Logistics Port Development Strategies in Revitalizing Northeast China

A Case Study of Dalian Port, China

By

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DECLARATION OF ORIGINALITY

I, WANG Baixun, hereby certify that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institute of tertiary education. This Master's thesis contains ideas and information derived from published and unpublished work of different authors which have been acknowledged in the text and list of references. Any contribution of others have been cited or acknowledged appropriately.

WANG Baixun

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LIST OF ABBREVIATIONS AND SYMBOLS

AIS	Automatic Identification System
BCT	Block Container Trains
BSER	Bohai Sea Economic Rim
CNPC	China National Petroleum Corporation
COSCO	China Ocean Shipping Company
CSTD	China Shipping Terminal Development Co., Ltd
CSC	China State Council
CFS	Container Freight Station
CT	Container Terminal
CY	Container Yard
CIQ	Customs, Immigration and Quarantine
DALC	Dalian Automobile Logistics City
DDPB	Dalian Dry Port Base
DETDZ	Dalian Economic Technological Development Zone
DFTZ	Dalian Free Trade Zone
DIA	Dalian International Airport
DILP	Dalian International Logistics Park
DFTPZ	Dayaowan Free Trade Port Zone
EPCI	Express Port Community Interface
EXP	Extended Customs Clearance for Export
FSPAC	Fifteen Sub-Provincial Administrative Cities
FDI	Foreign Direct Investment
FTPZ	Free Trade Port Area
FTZ	Free Trade Zone
FCL	Full Container Load
GIS	Geographic Information System
GDP	Gross Domestic Product
JIT	Just in Time
LCL	Less than Container Load
NDRC	National Development and Reform Commission
NLLHC	National-Level Logistics Hub Cities
NYK	Nippon Yunsen Kaisha
NAER	Northeast Asia Economic Region
NEAC	Northeast Economic Area of China
PRNC	Plan of Revitalizing Northeast China
PDA	Port of Dalian Authority Dalian Port Co., Ltd.
PSA	Port of Singapore Authority
PX	Para -Xylene
RFID	Radio Frequency Identification
R&D	Research and Development
RMB	Chinese Renminbi Yuan

TPL	Third Part Logistics
TEU	Twenty-Foot Equivalent Unit
USD	US Dollar
VAT	Value Added Tax
VMI	Vendor Managed Inventory
YSEA	Yellow Sea Economy Area

ABSTRACT

Historically, in the development of an area or region, the evolution of port cities always plays a positive role in promoting the economy and society.

Dalian Port, the major port in Northeast China, serves not only as a regional industrial, financial and tourism city, but also a logistics hub port in the region.

Northeast China is the most important industrial and agricultural base in China for its abundant natural resources such as grain, mine, forestry, and petroleum. But it had developed comparatively slowly due to the planned economy (1949-1978). The region is facing a new development opportunity brought by the *"Plan for Revitalizing Northeast China"*, set up by China State Council as a national policy in 2003. In the same year, Chinese Central Government set a plan to build Dalian Port as the Northeast Asia International Shipping Center. In 2005, the plan regarding *"Revitalizing in Northeast China"* was promulgated by the State Council.

As the main logistics port of the region, Dalian Port has been playing a positive and crucial role in the revitalization. In this respect, the development of Dalian Port is vitally important to the society and economy in the region. Accordingly, the new development of hinterland also supports the booming of logistics in Dalian Port.

The study topic focuses on the development strategies of Dalian Port in revitalizing Northeast China. In addition, the study evaluates the development situation and put forward the suggestion for the establishment of Dalian International Shipping Center by analyzing the three main fields as follows:

i The development of logistics in Dalian Port

ii The development of Dalian Economic Technology Development Zone, Dalian

Free Trade Zone and Dayaowan Free Trade Port Zone

iii The establishment of Dalian International Shipping Center

The study uses primary sources from field researches, observation, document analysis and case study. The main data and other sources are based on the indexes of the "*10th Five-Year Plan (2001-2005)*" and "*11th Five-Year Plan (2006-2010)*" periods in China because the revitalizing was set up and implemented in the recent ten years .In addition, the secondary sources collected from documents are also used for the study. For the primary resources, the qualitative method of data collection is used for the study.

The main methods of the study are date collection and analysis, field research and interview and evaluation. The qualitative and quantitative analyses are used for the study in order to identify the problems in the development and find the trend of each index which is important to the development of Dalian Port. The qualitative analysis for the study is based on the results of the quantitative analysis.

Having analyzed the data and literature, the studies find that the mutually promotion between hinterland of Northeast China and Dalian Port, at the same time, the studies also give suggestions for the promotion of logistics development in Dalian Port.

CHAPTER 1 INTRODUCTION

1.1 Introduction

Historically, the evolution of the port cities always plays a positive role in promoting the economy and society in the development of an area (He Jianzhong, 2005). Take the cases of China, the primary impetus behind their economic growth of some economically developed areas, such as the Pearl River Delta and Yangtze River Delta, are the development of their main port cities, Shenzhen and Shanghai, which are also famous port cities in the world.

Northeast China, the most important industrial and agricultural base with abundant supplies of natural resources, now faces a series of development opportunities that brought by the ***Plan of Revitalizing Northeast China*** (hereafter referred to as *PRNC*) which issued by China State Council (hereafter referred to as CSC). Therefore, the development of Dalian Port, the major port in the region, will play an irreplaceable role in the revitalization of economy in the region.

Dalian Port, the only major port in Northeast China, locates at the east coast of Eurasia and the southernmost point of Liaodong Peninsula. And it is also the northern gate of Bohai Sea. Based on the geographic and strategic advantages, "**Strengthening the City by Developing the Port**" has been set up as the long-term development strategic target for the port city since it was founded as a free port in the year 1899.

Considering from the view of global logistics, Dalian Port locates at the center of Northeast Asia Economic Region (NAER). It is also the confluence of Northeast Economic Area of China (NEAC) and Bohai Sea Economic Rim (BER). Besides, the port is close to the main global shipping lines. Developing for more than one century, Dalian Port has become the most important logistics city in the region and the

transportation hub for the cargoes that are from Northeast China to not only North and East China but also every quarter of the globe.

By the Analyses from the different economic patterns in Northeast Asia, most of the underdeveloped or backward areas is situated above the latitude 38°N, such as Northeast China, North Korea, Mongolia and Far East of Russia; correspondingly, some developed countries and areas, such as, Japan, South Korea, Shandong Peninsula and Yangtze River Delta, are located below the latitude 38°N. The remarkably differences of resources, industries, markets, and consumption levels in both the areas are strongly complementary to each other.

In addition, with the rapid development of the economic globalization, the needs of cooperation and integration of economies in both of the regions have been more important than ever. The two regions and markets are connected by Dalian Port. This advantage makes the port city not only the pivotal logistics center for the two regions, but also the special city that promotes the development of economic cooperation among Northeast China, Japan and South Korea around the Yellow Sea Economy Area (YSEA). In addition, the unique geographical superiority of Dalian Port is convenient to transport by ship, highway, and railway in Northeast Asia.

Dalian Port serves not only as a regional industrial, financial and tourism city, but also an important international shipping center and logistics hub in China and Northeast Asia. In accordance with the Open Policy Strategy of Chinese central government, Dalian has been being built as a modern logistics port city since the year 1978.

In the year 1984, CSC approved Dalian to be one of the first Fourteen Coastal Open Cities. In the year 1994, Dalian was set up as one of the Five Cities that directly planned by central government and one of Fifteen Sub-Provincial Administrative Cities (FSPAC). In the year 2009, Chinese central government positioned Dalian as

one of the Twenty-one National-Level Logistics Hub Cities (NLLHC) of China. In the same year, Dalian was appointed as a core city in the national level strategy plan, which titled ***The Plan of Developing Costal Economy Zone in Liaoning Province***.

Dalian Port locates at Northwest Pacific. It is a pivotal port in Northeast China. It is also one of the main container and trade ports in China. As the most convenient gateway to the Pacific and the outside world, Dalian Port is plays an important role in logistics between Far East, South Asia North America and Europe. With the unique regional advantages, port conditions and opening degree, the efforts of the logistics enterprises and the economic support of hinterland in Northeast China, Dalian undertakes 70% of the import-export goods and 90% of the container transportation of the area (Sun Chunlan 2005).

By the end of the year 2010, there are 80 container shipping lines link to Dalian Port as well as more than 300 ports of 160 countries and regions. In addition, Dalian has36 international air lines from West Europe, Far East Russia, western coast of Canada and United States, Japan, South Korea, Australia, Taiwan, Hong Kong and Singapore (Dalian Logistics Association 2010).

Nowadays, Dalian Port has been an important port city in China, even in Northeast Asia. Besides, the port has become a dynamic city in Northeast China with the highest degree of openness in the region.

1.2 Background of the Research

1.2.1 New Development Opportunity of Dalian Port

Chinese central government and National Development and Reform Commission (hereafter referred to as NDRC) took "***Revitalizing Northeast China***" as a national strategy since the year 2003. As the major port in the region, Dalian Port now faces new opportunity in development. Besides, the central government has put some

policies in order to support the development of Dalian Port.

In the year 2003, CSC promulgated *"**Suggestions on Revitalizing Northeast China**"* as a guidance plan of establishing Dalian Port as a significant international shipping center in Northeast Asia (NDRC, 2003).

In the year 2005, *PRNC* was promulgated by CSC which focuses on speeding up the establishment of Dalian International Shipping Centre. The construction of port facilities must be strengthened to further economic increase of Dalian Port and foreign investment. The supports of policies will focus on the large ports, container terminals, industries that are adjacent to Dalian Port NDRC, 2005).

In the year 2007, CSC ratified the PRNC the most important official plan to the development in the region. Geographically, the areas mentioned in this plan include the following provinces and cities: Liaoning Province, Jilin Province and Heilongjiang Province as well as Hulunbeier City, Xinggan League, Tongliao City, Chifeng City and Xilinguole League, with the latter five areas seated in the eastern part of Inner Mongolia Autonomous Region (see Figure 1.1). These areas are home to 120 million people and stretch for 1.45 million square kilometers. The main purpose of the plan is to accelerate the revitalization in Northeast China and promote the regional economy (NDRC, 2007).

Based on the plan, Northeast China faces new development opportunities and challenges. As a crucial support for the development in the region, the development of logistic in Dalian Ports has been listed in the plan as a key part.

The plan suggests making the development of logistics as a priority. Overall planning should be made to establish inter-provincial logistics centers and corridors. Besides, Dalian Port should establish and improve the information platform for logistics and

distribution facilities as well as promote the applications of information technologies in logistics management (NDRC, 2007).

Figure 1.1 Northeast China

Source: Processed by the author base on http://chinaneast.xinhuanet.com/2007-11/20/content_11722111.htm

The plan, for the first time, put forward the idea of "speeding up the construction of international logistics center in Dalian" (NDRC 2007, 1), which indicated the future development of the port city.

In the year 2009, CSC promulgated the plan "*Suggestions on Further Revitalization in the Northeast China*" to specify the necessary of accelerating the construction of Dayaowan Free Trade Port Zone (hereafter referred to as DFTPZ) in order to establish

Dalian Port as an international shipping center.

As mentioned above, Dalian Port, the major logistics center in Northeast China, has a unique status in the plan for its advantages on both geography and economy in the region. From these policies, it is clear that the construction and development of Dalian Port is the main factor for the evolution of Dalian even the whole Northeast China.

Thus, the study of Logistics Port Development Strategies in Northeast China should focus on Dalian Port, including the transportation facilities such as seaport, airport, railway, highway and Dalian Economic Technological Development Zone (hereafter referred to as DETDZ). Actually, the new development period of Dalian Port started from the year of 2003 when ***Suggestions on Revitalizing Northeast China*** had been promulgated.

With the supports from the new policies, Dalian Port has taken great development since the year of 2006, when the *11th Five-Year Plan* of began.

The developments of seaport, airport, railway, and highway in Dalian Port have been making remarkable progress since the implementation of the plan since the year 2007. Now there are many logistics modes for the effective transportation through Dalian Port. Besides, after the nine-year development, the logistics network and some transportation facilities have been established in Dalian Port. All the progresses provided great motivation and support to the modernization and improvement of the economic and social development in Dalian Port even the whole Northeast China.

The aforementioned positive changes indicate that the implementation of PRNC on logistics in Dalian Port was successful so far.

1.2.2 The Problems in Development Process of Dalian Port

During the revitalization development period, there were some serious problems in Dalian Port.

In the 3rd Part “Promote Upgrading of Industrial Structure” of PRNC, “The major tasks are as follows: first, to establish new-type petrochemical industrial base, with focus on ten-million-ton crude oil processing bases such as Fushun Petrochemical Company, Dalian Petrochemical Company, and Dalian West Pacific Petrochemical Company” (PRNC, 2007).

Under the circumstance, Dalian municipal government drew up a plan that establishes some new-type petrochemical and chemical projects in Dalian Port in order to promote the economic development.

Based on the situation mentioned above, the petrochemical and chemical projects in Dalian Port have been developed faster than ever before and brought high fiscal revenue to the local government.

But the storage management security was not considered as a key factor during the rapid development period. As a result, there were some accidents of petrochemical industry in Dalian Port since the middle of the year 2010.

There were five accidents that happened from 2010 to 2011 at the affiliated oil wharfs and factories of China National Petroleum Company (CNPC) Dalian Branch in DETDZ and Dalian City. Besides, all the accidents made the pollutions to various extents (see Table 1.1).

Table 1.1 CNPC Dalian Branch Petrochemical Accidents (2010-2011)

Date	Accident	Cause of the Accident	Impact
2010.7.16	An explosion happened to the crude oil pipeline causing a 100 thousand crude oil tank of CNPC Dalian International Storage Company at Dalian New Port to explode.	The over oxygen in the pipeline caused by ZC-PCD with strong oxidizer, which was being injected into pipelines after the crude oil unloaded.	Polluted seawater was 430 square km^2. Most of the coastal sea life was also polluted by the oil.
2010.10.24	Residue crude oil at the bottom of the destroyed tank (on 7.16) caught fire when it was torn down.	Residue crude oil was kindled.	Air Pollution
2011.7.16	A 10 million class Atmospheric-vacuum Distillation Unit of CNPC Petrochemical Dalian Branch caught fire.	Leakage of the three-distillation heat exchanger.	Air Pollution
2011.8.29	No. 875 diesel tank of CNPC Petrochemical Dalian Branch storing 800 ton diesel caught fire.	The static fire of the pipe line between the two diesel tanks that took place during the operation	Air Pollution
2011.11.22	No. 31 and 32 crude oil tanks of CNPC Petrochemical Dalian Branch both storing 100 thousand ton crude oil caught fire.	The seal curtains of the tanks were struck by lightning.	Air Pollution

Source: created by the author based on http://news.xinhuanet.com/fortune/2011-11/24/c_111192315.htm

Moreover, a breakwater construction accident of a P-Xylene[1] (PX) Plant, a chemical plant which is locating at Dalian Port, almost caused a serious chemical accident at the beginning of August, 2011.

1.3 Research Objectives

The main objective of the research is to study how much Dalian Port has been developed after the implementation of *PRNC* based on the view of logistics development.

The second objective is to research the backing forces for the development of logistics in Dalian Port by analyzing the development of DETDZ and DFTZ as well as the business models in DFTPZ.

And there are two more specific objectives as follows:

1) To review the major arguments and theories on development of Dalian Port to define the research target;

2) To analyze the geographic situation of Dalian Port and in order to provide a better understand of the natural situation, geographic advantage and importance of the development in Dalian Port;

1.4 Research Questions

This theis seeks to answer the following research questions based on the objectives of

[1] PX denotes P-Xylene, an aromatic hydrocarbon, based on benzene with two methyl substituents. The “P” stands for Para, identifying the location of the methyl groups as across from one another. It is characterized as one of hazardous chemicals and a kind of Group 3 carcinogens, the agent (mixture or exposure circumstance) classifiable as to its carcinogenicity to humans. Besides, it can be breathed in, ingested and absorbed through skin. And it has a stimulating effect on the respiratory tract and eyes, while high concentrations have a narcotic effect on the central nervous system.

the studies mentioned above.

1) How much Dalian Port has been developed after the implementation of *PRNC*?

2) How importance is the establishment of Dalian International Shipping Center to the development of Northeast China?

1.5 Significance of the Research

For the new seedtime of the economic cooperation in Northeast Asia, Chinese central government has put the establishment of Dalian Port for a long term development strategy. Some vital policies have been implemented since the year 2003 in order to support the development of Dalian Port. After a 10-year development, these policies have made some achievements.

However, there are some negative impacts brought by the development due to the lack of the academic knowledge which pertains to the relationship between the port development and its related environmental issues.

Consequently, the findings of the studies will make some positive and valuable contributions to the knowledge of port city developing and the policy makers. Besides, the findings could provide the sustainable developing recommendation for the government at all levels of a port city. Finally, the findings will not only contribute to the port cities which are in redevelopment or revitalization in China, but also to that in other developing countries in terms of the policy implementation as well as the effective operation.

1.6 Scope and Limitations of the Research

Having the same condition of most other researches and studies, the studies also has some limitations.

The studies of Dalian Port developing strategies mainly focus on the developing processes and achievements of sea ports, airport, highways, and railways in the port as well as DETDZ, DFTZ and DFTPZ, which are the core parts of the whole Dalian Port. Therefore, the studies do not cover all the developing factors of Dalian Port due to the limited research time and insufficient information and data. The reason is that the policies about revitalizing North China were implemented in the year 2003. Thus, there is lack of the literatures, researches and studies of predecessors on the field.

Besides, some public materials only hold by some state organs or government agencies, the researchers cannot obtain the information and materials without permission. Thus, the study also depends on some secondary materials or sources that are from books, internet, journals and annual reports.

In addition, the researcher is a beginner who works on research and has few experiences to do a professional research with comprehensive points of view as well as the writing experiences for an excellent master thesis. In addition, the time of the field studies in the year 2011 and 2012 were limited.

However, the reference materials of previous studies and researches could offer the secondary information, data and the research experiences for the studies.

1.7 Contents of the Thesis

The thesis for master degree consists of seven chapters. Chapter 1 provides the introduction to the research, including the research introduction, background, objectives, questions, significance and the scope and limitation of the research. Chapter 2 reviews the literatures which are mainly relevant to the past studies on the development of Dalian Port. Chapter 3 lists the methodology for the thesis including the research design, data collection and analysis, field research and interview, comparative analysis and evaluation. Chapter 4 explains the development of logistics

in Dalian Port in revitalizing Northeast China. Chapter 5 analyzes the development of Dalian Economic Technology Development Zone and Dayaowan Free Trade Port Zone, which are the strong backing force for the development of Dalian Port. Chapter 6 emphasizes the importance of the establishment of Dalian International Shipping Center. Finally, Chapter 7 concludes by the suggestions for the future development of Dalian Port.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

This chapter highlights and discusses the general concepts, previous researches and significance related to the development of Dalian Port.

The literatures are mainly including the following fields: the status and importance of Dalian Port in Northeast China, the development of DETDZ, DFTZ and DFTPZ and the establishment of Dalian International Shipping Center. The previous studies provide the theoretical foundation of developing strategies for Dalian Port.

The ideas of the studies are based on the reviews of the previous concepts and theories about the development strategies on Dalian Port. Summaries and experiences from the former studies are the guidance of formulating the general research framework and methods, for instance, research design, data collection and evaluation.

2.2 Current Status and Importance of Dalian Port

2.2.1 Current Situation

The natural condition is an advantage of Dalian Port. The port locates at the entrance of Bohai Sea with no silt and ice-free.

Dalian Port has a vast hinterland with rich natural resources. And Dalian Port is also the logistics center in Northeast China and a hub port of the Bohai Sea Area (Dalian Container Terminal Co., Ltd, 2008).

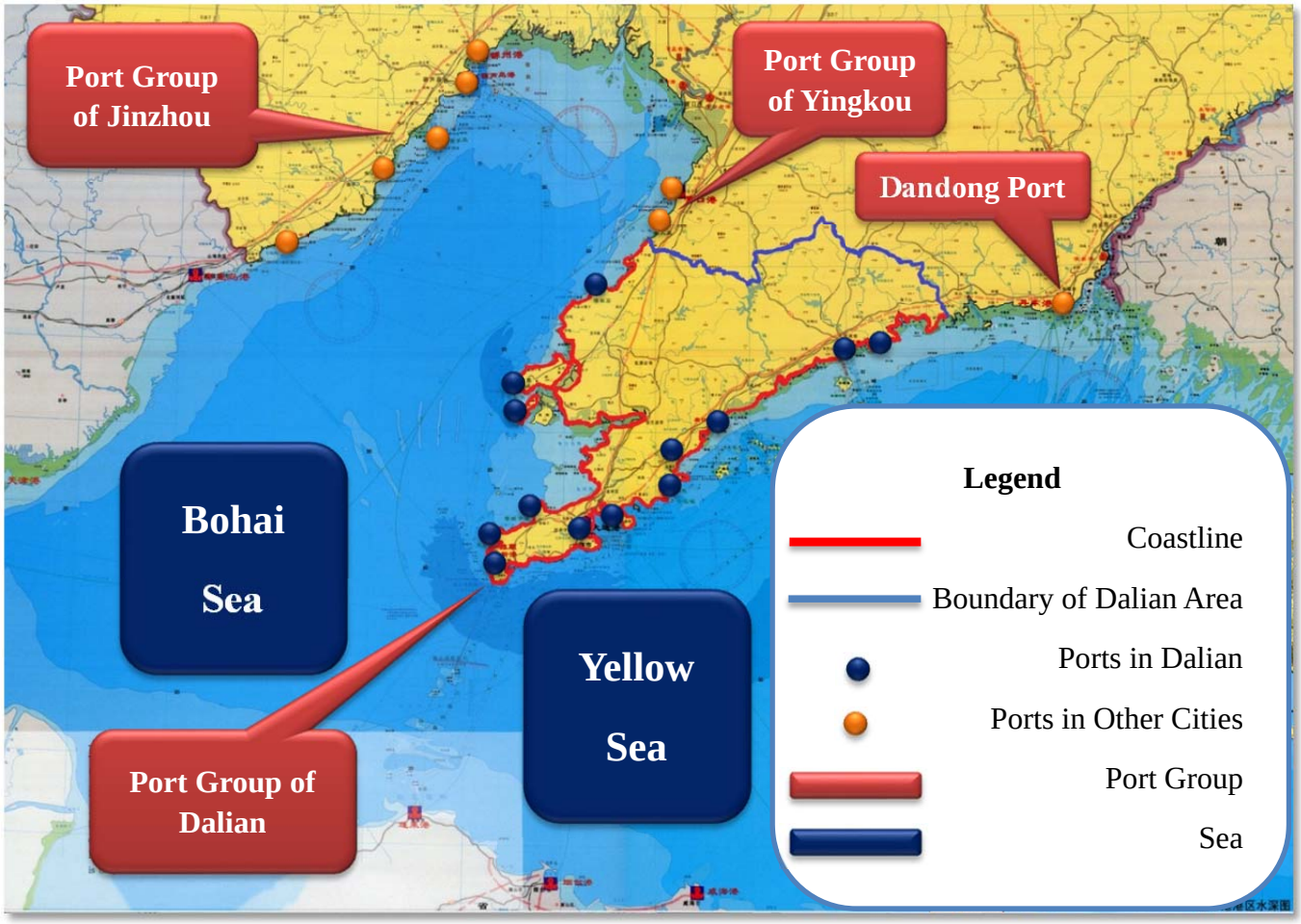
The place where Dalian Port locates at is also the southernmost tip of Liaodong Peninsula, which is also the southernmost point of Northeast China (see Figure2.1).

Figure 2.1 Location of Dalian

Source: Courtesy of Dalian Port Bureau

Dalian has 1,906km coastline, 404.6km of which is deep-water coastline (the depth is between 10 and 48 meters). Dalian Bay, Dayaowan Bay and Shuangdaowan Bay are the excellent ports of nature along the coastline of China (see Figure2.2). The natural situation offers Dalian an enormous potential on deep-water ports construction (Xing, 2005). Besides, Dalian Port locates at the center of Northeast Asia, where the node for not only international and domestic markets but also the material and manufacture market (Wen, 2004).

Figure 2.2 Coastline and Ports of Liaoning Province



Source: Processed by the author based on the Courtesy of Dalian Port Bureau

2.2.2 Logistics Status in Northeast China

Dalian is one of the most important international trade ports in China. Dayaowan Port Area is one of the largest deep-water ports and one of the largest international container transportation centers in China. Now more than 70 container lines have been opened in the port, including over 60 international lines.

The national biggest specialized terminals of crude oil, ore, and grain, automobile and liquefied natural gas (hereafter referred to as LNG) are locating at Dayaowan Port Area. Dalian International Airport has opened 90 international and domestic airlines; the railways from Dalian Port to the hinterland of Northeast and North China have been established in recent years; the Shenyang-Dalian Highway, which so called

“No.1 Highway in China” have run through the Liaodong Peninsula since the year 1990 (Dalian Free Trade Zone Administration, 2011).

Dalian Port, a group of comprehensive ports in Northeast China, is playing a pivotal role in both the economic development and transportation of the cargoes in the region. The transportation through Dalian Port has taken over 70% of the gross sea-borne freight in Northeast China. The throughput of Dalian Port in the year 1997 was 70 million tons, 171 million tons in the year 2005 (Chen, 2007) and 249 million tons in the year 2008 (Liu & Wang, 2011). In the year 2011, the throughput reached to 267 million ton (The People’s Government of Liaoning Province, China, 2012). Besides, Dalian Port is taking over 90% of the container transportation of the region. In the year 2007, there are nearly 300 ports of more than 160 countries that link to Dalian Port (Ao & Song, 2007).

Northeast China, including Liaoning, Jilin and Heilongjiang Province and the eastern part of Inner Mongolia, is the economic supports for Dalian Port. The main cargoes transported via Dalian Port include petroleum (47.4% of gross throughput), grains and corps (16.1% of gross throughput), general merchandise (16% of gross throughput). The annual throughput of metallic and nonmetallic ores, iron and steel, coal, chemical fertilizer is has reached to 2.5 million tons. The ratios of the materials and goods transported by sea from Heilongjiang, Jilin Province and eastern Inner Mongolia via Dalian Port are 95%, 67% and 70% respectively (Yang, 2010).

Dalian has been playing an important role for the economic development in Liaoning Province, where the city locates at. There are 29 ports along the coastal economic zone in Liaoning Province, 14 of which locate at Dalian Area, which means Dalian owns 48% of total ports in the province (Li, 2010).

By the end of year 2006, Dalian Port owned 191 berths (65% of total in Liaoning

Province) with the throughput capacity of 196 million tons (68% of total in Liaoning Province) per year. In the year 2007, the gross throughput of Dalian port reached to 220 million tons with 381 Twenty-Foot Equivalent Unit (TEU), which accounted for 53% and 68% respectively of the total amounts in Liaoning Province.

The studies reviewed above show that Dalian Port has a stable circumstance for a further logistic development. The supports of geography, economy and industry are the good foundations for promoting the revitalization of Northeast China.

Hui (2005) suggested that Dalian Port should become the important supplement for the open economic circumstance in Northeast China. Furthermore, Dalian Port should be a comprehensive logistics platform in order to improve the integrated the transportation system in the region. Finally, Dalian Port will be constructed as an important port for the international trade of the raw materials and energies.

But the former results did not involve the content on construction the international shipping center in Dalian. Thus, the research will pay attention on the field.

It is clear that the throughput of Dalian Port is steadily increasing in recent 15 years. The analyzing on the capability of transportation and transshipment of Dalian Port indicated the port city is the key factor for the economic development in Northeast China (Dalian Free Trade Zone Administration, 2011).

2.2.3 Finance and Trade Status

Dalian is one of the first batch costal open cities in China; it is also a city which has the largest foreign trade. The gross foreign direct investment (FDI) in Dalian accounts for 50% in Liaoning Province and 33% in Northeast China (Wen, 2004).

The trade and capital accumulated for the soybean futures in Dalian Commodity

Exchange Institute is at the 1st rank in Asia and 2nd in the world. Given based on the situation, Dalian has become the international financial center and foreign exchange settlement center in Northeast China. 71 foreign and domestic financial institutions have established their branches or offices in the city (Dalian Free Trade Zone Administration, 2011).

Dalian is also the open window of Northeast China to all over the world. The only free trade zone and free trade port area in Northeast China locate at Dalian Port. 84 of the world top 500 enterprises have invested 179 projects in Dalian Port. "Summer Davos" becomes another business symbol for Dalian to perform on the international stage (Dalian Free Trade Zone Administration, 2011). Therefore, Dalian has a very favorable business and investment environment in Northeast China, which is also an advantage in developing economy in the region (Tian & Qiu, 2007).

