feeder service sometimes takes longer than transshipping via POG by railway distribution. According to the Swedish state-owned railway company, Green Cargo, and Intercontainer-Interfrigo, the rail distribution can offer a much faster transit time for transshipment to and from several places in Sweden, partly because the trains are faster than ships, and partly because of the much greater number of feeder vessels calling at Gothenburg compared to other Swedish ports. (Beddow, 2002)

The carriers need to consider the transit cost of using intermodal services via POG more thoroughly in more ways. Firstly, statistics show that because of economy of scale, if the vessel has more than a certain volume of import/export traffic, transshipment via the POG is more cost attractive. And the relatively high cost of feeder service from other European ports should make the main-line carriers consider more about calling directly at Gothenburg with their deep-sea vessels.

Intermodal transport within Sweden does not enjoy a high profile, but it has been greatly improved in recent years thanks to a number of initiatives taken by the port of Gothenburg. During the last couple of years, the port has been instrumental in helping to set up a range of daily rail shuttle services to Oslo, Karlstad, Sodertalje/Stockholm, Skane and Borlange. The port's container terminal is directly connected by rail, thereby cutting out the need for transfer services that have to be provided in other ports. The rail service operators used to pull normal 60ft wagons that are not so efficient, inevitably resulting in higher costs. Now they are using 80ft wagons that enable them to conveniently cater for 40ft containers with lower cost. Turning more regular and reliable, the rail service is not confronted with wagon shunting uncertainties and changing of trains. Continuous improvement can be seen in its utilisation levels: Since 1999, the percentage of the port's hinterland traffic performed by rail has increased from 18% to 23% in 2003, developing from 45,000 units in 1999 to 105,000 units in 2003. It is planned by the port that half of all volumes arriving would be transported by rail.

9 Conclusion and Recommendation

We found that a direct call at the Port of Gothenburg is worth considering, particularly for the following two kinds of ocean carriers: Those which already have or will have large cargo supply in Greater China Area (including Mainland China, Hong Kong, Macao and Taiwan), and those which already have a strong presence in the Scandinavian market and plan to extend business even further. From the operation of the Maersk Sealand's direct line between China and Sweden, we can see clearly that paying a direct call to POG should be favoured by the local industry in Sweden, and it could potentially also benefit from loading additional feeder cargo which was discharged in some European ports.

Some necessary initiatives have been completed for the direct traffic between China and Sweden. Most ports in China are expanding and they are investing heavily in all-round port construction. The POG has achieved much in construction of port's infrastructure and inland distribution network. This will lead to a more efficient handling of goods both in Sweden's and China's harbour. The shipping companies can take advantage of more effective solutions because of the reduced transit time and cost.

The transoceanic market between the Greater China Area and northern Europe is turning a more and more promising market for the shipping companies. The international trade in this market is growing rapidly. Especially, the diplomatic ties and bilateral trade has been developing steadily between China and Sweden. China's WTO Accession is expected to be fully implemented by 2006: The reduced custom tariffs, the more transparent and reasonable trade policy, and the improved infrastructure will push the country's import and export forward. We have not found factors that can keep the westbound trade from continuing to increase; and the growing purchasing power in the Scandinavian region can bring about more transoceanic transport demand.

However, the potentials for a direct traffic between China and Sweden is rather difficult to achieve right now, unless the goods flow from and to all the Nordic countries can be coordinated to go through the POG. Of course, the critical Swedish shippers can also affect the situation. If most importers and exporters

turn to prefer using intermodal services via Gothenburg, the direct traffic can be more practical.

It is of great importance for POG to keep its leading position in the Baltic States and west Russia and to coordinate the entire transportation network within the region. In this region, container traffic is increasing and there are good opportunities for expansion for the POG. Though the immediate access to the motorway and the railway link could provide swift cargo transports at the port, cooperation in the entire network is still needed for offering the customer better organised and more efficient “door to door” service.

We believe that to choose the right Chinese port to cooperate with would lead to meaningful consequence. As we recommend in the previous chapter: to cooperate with Qingdao Port in the North, which has the Bohai Sea Rim as its hinterland; Shanghai Port in the middle, whose hinterland covers the Yangtze River Delta; and Guangzhou Port in the South, which locates strategically in the center of Pearl River Delta. It is necessary to strengthen the cooperation with Shanghai port. As one respondent said, the cooperation can be performed at different levels. Only the cooperation which has clear and practical objective and mutual effort can work for developing the transoceanic market.

We consider that the Port of Gothenburg should implement a more active marketing policy, especially in cooperating with Chinese ports and the shipping companies in Asia. We have noticed that the port has done a lot in promoting itself, but we do not think it is enough, and the port needs to continue some activities for longer. During the interview of several respondents, we found that they have no or very little, even wrong information about the Port of Gothenburg. They are holding that the price level of the inland rail distribution is still the same to that of several years before. Some respondents of shipping companies talk about their concern about the water depth of the port. More contact and more communication can be really helpful to solve these problems. Information should be better shared with clients and customers alike, by facilitating access to reliable information.

Finally, we want to say that it is very important to understand the Chinese culture in order to have a successful business in China. To do business in China is based very much on relationship (“Guanxi” in Chinese). You need to set up good relationships with your customer and related authorities and governments.

- Conclusion and Recommendation -

It is of great significance to visit the customer and partner often in order to make the relationship stronger.