2.2.4 Industry Status

Dalian is an important industrial base with strong industrial foundation in Northeast China (Tian & Qiu, 2007). Industrial enterprises in Dalian are diffusely engaged in the fields such as ship building, mechanical manufacturing, petro-chemical, software, pilot industries, ocean-going vessels, diesel locomotives, refrigeration devices, sophisticated bearings, petro-chemical industry, and electronics. The rapid development of software has made Dalian becomes the national software base and a software internationalization model city (Dalian Free Trade Zone Administration, 2011).

Dalian is an electronic commerce city in Northeast China. The communication and network equipment in the city have come up to advanced world standards. Depending on the technological advantage, Dalian has become the regional information service, logistics distribution and delivery center in Asian for many multinational corporations. Now 22 of the world top 500 enterprises have established or started to set up the

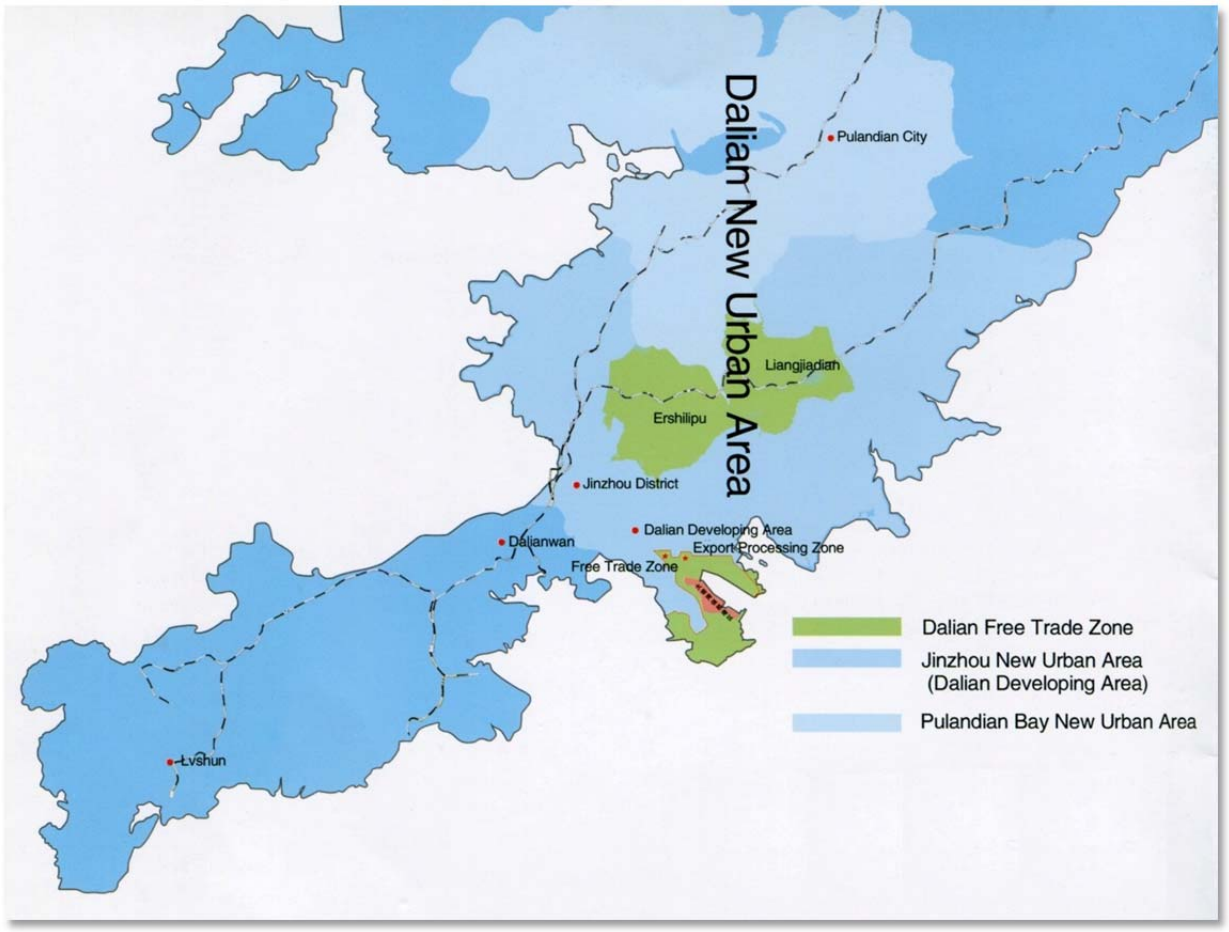
Asian information service centers in Dalian (Ao & Song, 2007).

2.3 Dalian Economic Technological Development Zone (DETDZ)

2.3.1 Current Situation

DETDZ (now has been Jinzhou New Area, also called Dalian New Urban Area) locates at the Dagushan Peninsula on the northeastern of Dalian (see Figure 2.3).

Figure 2.3 Dalian Free Trade Zone



Source: Courtesy of Dalian Port Bureau

The zone is planned to develop 210 km^2, now it has been developed with 50 km^2, 30 km^2 of which is covered by the buildings. The main parts of Dalian Port, such as Dayaowan Port Area and Automobile Terminal, locate at the zone.

DETDZ is the first national level economic and technological development area that approved and established after Chinese central government implemented the Reform and Open Policy (Cong, 2004). DETDZ was approved as a state level developing zone by CSC in September, 1984.

In addition, there five streets run cross the zone with a population of 220,000. By the efforts of introducing the foreign hi-tech and supporting the development of domestic high-tech projects, the hi-tech industry developed rapidly in the zone. The main hi-tech enterprises focus on biological engineering, telecommunications, chemicals, new materials and new energy (China Academic Journal Electronic House, 2003).

Dalian Government established a new development area named “Dalian Jinzhou New Area” in the year 2010. The new zone consists of DETDZ and Jinzhou District. The data and other information of DETDZ for the studies are mainly based on the database and literatures before the year 2010. The revitalizing period, which the studies focuses on, started from the year 2003, and the new area was funded in 2010. Thus, Jinzhou New Area is not a representative terminology for the study. DETPZ will be used as an accurately stated terminology for the studies.

2.3.2 Advantages of Development

The research of Cui (2001) discussed there are five main advantages for the development in DETDZ:

1) Location

The zone locates at the center of Dalian Area, where is rich in the deep-water ports.

2) Infrastructure and facilities

By the end of year 2000, the gross investment on the infrastructure facilities and public service facilities was USD 1.1 billion. Many logistics facilities have been built in the zone.

3) Transportation and port

The zone is 27km away from the center of Dalian City and 21km away from Dalian international airport, besides, the zone is next to Shenyang-Dalian Highway and Beijing-Dalian Railway, which are the linking between DETDZ and the hinterlands in Northeast and North China. What is more, there are 6 ports locate at the zone, which strongly support the shipping from all over the world to Dalian Port, vice versa.

4) Human Resource and labor force

There are 18 university and more than 200 scientific research institutions in Dalian. The number of professional human resource and qualified personnel in Dalian has reached 250 thousand. The Parks of Science & Technology in both Dalian City and DETDZ are the strong support for the future development of the high-tech industry.

5) Marketing

The cargoes and goods import or export through DETDZ by shipping and air have been transported to the markets that are around the zone such as North and Northeast China, Japan, South Korea, and Southeast Asia.

2.3.3 Analysis on Development

Cong (2004) listed five achievements of DETDZ during its 20-year development as follows:

1) The rapid growth of economy and the utilization of foreign capitals

The zone has introduced foreign capital from 37 countries and regions and attracted 1,481 foreign enterprises set up branches in the zone with a total investment of USD 11.73 billion. There are 293 projects with the investments that exceed USD 20 million and 9 projects with the investments that are over USD 100 million. And, 40 of the world top 500 enterprises invested in the zone. The investment scale of the enterprises has reaches USD 70 million.

2) The modern industrial cluster in the zone

A group of industries have been established in the zone , including petrochemical, building material, electronics, information technology, mechanical and electrical, biological medical, food processing, textile, clothing, fine chemicals, precision machinery and automotive spare parts.

3) High-Tech industry in the zone

DETDZ also carried the policies that prompt the investment on high-tech industry. With the development for 20 years, the industry in the zone have turned into an high-tech base of electronics and information, biological medical, new materials, optical-mechanical-electronic integration, new energy and environment protection. By the end of year 2003, 100 high and new technology projects of 47 state-owned high-tech enterprises with approved by government, the high-tech output value reached to USD 4.2 billion in the year.

4) DETDZ in promoting of the development of Northeast China

The rapid economic growth in DETDZ drove the development of Northeast China. The domestic purchases by the companies that invested by foreign enterprises in the zone have been increasing since it was founded in 1984. The gross purchase reached to USD 2 billion in the year 2003. The increase brought new opportunities for the domestic enterprises in both the development of markets and the job openings. It also improved the technological cooperation between domestic and foreign enterprises.

5) Energetic efforts for the investment circumstance

DETDZ, which has passed the State Environment Protection System of ISO 1400, becomes one of the Environment-Protected Industrial Zones in China for its favorable natural environment and perfect facilities. Keeping the idea of “Environment is the soul of life and innovation” in mind, the zone will set up a scientific management system for open, fair, honest and efficient environmental administration.

China Academic Journal Electronic House (2003) dissertate the main factors attracting investors to invest in DETDZ as follows:

i The potential markets of many industries in Dalian;

ii Rich resources, many industrial bases and strong technical backing forces;

iii Minimum investment cost. The local government of the zone works hard to reduce the investment cost for investors and cancels the uncompetitive regulations in order to achieve the “zero cost” goal;

iv Traffic and logistic advantages. The three sides of the zone face to the sea with six large ports and the port facilities are perfect. The zone is 18 km away from Dalian International Airport, which have opened 70 lines to 100 countries and regions, besides, the zone is 8 km away from Shenyang-Dalian Highway and Harbin-Dalian electrified railway as well as Beijing-Dalian railway. Dayaowan port railway directly links to the railway in Northeast China. Dalian Port now has become one of main hub ports in the Euro-Asia Continental Bridge, the cargoes from the zone can be exported to European with the developed logistics network.

v Perfect infrastructures and public service facilities;

vi Rich talents and labor forces. There are 200 science research institutes and 18 universities and colleges in Dalian Area;

vii Superior administrative environment. The local government adopts open administrative system for providing effective and fast services for the enterprises in the zone.

viii Perfect financial facilities. Dalian is the largest settlement center in Northeast China. 24 foreign banks and financial organs have representative offices in Dalian. They will provide best services for foreign invested enterprises.

2.3.4 Logistics Development

Dalian Port Bureau and Dalian Logistics Association (2004) expatiated on the development of logistics four aspects.

1) The infrastructure construction of Dalian Port

The so called “One island and three bays” project is the core of the development. “One island” means Dagushan Peninsula, “Three bays” means Dayaowan Bay, Nianyuan Port Area and Dalian Bay Port Area, which include ore hub port, Beiliang port zone and Heshangdao port zone (see Figure 2.4). The constructions of the core began to take shape at the end of 2004. Dayaowan is the central node of the whole logistics system; the Baltic Dry Bulk Cargo are mainly transported via the southern of Dayaowan port zones, while the containers and vehicles are mainly transported via the northern of Dayaowan port zones, and the grocery and the Roll on/Roll off vessels are mainly via the western ports., which locates at Heshangdao port zone.

Figure 2.4 One island and Three Bays in DETDZ

Source: Created by the author based on the Courtesy of Dalian Port Bureau

2) The construction of deep-water ports and berths

After 2 years' construction, a 300-thousand-class oil wharf with the annual throughput capacity of 22.8 million tons and a 300-thousand-class ore terminal with the annual throughput capacity 15-20 million tons were put into service in September, 2004. The total investment to the oil wharf was USD 66 million and USD 200 million to the ore wharf. Both of the wharfs now have been the main supports of the throughput increase of Dalian Port.

3) The establishment of Dalian International Logistics Park

Dalian International Logistics Park (DILP) is a core zone and the main hub of the establishment of on the international shipping center in Dalian. Depending on the logistics development plan in Dalian, the park will be built in to a belt shape that around the Dagushan Peninsula, it covers an area of 12 km^2. The project is based on the integration of Dalian Free Trade Zone Logistics Park and Dalian New Port Logistics Park. Beiliang Logistic Port Area and Shuang-D Port Area are the other two main parts of the logistic park.

From the year 2004, DILP was put in to service as a demonstration. The demonstration passed the acceptance check by Dalian Customs which was on behalf of China Customs General Administration. This park is the second Chinese district-port joint park after the first one was established in Shanghai Yangshan Port Area. The park has attracted more shipping and logistics enterprises to settle in. Besides, the park is a key part of the establishment of the international shipping center.

4) The construction of Dalian Dry Port Base

Dalian Dry Port Base (DDPB) locates at both sides of Houyan Exit of Shenyang-Dalian Highway, which is in Ganjingzi District, Dalian City. The base covers an area of 5.35 km^2.

The main function of the base is to develop the comprehensive logistics, including transportation, warehouse, packaging, loading and unloading, carrying, processing of materials, distribution, intermodal transportation, logistics information processing and other logistics business.

In addition, the base also offers the door to door transportation service by the service platforms on bonded products exhibition and trade, storage and distribution, information processing, customs and other service. This is also an important part of distribution system of the international shipping center.

These efforts on the researches articulated above introduce the basic situation and development about DETDZ. The researchers did panoptic views of the development situation in the zone till the end of the year 2004. The lack of materials and data of the results made a blank of the field. To study the developing strategies for Dalian Port as a whole, the materials and data has been collected in order to fill the blank of the field. Besides, the research will also focus on the relationship and effects between the development of DETDZ in recent years and the future development of international shipping center which is the main development orientation of Dalian Port.

2.4 Dalian Free Trade Zone (DFTZ)

2.4.1 Current Situation

Dalian Free Trade Zone (DFTZ) is a special area that set up by CSC in the year 1992 and supervised by Dalian Customs (China Development Zone Yearbook, 2002).

The area of the zone is 251.3 km^2 it services as the trade and global logistics for Northeast China (Air Transport & Business, 2006). It is located at the center of Dalian New Downtown Area, between DETDZ and Dayaowan Port Area..

The whole DFTZ consists of the following 5 parts: DFTZ, DFTPZ, Zone A of Export

Processing Zone, Dalian Automobile Logistics City and Specialized Terminal Area (Dalian Free Trade Zone, 2011).

There are 3 special customs supervision areas in DFTZ, including DFTZ, DFTPZ, and Zone A of Export Processing Zone. The zone enjoys the most preferential policies and endowed by a supervision mode of "**within Chinese border while outside Customs territory**" (Dalian Free Trade Zone, 2011). The mode conforms to the common international rules and regulations. "Custom in territory" means the zone entitles the preferential policies such as tax free and bonded. DFTZ offers the favorable conditions to modern logistics development, the policies and operation depending on the advantages that the zone is close to the port areas and the special policies of market access, tax, foreign exchange, and express clearance and convenient distribution system (Zhang & Sun, 2005).

Having been founded in 1990s', all the FTZs in China hold a considerable proportion of the Export-Oriented Economy in the country. They are not only the key growth point of the regions where they locate at but also the important channels and nodes of economy between Chinese hinterland and other countries (Yan, 2005). Considering of the geographic advantage and the economic supporting from Northeast China hinterland, Dalian Port and DFTZ will promote the further development in the region.

2.4.2 Five Zones

Dalian Free Trade Zone Administration (2011) lists five parts in the zone as follows:

1) **Dalian Free Trade Zone**, covering an area of 1.92 km^2, was officially authorized by CSC in May of 1992. After a decade of development, DFTZ has made full utilization in international trade, bonded storage, export processing and bonded exhibition, thus the zone attracts more than 2,000 enterprises to come to invest (China Development Zone Yearbook, 2002). Over 500 foreign invested enterprises from 41

countries and regions have invested in DFTZ. Besides, some world-renowned enterprises like ITOCHU, PROLOGIS, IMC GROUP, TOSHIBA have already started their businesses in the zone. DFTZ fully plays its role in promoting economy of Northeast China, improving international trade and connecting the domestic market with foreign markets to adapt to the trend of globalization.

2) **Dayaowan Free Trade Port Zone**, covering an area of 6.88 km^2, was officially authorized for the establishment by CSC on 31 August, 2006. On 28, June, 2007, Phase-I Project of the port area is 3.06 km^2, it was examined and approved by the authorities from CSC and officially put into operation on 20, August in the same year.

Free Trade Port Areas in China are the main economic areas that integrate the most favorable policies, the most convenient customs services and the most competitive location advantages. It is targeted to perform in four major business fields: port service, logistics, processing and exhibition. DFTPZ enjoys and integrates all the preferential functions and policies which other special economic areas like Free Trade Zone, Export Processing Zone and Bonded Logistics Park.

3) **Zone A of Dalian Export Processing Zone**, established in April of 2000 by CSC, is one of the 15 leading export processing zones in China. After 10 years' development, the zone is now provided with perfect infrastructures, facilities and a better development environment. The enterprises in the zone could conduct business in bonded processing with bonded logistics.

4) **Dalian Automobile Logistics City (DALC)**, consists of two parts, is located in Ershilipu and Liangjiadian, in DFTZ. Relying on the preferential policies and competitive location, DALC will vigorously develop its automobile export industry and become an ecological satellite city that is supported by modern service.

5) **The DFTZ Administration Committee** is an office of Dalian Municipal

Government and performs the municipal administration. With its regional characters on principle of putting enterprises and entrepreneurs' interests above everything else, the governmental departments in DFTZ, including DFTZ Administration Committee, Dalian Customs, Immigration and Quarantine (CIQ), Commerce Bureau, State Taxation Bureau and Local Taxation Bureau, provide the high-quality service and sound investment environment for the investors.

2.4.3 Development

Founded in the year 1992, DFTZ is playing a unique and pivotal role in economic and logistics radiating in the development in Northeast China over the past 20 years.

Yang (2001) opined that the operation and management methods in DFTZ should be follow the international practices as much as possible. Besides, DFTZ should also be the most open area in free trade, free investment and free finance.

The aims of DFTZ’s development should be focused on attracting foreign investment and should be a complemented bridge of resources between the free trade zone and export processing zone. In addition, Dayaowan Port Area has a high throughput and the convenient transportations of sea, air railway and highway. Those advantages could attract re-export trade and transit trade.

Han and Zhang (2004) characterized the future development trend would focus on the integration between DFTZ and Dalian Port. The policies for DFTZ would cover Dayaowan Port Area. The integration includes planning, construction, customs supervision and logistics service. The efforts would come into the unique policies advantage and improve a fair and open international business environment in DFTZ.

Han (2008) pointed that the main functions of DFTZ are the conjoint point of foreign and domestic markets, the special economic zone that promotes international trade

and absorbs overseas capital. The free trade zone will fetch in the foreign technologies and promote the development of the industries in the port city.

Hou (2007) mentioned there were more than two thousand enterprises from over forty countries invested and set up branch offices in the zone. DFTZ built three main industries that show itself characteristics and advantages, including trade, logistics and export processing during the 15 years' development. There are three aspects that propel the development of DFTZ:

1) A resources production distribution center has been built in the zone

DFTZ combined advantages of the resources from hinterland with its port logistics to build the distribution center in oil, ore and grain. Now five distribution centers that link to the hinterland of the region on ore, oil, container, automobile and grain have been established at Dagushan Peninsula, meanwhile, the throughput of all the ports located at the peninsula are keeping rapid growth.

2) The logistics in DFTZ

Logistics is one of the main development aspects in DFTZ. The bonded logistics that focusing on global logistics, bonded warehouse, distribution-transportation and third part logistics (TPL) has been developed since the zone founded 15 years ago. The establishment of DFTPZ in 2006 brought new development opportunities for DFTZ. Up to the year 2007, there were 46 logistics enterprises registered in Bonded Logistics Park.

3) The market clusters is rising

Combining with the results of development of logistics and port, DFTZ established comprehensive specialized markets on automobile, petrochemical products, materials and grain and oil, and supplemental markets on industrial parts, gold and jewelry, and automobile spare parts. Those markets promoted the growing of trade in the zone. There are 16 specialized markets in DFTZ with more than 600 enterprises. The annual

turnover of the market reached to USD 7.58 billion.

The development of logistics in DFTZ connects DFTPZ with hinterland of Northeast China. The logistics network in Northeast China which consists of railways and highways is the key support of the development of Dalian and hinterland in the revitalization. The network that centered at the origin of DFTPZ with the logistics nodes such as dry ports, free trade zone, free trade port, bonded logistics center, warehouses and factories has been taking shape in the region.

Zheng (2008) amplified the development achievements of DFTZ, by the end of 2007, DFTPZ started operation and all the economic indexes kept the growth speed with more than 20% in the year. The GDP in DFTZ reached to about USD 1.1 billion, the gross industrial output value increased to USD 957 million. The the total import and export reached to USD 900 million. The development of DFTZ until the year 2007 was rapid and the targets of the development plan were basically met.

2.5 Dayaowan Free Trade Port Zone (DFTDZ)

2.5.1 Characteristics

“Free Trade Port Zone (hereafter referred to as FTPZ)”, as defined by Administration Dalian Free Trade Zone (2011) refers to the areas under the special regulation and supervision of Customs. The zone is established with the approval of CSC. The ports in the zone are open to foreign countries. FTPZ integrates all the policies and functions which were formerly granted to Free Trade Zone (FTZ), Export Processing Zone, Bonded Logistics Zone and Port Area. It is a free trade port with Chinese characteristics with the bonded logistics, the most favorable policies and the most powerful functions, which integrated port and land of Northeast China.

Qi (2008) described that FTPZ has the best advantages on bonded logistics level, policies and location for the mutual development between the port city where the

FTPZ locates at and the related hinterland areas. Comparatively speaking, FTPZ has more advantages than FTZ on the aspects of port, logistics, processing and exhibition. The main business in FTPZ includes cargo transit, global delivery, international sourcing, re-export trade, export processing and exhibition.

DFTPZ was officially approved by the State Council on the 31st August, 2006 through the State Letter [2006] No.80 (Chinese State Council, 2006) for Dalian Port's momentous consequence in Northeast China and the international shipping center development plan (Qi, 2008). DFTPZ covers an area of 6.88km^2. Bonded Logistics Zone, Container Terminal (CT) and the Container Yards (CY) at its front, one berth of Dalian Automobile Terminal and partial backing area of Automobile Logistics Zone locate at the area. DFTPZ Phase-I Project owns a space of 3.06km^2. The No.9 and No.10 berth of Dayaowan CT Phase-I Project and its front yards as well as the No.11–No.16 berths of Dayaowan CT Phase-II Project and its front yards have been established in the port area (Yang& Xu, 2007).

2.5.2 Policy Advantages

Dalian Free Trade Zone Administration (2011) specified three policy advantages of DFTPZ as follows:

1) Taxation Policies

Goods that to be shipped into FTPZ will be kept in the bonded status, if the goods that stocked in the zone are to be distributed to domestic market, the customs duty will be charged. The domestic goods will be regarded as exported upon delivery into the zone. Therefore, the exporter will be required to go through export formalities and the value added tax (hereafter refers to VAT), which the exporter paid previously, will be refunded thereafter. Goods transactions within the zone are free from VAT and consumption tax.

2) Duty Free Policy

The following foreign goods are exempt from Customs duty in DFTPZ: equipment and materials to be required by infrastructure construction projects of FTPZ, machinery, equipment, logistics facilities as well as their spare parts that for the logistics operation and reasonable quantity of office necessities in FTPZ.

3) Quick & Convenient Operational Management

Customs implements an electronic bookkeeping system after the transportation to control the goods of bonded warehouse, distribution, and processing, between the zone and overseas market and in order to provide the VAT refund certificate upon entry of the goods into the zone. The goods transactions in the zone are duty free; enterprises only need to provide Customs with the electronic information of relative goods. Customs allows the enterprises of the zone to register to be customs Declaration Company with both acting declaration and self-declaration. The enterprises outside the zone can operate in FTPZ by registering a branch. The bonded processing businesses in FTPZ are exempt from bank deposit account for processing trade, contract verification, and standard charge for wasting.

The cargo trade between the companies in FTPZ and domestic companies can be settled not only by RMB but also by the foreign exchange. If the buyers in domestic area import the goods from enterprises in the zone, the domestic buyers could make the settlement either to the enterprises in the zone or to a bank account in overseas market, when domestic firm exports to the zone, the payment could be made either from the zone or abroad.

2.5.3 Meaning of DFTPZ to Northeast China

As the most important FTPZ in Northeast China, DFTPZ has a developmental significance to the plan of revitalizing Northeast China. DFTPZ is a positive factor that promotes the development of logistics in the region and enhances the functions of

Dalian Port as the logistics center for the region.

And the region needs a shipping center that includes free trade port to strengthen logistics, finance and information exchange. DFTPZ links to the ports that transport most of the containers, grain, automobile, crude oil and iron ore of the region. The sea-railways transportation system in the region makes the cargoes from the dry ports locating at hinterland such as Shenyang, Changchun, Harbin and Manzhouli to transport to DFTPZ.

The Northeast China will be more open than ever through the effective logistics system. The enterprises from hinterland can also set up branches in DFTPZ in order to get more opportunities to enjoy the advantage polices in the area (World Shipping, 2009).

Li (2007) stressed that the development of DFTPZ is the need of establishing the costal economic zone in Liaoning Province. Besides, the logistics centers, the dry ports locate at hinterland and other costal ports of Northeast China could transport the cargoes to DFTPZ, and vice versa. A bonded logistics network would be formed according to the revitalizing plan.

DFTZ was in an inferior position in the competition with the other ports in Japan and South Korea for the lagged policies. Many cargoes that should have been directly shipped from Dalian Port were transshipped via Japanese and South Korean ports (Zhou & De, 2006). The international cases showed that whether to use the policies about FTPZ is an important mark to evaluate the development level of an international shipping center. The port cities near Dalian like Pusan, Kwangyang and Nagasaki are operating free trade policies in their ports with high economic openness and flexible operation ways. DFTPZ would provide the backing forces on policies and functions for the establishment of the international shipping center. In addition,

DFTPZ would bring more sources of international transit goods and enhance the international competitiveness of Dalian Port (Economic Daily, 2007).

Zhao and Sun (2007) amplified the meaning of DFTPZ for Northeast China in six aspects:

i Attract the transshipment containers and foreign investment;
ii Promote the economic development and logistics development;
iii Develop the Export-oriented economy and momentum of economic openness;
iv Enhance the international competition;
v Optimize the port facility environment;
vi Be beneficial to the development Northeast Asia trade and logistics center based on Dalian Port.

2.6 Establishment of Dalian International Shipping Center

2.6.1 Background

In the year 2003, ***The Suggestions on Revitalizing Northeast China*** promulgated by CSC stated the plan of establishing Dalian into a significant international shipping center in Northeast Asia (National Development and Reform Commission, 2003).

Xu and Gao (2004) analyzed that the reason for Chinese central government decided to set up the shipping center in Dalian was the geographic advantage and the economic development in the city in recent years. Besides, Dalian was playing a crucial role of promoting the economic development for Northeast China.

Northeast Asia has become one of the three biggest trade zones in the world as same as North America and Europe Union. Under this circumstance, the countries around the area were trying to establish the international shipping centers as their chief target in order to set up the regional economic centers and attract more resources from other countries, for instance, Russia improved the construction of Vladivostok and

Nakhodka; South Korea was developing Pusan and its affiliated ports at the same time.

In the year 2005, ***Suggestions of Enhancing the Opening of Northeast China*** promulgated by CSC said to speed up the development of Dalian International Shipping Centre. The constructions of the port facilities should be strengthened to further development of Dalian Port and to attract more foreign investment in order to absorb the essential factors of the development of logistics.

The supports from national policy are benefit for the construction of the large-sized ports and promote the development of the industries that invested by foreign enterprises. In addition the policies made a better investment environment for the investors (National Development and Reform Commission, 2005).

2.6.2 The Role of Dalian International Shipping Center

Zhang, Wang and Zhao (2006) point out that the most important function of the shipping center is the strategic logistics node for the revitalization in the region. Dalian Port locates at the center of Northeast Asia and close to the international container vessel line. Besides, a number of the national level heavy industry bases are locating at Northeast China such as, grain production base, the iron, crude oil, coal, timber and basic chemical material. Most of the products from these industrial bases are exported via Dalian Port.

Lu, Wan and Gong (2010) stressed that the main function of the shipping center is transportation and logistics. The intermodal transportation between Dalian Port and hinterland through air, sea, highway and railway will constitute a correlative whole of logistics. The ports and airports in the region connect to Dalian Port are the key nodes for the logistics network. And there are another seven functions in the center respectively trade, produce and processing, shipping counseling, financial service,

information center, human resource exchange and tourism.

2.6.3 Advantages for Dalian Port

Feng (2005) stated that the main advantage for Dalian Port is the national level revitalizing plan for Northeast China. The plan brings supports of policy and the deployment of resources. Another advantage is that Dalian Port could integrate the resources fom the other ports locate in the region such as Yingkou, Dandong and Jinzhou Ports in the process of constructing the shipping center (see Figure 2.2). Finally, a shipping group centralized by Dalian Port will become a high efficiency logistics system with better cooperation and low cost.

Wu (2011) indicated that Dalian Port is a famous international trade port in the world for its natural deep-water. It is also the nearest point for Northeast China to the world. In the past, the development of Dalian Port was affected by the slow economic growth in Northeast China, but now the revitalization in the region will be a support for the development in Dalian Port.

Lu, Wan and Gong (2010) point out that DFTPZ is the only FTPZ in Northeast China. DFTPZ has brought more resources of supply since it founded for its advantages of policies, management methods, operation ways and service.

Zhu (2007) summarized the advantages of Dalian Port for the establishment of the shipping center. DFPTA, the most important part of Dalian Port, has the best tariff and tax policies as well as the operation policies for the enterprise. For example, both of the bonded and non-bonded goods can be stored in DFTPZ with no time limitation. Besides, the processing enterprises in DFTPZ can enjoy the free of VAT policy.
In addition, more than ten universities in Dalian have started to study logistics. There are more than three thousand students graduate in the major annually. It is a strong support for the development of logistics in the port.

The export goods provided from hinterland of Northeast China have been the main source for the logistics enterprises. The main goods include automobile and its spare parts, coal and crude oil. There are more than 200 countries and regions have set up business relation with Dalian Port.

2.6.4 Main Problems

The research of Li and Li (2004) analyzed two development issues of the international shipping center.

First, the economy grew slowly in the hinterland of the region causes the lack of containers to Dalian Port. Dalian Port was the largest trade port in China, but the position of has slipped from the 1990s. In the year 2003, Dalian Port was at the 6th in the port list of China. The development of the container transportation was relative slowly compared with Tianjin Port and Qingdao Port which are locating around BSER. What is more, Dalian Port also lagged far behind the other international container ports in Northeast Asia.

Second, most international trade shipping lines from Dalian Port are Near-Sea shipping lines; only few of the lines are ocean transportation lines. Influenced by the economic development and foreign trade structure, the container shipping lines from Dalian Port are mainly to Japan and South Korea. There were only 8 ocean transportation lines in 2004. In the year of 2002, the throughput in Dalian Port was 652 thousand TEU. The lack of ocean transportation led part of the containers from hinterland must be transferred via the ports of other countries such as Pusan Port.

Zheng, Jin and Zheng (2005) stated 67% of the ocean transportation containers from Dalian Port were transferred via Japanese port in the year of 2001. The losses of the source of containers severely affected the international shipping of Dalian Port in the past.

2.7 Summary

These past studies articulated above introduce the basic development situations for the development of Dalian Port and the establishment of the international shipping center. The researchers did concluding summaries of the issues. The lack of materials and data of former studies made a blank of the research field. To study the developing strategies for Dalian Port and the international shipping center, the materials and data will be collected and analyzed in order to make the proposal and advisable suggestions to the topics. The topics focuses on the establishment of international shipping center is the main development target of the development of Dalian Port.

CHAPTER 3 METHODOLOGY

3.1 Introduction

This chapter presents the research design, methods of date collection and analysis, research trip and interview and comparative analysis and evaluation. Data analysis in the study is also stated in the chapter.

3.2 Research Design

The studies focus on the development strategies for Dalian Port under the background of the revitalization in Northeast China. The thesis consists of three main parts that play important roles in the development of Dalian Port:

1) The development of logistics in Dalian Port
2) The development of Dalian Economic Technology Development Zone and Dayaowan Free Trade Port Zone
3) The establishment of Dalian International Shipping Center

The studies use the primary sources from field study, observation, document analysis and case study. In addition, the secondary sources collected from documents were also used for the studies. For the primary resources, the qualitative method of data collection is used for the study.

Besides, the analysis of the study base on the chronological approach. It is easy to display the tendency of the indexes such as the container throughput. The study uses qualitative and quantitative analysis in order to identify the problems in the development and find the trend of each index which is important to the development of Dalian Port. The qualitative analysis for the study is based on the results of the quantitative analysis. Thus, the results of the study will be logical and reliable.

3.3 Data Collection

In order to secure the relevant data for the studies, data from *Dalian Statistical Yearbook* and other related literatures have been collected pertaining to history of logistics development and environment of Dalian spanning from 2003 to 2011. In addition, interviews with the persons who are in charge of departments concerned of Dalian Port, such as Dalian Port Group, Dalian Marine Department, and Dalian Railway Department.

3.4 Method of Data Analysis

The data analysis has been conducted based on relevant data being collection through field research and other materials. The method of data analysis is based on comparative analysis which will be benefit for identifying the roles of the factors, i.e. positive or negative, and the analysis about how to change the negative factors in the future development procedures will be put in the thesis as one of the strategies.

The comparative analysis has identified the trends of the developments factors, i.e. positive or negative. Through comparing the change of the data, the trends of the development of logistics in Dalian Port such as the fluctuating of import and export cargos have been shown in figures and tables.

3.5 Field Research Trip and Interview

Field researches and interviews have been conducted in Dalian Port and all departments concerned during the past one year. Through those field researches and interviews relevant information and data have been obtained.

From the field researches and interviews brought some new ideas relating to the studies. The main purposes in doing the field research is to collect the relevant official data regarding the logistic development, including ports, highways and railway and logistics development policies.

The interviews with the people who are working at Logistics Department of Dalian Economic Technology Development Zone Administrative Commission and Logistics Bureau of Dalian Free Trade Zone conducted for over two weeks between August and September in 2011, and one week in March, 2012 for collecting more official data of Dalian logistics. And the damage and loss by petroleum storage tank explosion of China National Petroleum Cooperation Dalian Branch are also the important contents of the data collection.

3.6 Evaluation

The estimation is based on the judge of the results of the studies in order to evaluate the potential of the studies to this academic sector. In addition, the estimation also focuses on the contribution of the studies to the future studies and sustainable development for Dalian Port. The studies try to find a positive developing proposal for Dalian Port in the future. The studies will contribute to not only the logistics development of Dalian Port but also other port cities that have the similar to that in Dalian.

CHAPTER 4 LOGISTICS DEVELOPMENT OF DALIAN PORT

4.1 Introduction

This chapter is an overview of the logistics development in Dalian Port in revitalizing Northeast China. Besides, the chapter presents the development targets, achievements and the main problems of Dalian Port in revitalizing period so far. It is necessary to introduce the development situation of Dalian Port as a whole in order to lay a foundation for the analyses in the following chapters.

4.2 Overview of Dalian City and Port

Dalian Port has become the opening window and a leading port city in Northeast China since the year 1984. It is the main gateway and hub port for the export of the commodities and materials from hinterland of Northeast China to the other parts of China as well as to the international market, and is also a significant nodal point for connecting the two markets–domestic and foreign markets–and two types of resources–domestic and foreign resources.

Dalian is the window of Northeast China open to the outside world. The only Free Trade Zone and Free Trade Port Area in Northeast China are located here. 84 world top 500 enterprises have invested 179 projects in Dalian.

Dalian Port locates at the center of Northwest Pacific, it is the core port of coastal area in China, one of the main container ports, and one of the largest international trade ports in Northern China. As the most convenient gateway to the Pacific and the outside world, Dalian Port is one of the most ideal ports to ship cargos to the Far East, South Asia, North America and Europe.

Facing the Bohai Sea on the west and bordering the Yellow Sea on the east, Dalian Port is situated at the center of the Northeast Asian economic circle and the Bohai

Rim. It’s the nearest point for port cities around Bohai Rim Zone and Liaodong Peninsula to open up to the outside world, and also the most convenient gateway for the Northeast Asian area to enter into the Pacific Ocean area and reach out to the world.

With a history of over 100 years, Dalian Port has developed into a comprehensive port with advanced facilities and complete service functions. It possesses 38 port-based enterprises and 225 berths, among which there are sixty-one 10,000-ton berths. Total length of the berths is 30 kilometers with annual throughput of 155 million tons and the maximum berthing capacity is 0.3 million tons. Dayao Bay Container Logistics Port Zone, Beiliang Port Grain Transshipment Center, Dagushan Ore Transshipment Center, Nianyu Bay Oil Products and Chemicals Transshipment Center, Passenger and Cargo Ro-Ro Vessel Functional Zone, and Dalian Bay General Groceries Functional Zone have initially come into being. And Lushun-Yantai-Dalian Train Ferry Functional Zone is currently under construction. In 2004, Dalian Port handled 145 million tons of cargo, and container throughput reached 2.21 million TEUS and passenger 6.17 million.

Dalian Port is backed by Inner Mongolia and the economic hinterland in Northeast China, and faces Japan, North Korea and South Korea across the sea. It' s one of the most convenient ports to transport cargos to and from the Far East, South Asia, North America and Europe-As the main port for foreign trade and transportation in northeast economic zone of China, Dalian Port handles over 62% foreign trade transportation and over 90% of containers for foreign trade in the Northeast China. At present, it has established trading and shipping relationships with more than 300 ports in over 160 countries and regions around the world.

4.3 Targets of Logistics Development

Dalian Port is an important coastalkey port and main truck line for containers. It is the

central port around Bohai, and it is also a super large port for strategic materials transshipment in deep water in Northeast China and one of the comprehensive traffic and transportation hinges in China. Dalian Port will focus on developing international main transportation line for container, and comprehensively develop the bulk cargo transshipment for crude oil, ore, bulk gain, commercial auto etc., and accelerating the enlarging pace on port logistics, bonded tax, information, commerce and trade, and international sea travel service. Besides, Dalian Port will also actively promote the formation of marine economic zone and port industrial area, aiming to establish Dalian Port into a comprehensive, international, multifunctional, and modern great port, which can serve clients and cargo, combine domestic and foreign trade, and engage in commerce, industry, and trade at the same time. And it will become the core carrier for logistics in northeast and international shipment center in Northeast Asia.

As mentioned in Chapter One, the development plans for Dalian Port were set from 2003 to 2007. The “Plan of Revitalizing Northeast China” was set up in 2003–the middle time of the “*10th Five-Year Plan (2001-2005)*” period. Dalian Port seized the opportunity and developed rapidly from the year. The logistics in Dalian port came to a new era of all round development. The long-term development target for the port is to establish Dalian International Shipping Center.

Dalian Port made significant progress in the “*11th Five-Year Plan (2006-2010)*” period. The main development target of the port city is to construct the infrastructures and absorb the foreign capital for the port. In addition, Dalian Port also increased the attractiveness and was successful in upgrading the competitiveness in order to promote the establishment of the Shipping Center in the same period.

The general layout for port development will focus on “Two Zones and One Belt”, and develop other ports proportionally so as to form a multi—level port system with perfect function and strong core competitive power. That is, form a general

development layout which are composed by multi-level industry ports like the core transportation port zone of "One Peninsula and Three Bays" (Dagushan Peninsula, Dayao Bay, Dalian Bay and Nianyu Bay), the Changxing Island Port New Comprehensive Port Area which focuses on port neighboring industry, Zhuanghe "-Pikou Marine Economic Belt, Shuangdao Bay, Dagang Port Zone, Lushun New Port, and West Coastal Port Neighboring Area of Dalian Bay etc.

4.4 Development Achievements of Logistics

4.4.1 General Development

In the "*11th Five-Year Plan* (2006-2010)" period, Dalian City invested Chinese Renminbi Yuan (RMB) 39.6 billion in the fixed assets of Dalian Port. The throughput of the cargoes imported and exported via Dalian Port in the period reached to 1.25 billion tons, meanwhile, the throughput of Twenty-foot Equivalent Unit (TEU) through Dalian Port rose to 213.86 million. As an important node of the world shipping network, Dalian Port undertook 64% of the import and export cargoes of Northeast China.

The logistics development in Dalian Port grew vigorously in the same period. In 2010, the gross revenue of Dalian logistics rose to RMB 1,450 billion. In addition, the added value of Dalian logistics was RMB 47.29 billion, which represent 9.5% of the annual GDP. Based on the booming of global logistics in Dalian Port, the international competition of the industries related to the international and domestic trade was promoted in Northeast China，such as mining, automobile industry, petrochemical industry and servicing business. Overall, the rapid development of logistics in Dalian Port promoted the national economy in the region. These achievements are the strongly support for the revitalization in Northeast China.

4.4.2 The Investment in Dalian Port

The gross fixed assets investment in Dalian Port goes up to RMB 72.84 billion from

the year 2003 to 2011 (See Figure 4.1), RMB 39.6 billion of which was invested in the "*11th Five-Year Plan*" period. With the financial supports, Dalian Port was developing at an unprecedented rate in the recent 9 years after the implementation of the plans for revitalization and International Shipping Center establishment in Dalian City

The analysis of the investment in Dalian Port bases on the statistical data from 2003 to 2011. All the new development plans for the port were authorized by Central Government from 2003, in other words, the year 2003 is the beginning of revitalizing time in Dalian Port. The Statistical Communique of Dalian National Economic and Social Development did not mention the contents related to the fixed assets investment in the port because the results of revitalizing plan were taken into statistics yearbook since the year 2004.

The characters of the subjects of investment to Dalian Port are marketization and diversification as well as the operators of the port.

The Phase-I Project of Dayaowan Container Terminal of Dalian Port was invested by Dalian Port Co., Ltd. (PDA) and Port of Singapore Authority (PSA), the total amount of the investment was RMB 4 billion.

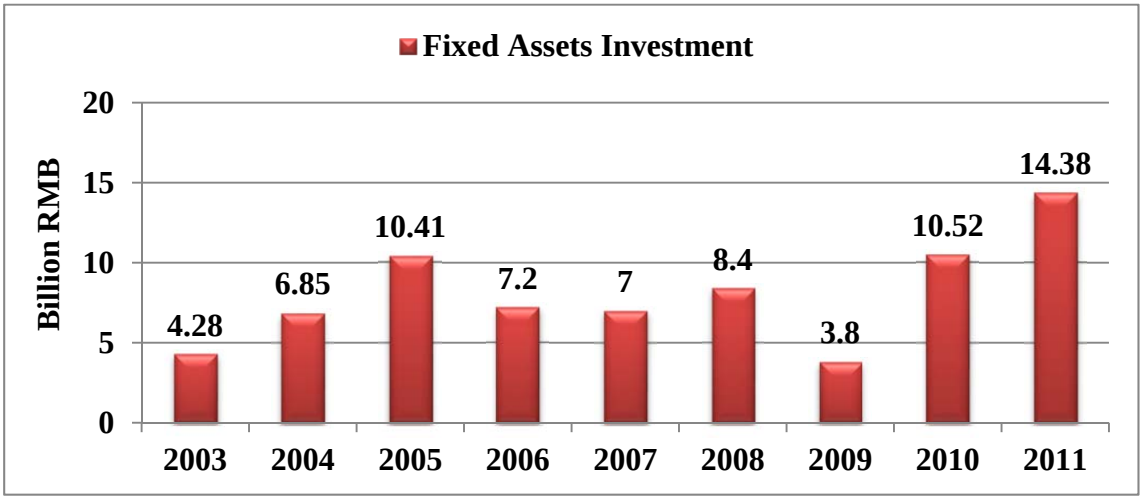
The Phase-II Project of Dayaowan Container Terminal was invested by PDA, PSA, China Ocean Shipping Company (COSCO) Pacific Limited and AP-Moller-Maersk Group, the total amount of the investment was RMB 800 million.

The Phase-III Project of Dayaowan Container Terminal was invested by PDA, China Shipping Terminal Development Co., Ltd. (CSTD), CSTD Hong Kong Branch and Nippon Yunsen Kaisha (NYK), the total amount of the investment was RMB 4 billion.

At the same time, ProLogis, the leading global provider of industrial real estate, invested to the ProLogis–Jifa Logistics Park project in DFTPZ.

Figure 4.1 illustrates the three new development periods by the trend of the fixed assets investment in the nine years. The early period is from 2003 to 2005, the stable development period is from 2006 to 2008 and the adjustment period is from 2009 to 2011.

Figure 4.1 Fixed Assets Investment to Dalian Port (2003-2011)



Source: Create by the author based on Statistical Communique of Dalian National Economic and Social Development 2003-2011

1) Early Period (2003-2005)

As mentioned above, 2003-2005 is the early time of the new development period. The investments to the fixed assets of Dalian Port were increasing year by year. The large investment was the key support of the infrastructure construction of port, highway and railway terminal. The investment in 2004 and 2005 effectively prompted the establishment of Dayaowan Port and the building of highway network project in Dalian.

In the year 2003 and 2004, the main development items for Dalian Port were the construction of the ore terminal and oil wharf, which are both of 300 thousand-ton class dock berths, and both of the items were completed in 2004. The new port

facilities brought 33 million tons throughput capacity of dock berths for Dalian Port. And. In addition, the Land Reclamation Project in DFTZ was also completed.

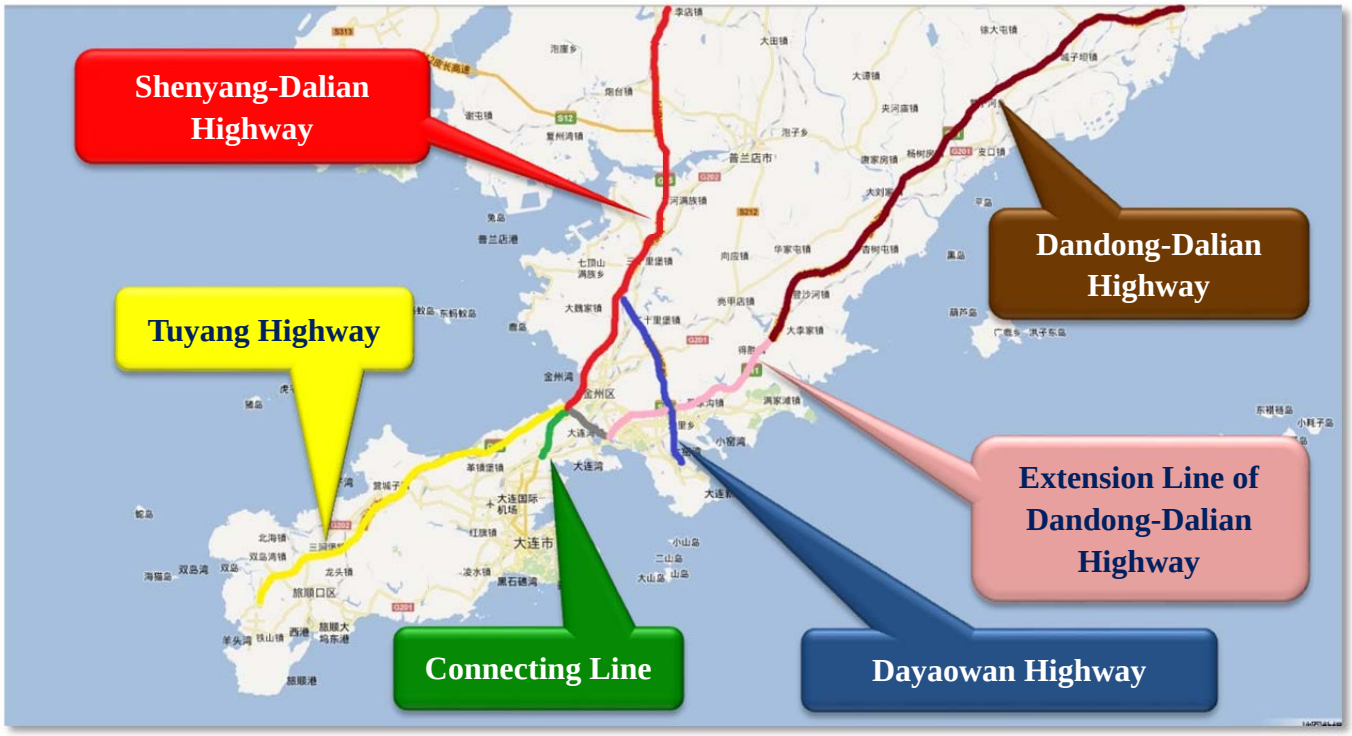
The Railway Ferry Terminal of Yan-Da Ferry Railway which is from Dalian Port to Yantai Port (in Shandong Province) was launched in 2004. What is more, Dalian Port opened 2 new international shipping lines and Dalian Airport opened 3 new international airlines in 2004. Dayaowan Phase-II and Phase-III Container Terminal Projects as well as the Automobile Terminal and the General Break-Bulk berth that locates at Dalian Bay were still under the construction.

The main developing items in 2005 included 41 shipping projects and the 2 berths constructions of the Phase-II Project at Dayaowan Container Terminal. Besides, the constructions of Dayaowan Phase-III Project, the General Break-Bulk berth, Automobile Terminal were speeded up in this year.

The Railway Ferry Terminal of Yan-Da Railway was completed in this year. Besides, The project of Dalian high ways network (see Table 4.2) including Tuyang Highway (the yellow line), Dayaowan Highway (the blue line), and the connecting line (the gray line) between Shenyang-Dalian Highway (the red line) and Dandong-Dalian Highway (the brown lines) was launched in 2005. The total length of the highways is 85 kilometers and the investment for the project is RMB 5.3 billion.

Dalian Port opened 15 new international shipping lines and Dalian Airport opened 11 new international airlines in this year.

Figure 4.2 Dalian Highway Network



Source: Create by the author based on http://liaoning.nen.com.cn/7799385731629056O/20080817/2485875.shtml

2) Stable Development Period (2006-2008)

The investment trend in Figure 4.1 indicates that 2006-2008 is a stable development period of the new development period. The investments to the fixed assets of Dalian Port in the three year were stable. Though the investments in the three years were less than the former years, the projects of the logistics infrastructures in Dalian Port were progressing smoothly.

In the year 2006, DFTPZ Project was officially approved by the State Council. There 48 shipping projects started to operate in Dalian Port. And 23 new berths with throughput capacity of 50 million tons per year and the Automobile Terminal were available from this year.

In addition, the construction of General Break-Bulk berth was completed. Dayaowan Phase-II and Phase-III Container Terminal were still under the construction as before. The construction projects of public port area at Changxing Island and Dalian Railway

Container Terminal initiated in this year. At the same time, the north shore area of Dayaowan Bay was started to develop. The main part of Dalian high ways network was completed in this year.

The airlines of Dalian Airport reached to 119, including 76 domestic lines and 43 global lines in this year.

In the year 2007, the Phase-I Project of DFTPZ passed the approval and acceptance check procedure by the State Council and started to operate. And 12 new berths with throughput capacity of 14 million tons per year brought into service.

The construction projects of 3 50-thousand-ton class dock berths at Changxing Island were completed and the berths were put into operation in this year. The constructions of the large specialized berths of Dayaowan Phase-II and Phase-III Container Terminal speeded up in this year. The double tracking railways of Jin-Yao line and Dayaowan Highway opened to traffic.

The carrying capacity of the new railway line is 48 million tons per year. Besides, the projects of upgrading Dalian Bay Railway, the Phase-I Changxing Island Railway and the main part of the connecting line between Shen-Da and Dan-Da highways were completed in this year. In addition, the Port Highway and Binhai Road in Changxing Island were launched in this year. The airlines of Dalian Airport reached to 133, including 84 domestic lines and 49 global lines in this year.

Dalian Port signed an Agreement in terms of Strategic Cooperation with Yingkou and Jinzhou Port in 2008.

The integration of port resource made a breakthrough in Liaoning Province. And 12 new berths with throughput capacity of 13.29 million tons per year brought into

service. The projects of the #17 and #18 berths at Dayaowan Container Terminal were completed and put into operation. The projects of a new 300 thousand-ton class oil wharf and the Liquefied Natural Gas (LNG) terminal owned by China National Petroleum Company Dalian Branch were speeded up in this year.

The Yan-Da Ferry Railway started to operate in this year. The construction projects of public port and its breakwater at Changxing Island were completed.

The airlines of Dalian Airport reached to 147, including 100 domestic lines and 47 global lines in this year.

3) Adjustment Period (2009-2011)

Influenced by Lehman Shock, the fluctuation of the investment in 2009-2011 was in a wide range. The investment to the fixed assets of Dalian Port main focused on the infrastructure construction of port areas, the Logistics Park and expansion project airport. The investment in 2009 and 2011 effectively prompted these projects.

Lehman Shock that happened at the end of the year 2008 affected the economy of all over the world, especially influenced the global trade. As a logistics port, Dalian also suffered from crisis. Though the economic situation was very critical, Dalian Port was still kept developing in the year.

In the year 2009, the projects of No.22 oil wharf at Nianyuwan Port, the main part of the road for port congestion of Changxing Island and the road for port congestion of Dayaowan Port were completed in this year. The Phase-III Expansion Project of Dalian Zhoushuizi Airport was progressing smoothly.

In addition, the constructions of the deep-water port of Changxing Island and the road for port congestion of Dalian Bay were launched in this year. Some new ports projects in Dayaowan Port Area, such as 4 berths of container terminal, the new 300

thousand-ton class oil wharf and the specialized ore terminal and the projects of new ports areas in Zhuanghe and Lvshun, were all through the acceptance check and put into service simultaneously. As a result, the throughput capacity for whole Dalian Port increased by 30 million tons per year.

Besides, 6 block container trains (BCT) from Dalian Port to the main logistics node cities in Northeast China and Dalian–Far East Russia train were open to service in this year.

The airlines of Dalian Airport reached to 144, including 107 domestic lines and 37 global lines in this year. The growth of domestic lines was driven by the policies of expanding domestic demand. And the shrinkage of international flight was due to the affect by the global depression.

Dalian Port shook off the shadow of Lehman Shock in the year 2010. The porjects of the logistics in Changxing Island, including a 300 thousand-ton class oil wharf and the breakwater of North Port were speeded up in this year.

Dayaowan Railway Cotainer Terminal of Yan-Da Railway was completed and in this year put into service. The infrastructures project in the north shore area of Dayaowan Bay was speeded up as well as the International Logistics Park of Dalian Airport in this year. The airlines of Dalian Airport reached to 152, including 116 domestic lines and 36 global lines in this year.

In the year 2011, the investment for fixed assets of Dalian Port kept increasing to launch new project of infrastructures.

The port areas that locate at Taiping Bay and Lizifang Bay began to be constructed. The No.15 berth of Dayaowan Container Terminal was put into service. The 300

thousand-ton class oil wharf in Changxing Island and the International Logistics Park of Dalian Airport were speeded up in this year.

The Phase-III Expansion Project of Dalian Zhoushuizi Airport was completed in the year. The areas of the new terminal, apron and parking area were 71 thousand m2, 340 m2 and 140 m2 respectively. The airlines from 15 countries to Dalian reached to 154, including 115 domestic lines and 39 global lines in this year.

4.4.3 The Development of the Logistics System

The analysis mentioned in last section indicates that the infrastructures of Dalian Port, including seaports, airport, shipping, highways and railway, were developing by leaps and bounds in the "*11th Five-Year Plan*" period. The functions of both seaports and airport were upgrading. In addition, the comprehensive strength of whole Dalian Port was improved in the period.

After developing for 9 years, Dalian Port has transformed into a Third Generation Port which focuses on intermodal transportation. Now it has been a distribution center of resources. Besides, the cooperation and integration between Dalian Port and other port cities including Jinzhou, Huludao and Dandong form a group of featured cluster of ports which centers on Dalian Port.

Now the development of the logistics network (see Figure 4.3) in Dalian Port has been a strong support for the revitalization in Northeast China.

Figure 4.3 Logistics Network of Dalian Port

Source: Create by the author based on The Report on the Development of Dalian Logistics Industry 2010

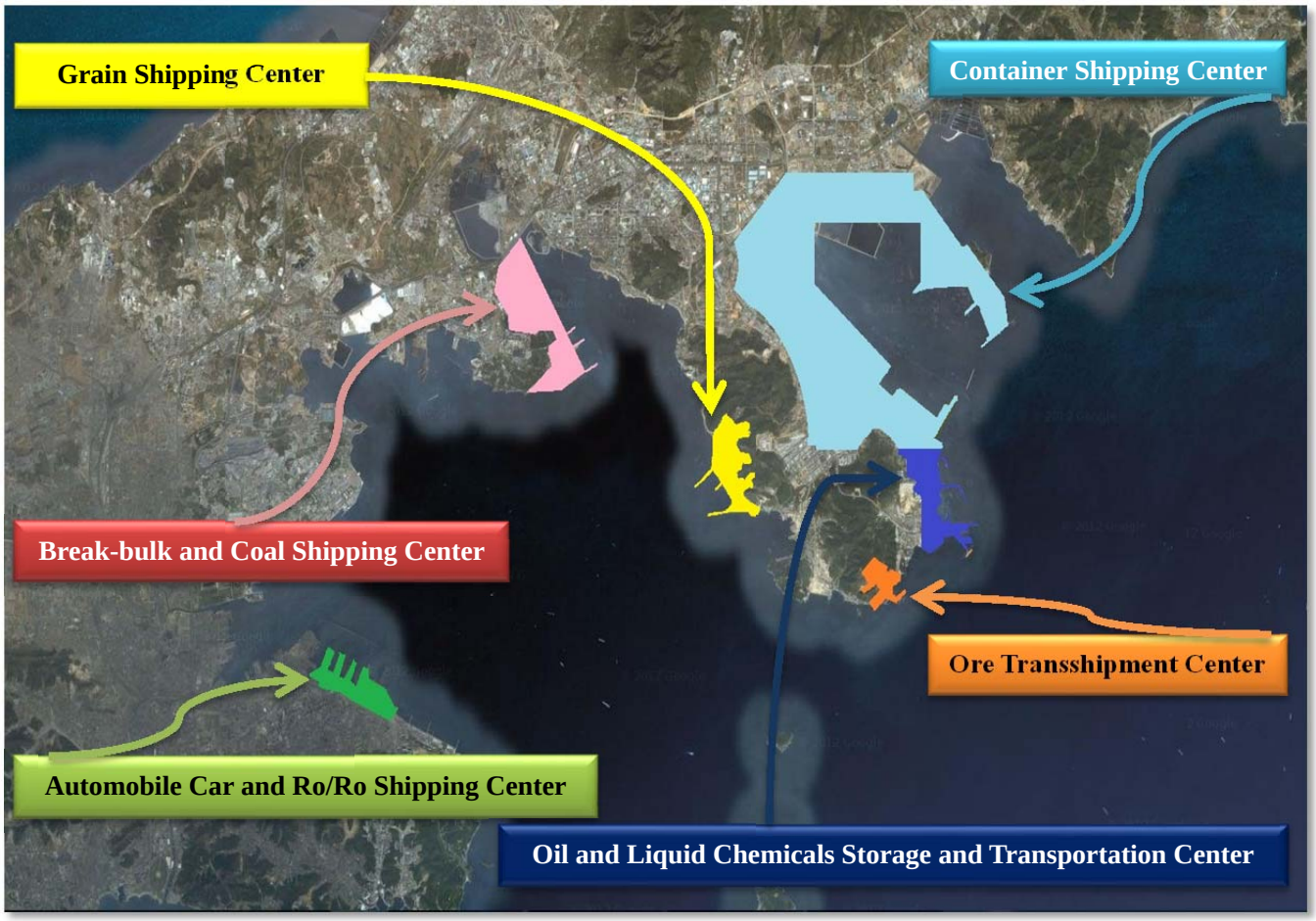
Now Dalian Port owns 196 berths, 78 of which are 10-thousand-ton class berths. Especially the Automobile Terminal and the 300-thousand-ton class oil wharf and ore terminal. These port facilities has come up to advanced world standards and play a crucial role in the transportation of domestic and foreign resources.

There are six shipping center in Dalian Port (see Figure 4.4).

The Container Shipping Center, Grain Shipping Center, Container Shipping Center and Oil and Liquid Chemicals Storage and Transportation Center locate at Dayaowan Port Area.

The Break-bulk and Coal Shipping Center and the Automobile Car and Ro/Ro Shipping Center locate at Dalian Bay Port Area.

Figure 4.4 Shipping Center in Dalian Port



Source: Created by the author based on The Report on the Development of Dalian Logistics Industry 2010

There are some specialized port areas in the "One Peninsula and Three Bays" area, which focus on the construction of Dayaowa Port Area, Dalian Bay Port Area, Nianyu Bay Port Area, Ore Port Zone, and Beiliang Port Zone etc. In addition, the Yan-Da Ferry Train Terminal locates at Lushun Port Area in order to reduce the distance of transportation.

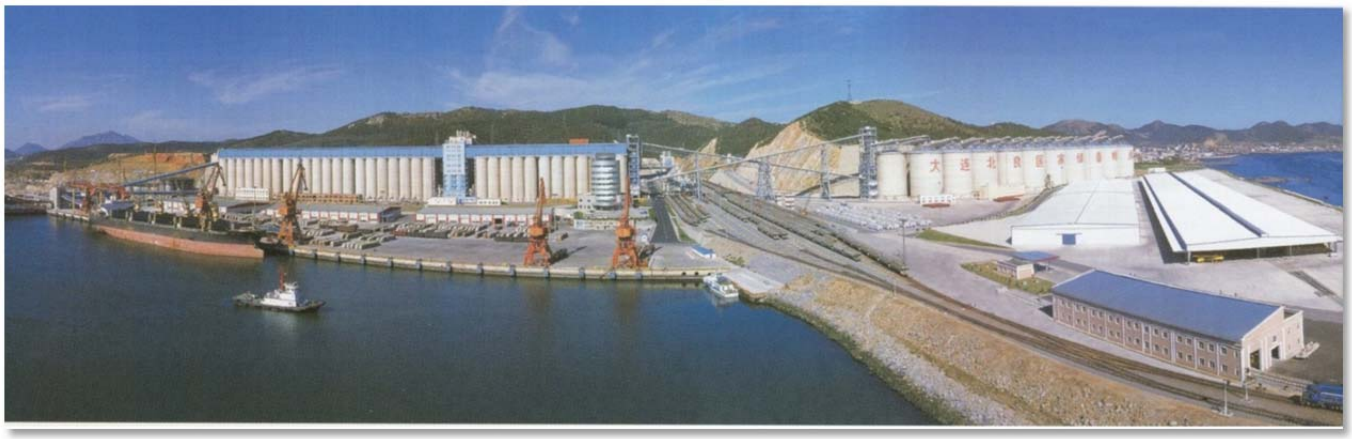
The specialized deep water port areas include the ports for container, petroleum and liquid chemicals, ironstone, break-bulk, commercial automobiles, groceries, passenger, Ro/Ro vessels, and international mail ship.

4.4.4 Main Port Areas in Dalian

1) Bei Liang Grain Transshipment Center Port

Beiliang Grain Transshipment Center Port locates at the southwest bank of Dagushan Peninsula. The port possesses 3 large berths for loading and unloading the bulk grain and 7 multipurpose berths. The quay line of Beiliang Port is 2,879 meters long and the depths of the berths are from 12m to 16m (see Figure 4.5). Its maximum berthing capacity is 10 thousand tons and the annual cargo handling capacity is 28 million tons. The maximum capacity for unloading of train and loading of ship amounts to 4000 tons per hour, and that for unloading from ship and loading for railway is 2000 tons per hourin the port. The annual transshipment capacity of Beiliang reaches 12 million tons.

Figure 4.5 Bei Liang Grain Transshipment Center Port



Source: Courtesy of Dalian Port Bureau

2) Nianyu Bay Port Area

Nianyu Bay Oil Products and Chemicals Transshipment Center locates at the southeast bank of Dagushan Peninsula and is comprised of 2 crude oil docks, 5 product oil docks, and 3 docks for both crude and product oil. The total length of the berth is 2,710m and the annual handling capacity of the port is 50.71 million tons (see Figure 4.6).

The 300 thousand-ton class wharf built in 2004 for the imported crude oil is the largest crude oil wharf currently available in China. The deepness of its front edge is 25m. The unloading capacity of the wharf is 30 thousand deadweight tonnages (DWT). In another word, the wharf can unload the crude oil from very large crude carrier (VLCC), which shipping capacity is 16 to 30 thousand tons.

Figure 4.6 Nianyu Bay Port Area

Source: http://guoyou.cnerent.com/2007/yinzhijiang/469.html

3) Dayaowan Port Area

Dayaowan Port Area is the largest container transportation and transshipment base in North China. It locates at the north bank of Dagushan Peninsula. There 7 berths completed in the Phase-I Project of Dayaowan container terminal, 5 of which are linear berths. The maximum depth of the berths is 14.5m and the total length of the dock is 1,500m (see Figure 4.7).

Figure 4.7 Dayaowan Port Area

Source: http://www.ceh.com.cn:8080/epaper/ceh/20110910/E15/E15_73.htm

The annual throughput in the port area is 2 million TEUs. 6 deep-water berths for containers have been constructed in Phase-II Project. There 2 berths of Dayaowan container terminal Phase-II Project have been completed and put into service already. The water depths of the new berths are also 14.5m, and the dock lines of Phase-II Project is 2,097 meters. The container throughput capacity of the whole port area will reach to 18 million TEU annually when the constructions of Phase-II Project, Phase-III Project and the container terminal project at north bank of Dayaowan Bay are completed.

At present, the port area has 70 container shipping lines for domestic and foreign trade including 10 ocean lines. There more than 300 vessels call the port area monthly.

4) Dagushan Ore Transshipment Center

Dagushan Ore Transshipment Center (see Figure 4.8) locates at the south bank of

Dagushan Peninsula. The center contains 1 specialized 30 thousand ton class ore unloading berth and one 15-thousand-ton class transshipment berth (with unloading capacity).

Figure 4.8 Dagushan Ore Transshipment Center

Source: Courtesy of Dalian Port Bureau

Based on its annual throughput capacity of 15 million ores, the center can conduct the transshipment of 4.2 million tons ores per year. The dock of the port is of trestle style. The length of its approach bridge is 465m and it of the berth is 450m. The length of the operation platform is 393m and the wideness of it is 37m. The depth of the water in the port is 23m.

The dock is the largest unloading berth available in China with the most advanced facilities, and it can anchor all bulk ore vessels from all over the world.

5) Dalian Bay General Groceries Functional Zone

Dalian Bay General Groceries Functional Zone locates at Dalian Bay Port Area. The port area contains 9 berths for general groceries, including three 30-thousand-DWT berths, two 50-thousand-DWT berths, and two 70-thousand-DWT berths. The length of the berth is 2,774m. The maximum water depth of the berths is 13.7m. The annual throughput capacity of the port area is 14 million tons.

Figure 4.9 Dalian Bay General Groceries Functional Zone

Source: Courtesy of Dalian Port Bureau

6) Passenger and Ro/Ro Cargo Vessel Port Area

The Passenger and Cargo Ro/Ro Vessel Port Area (see Figure 4.10) is composed of five passenger station docks. The docks mainly locate in Dalian Port Passenger Station, Xianglujiao Passenger Station of PDA, Dalian Bay Passenger Station of PDA, Dalian Bay New Port Passenger Station of Liaoyu Group, and Dalian New Marine Shipping Passenger Station. The port areas mainly service for inter-provincial passenger and RO/RO cargo shipment.

There are 13 passenger and Ro/Ro cargo vessel berths with total length of 1,981m, and the maximum berthing capacity of the berths is 8,000 tons. In 2010， the passenger via the port area reached to 4.14 million. Now Dalian Port has opened some passenger shipping lines to Yantai, Penglai, Weihai, and Tianjin etc.

Besides, the port areas will focus on developing the international cruise service so as to develop it into international shipping and business service center as well as a port information service center.

Figure 4.10 Passenger and Ro/Ro Cargo Vessel Port Area

Source: http://food.runsky.com/content/2011-06/15/content_3746948.htm

7) Lushun—Yantai—Dalian Train Ferry Terminal

Lushun—Yantai—Dalian Train Ferry (also called Yan-Da Train Ferry or Bohai Sea Train Ferry) Terminal locates at Yangtouwa Port Area of Lushun. It commenced to be built in the year 2004 and have been completed and put into service in the year 2006 (see Figure 4.11).

Figure 4.11 Lushun—Yantai—Dalian Train Ferry Terminal

Source: http://www.jiaodong.net/news/system/2011/02/25/011143002.shtml

The length of the train ferry berth is 200m, and the water depth of the berth is 12m. in addition, the length of the train berth for vessel overhaul is 220m and the water depth of the berth is 11m.

According to the plan, up to 2010， the southward volume (to Yantai) of railway freight has reached to 4.5 million tons, whereas the northward volume (to Dalian) has reached to 3.8 million tons. Besides, there 11 thousand Ro/Ro vehicles were transported by the ferry in 2010.

After six years of operation, the ferry has become an important hub of the train and truck transportation between Northeast China and North China.

4.4.5 The Analysis of Logistics Development

1) Port

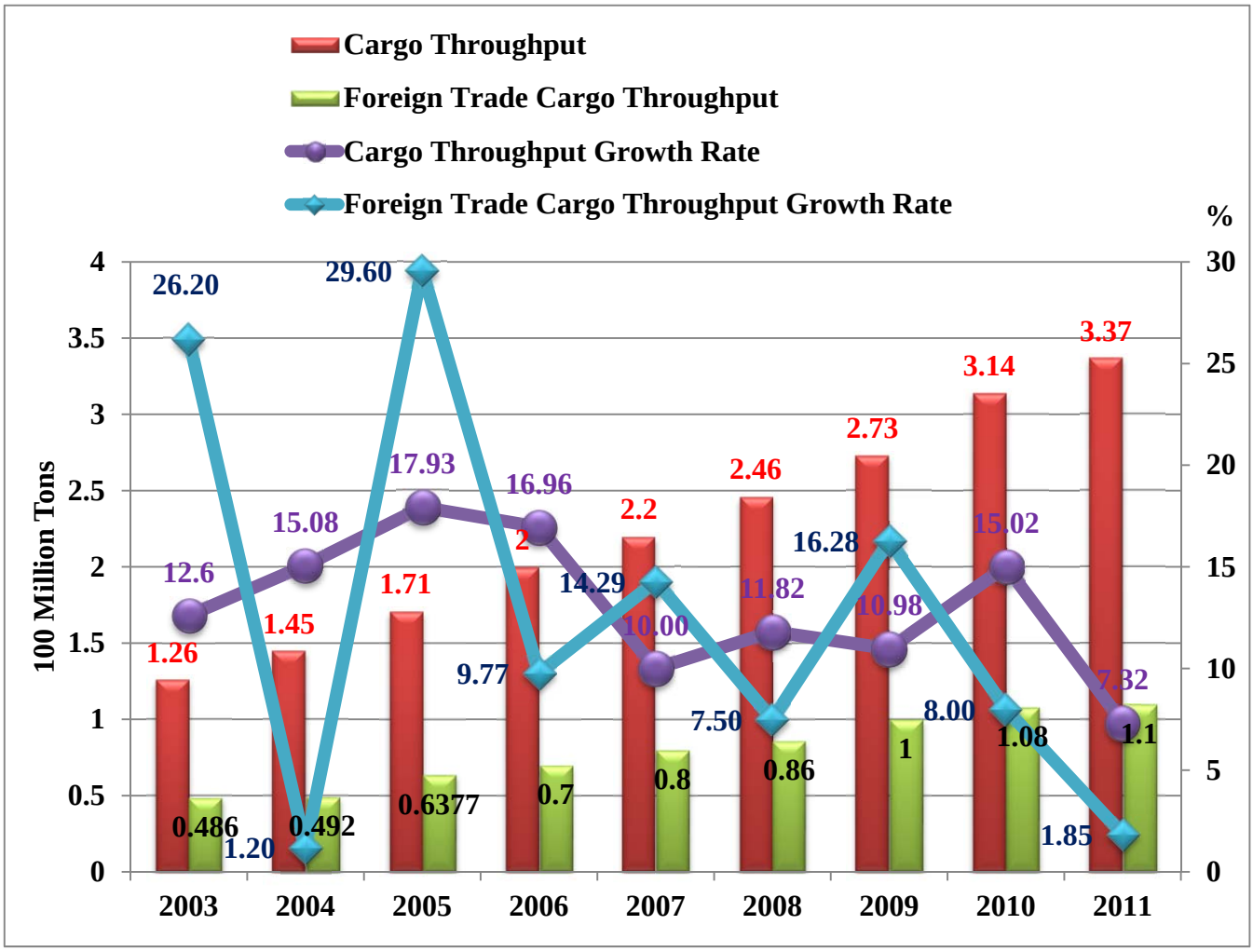
Dalian port has successively developed the cooperation relation between more than 300 ports in over 160 countries. In addition, the Port has opened 80 containers lines all over the globe. The gross throughput of Dalian Port goes up to 20.35 tons from the year 2003 to 2011 (See Figure 4.12), 12.53 tons of which was handled in the "*11th Five-Year Plan*" period. The total container throughput of Dalian Port goes up to 34.3562 million, 21.387 of which were handled in the "*11th Five-Year Plan*" period.

Figure 4.12 indicates that the throughput of both Cargo and Foreign Cargo are kept increasing from 2003 to 2011, but, the growth rates of both the indexes were fluctuating in the same period.

As Figure 4.11 shows in last section, the investment of fixed asset were kept increasing in the first three years, as a result, both the growth rates of both indexes were increasing in the period spurred by the development of the infrastructures in Dalian Port.

Both the growth rates were affected indirectly by Lehman Shock after 2008. The cargo throughput growth rate decreased in 2011 and the foreign cargo throughput growth rate went down from 2010. The trends of both throughputs and growth rates indicate the trade of Northeast China is increasing slowly after Lehman Shock. And the development of the international trade in Northeast China has been slowing down since 2009.

Figure 4.12 Cargoes Throughput and Foreign Trade Throughput of Dalian Port (2003-2011)

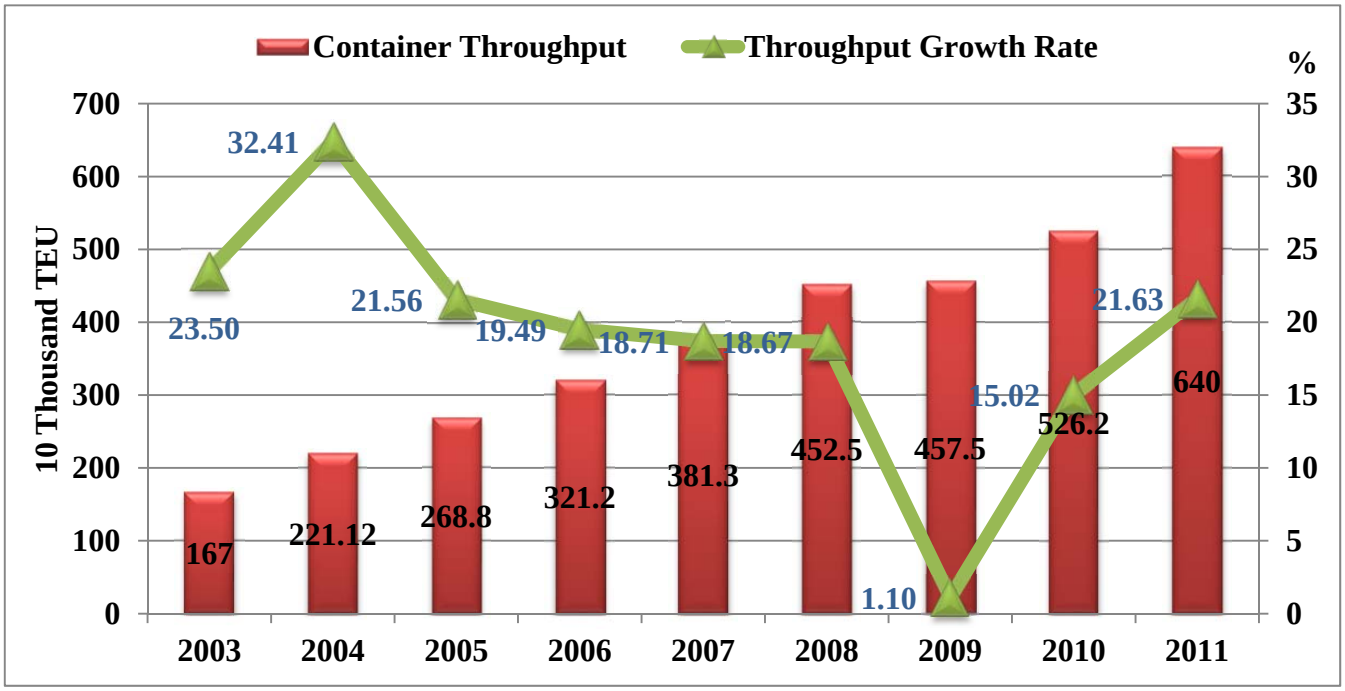


Source: Created by the author based on Statistical Communique of Dalian National Economic and Social Development 2003-2011

Figure 4.13 indicates that the throughput of container in Dalian Port is kept increasing from 2003 to 2011.

Reviewing of Figure 4.13, the trend of container throughput rate is similar to the fluctuation of the fixed assets investment to Dalian Port. The average growth rate of container throughput of the first three years is 25.82%, based on the analysis in last section, many projects of port logistics were completed in the same time. The development of port infrastructures are the strong support for the increasing of container throughput.

Figure 4.13 Containers Throughput of Dalian Port (2003-2011)



Source: Created by the author based on Statistical Communique of Dalian National Economic and Social Development 2003-2011

The growth rate of container throughput in Dalian Port was coming down moderately from 2006 to 2008. But the overall trend in the three years was stable.

Affected by Lehman Shock, the container throughput increased only 1.1% in 2009. But Dalian Port shook off the negative influence rapidly in the next year. The local government put out a policy for offering the subsidies to the shipping companies, railway and the owners of the cargoes in order to attract the container vessels to berth alongside at Dalian Port. The policy supports the growth of the container throughput in Dalian Port. Though the throughput growth rate of foreign cargo were decreasing from 2010, the container throughput are kept increasing in 2010 and 2011.

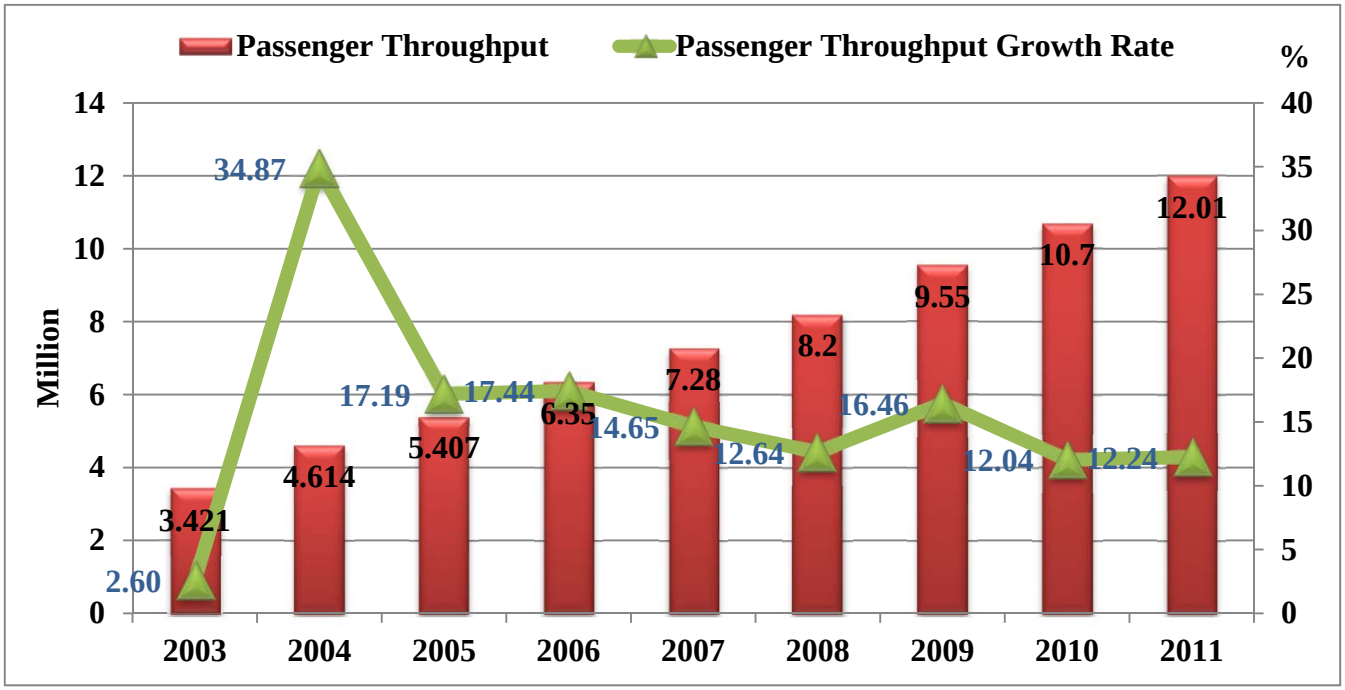
2) Airport

The location advantage of Dalian Port is the developing support of Dalian International Airport (DIA) which is an international airport with the largest passenger passing capacity in Northeast China. Its fight lines have covered all big citits in China

and Russia, Japan, South Korea, Southeast Asia, Europe, and Oceania. As the other main part of Dalian Port, the airport was developing steadily from 2003 to 2011.

The gross passenger throughput in DIA from 2003 to 2011 reached to 67.532 million, 42.08 million of which was in the "*11th Five-Year Plan*" period (see Figure 4.14).

Figure 4.14 Passengers Throughput of Dalian International Airport (2003-2011)



Source: Created by the author based on Statistical Communique of Dalian National Economic and Social Development 2003-2011

Figure 4.14 indicates that the passenger throughput of DIA is kept increasing from 2003 to 2011. The growth rates sharply increased at the beginning of the revitalization. And the growth rate was fluctuating from 17.44% to 12.04% from 2005 to 2011 the range of the fluctuation is 5.4%. Though influenced by Lehman Shock, the growth of passenger throughput in DIA changed in a small scope fluctuation because Dalian is also a tourism city.

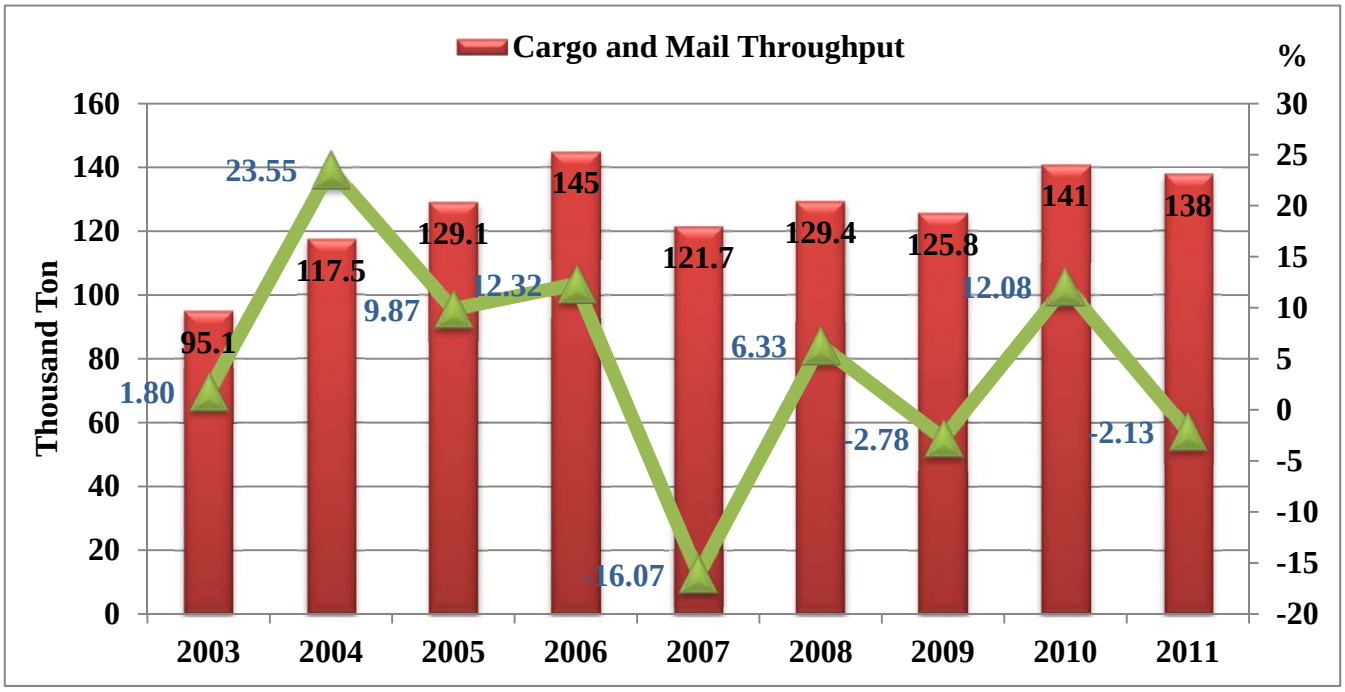
The cargo and mail throughput in DIA from 2003 to 2011 reached to 1142.6 thousand tons, 662.9 thousand tons of which was in the "*11th Five-Year Plan*" period (see

Figure 4.15).

Figure 4.15 indicates that the cargo and mail throughput of DIA from 2003 to 2011. The growth rates steadily increased from 2003 to 2006. The reason why the negative growth in 2007 is some key sea ports infrastructures were completed and put into service in the year. Some cargos and mails by air were changed by ship.

The throughput went up a bit in 2008, but, it went back down in 2009 due to the influence by Lehman Shock. The unsteadiness of economy is the main reason of the fluctuating growth since 2009.

Figure 4.15 Cargo and Mail Throughput of Dalian International Airport (2003-2011)

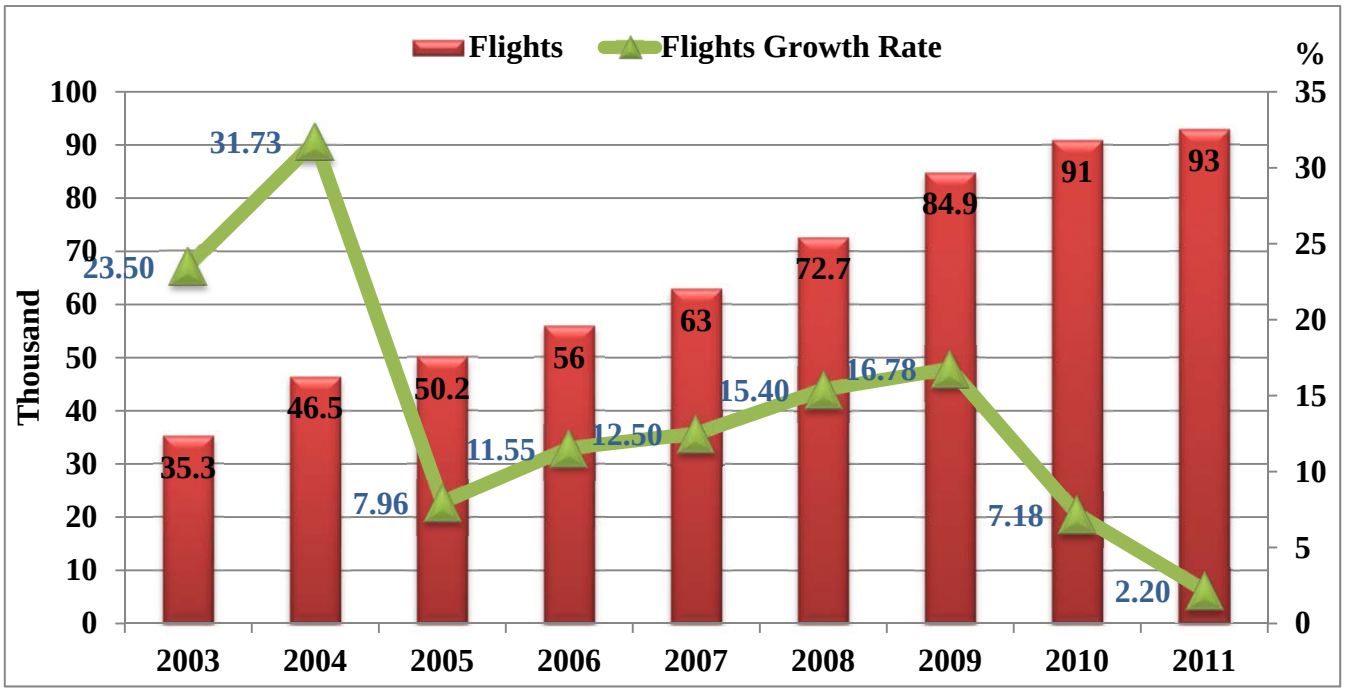


Source: Created by the author based on Statistical Communique of Dalian National Economic and Social Development 2003-2011

Figure 4.16 indicates that the flights of DIA is kept increasing from 2003 to 2011. The growth trend indicates the rapid growth of flights in DIA in the first two years of the revitalization, the reason of the increase is the revitalizing plan attracted more flights to Dalian Port.

The growth rate from 2005 to 2009 was slowly but steadily. Likewise most indexes analyzed above, Lehman Shock also affected the flights via DIA. The growth rates of flight of DIA were decreasing sharply from 2010 to 2011.

Figure 4.16 The Flights of Dalian International Airport (2003-2011)

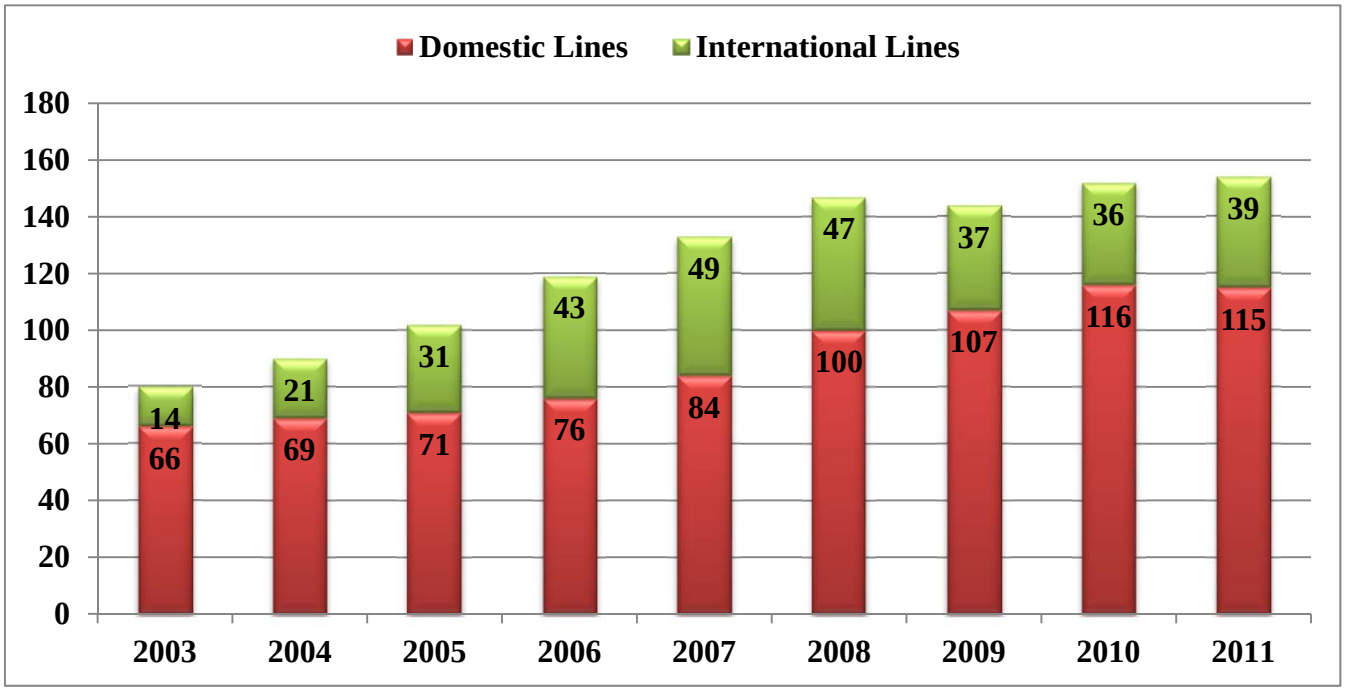


Source: Created by the author based on Statistical Communique of Dalian National Economic and Social Development 2003-2011

Figure 4.17 indicates that the domestic lines of DIA is kept increasing from 2003 to 2011. And the international lines of DIA were increasing from 2003 to 2007.

Affected by Lehman Shock, the international lines kept decreasing in 2009 and 2010. Driven by the policies of expending domestic demand by China Central Government, the domestic lines still increased after Lehman Shock. The international lines increased in 2011 because of the recovery of the global economy.

Figure 4.17 Domestic & International Lines of Dalian International Airport (2003-2011)



Source: Created by the author based on Dalian Statistics Year book, 2004-2011 & Statistical Communique of Dalian National Economic and Social Development 2003-2011

3) Shipping

By the end of 2010, Dalian Port owned 273 shipping vessels. The gross shipping capacity reached to 6.5 million tons.

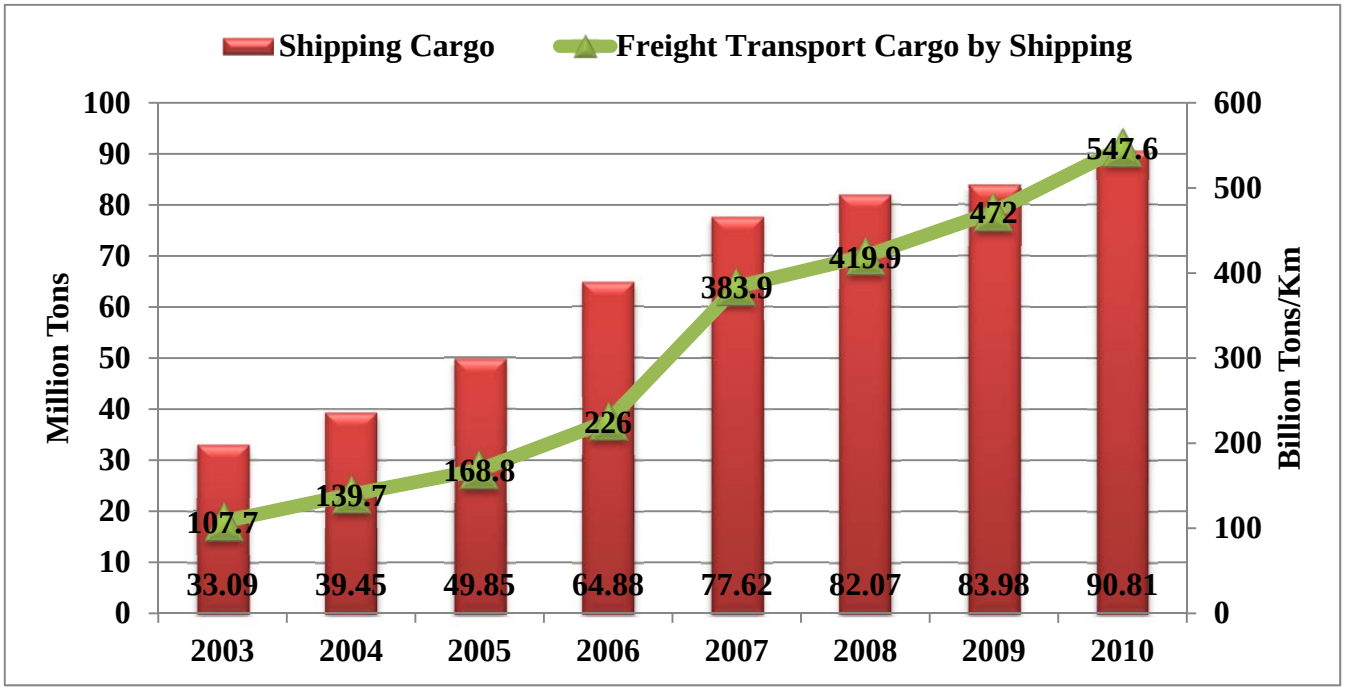
The gross shipping cargo in Dalian Port from 2003 to 2010 reached to 52.18 million tons, 39.93 million tons of which were in the "*11th Five-Year Plan*" period.

The gross freight transport cargo by shipping in Dalian Port from 2003 to 2010 reached to 24.66 million tons, 20.49 million tons of which were in the "*11th Five-Year Plan*" period (see Figure 4.18).

Figure 4.18 indicates that the both the shipping cargo and freight transport cargo of Dalian Port are kept increasing from 2003 to 2010. The growth rates sharply increased in 2007 because the projects of the infrastructures in Dalian Port were completed and put in to service in this year. Having influenced by Lehman Shock, the growth of both

indexes increased in 2009 was less than any other years. The indexes still kept positive increasing after the shock because of the major status of Dalian Port on the shipping for Northeast China. The trend shows that Dalian Port is still keeping development under the severe circumstance. This is a sign that Dalian Port is very important on shipping for the revitalization in the region.

Figure 4.18 Shipping Cargo and Freight Transport Cargo by Shipping of Dalian Port (2003-2010)



Source: Created by the author based on Dalian Statistics Year book, 2004-2011

4) Highway

There are 512 town-class roads in Dalian City, with a total length of 6,000 Km, of which is Highway, with a length of 500 Km.

The gross cargoes transferred by highway in Dalian from 2003 to 2010 reached to 1491.46 thousand tons, 984.51 thousand tons of which were in the "*11th Five-Year Plan*" period.

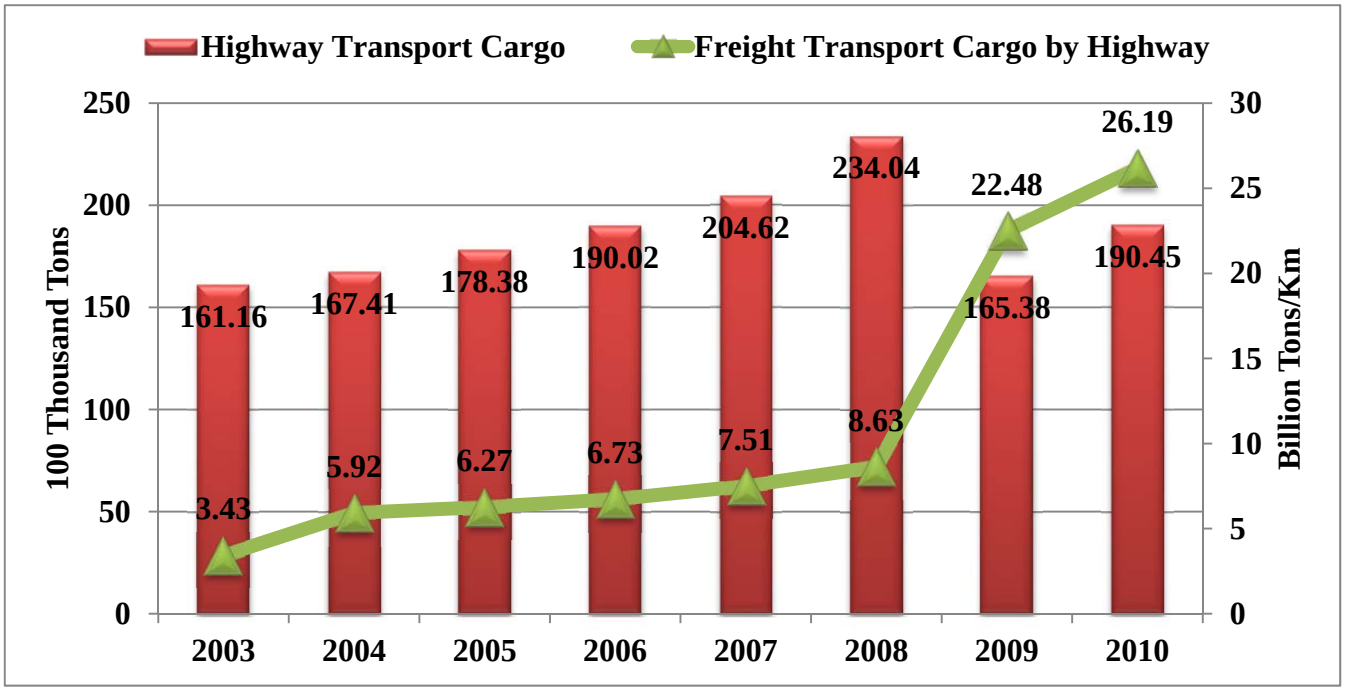
The gross freight transport cargo by highway in Dalian from 2003 to 2010 reached to 97.16 billion tons, 71.54 billion of which was in the "*11th Five-Year Plan*" period (see

Figure 4.19).

The trend of the cargo transported by highway in Figure 4.19 indicates it kept increasing steadily from 2003 to 2008, and it decreased in 2009 due to Lehman Shock and the cost of highway transportation was increased. The transportation through highway in Dalian City reduced in the year and went up in 2010 but not much due to the charge of the highways is kept increasing in recent years.

In addition, the trend of the freight cargo transported by highway in the figure indicates that it kept increasing from 2003 to 2010, and it had a sharp increase in 2009 because the convenient and developed logistics system in Dalian Port can support the transportation from Dalian Port to the hinterland of Northeast China through highways and vice versa.

Figure 4.19 Highway Transport Cargo and Freight Transport Cargo of Dalian Port (2003-2010)



Source: Created by the author based on Dalian Statistics Year book, 2004-2011

As mentioned above in Figure 4.12 and Figure 4.18, the both the cargo throughput in Dalian Port and the shipping cargoes through Dalian Port were increasing in 2009 and

2010, that is another reason that the increase of the freight cargo transported by highway through Dalian Port.

5) Railway

By the end of the year 2010, there are 55 train stations in Dalian City and 17 operating railways. The length of the railways has reached to 1,385 Km.

The gross cargoes transferred by railway in Dalian from 2003 to 2010 reached to 189.57 thousand tons, 116.9 thousand tons of which were in the "*11th Five-Year Plan*" period.

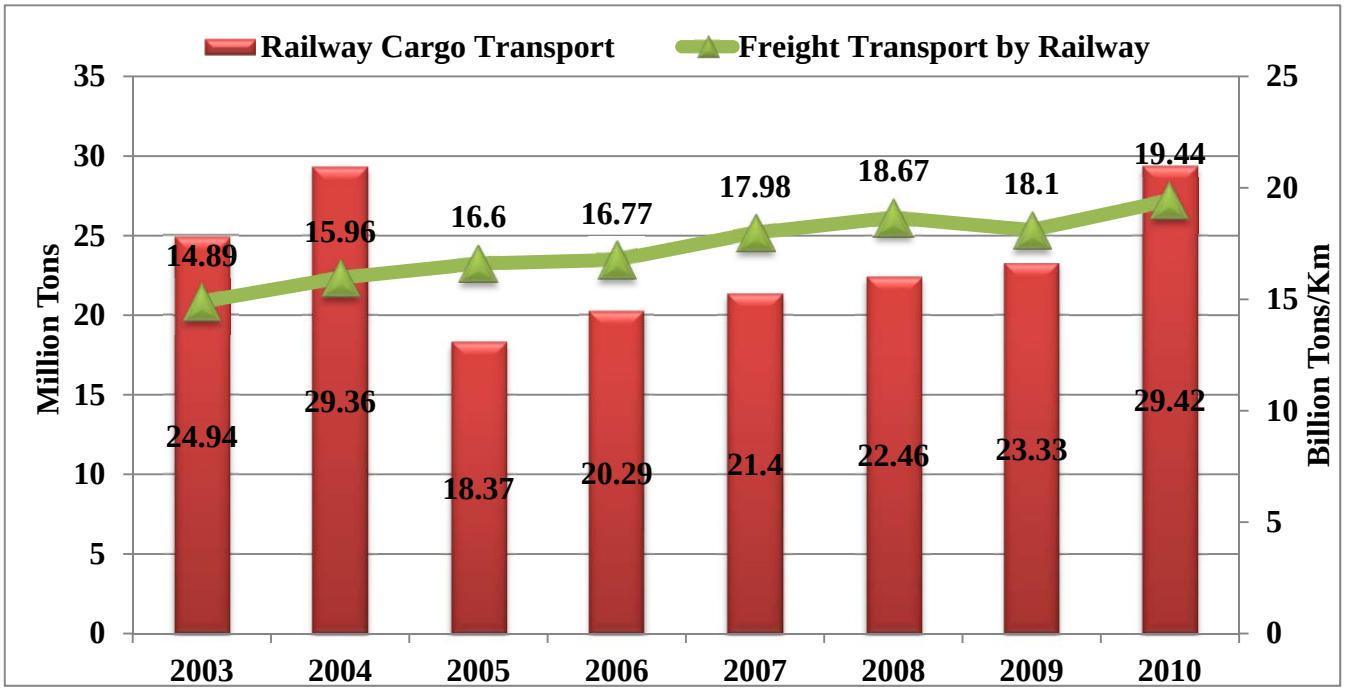
The gross freight transport cargo by railway in Dalian from 2003 to 2010 reached to 160.09 billion tons, 90.96 billion of which was in the "*11th Five-Year Plan*" period (see Figure 4.20).

The trend of the cargo transported by railway in Figure 4.20 indicates it was increasing in the first two years of the revitalization. The index decreased in 2005 due to the two reasons as follows. For one thing, the highway carriage expense was adjusted to attract more business in this year. Besides, some productions such as coal, crude oil, iron and grain, which are mainly transported by railway, were reduced in this year in whole China, as a energy and grain base, Northeast China also suffered from the impact.

The cargo transported by railway kept increasing from 2005 to 2010. The sharp increase in 2001 because the cost of highway transportation was increased since 2009.

The freight transport by railway was increasing in most of the revitalization period expect in 2009 due to the influence over the global economy and trade by Lehman Shock. The trend indicates that the freight transported by railway has become a crucial transportation in Dalian Port.

Figure 4.20 Railway Transport Cargo and Freight Transport Cargo of Dalian Port (2003-2010)



Source: Created by the author based on Dalian Statistics Year book, 2004-2011

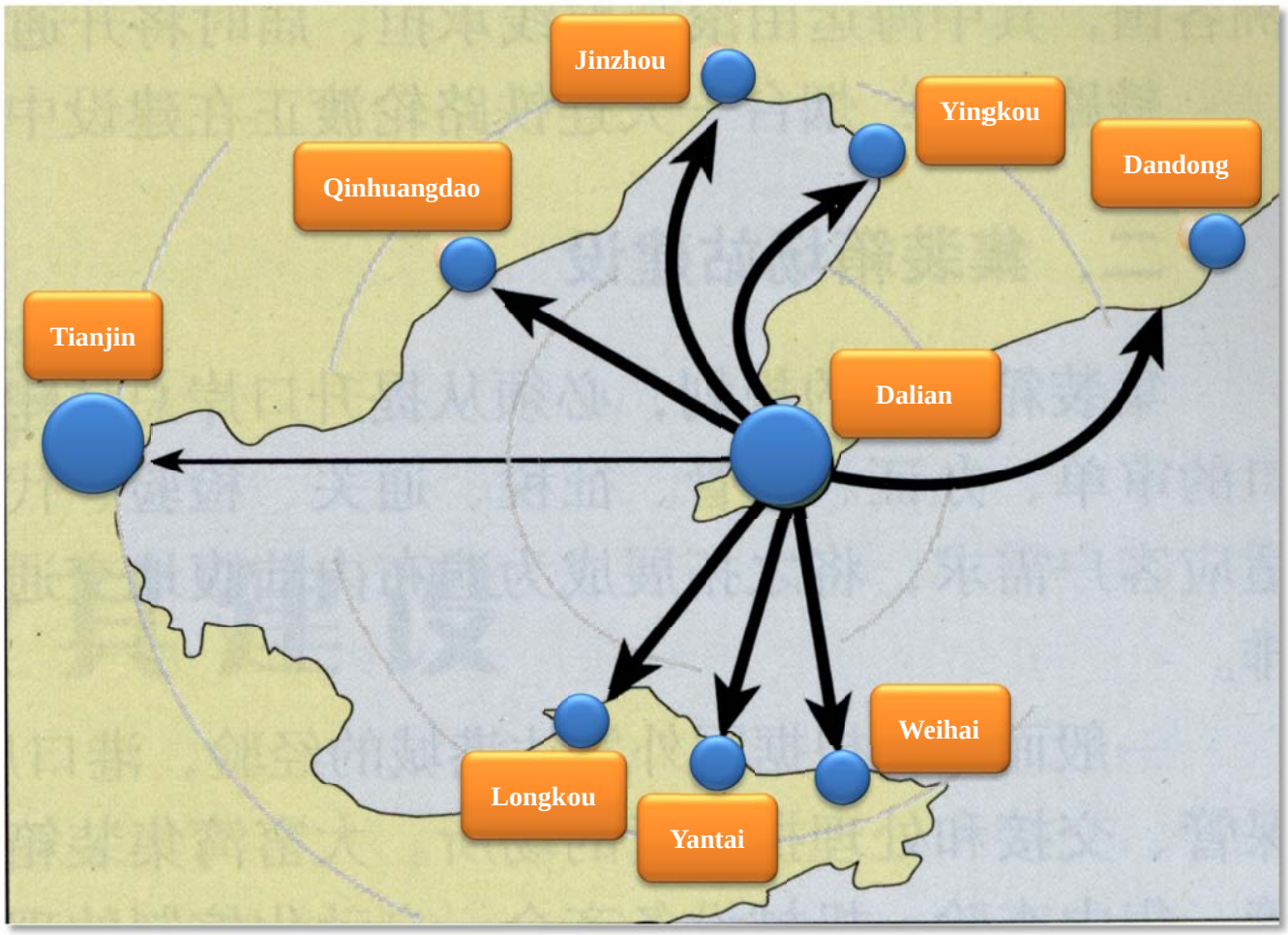
6) Intermodal Transportation

Along with the development of the complex transportation in the world, the intermodal transportation has been the development aim of logistics in Dalian Port.

In order to establish a modern transportation system, Dalian Port invested Bohai Sea Circle Lines and some dry ports (also called inland port) in hinterland of Northeast China with the cooperation of the railway department in the "*11th Five-Year Plan*" period (see Figure 4.21 & Figure 4.22). Now Northeast China and Bohai Economy Zone are connected by these projects, a new logistics network has been set up in North China.

The intermodal system that consists of shipping, railway and train ferry, and the new system is benefit for increasing the container throughput in Dalian Port in recent years, especially in the "*11th Five-Year Plan*" period, the containers transported by intermodal transportation reached to 100 million. In addition, there are 50 unit trains from Dalian Port to hinterland in one week.

Figure 4.21 Bohai Sea Circle Lines

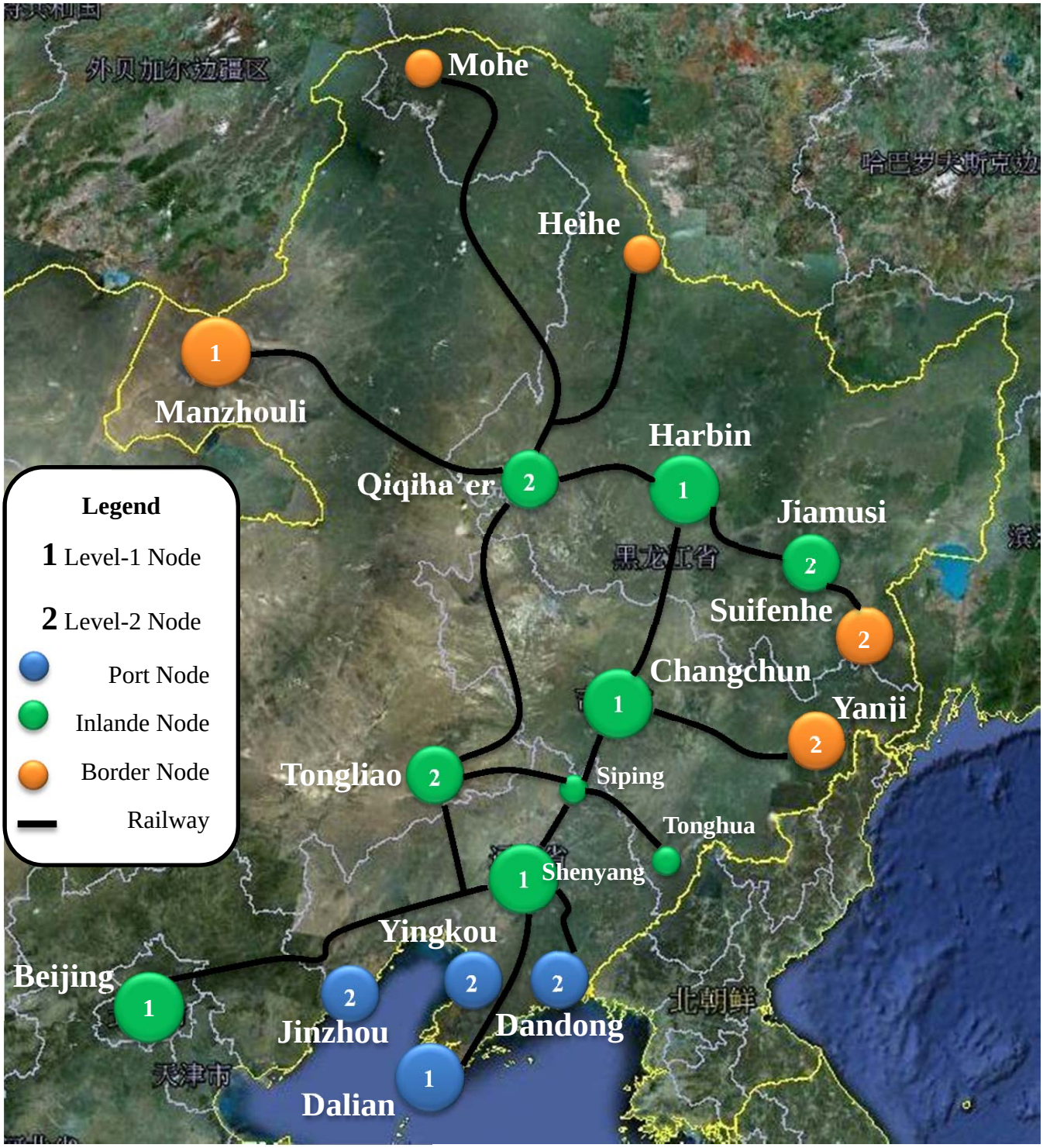


Source: Created by the author based on The Report on the Development of Dalian Logistics Industry 2010

The railways link Dalian Port to the dry ports, sea ports and resource base in Northeast China such Manchouli, Qiqiha'er, Harbin, Shenyang, Dandong Port, Jinzhou Port and Yingkou Port.

The new logistics system is good for the transportation in Northeast China. The cost of logistics has been decreased, and the transportation has become more efficient than before in the region.

Figure 4.21 Dry Ports in Northeast China



Source: Created by the author based on The Report on the Development of Dalian Logistics Industry 2010

7) Warehouse

Warehouse is the support for logistics and plays pivotal role in the economic development of port cities. As an important part of logistics in Dalian Port, warehouse

has a great development in the "*11th Five-Year Plan*" period.

The categories of warehouses in Dalian Port are classified as 8 types including grain, mechanical and electrical, chemical industry, refrigeration, ore and textile. The main businesses cover transfer, storage, distribution and bonded storage.

According to the statistic data, by the end of year 2010, there were 277 warehouse and storage enterprises in Dalian Port, and the area of all the warehouses was 9.112 million m2 with the storage of 9.76 million tons. The throughput of the warehouse in 2009 was 44.2 million tons and the revenue of the industry reached to RMB 2.58 billion.

Dalian Port is strengthening the constructions of the infrastructure facilities for warehouses in recent years. These projects promoted the development of storage and transportation, the spot transaction, barter trade and futures. Many warehouse enterprises which focus on storage have been upgraded to comprehensive logistics services enterprises. The establishments of storage and transport system of national grain, crude oil and other stable good and materials is a sign that the warehouse in Dalian Port has stepped into a new development period.

4.4.6 The Development of the Digital Logistics Information Platform

The Information-based Logistics is one of the marked characteristics and the inevitable trend for the development of modern logistics in electronic business ages.

1) Digital Logistics Information Platform Developed by Official Departments

The Logistics Information-based in Dalian Port was developing rapidly in the "*11th Five-Year Plan*" period. The main developer of the platform is Dalian Port and all-level governments in Liaoning Province.

An efficient logistics information platform for Dalian Port has been set up, the

platform includes the Intermodal Transportation Service System of Northeast China, Liaoning Electronic Port, Dalian Harbor IT Service Center, Express Port Community Interface (EPCI), Automatic Identification System (AIS), Electronic Declaration and Control System, the Express Quarantine Service System, and Dynamic Tracing System for Railway and Shipping. In addition, there more than 120 kinds of electronic messages applied to logistics information platform of Dalian Port by the end of year 2010. These information systems are used by logistics, customs, trade and finance and electronic government.

The systems mentioned above serve as an information platform for all the port supervisors, shipping companies and forwarder enterprises in all business process of port logistics, besides, EPCI and .the Linkage System of Port and DFTZ cover all the enterprises in the FTZ.

These information systems have strengthened the port management and streamlined the customs clearance. Besides, it also has improved the quality of port service. The information about port, shipping, railway and supervision of Dalian Port now can be shared with other logistics cities in Northeast China.

2) Digital Logistics Information Platform Developed by Enterprises

In order to promote the business efficiency, some logistics enterprises in Dalian Port also developed the information-based logistics system themselves in the "*11th Five-Year Plan*" period.

For instance, the "Digital System for Dalian Port" developed by PDA has obtain financial fund by Chinese National Development &Reform Commission and passed the national acceptance check.

The Freight Management System developed by CSTD North Logistics Company is an information system that focuses on the logistics business in Dalian Port. At the same

time, COSCO developed a comprehensive warehouse management information system.

Besides, some logistics enterprises in Dalian Port has started to use the information technologies such as Global Positioning System (GPS) Geographic Information System (GIS) and Radio Frequency Identification (RFID) to make the logistics business be more efficient.

4.4.7 The Development of the Logistics Enterprises

According to incompletely statistics, there are more than 3,500 logistics enterprises in Dalian Port (see Table 4.1), more than 200 of which are large and medium enterprises.

The characters of the logistics enterprise Dalian Port are marketization and diversification as well as the rapid development of both domestic and foreign enterprise in the "*11th Five-Year Plan*" period.

Table 4.1 Classification of Logistics Enterprise in Dalian Port

Classification	Number of Enterprise	Share in Total (%)
Logistics	1,561	44.6
Forward Shipping	710	20.3
Highway Transportation	700	20
Warehouse	264	7.6
Shipping	117	3.3
Express	57	1.6
Port	56	1.6
Information Development	35	1
Total	3,500	

Source: Created by the author based on The Report on the Development of Dalian Logistics Industry 2010

1) Foreign and Joint Logistics and Enterprises

The foreign logistics enterprises play an important to the logistics development in Dalian Port. In the "*11th Five-Year Plan*" period, some prestigious international logistics enterprises registered into Dalian Port (see Table 4.2).

Besides, some Chinese enterprises established joint logistics ventures with international logistics enterprises (see Table 4.3). There are 115 foreign logistics enterprises and 53 logistics enterprises invested by the enterprises from Hong Kong, Taiwan and Macau by the end of year 2010.The asset-light strategies, management styles, logistics technologies and enterprise culture of these companies brought new business conceptions to the development of logistics in Dalian Port.

Table 4.2 Main Foreign Logistics Enterprises in Dalian Port

Name of the Enterprises	Nationality
Maersk Line Shipping Container Co., Ltd., Dalian Branch	Denmark
CH Robinson Worldwide, Inc., Dalian Branch	United States
Nippon Yusen Kaisha (China), Dalian Branch	Japan
Hanjin Shipping (China), Dalian Branch	Korean
Orient Overseas Container Line (OOCL) Logistics Ltd.(China), Dalian Branch	Hong Kong
Dalian Sankyu International Logistics Co., Ltd	Japan
Dalian Kintetsu Logistics Co., Ltd	Japan
Compagnie Martime d'Affretement-Compagnie des Messagenes Marltines & Compagnie Generale Translatlanonque (CMA-CGM) China, Dalian Branch	France
TNT Dalian Branch	Netherlands

Source: Created by the author based on The Report on the Development of Dalian Logistics Industry 2010

Table 4.3 Main Joint Logistics Enterprises in Dalian Port

Name of the Enterprises	Nationality of Investors
Nittsu sinotrans Logistic Dalian Ltd	Japan
Dalian Alps Teda Logistics Co., Ltd.	Japan
Dalian YIDU-JIFA Cold Logistics Co., Ltd	United States
Dalian Jilong Logistics Co., Ltd	Swedn
Kerry EAS Logisics, Dalian Branch	Hong Kong
Dalian Rieck Henco Int'l Transportation Co,Ltd	Germany & Hong Kong
Dalian Schnellecke Logistics Co., Ltd	Germany
Dalian Singamas International Container Co., Ltd.	United States

Source: Created by the author based on The Report on the Development of Dalian Logistics Industry 2010

2) State-owned and State Holding Logistics Enterprises

Along with the global globalization and the rapid development of market economy in China, Dalian Port has been an important part in the global logistics system that consists of ports and intermodal transportation. Now Dalian Port is a key logistics node of the global supply chain.

According to the official report, the state-owned and state holding logistics enterprises are in the van of the industry in the "*11th Five-Year Plan*" period, which is the beginning of the revitalization. These enterprises that did simplex logistics business before have upgraded to the large scale logistics enterprises groups (see Table 4.4) by reforming the technology, the methods of management and the business process.

Table 4.4 Main State-owned and State Holding Logistics Enterprises in Dalian Port

Name of the Enterprises
Dalian Port Co., Ltd.
North Logistics Company of China Shipping Terminal Development Co., Ltd.
Beiliang Co., Ltd. Of China Grain & Logistics Corporation,
Sinotrans Liaoning Co., Ltd.
China Ocean Shipping CompanyLogistics (Dalian)
Dalian Zhoushuizi International Airport Group Co., Ltd.
Dalian Jiaoyun Group
China Railway Tielong Container Logistics Co., Ltd.

Source: Created by the author based on The Report on the Development of Dalian Logistics Industry 2010

3) Chinese Private Logistics Enterprises

The private logistics enterprises account for 90% of total enterprises in Dalian Port. Many of them have been restructured into the TPL enterprises. Besides, some of them have put the solutions of logistics into not only the supply chain management and the optimization of customers, but also the whole logistics business processes.

As a result, a great many private logistics enterprises emerged in recent years as powerful competition of the industry in Dalian Port (see Table 4.5).

Table 4.5 Main Private Logistics Enterprises in Dalian Port

Name of the Enterprises
Jincheng Trans Logistics Inc.
CMT International Logistics Group Co., Ltd.
Tader Coal SCM Co., Ltd.
Dalian Changbo Logistics Co., Ltd.
Dalian NGE Logistics (China) Ltd.
Dalian Winland Group Co., Ltd.
Dalian Jiaoyun Group
Dalian Jietong Logistics Co., Ltd.

Source: Created by the author based on The Report on the Development of Dalian Logistics Industry 2010

4.5 Main Problems of Logistics Development

Though the logistics in Dalian Port developed steadily in the "*11th Five-Year Plan*" period, there still some in-depth contradictions and problems of the logistics development, for instance, logistics structure is imbalance, the service system is not perfect.

At the same time, there are some problems in tax policies, transportation management, administrative efficiency and the human resource management of logistics.

4.5.1 Lack of the Senses of Service

The lack of the senses of service is common in both logistics enterprises and local governmental agencies, besides, both of them do not have enough cognition about the development of regional integration. The obstructions in promoting fair competition, win-win cooperation and to observe of market disciplinarian are also the problems that should be solved quickly by the logistics enterprises and local governmental agencies.

4.5.2 Negative Effects of Administrative System and Mechanism

The greatest obstacles to establish the regional international and market-oriented logistics system are the backwardness of administrative system and mechanism.

Compared with Southeast Coastal Area in China, the reform in Northeast China, including Dalian City, is relatively backward. It should minimize the government interference and rely on both market and enterprises in order to promote the development of logistics integration and establish an open logistics system more effectively in Dalian Port.

4.5.3 Problems of Logistics Structure

The logistics in Dalian Port developed rapidly in the "*11th Five-Year Plan*" period. The logistics network in consists of the Dalian Port, Dalian International Airport, the Ha-Da Electric Railway (from Harbin to Dalian) and Shen-Da Highway (from Shenyang to Dalian). Besides, the urban and rural highways are the channels for the network. The main transportations in Dalian port include shipping, air, railway, highway and pipeline.

By the standards of the establishment of Northeast Asia International Shipping Center and Northeast Asia International Logistics Center, the primary problems of logistics in Dalian Port are the transportation structure is unreasonable; the transport corridors between the port area and urban traffic system are not developed and the resources of traffic in Dalian are not integrated well.

4.5.4 Insufficient Demand

The insufficient demand of TPL is the primary reason that the logistics developed slowly in the whole Northeast China.

Generally, the total economic output in Northeast China is small, thus, the gross

logistics demand in the region is insufficient. The latent demands of logistics have not been transformed into market demands. The degree of the socialization of logistics does not keep abreast of the economy development in the region. Besides, the supply capacity of specialized logistics is not enough to the development of the international trade. Finally, there are considerable small scale logistics enterprises in Dalian Port, too many small logistics enterprises is not conducive to the development of TRL.

4.5.5 Shortage of Human Resource

At present, the amount and structure of logistics human resource in Dalian Port cannot fit in with in the needs of transformation and upgrading of the logistics in the port city. Though many logistics graduates are engaged in logistics in Dalian Port in recent years, the qualified personnel for logistics development is still insufficient. The high qualified people who can design the logistics network, optimize the logistics process and can deal with the shipping business are needed for logistics in Dalian Port.

4.5.6 Restriction on Market Environment

Firstly, the arbitrary and unreasonable charges, tax policies, land policies and transportation that affect the development of enterprises have not been solved for long time.

Secondly, as mentioned above, the socialization of logistics is not in accordance with the economy development in Dalian port. In addition, the logistics technologies did not get the extensive application in the development of logistics in the region.

Finally, compared with international advanced shipping service market, the market in Dalian Port still lags fairly far behind. The development of logistic in the region is still need the guidance and coordination from the market. The governmental services and the policies' support cannot meet the development needs of contemporary global logistics.

4.6 Summary

This chapter presents the development of logistics in Dalian Port from the beginning of the revitalization Northeast China in 2003 to the year 2011.

The analyses presented above indicate that the "*11th Five-Year Plan*" period is the main development stage of the nine years. The contents of this chapter focus on the analyses on the development achievements in Dalian Port, including the investment on port infrastructures, the development of the logistics system and the main port areas and the logistics development. The analyses on these cases are mainly based on the data analysis and comparison. Besides, the digital logistics information platform and the conditions of logistics enterprises are also the key contents in the chapter. Finally, this chapter has pointed out the main problems in the development.

The logistics infrastructures in Dalian Port have a great development in the "*11th Five-Year Plan*" period. The gross investments to the infrastructures in Dalian Port from the year 2003 to 2011 exceed the total amount before the revitalization. As a result, a lot of port constructions and projects, including container terminal, berths, oil wharf, highway, railway ferry and airport, have been completed since the year 2003. These new establishments and facilities have become the strong supports for the logistics development in Dalian Port.

There are six new shipping centers have been established in Dalian City. The businesses of the sox shipping centers cover grain, crude oil, container, ore, break-bulk cargo, automobile car and Ro/Ro cargo and train ferry. These shipping centers form a comprehensive shipping center with Dalian International Airport and Dalian Railway Network. The shipping center is the foundation of establish the Dalian International Shipping Center in Northeast Asia. Now the constructions of new port areas are focusing on the Dagushan Peninsula, including Dyaowan Bay and Xiaoyaowan Bay where are close to DFTZ and DFTPZ.

The analyses on logistics development in Dalian Port indicate that though affected by Lehman Shock in the year 2008, the throughputs of cargo, container, airport of Dalian Port keep increasing in amount in view of the overall revitalization period. But the growth rates indicate that the some of the throughputs are slowing down or decreasing after the year 2008.

The indexes of the transportations by shipping, railway and highway indicate that both cargo and freight transport in Dalian Port were also affect by Lehman Shock but not serious. All the indexes keep increasing except the highway transport cargo.

The intermodal transportation system has started to establish since the year 2003. The system consists of shipping, railway and train ferry. The system links the dry ports from Northeast China to Northeast China. The costs of logistics in the wide region have been decreased, as well as the logistics businesses in the transportation system have become more efficient than before.

As the important supports for logistics, both the warehouse and information-based logistics system are developing continuously in the revitalization period. They provide the hardware and software supports for the development of logistics in Dalian Port. The developments of both the items have promoted the efficiency and integration of the logistics for both enterprises and governmental agencies.

In addition, the prosperity of logistics enterprises kept pace with the development of Dalian Port. Now there are 3,500 enterprises in Dalian Port, including foreign-owned corporations, joint ventures and private companies, engage in logistics in recent years.

Though the logistics in Dalian Port improving rapidly in the "*11th Five-Year Plan*" period, there still some problems in the development of logistics such as logistics structure is imbalance, the service system is not perfect, and the negative effects from

administrative system and mechanism. What is more, the insufficient demand, the shortage of qualified personnel and the restrictions on market environment are the three bottlenecks of restricting the development of logistics in Dalian Port. These problems need to be solved urgently.

Nowadays, the industries in port area are the strong backing force for the development of a port. In addition, the Free Trade Zone and Free Trade Port Area have been the pivotal roles for increasing the international competition of the port. In this connection, the study in next chapter will analyze the development of Dalian Economic Technology Development Zone, Dalian Free Trade Zone and Dayaowan Free Trade Port Zone, which are the strong backing force for the development of Dalian Port.

CHAPTER 5 BACKING FORCES FOR THE DEVELOPMENT OF DALIAN PORT

5.1 Introduction

This chapter analyzes the development of Dalian Economic Technology Development Zone in the revitalizing period and presents the policies and functions of Dalian Free Trade Zone as well as the projects and functions of Dayaowan Free Trade Port Zone.

The special economic and trade zones are the pivotal backing forces for the economy, society and logistics development in Dalian Port because of the preferential economic and trade policies that have been implemented in the zones. The studies on the cases show the importance of the zones to the logistics development in Dalian Port.

5.2 Dalian Economic Technology Development Zone

In the year 2010, Dalian Government established a new development area named "Dalian Jinzhou New Area". The new area mainly consists of DETDZ and Jinzhou District in order to integrate the economic and social resources and strive for the greater development. As the reason mentioned in Chapter 2 (Paragraph 3, Line, 1 Page 20), DETPZ will be used as an accurately stated terminology for the studies.

5.2.1 The Economic Development

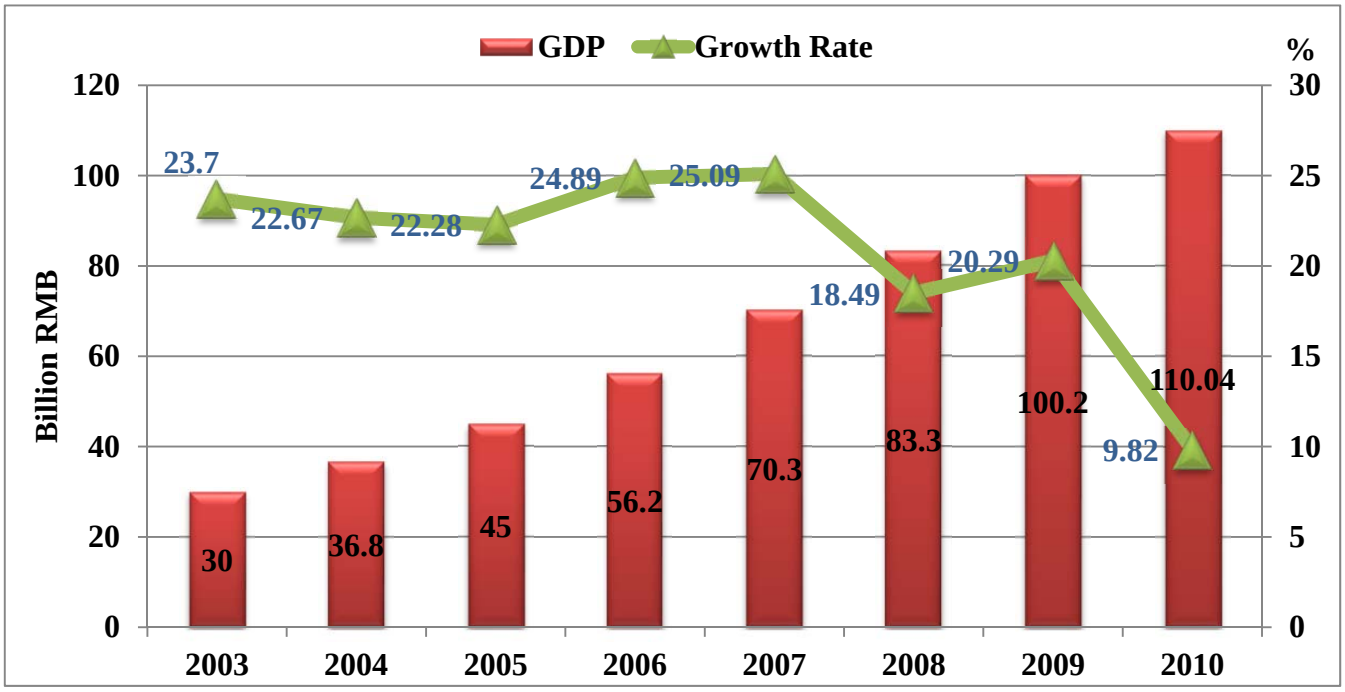
1) Gross Domestic Product

The GDP in DETDZ comes up to RMB 531.84 billion from the year 2003 to 2010, RMB 420.04 billion of which was in the "*11th Five-Year Plan*" period.

The GDP kept growing from the year 2003 to 2010. The general growth rate kept stable increase from 2003 to 2007, and it sharply decreased in 2008, then the index increased slightly in 2009, but it slumped again in the year 2010 (see Figure 5.1).

The phenomenon shows that as an international trade zone, DETDZ was influenced directly by Lehman Shock in the year 2008. This is different from the condition of Dalian Port. But, the GDP still keeps positive growth after the shock because the policies of expanding domestics demand that implemented in the year 2008.

Figure 5.1 GDP of DETDZ (2003-2010)



Source: Created by the author based on National Economic and Social Development Statistical Communique of Dalian Economic Technology Development Zone 2003-2011

2) Industrial Output of Large-scale Enterprise

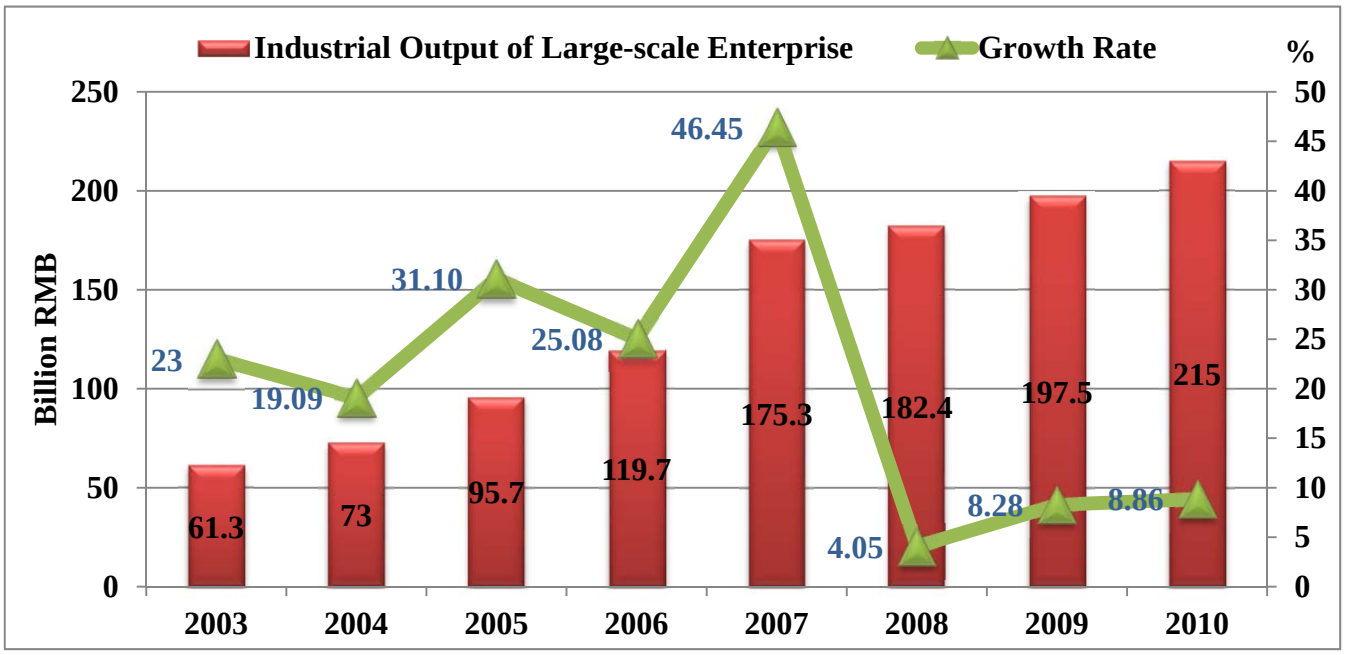
The gross industrial output of large-scale enterprises in DETDZ amount to RMB 1119.9 billion from the year 2003 to 2010, RMB 889.9 billion of which was in the "1*1th Five-Year Plan*" period.

The industrial output of large-scale enterprises kept growing from 2003 to 2007 and it increased slowly from the year 2008 to 2010. The growth rate from 2003 to 2007 increased in waves and it slumped in the year 2008, the growth in the year 2009 and 2010 are slight but kept positive increase (see Figure 5.2).

The figure shows that the large-scale enterprises in DETDZ, which are in exporting processing and international trade, were affected seriously by Lehman Shock in the year 2008. And the influence was lasing for three years. The demand of world still remained weak since then. Under the sluggish circumstance, the large-scale enterprises in DETDZ can keep positive growth though it was slight.

With the growth in GDP and industrial output of large-scale enterprises, DETDZ was developing fast in the recent 9 years after the implementation of the plans for revitalization and International Shipping Center establishment in Dalian Area. In other words, though influenced by Lehman Shock, the plan is still positive for renaissance and development in the region.

Figure 5.2 Gross Industrial Outputs of Large-scale Enterprises in DETDZ (2003-2010)



Source: Created by the author based on National Economic and Social Development Statistical Communique of Dalian Economic Technology Development Zone 2003-2011

5.2.2 The Trade Development

1) Export

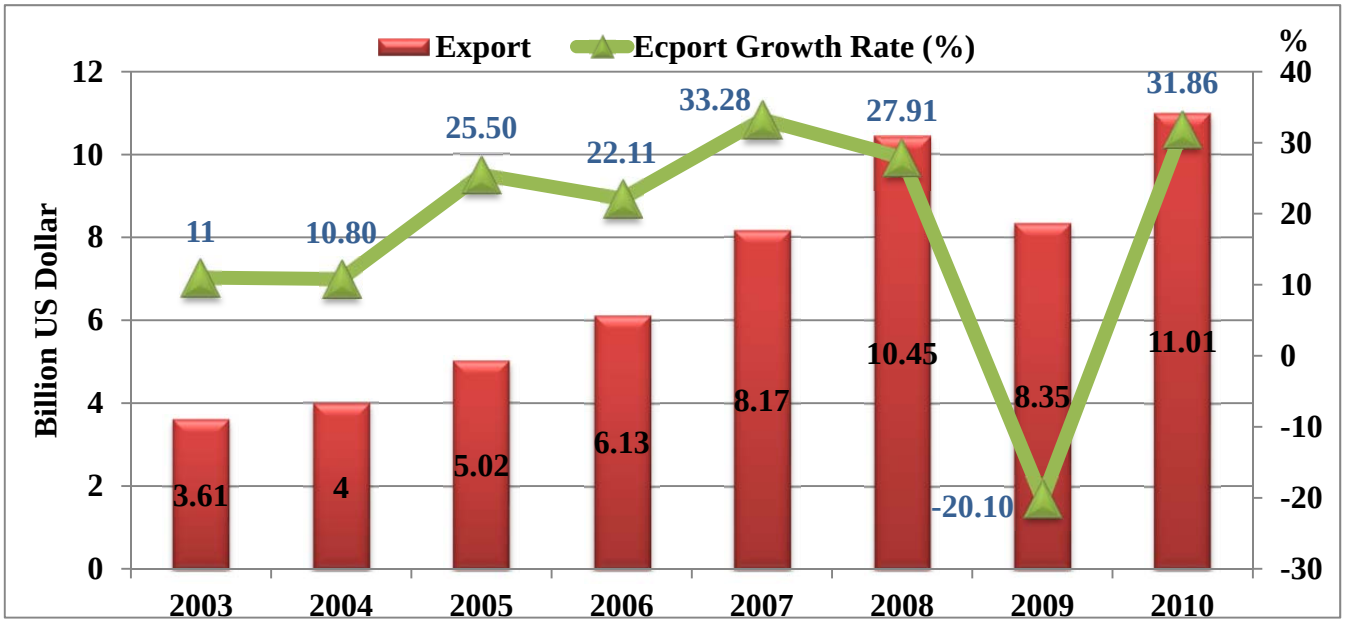
The gross export of DETDZ comes up to USD 56.74 billion from the year 2003 to

2010, RMB 44.11 billion of which was in the "*11th Five-Year Plan*" period.

The export kept growing from the year 2003 to 2008. In the year 2009, it had a negative increase, and it rose up in 2010. The general growth rate was increasing in waves at the same time. It sharply decreased in 2009, then it increased sharply in 2010 (see Figure 5.3).

The phenomenon shows that the export of DETDZ was influenced directly by Lehman Shock in the year 2009. But, it recovered in the year 2010 after only year of the shock because cost of labor force and production is low in China, especially in Northeast China, which is under the revitalization period. The absolute increasing value in the year 2010 reached to 51.96%.

Figure 5.3 Export of DETDZ (2003-2010)



Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

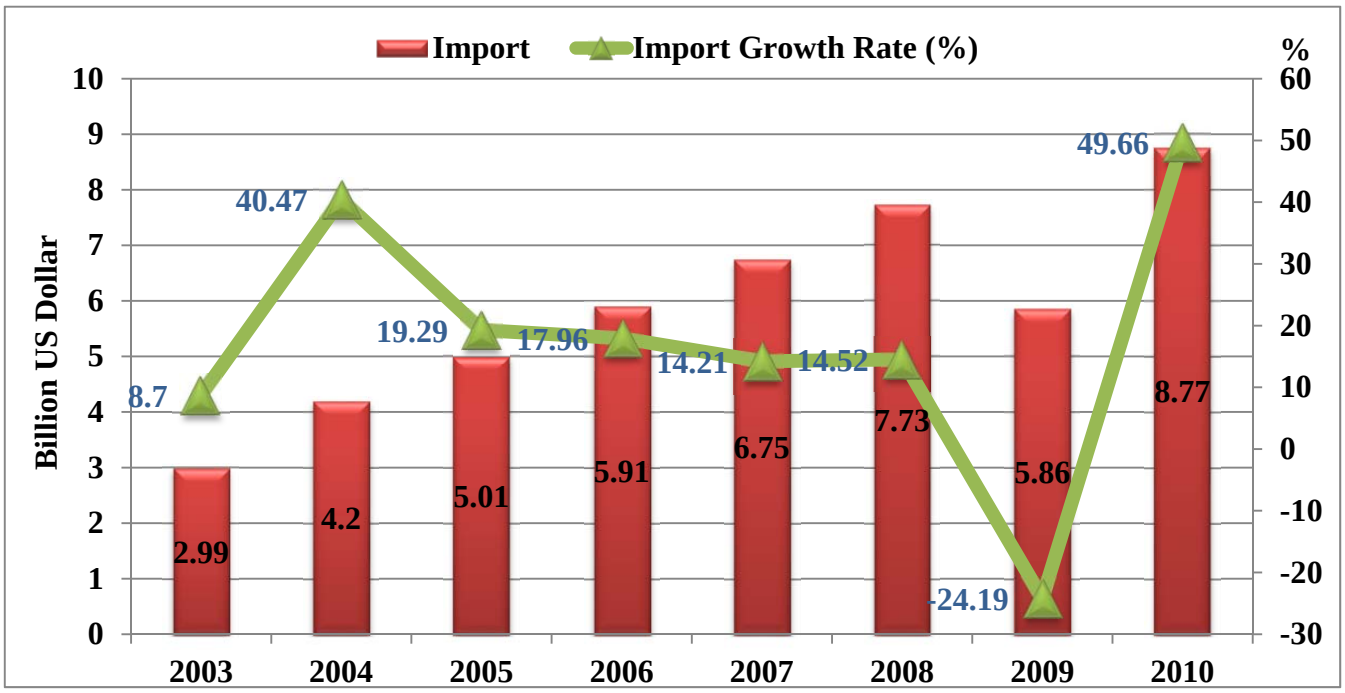
2) Import

The gross import of DETDZ amounts to USD 47.22 billion from the year 2003 to 2010, USD 35.02 billion of which was in the "*11th Five-Year Plan*" period.

The import kept growing from 2003 to 2008. The growth rate was increasing in waves at the same time, but the general trend is decreasing. It decreased in 2009, then it increased sharply in 2010, the absolute increasing value in this year reached to 73.85% (see Figure 5.4).

The figure shows that the export is always more than import in DEFTZ. Both export and import were severely affected by Lehman Shock.

Figure 5.4 Import of DETDZ (2003-2010)



Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

3) Export of Foreign and Domestic Enterprises

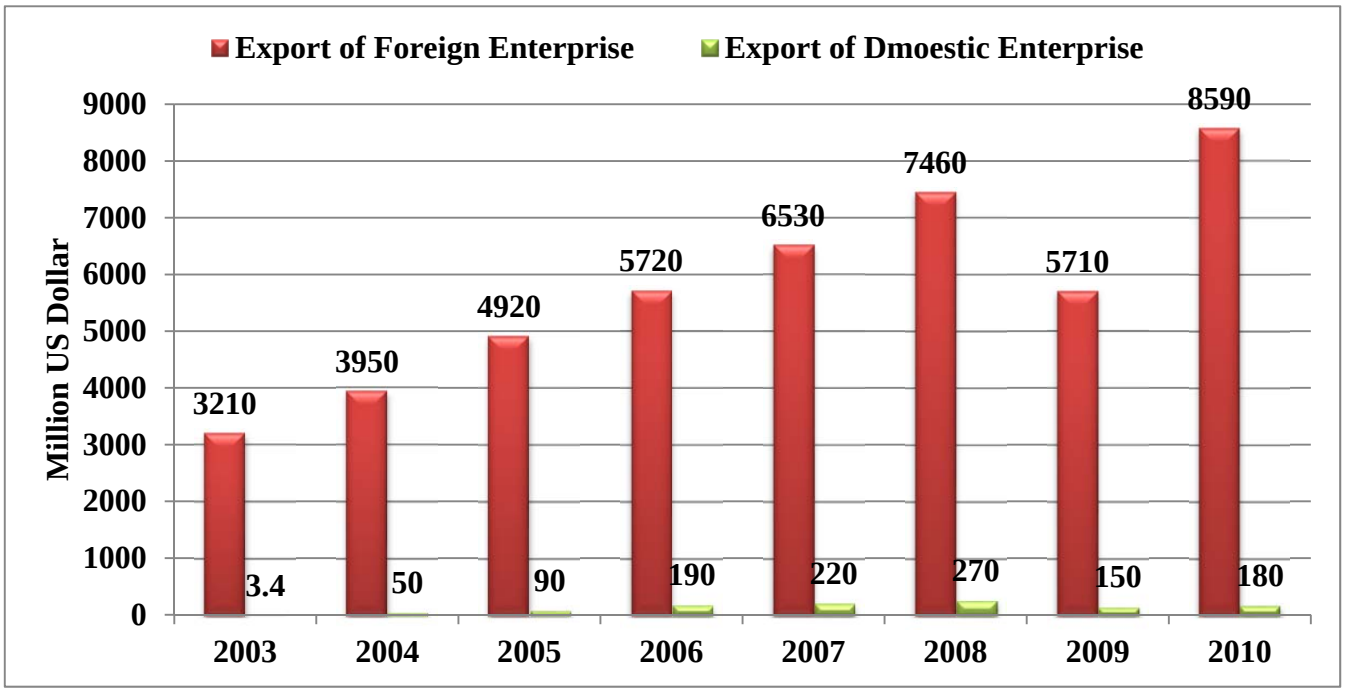
The export of foreign enterprise in DETDZ comes up to USD 46,090 million from the year 2003 to 2010, USD 34,010 million of which was in the "*11th Five-Year Plan*" period.

The export of foreign enterprise kept growing from 2003 to 2008. It decreased in 2009, then it increased sharply in 2010 (see Figure 5.5). The export of domestic enterprise in DETDZ amounts to USD 1，153.4 million from the year 2003 to 2010,

USD 1，010 million of which was in the "*11th Five-Year Plan*" period. The export of domestic enterprise also kept increasing from 2003 to 2008. It decreased in 2009, then it increased slight in 2010 (see Figure 5.5).

The export analyses show that the foreign enterprises is the main international trade force in DEFTZ and the domestic enterprises are still in the early developing statue.

Figure 5.5 Export of Foreign and Domestic Enterprises in DETDZ (2003-2010)

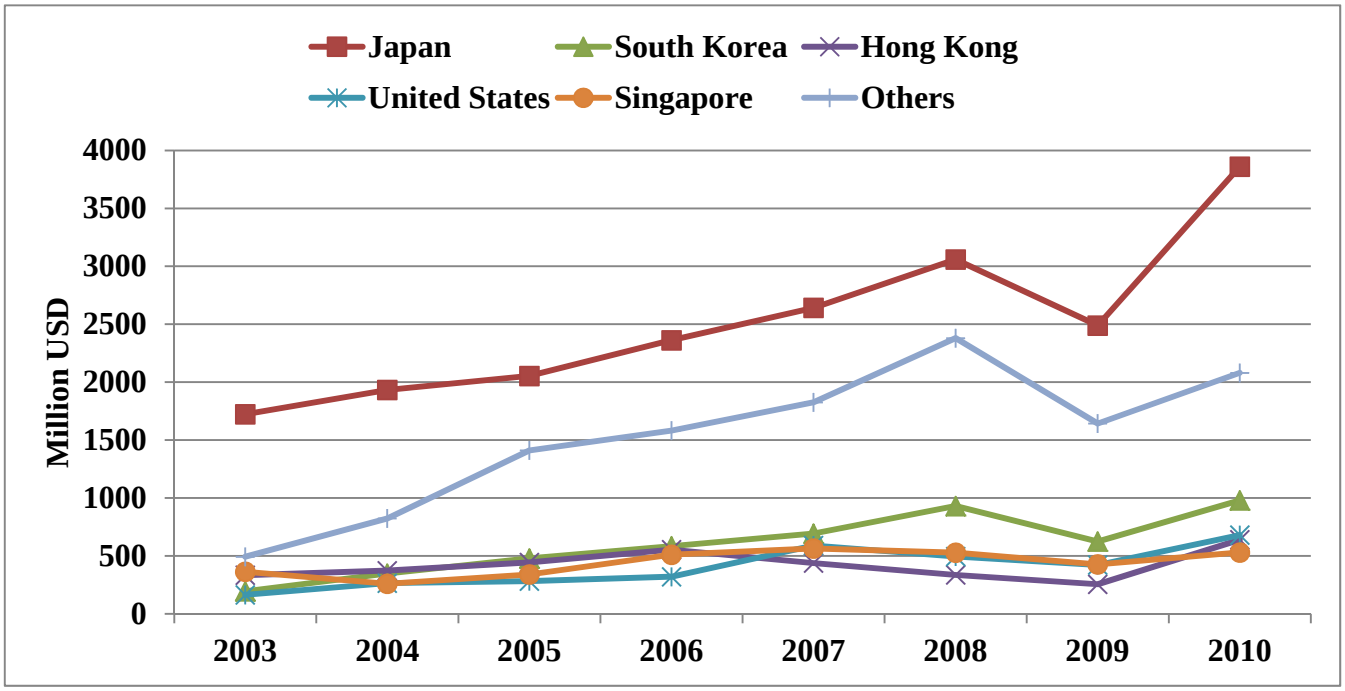


Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

4) Importing Countries and Regions from DETDZ

The import from DETDZ to other countries and regions sums to USD 47,311 million from the year 2003 to 2010, USD 35,026 million of which was in the "*11th Five-Year Plan*" period. Generally, the import of the countries and regions were increasing from 2003 to 2008. All the countries and regions reduced the import from DETDZ due to the influence by Lehman Shock. The import recovered and rose up in 2010 (see Table 5.6 and Table 4.1).

Figure 5.6 Importing Countries and Regions from DETDZ (2003-2010)



Source: Created by the author based on Annual Statistical Report of Dalian Economic Technology Development Zone 2003-2010

Table 5.1 Importing Countries and Regions from DETDZ (2003-2010)

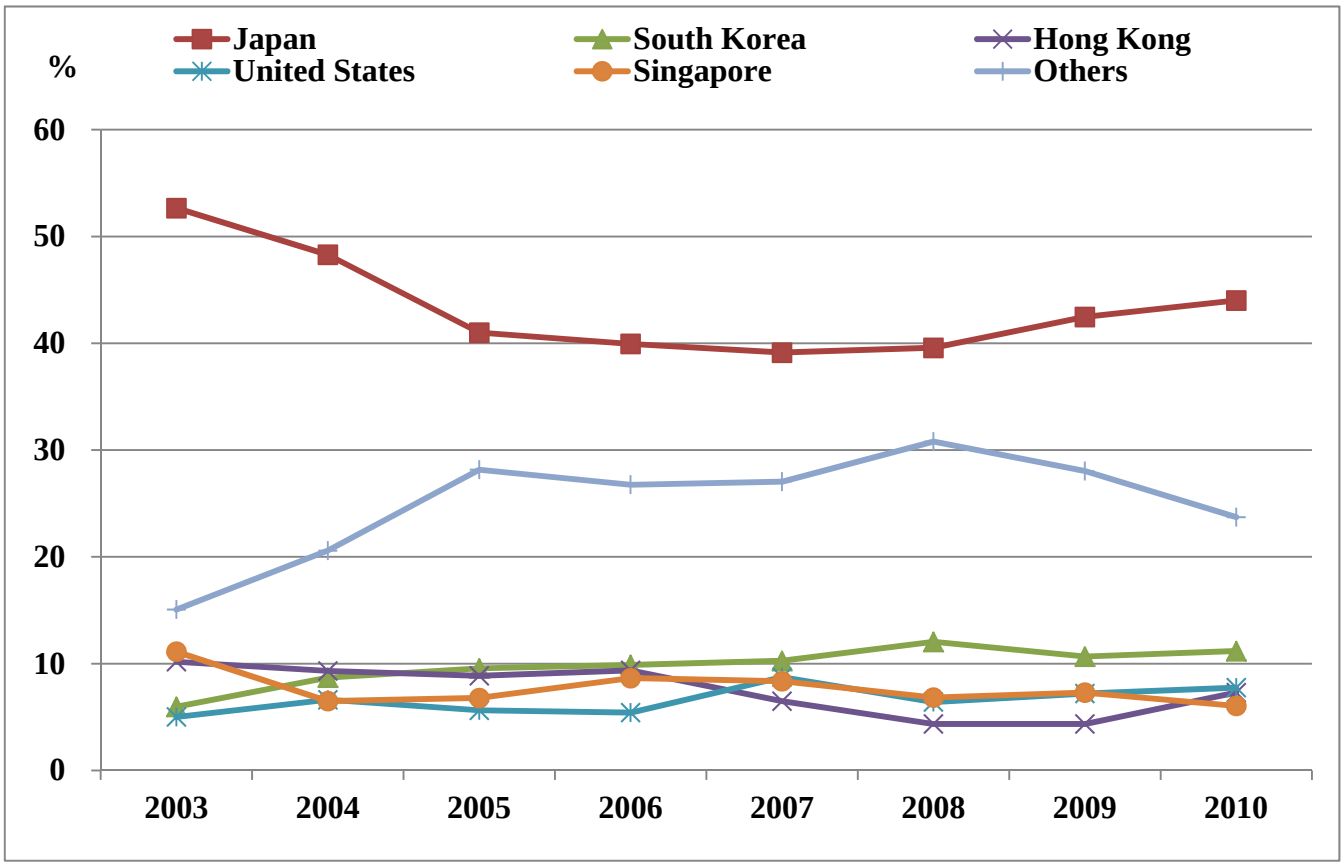
	Japan (in Million USD)	South Korea (in Million USD)	Hong Kong (in Million USD)	United States (in Million USD)	Singapore (in Million USD)	Others (in Million USD)	Total (in Million USD)
2003	1723	195	333	164	364	493	3272
2004	1933	348	373	265	260	824	4003
2005	2054	479	444	282	340	1411	5010
2006	2362	584	554	320	511	1582	5913
2007	2642	693	438	590	564	1826	6753
2008	3059	931	336	495	528	2380	7729
2009	2489	625	255	422	427	1643	5861
2010	3860	980	640	680	530	2080	8770

Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

The main importers are Japan and South Korea. The average percent of the import to Japan in the eight years is 48.385%. The other countries and regions have become major importers in recent years (see Table 5.7 and Table 4.2).

The analyses indicate DEFTZ is important to the international trade between Northeast China and Northeast Asia, especially to Japan and South Korea.

Figure 5.7 Ratio of Importing Countries and Regions from DETDZ (2003-2010)



Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

Table 5.2 Ratio of Importing Countries and Regions from DETDZ (2003-2010)

	Japan (%)	South Korea (%)	Hong Kong (%)	United States (%)	Singapore (%)	Others (%)	Total (%)
2003	52.66	5.96	10.18	5.01	11.12	15.07	100.00
2004	48.29	8.69	9.32	6.62	6.50	20.58	100.00
2005	41.00	9.56	8.86	5.63	6.79	28.16	100.00
2006	39.95	9.88	9.37	5.41	8.64	26.75	100.00
2007	39.12	10.26	6.49	8.74	8.35	27.04	100.00
2008	39.58	12.05	4.35	6.40	6.83	30.79	100.00
2009	42.47	10.66	4.35	7.20	7.29	28.03	100.00
2010	44.01	11.17	7.30	7.75	6.04	23.72	100.00

Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

5.2.3 The Foreign Investment

1) Contractual Foreign Capital and Actually Utilized Foreign Capital

The gross contractual foreign capital of DETDZ amount to USD 11,380 million from the year 2003 to 2010, USD 7,330 million of which was in the "*11th Five-Year Plan*" period (see Figure 5.8).

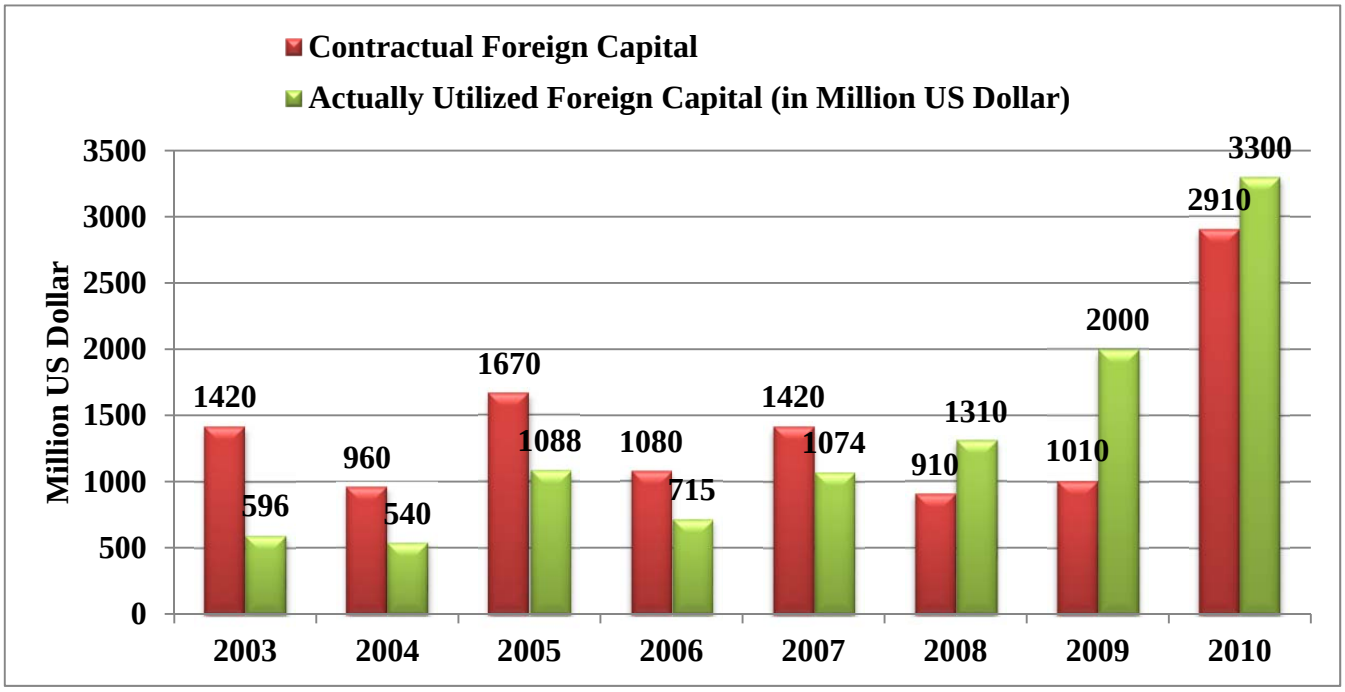
The gross actually utilized foreign capital of DETDZ amount to USD 10,623 million from the year 2003 to 2010, USD 8.399 million of which was in the "*11th Five-Year Plan*" period (see Figure 5.8).

The gross contractual foreign capital almost equal to the gross actually utilized foreign capital. The characters of the foreign capital distributions are that the contractual capitals were more than utilized capitals before 2008, and the utilized capitals were more than contractual capitals after 2008.

The reason for the phenomenon is the influence by Lehman Shock in the year 2008.

The foreign capital decreased in this year and the former contractual capital had been put in DETDZ in succession since this year. Thus, the total utilized capitals in 2008 and 2009 were USD 3,310 million. With the betterment of the world economy, both the contractual capitals and utilized capitals were reached a record high in 2010.

Figure 5.8 Contractual Foreign Capital and Actually Utilized Foreign Capital of DETDZ (2003-2010)



Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

2) Countries and Regions Investment to DETDZ

The total investment from foreign countries and regions comes up to USD 115,305 million from 2003 to 2010.

The most investment to DEFTZ is from Japan, the amount has reached to USD 36,024 million. The second most investment from South Korea and the third is Hong Kong. The amounts are USD 18,622 million and USD 18,616 million respectively. In the year 2010, Hong Kong surpassed South Korea to become the second-largest investment region (see Figure 5.9 and Table 5.3).

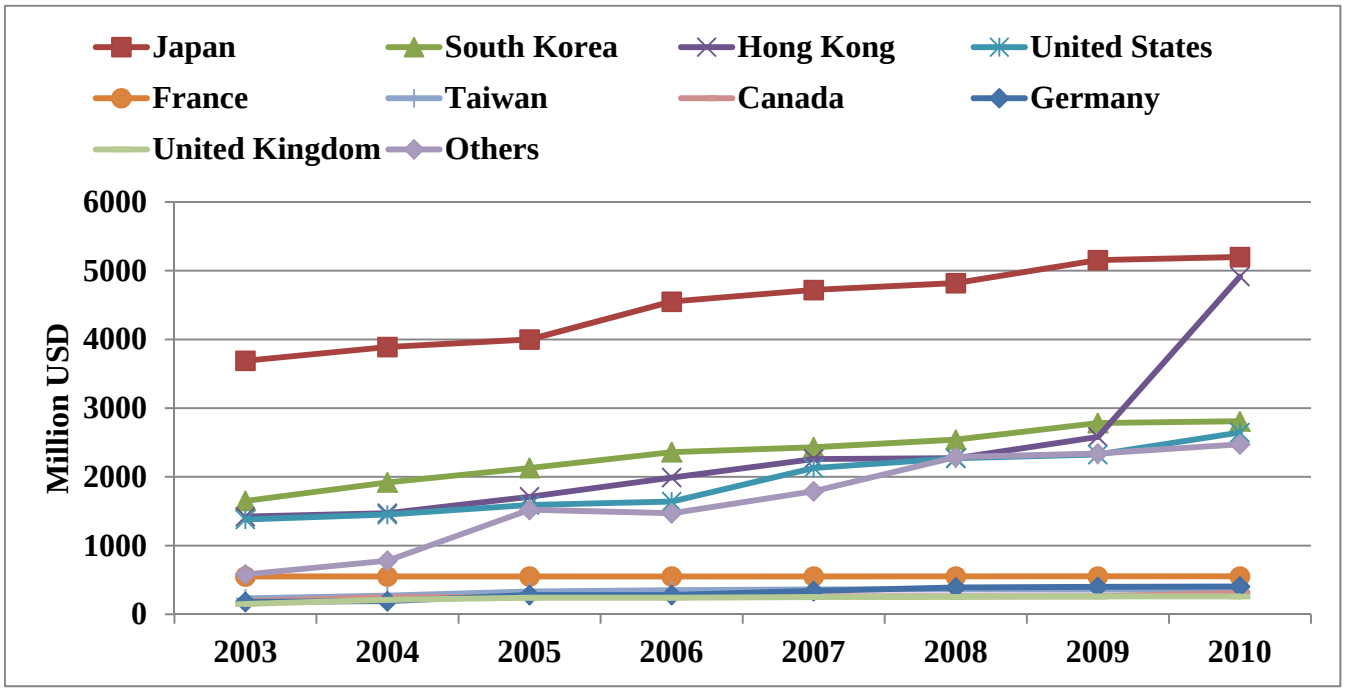
Remarkably, the investment from most of the countries and regions kept increasing in

the whole eight years though the world economy was seriously affected by Lehman Shock in 2008.

The ratio of the investment from Japan is highest among the countries and regions. But the ratio keeps decreasing in the eight years. The ratio of Hong Kong rose to the second in 2010 (see Figure 5.10 and Table 5.4).

The analyses on the investment from foreign countries and regions to DETDZ indicate that the zone is able to attract a lot of foreign investment because of the great potentiality of development in the zone. The potentiality gives confidence to the investors. This is the reason why the investment could keep increasing after Lehman Shock.

Figure 5.9 Countries and Regions Investment to DETDZ (2003-2010)



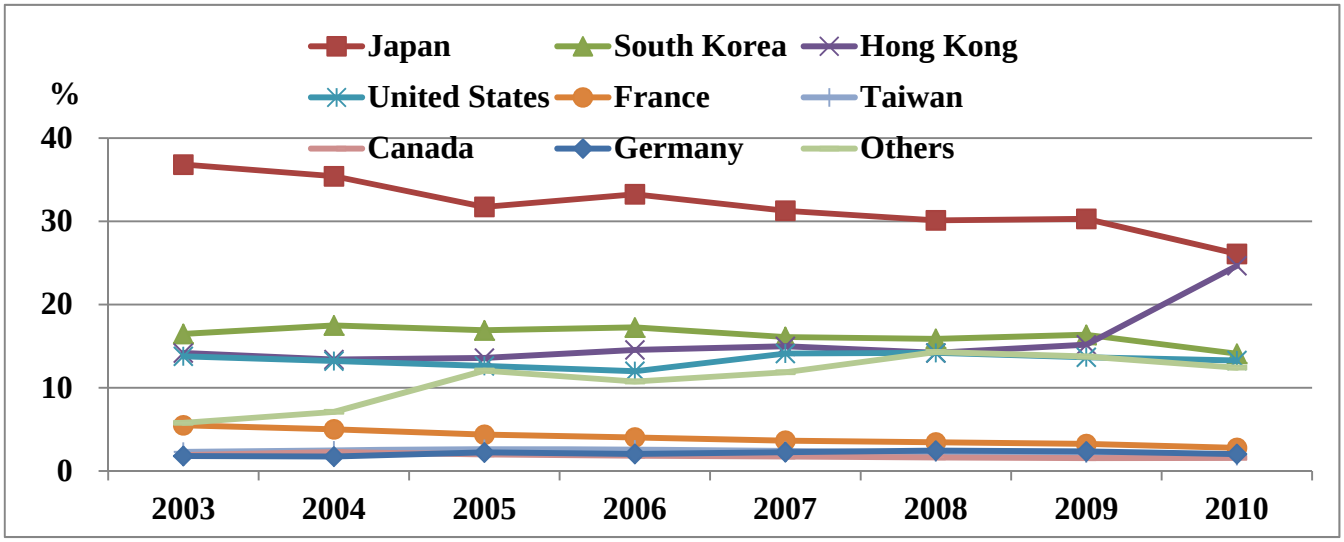
Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

Table 5.3 Countries and Regions Investment to DETDZ (2003-2010)

	Japan (in Million USD)	South Korea (in Million USD)	Hong Kong (in Million USD)	United States (in Million USD)	France (in Million USD)	Taiwan (in Million USD)	Canada (in Million USD)	Germany (in Million USD)	United Kingdom (in Million USD)	Others (in Million USD)	Total (in Million USD)
2003	3690	1650	1420	1380	550	230	190	180	150	580	10020
2004	3890	1920	1470	1450	550	270	250	190	210	780	10980
2005	4000	2130	1710	1590	550	330	250	280	240	1520	12600
2006	4550	2360	1990	1640	550	350	250	280	240	1470	13680
2007	4720	2430	2260	2130	550	360	260	340	250	1790	15090
2008	4820	2540	2270	2270	550	360	260	390	252	2288	16000
2009	5155	2784	2581	2324	552	359	261	398	258	2339	17011
2010	5199	2808	4915	2645	552	359	311	404	258	2473	19924

Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

Figure 5.10 Ratio of the Countries and Regions Investment to DETDZ (2003-2010)



Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

Table 5.4 Ratio of the Countries and Regions Investment to DETDZ (2003-2010)

Year	Japan (%)	South Korea (%)	Hong Kong (%)	United States (%)	France (%)	Taiwan (%)	Canada (%)	Germany (%)	United Kingdom (%)	Others (%)	Total (%)
2003	36.83	16.47	14.17	13.77	5.49	2.30	1.90	1.80	1.50	5.79	100
2004	35.43	17.49	13.39	13.21	5.01	2.46	2.28	1.73	1.91	7.10	100
2005	31.75	16.90	13.57	12.62	4.37	2.62	1.98	2.22	1.90	12.06	100
2006	33.26	17.25	14.55	11.99	4.02	2.56	1.83	2.05	1.75	10.75	100
2007	31.28	16.10	14.98	14.12	3.64	2.39	1.72	2.25	1.66	11.86	100
2008	30.13	15.88	14.19	14.19	3.44	2.25	1.63	2.44	1.58	14.30	100
2009	30.30	16.37	15.17	13.66	3.24	2.11	1.53	2.34	1.52	13.75	100
2010	26.09	14.09	24.67	13.28	2.77	1.80	1.56	2.03	1.29	12.41	100

Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

5.2.1 Foreign Investment Structure

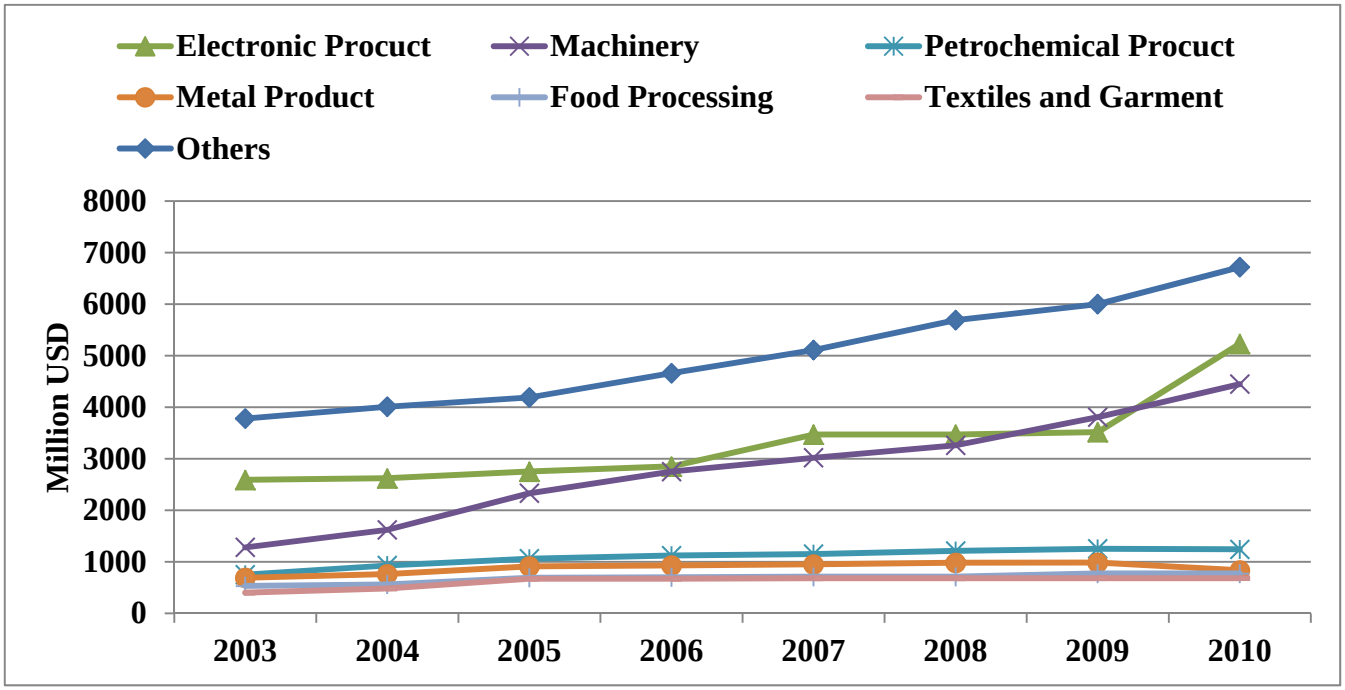
The total investment from foreign countries and regions comes up to USD 115,305 million from 2003 to 2010. These investments mainly focus on electronic product, machinery, petrochemical product, metal product, food processing and textiles and garment.

The largest part that the investments focus on is electronic product. The amount reached to USD 26,495 million by the end of the year 2010. The second part is machinery and the third is petrochemical product. The amounts are USD 22,514 million and USD 8,715 million respectively. In the year 2009, machinery became the first one temporarily (see Figure 5.11 and Table 5.5).

The ratio of the investment to electronic product is general highest among the industries expect in the year 2009. The ratio of machinery rose to the first position in 2009 (see Figure 5.12 and Table 5.6).

The analyses on the foreign investment structure in DETDZ indicate that the main investments from abroad are focus on the hi-tech industries in the zone. The total investments on electronic product, machinery and petrochemical product account for 50.062% of the total investments. This means that at least half of the enterprises in DETDZ are technology intensive enterprises.

Figure 5.11 Foreign Investment Structure in DETDZ (2003-2010)



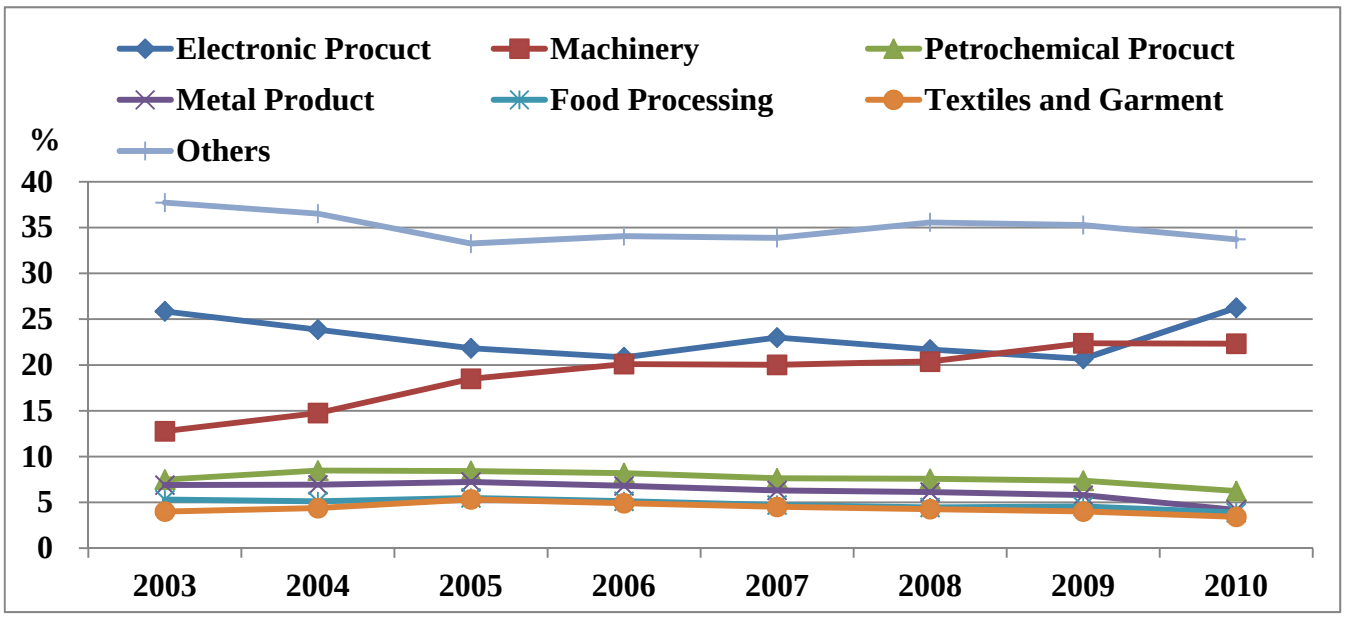
Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

Table 5.5 Foreign Investment Structure in DETDZ (2003-2010)

	Electronic Product (in Million USD)	Machinery (in Million USD)	Petrochemical Product (in Million USD)	Metal Product (in Million USD)	Food Processing (in Million USD)	Textiles and Garment (in Million USD)	Others (in Million USD)	Total (in Million USD)
2003	2590	1280	750	690	530	400	3780	10020
2004	2620	1620	930	760	560	480	4010	10980
2005	2750	2330	1060	910	690	670	4190	12600
2006	2850	2750	1120	930	700	670	4660	13680
2007	3470	3020	1150	950	710	680	5110	15090
2008	3470	3260	1210	980	710	680	5690	16000
2009	3516	3806	1253	983	772	681	6000	17011
2010	5229	4448	1242	834	772	681	6718	19924

Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

Figure 5.12 Ratio of Foreign Investment Structure in DETDZ (2003-2010)



Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

Table 5.6 Ratio of Foreign Investment Structure in DETDZ (2003-2010)

	Electronic Product (%)	Machinery (%)	Petrochemical Product (%)	Metal Product (%)	Food Processing (%)	Textiles and Garment (%)	Others (%)	Total (%)
2003	25.85	12.77	7.49	6.89	5.29	3.99	37.72	100.00
2004	23.86	14.75	8.47	6.92	5.10	4.37	36.52	100.00
2005	21.83	18.49	8.41	7.22	5.48	5.32	33.25	100.00
2006	20.83	20.10	8.19	6.80	5.12	4.90	34.06	100.00
2007	23.00	20.01	7.62	6.30	4.71	4.51	33.86	100.00
2008	21.69	20.38	7.56	6.13	4.44	4.25	35.56	100.00
2009	20.67	22.37	7.37	5.78	4.54	4.00	35.27	100.00
2010	26.24	22.32	6.23	4.19	3.87	3.42	33.72	100.00

Source: Created by the author based on Annual Report of Dalian Economic Technology Development Zone 2004-2011

5.2.2 Problems in the Development

Subjectivity, there are some accidents that happened in the development period.

1) Petrochemical Accidents in DETDZ

As far as petrochemical accidents are concerned, there were 5 fires that took place in Dalian Branches of China National Petroleum Corporation (CNPC) from 2010.7.16 to 2011.11.22, 3 of which happened in DETDZ (see Table 5.7).

i The 2010.7.16 Explosion Accident

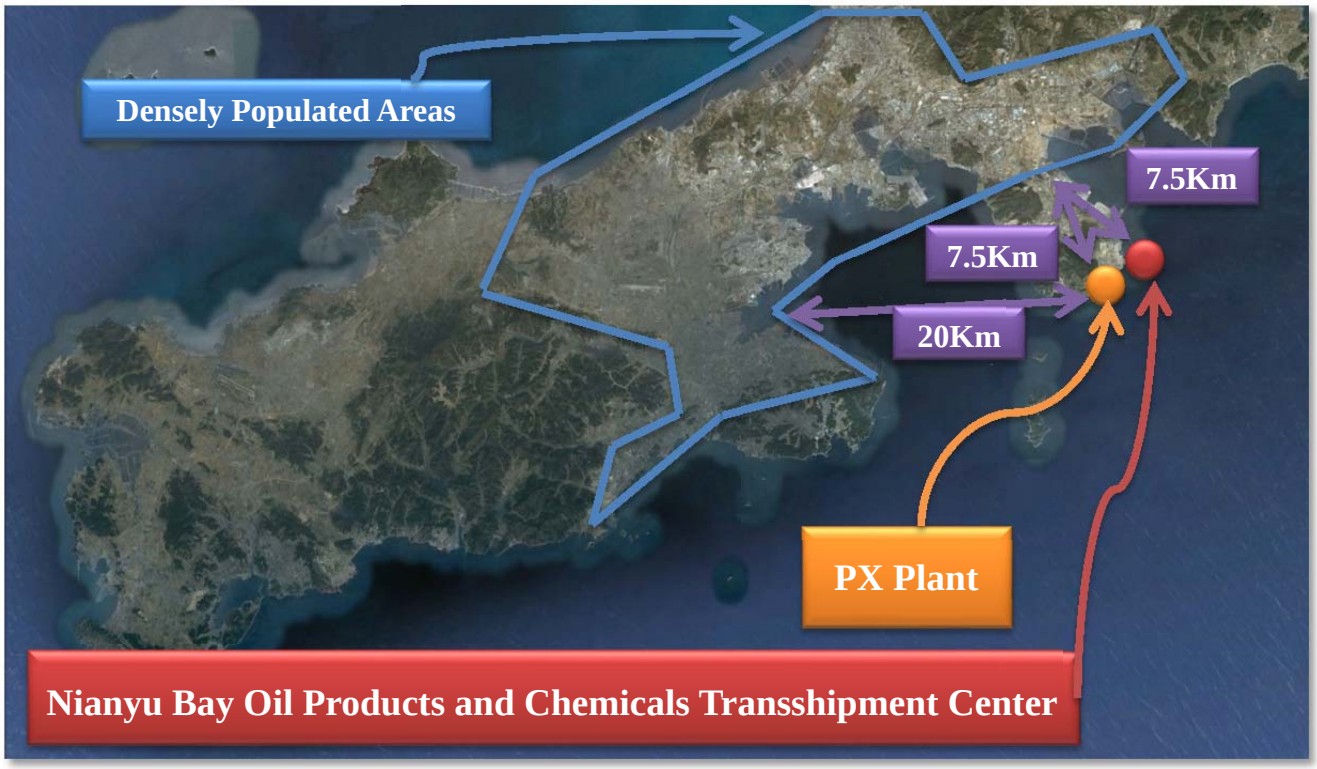
The 7.16 Accident caused by a kind of crude oil desulfurizer, ZC-PCD, over injected into the crude pipeline with strong oxidizer. The desulfurizer was being injected into pipelines for a long time after the crude oil unloaded.

The explosion can be caused if the oxygen content is over 30% in the air. This is the reason why the pipeline exploded. The pipeline that links to the oil wharf and storage

plant at Nianyu Bay Oil Products and Chemicals Transshipment Center was caught fire, and then a 100 thousand oil tank was also on fire right after the pipeline's fire. After an 18-hour firefighting, the fire was under control.

The distance between the oil wharf (the red point in Figure 5.13) and the living area of DETDZ is just 7.5 kilometers (see Figure 5.13). In order to avoid the explosion spread extensively, CNPC Dalian Branch released all the reserved crude oil to the sea. The polluted seawater was 430 km^2; in some sea areas the thickness of the released crude oil was one meter. Most coastal sea lives were also polluted by the crude oil.

Figure 5.13 Locations of Nianyu Bay Oil Products and Chemicals Transshipment Center and PX Plant



Source: Created by the author based on http://bjyouth.ynet.com/article.jsp?oid=80435482

ii The 10.24 Explosion Accident

The 10.24 Accident caused by the residue crude oil at the bottom of the destroyed tank (on 7.16). It was kindled when it was torn down. The fire was put out after 10 hours (from 16 p.m. to 2 a.m.), and the accident just pollute the air.

iii The 11.22 Explosion Accident

The 11.22 Accident caused by the struck by lightning on No. 31 and 32 crude oil tanks of CNPC Petrochemical Dalian Branch, both the tank stored 100 thousand ton crude oil. The fire was put out after 10 hours (from 16 p.m. to 2 a.m.), and the accident just pollute the air.

Table 5.7 CNPC Dalian Branch Petrochemical Accidents in DETDZ (2010-2011)

Date	Accident	Cause of the Accident	Impact
2010.7.16	An explosion of the crude oil pipeline caused a 100 thousand crude oil tank of CNPC Dalian International Storage Company to explode.	The over oxygen in the pipeline caused fire by ZC-PCD with strong oxidizer	Polluted seawater was 430 square km^2. Most of the coastal sea lives were also polluted by the oil.
2010.10.24	Residue crude oil at the bottom of the destroyed tank (on 7.16) caught fire.	Residue crude oil was kindled.	Air Pollution
2011.11.22	No. 31 and 32 crude oil tanks of CNPC Petrochemical Dalian Branch b caught fire.	The seal curtains of the tanks were struck by lightning.	Air Pollution

Source: Created by the author based on http://news.xinhuanet.com/fortune/2011-11/24/c_111192315.htm

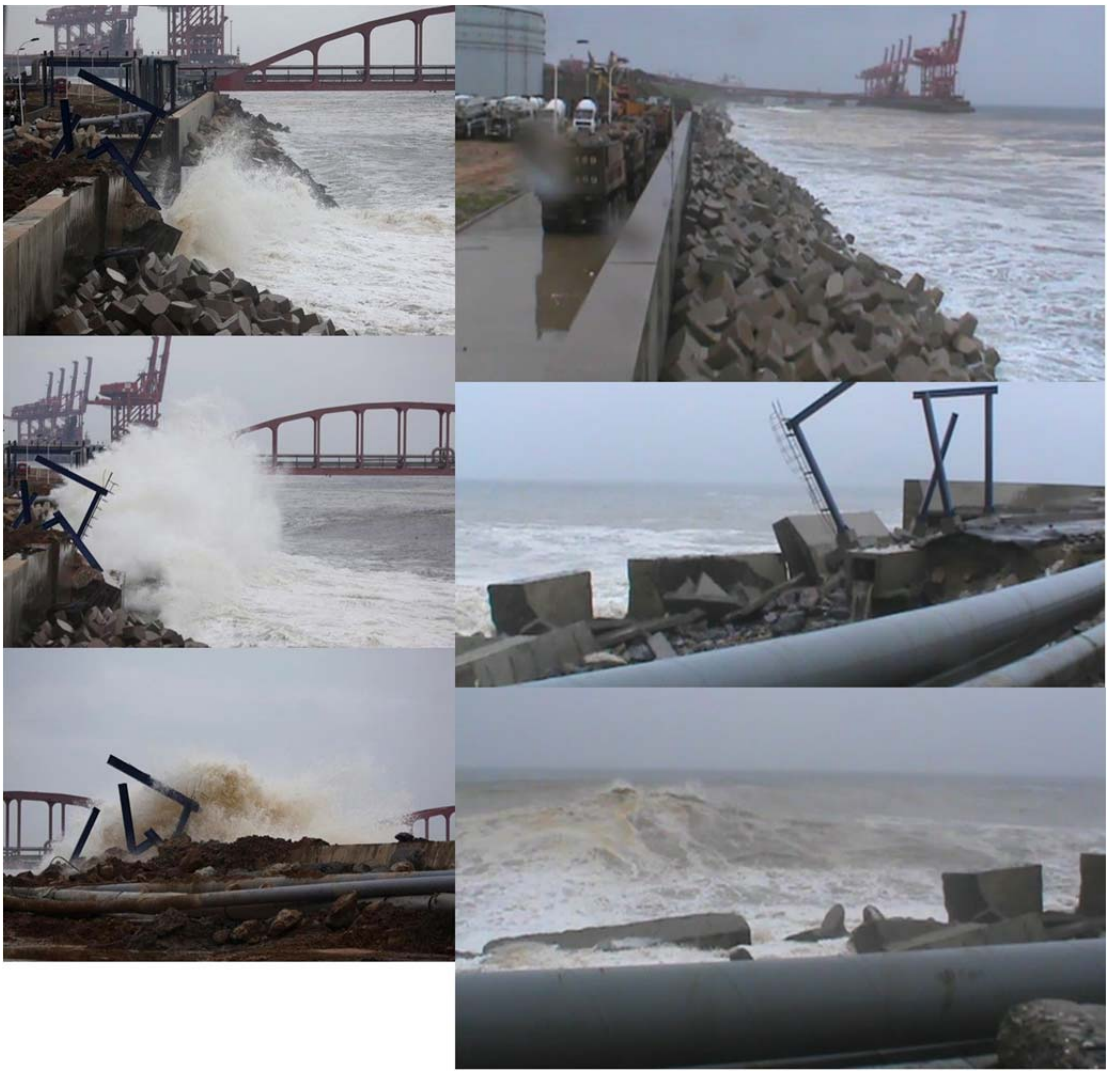
2) Awful Construction Accident of Breakwater of P-Xylene Plant in DETDZ

The accident happened on 8, August 2011. The damage of the breakwater of Fujia-Dahua P-Xylene Plant (hereafter referred to as PX Plant) caused a serious urban panic in Dalian City. At that time, it was at the edge of a serious accident.

Both of the two ends of breakwater were caved in due to the waves caused by No. 9 Typhoon Muifa in 2011 (see Figure 5.14), each end was destroyed for more than 30

meters. The distance between the damaged breakwater and two PX storage tanks is only 50 meters. The wind force on that day reached to strong gale (moves at the rate of 40 miles per hour), and the wave was up to more than 20 meters. In addition, the distance between PX Plant (the orange point in Figure 5.13) and the living area of Dalian City is just 20 kilometers and the distance between PX Plant and the living area of DETDZ City is just 7.5 kilometers (see Figure 5.13), which is much shorter than the standard safety distance between PX Plant and the living area——70 kilometers.

Figure 5.14 Damage of breakwater of Fujia-Dahua P-Xylene Plant in 2011



Source: Created by the author based on http://www.lh168.net/bbs/article-1573-1.html & http://weather.gdcct.gov.cn/qxyw/201108/t20110809_542259.html#text

i The Background of Dalian PX Program

Dalian Fujia-Dahua PX Plant is the largest PX program in China. The investment to the program reached to RMB 9.5 billion. Its annual production amounts to RMB 26 billion with a payment of tax RMB 2 billion. The production capability of the plant is 700 thousand aromatic hydrocarbons. Fujia-Dahua PX Plant is a cooperation program combined with Fujia Group and Dahua Group (Dalian Chemical Industry Group).

ii Uses of PX

P-Xylene is used on a large scale for the manufacture of terephthalic acid for polyester. Its polymer is known as Parylene.

The main uses of PX are on chemical industry, pharmacy, PET (Polyethylene Terephthalate), and resins (a kind of transparent plastic material, used to produce packaging of beverage, edible fat and solar films).

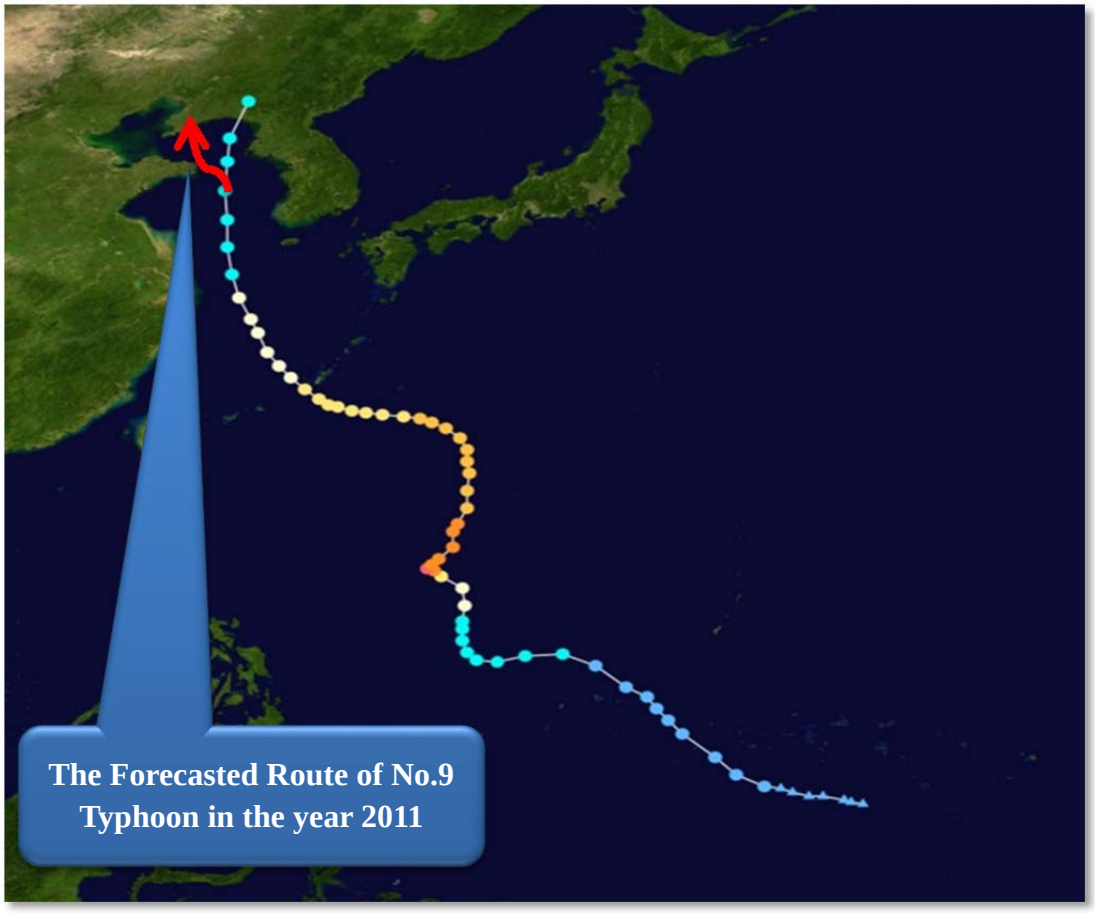
iii Side Effects on Health

- It is characterized as one of hazardous chemicals and a kind of Group 3 carcinogens, the agent (mixture or exposure circumstance) classifiable as to its carcinogenicity to humans.
- It can be breathed in, ingested and absorbed through skin.
- It has a stimulating effect on the respiratory tract and eyes, while high concentrations have a narcotic effect on the central nervous system.

iv The Dangerous Situation

The red arrow (see Figure 5.14) shows the forecast route of No. 9 Typhoon, if it moved to the forecasted direction, the wind and wave around Dalian would have been more serious and the breakwater would have been damaged more seriously.

Figure 5.15 Route of No.9 Typhoon in the year 2011



Source: Created by the author based on
http://upload.wikimedia.org/wikipedia/commons/5/5c/Muifa_2011_track.png

v The Impacts and Solution of the Accident

Due to the dangerous condition, a vast demonstration was held by local citizens on August 14th 2011. Then the local government promised to close down the production lines and relocate the PX Plant to another place.

A local government officer confirmed the production of PX Plant had returned to normal when he accepted an interview by New Business Daily on December, 30th 2011. And he also claimed the program to move the plant was also being implemented during the same period.

5.3 Dalian Free Trade Zone

Dalian Free Trade Zone (hereafter referred to as DFTZ) makes significant progress on logistics in revitalization period. It is one of the most important supports for the logistics development in Dalian Port.

5.3.1 Functions and Policies

Though located inside China, DFTZ is considered to be outside the Chinese customs territory. Thus, all the goods that import to China through DFTZ are not charged the tariff by Chinese customs until the goods leave the DFTZ for the market in China.

1) Major Functions

The main function of DFTZ is to offer the facilities and convenience for international trade, bonded storage, export processing and bonded exhibition in order to promote the trade and logistics for Northeast China.

2) Preferential policies

The goods that enter DFTZ from foreign countries or regions are exempt from duties, quotas or import and export permits. The duties are only required only after the import goods leave the zone for domestic market.

Export Processing Booklet is required by the customs when the goods enter DFTZ from the domestic market; all the imported equipment, construction materials and office necessities used by the enterprises which are located in the zone are exempt from import duties and licenses.

5.3.2 Dalian Export Processing Zone

A simplified supervision mode of “the goods are in Chinese border but outside the customs territory” is endowed to the processing zone. Abiding by the principle of "bookkeeping at the first line, clearing at the second line", customs authorities exert

an intensive supervision over the processing zone.

1) Major Functions

The main function of the processing zone is to offer the bonded processing and bonded logistics for the international trade and global logistics enterprises.

2) Preferential Policies

The imported construction materials, capital materials, raw materials and accessories are tariff-free. Moreover, if the above mentioned items are produced and purchased in domestic market, the value added tax (VAT) refund will be made.

5.3.3 Dalian Automobile Logistics City

Dalian Automobile Logistics City, which is adjacent to Dayaowan Free Trade Port Zone, is located inside Ershilipu and Liangjiadian in DFTZ.

A Sewage treatment plant, a power substation, a high voltage system corridor, Qingshan Water Plant and Beidahe alternative water sources are located in the area. In addition, a natural gas plant and a thermal power plant will be constructed according to the planning.

With its distinctive location and complete infrastructure, the place is considered to be the ideal location to develop industry of automobile logistics.

1) Location Advantages

Ershilipu Industrial Zone is 32km from Dalian City, and 30km from Dalian International Airport, besides, it is 40 km from Dalian Passenger Port, and 15 km from Dayaowan Free Trade Port Zone.

Bordering Bohai Sea and Huanghai Sea, the zone is the only access that connecting the hinterland of Northeast China with Dalian Port, DETDZ and Dayaowan Free

Trade Port Zone.

2) Industry Predominance

Dalian Port is a door of the Northeast China and Inner Mongolia open to North China, East China as well as the world.

Dalian Auto Terminal is the biggest international modernized Roll-on & Roll-off (Ro/Ro) harbor that specialized in automobile transportation in China. The terminal has one berth with the throughput capacity of 50 thousand tons. Besides, there are two berths with throughput capacity of 10 thousand tons. According to the development planning, the annual throughput capacity will reach to 1 million units of the vehicles.

Dalian Area has attracted many automobile and automobile–parts producers to invest in 8 assembly lines of coach, tank truck, and special truck for liquefied petroleum gas (LPG) and so on. There are also 88 automobile-parts produce enterprise including engine, camshaft, braking system, steel plate, tires, and internal decoration in Dalian Area.

The functions and policies are preferential in DFTZ and Dayaowan Free Port Area. The incomparable advantages over other economic areas in reducing production and operation costs, especially in promoting market competitiveness for the enterprises by reducing logistics costs have promote the development of automobiles in Dalian Port.

3) Development Strategy

The automobile logistics center is centered in old town area of Ershilipu. In recent year, five functional zones has been established including the automobile industry development zone, bonded logistics zone, storage and processing zone, ecological protection zone and urban functional zone.

Dalian Automobile Logistics City will make all efforts to build an ecological satellite

city led by automobile export, supported by bonded logistics, storage and processing, and affiliated by modern service industry.

5.4 Dayaowan Free Trade Port Zone

5.4.1 Brief Introduction

DFTPZ is a special trade area that is established in the port area under the special customs supervision on port, logistics and processing, etc.

5.4.2 Supervision & Custody

1) Major Functions

There are four major business functions in the: port service, logistics, processing and exhibition.

The following business are allowed and encouraged in the area: storage of cargoes awaiting customs clearance; foreign trade businesses including the international entrepot trade, international procurement, distribution and delivery, international transshipment, testing and maintenance, commodities exhibition; research and development (R&D)，processing and manufacturing; port operations; and other businesses approved by Chinese customs.

2) Customs Supervision Policies and Innovative Supervision Model

Sticking to the principle of “the free regulation at the front line, the strict control at the second line and the loose management in the zone”, DFPTA has set up a new supervision management model in the area.

The supervision management integrates the functions of special area and enriches all the functions of port, logistics, export processing, international trade, exhibition, etc.
The management of DFTPZ bases on the modernized method and implements the

information management to the port area, logistics network and electronic information system in order to integrate the DFTZ and DFTPZ perfectly. In addition, the new management model simplifies the customs procedures in order to make a better logistics system.

3) Digital Supervision

DFTPZ adopts the advanced supervision system of information, containers inspection and the