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Public Relation Department	Yantian International Container Terminal
Port Affairs Office	Chiwan Container Terminal
Marketing Department	Shekou Container Terminal Ltd.
Foreign Economics Division	Port of Qingdao
Port Affairs Office	Tianjin Port Authority
Contact Office	The Bureau of Port Affairs of Guangzhou
Investment Department	Xiamen Port Authority
The Office of General Manager	Dalian Container Terminal Ltd.
Contact Office	Ningbo Port Authority
Port Affairs Office	Fuzhou Port Authority
Contact Office	the Management Bureau of Zhongshan Port
Depart. of Terminal Business	Hanjin Shipping Co., Ltd
European Trade Division	COSCO Container Lines
Depart. of Freight Management	Orient Overseas Container Line Ltd.
The Affairs Executive Division	China Shipping Container Lines
Public Relation Department	Hyundai Shipping Lines
Contact Office	Yang Ming Marine Transport Corp.

11 Appendix 1—Questionnaire for Shipping Companies

1. Respondent information

Name: _____ **Title of the position:** _____

Company name: _____

Phone number: _____ **Fax number:** _____

E-mail address: _____

2. Try to rate the importance of the following factors when your company decides to make a direct call to a port. (Use a seven degree scale where 1= very low importance and 7=very high importance)

Factor	Importance						
	← Low			High →			
	1	2	3	4	5	6	7
a) The port's geographical location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) The port's technical capacity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) The port's practical maximum capacity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) The relationship with the port	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) The port's adaptation to the most cost-effective technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) The port's information system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) The port's handling efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h) The port's handling flexibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i) Stevedoring costs in the port	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j) port entrance costs plus related costs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k) The water depth of the port	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
l) The inland transportation solutions of the port for the arrived cargo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
m) The customer demands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
n) The tide conditions of the port	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
o) The climatic conditions of the port	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- p)** The port's service quality
- q)** The political stability of the port
- r)** The brand image of the port
- s)** The environmental impact of engine emissions
- t)** The provision of FTZs (Free Trade Zones)
- u)** Other factors, please specify:

3. What Kind of port do you think the port of Gothenburg is?

- Local ports with a local hinterland
- Important port for national foreign trade
- Feeder port to other European ports
- Port of transshipment (a port with direct transoceanic service transshipping the cargo to smaller tonnage operating in regional traffic.)
- Transit port (also a port of transshipment that has a hinterland larger than the country in which the port is located)
- "Hub and spoke" port (a highly effective transshipment port where cargo is shifted from transoceanic tonnage into feeder tonnage or road/rail links)

4. What do you think is the most time- and cost-efficient sea-route between the Northern Europe and the Great China Area (including mainland China, Hong Kong, Macao and Tai Wan)?

4. a The most time-efficient

- Direct call to Hamburg and feeder line to the Scandinavia
- Direct call to Rotterdam and feeder line to the Scandinavia
- Direct call to Antwerp and feeder line to the Scandinavia
- Direct call to Bremerhaven and feeder line to the Scandinavia
- Others, please specify:

4.b The most cost-efficient

- Direct call to Hamburg and feeder line to the Scandinavia
- Direct call to Rotterdam and feeder line to the Scandinavia
- Direct call to Antwerp and feeder line to the Scandinavia
- Direct call to Bremerhaven and feeder line to the Scandinavia
- Others, please specify:

5. Is the Port of Gothenburg included (or used to be) in any round trips of your company's ships as a direct call port?

- Yes
- No

5a. If No, What is the importance of the following factors for not making a direct call to the Port of Gothenburg?

Factor	Importance						
	Low			High			
	←			→			
	1	2	3	4	5	6	7
a) The volume of cargo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) The port's geographical location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) The cost of using the port	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) The port's service quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) The water depth of the port	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Other factors, Please specify:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Which ports is your company using in Northern Europe for direct calls?

- Hamburg
- Rotterdam
- Bremerhaven
- Southampton
- Antwerp
- Felixstowe
- Le Havre

7. For what reason/reasons are your company using these ports?

- The volume of cargo
- The transit time
- The cost of using the ports
- The water depth of the port
- The location of the ports
- Other reasons, please specify:

Which reason is the most important one? Please specify:

8. Do you think the Port of Gothenburg can attract more direct calls?

- Yes
- No

If no, what is the main reason? Please specify:

12 Appendix 2

1. Respondent information

Name:

Title of the position:

Company name:

Phone number:

Fax number:

E-mail address:

2. What are the main seaports cooperating with your port in Northern Europe?

What are the main ways of cooperation?

3. Do you think is it meaningful for seaports to cooperate?

Yes

No

3a. If yes, in which aspects? Please specify:

*3b. If yes, in which direction do you think the cooperation should develop?
Please specify:*

3c. If no, why? Please specify:

4. Do you think that cooperation between two seaports can make a shipping line start the traffic?

Yes

No

5. From your point of view, what are the main factors affecting the cooperation between seaports? Please specify:

6. Is your port planning to cooperate with more others seaports in northern Europe?

Yes

No

5a. If yes, which port is your port planning to cooperate with?

7. Do you know the Port of Gothenburg?

Very much

A little

No

8. Does your port want to cooperate with the Port of Gothenburg?

Yes

No

*8a. If yes, in which way your port wants the cooperation be performed?
Please specify:*

8b. If no, would you please specify the main reason: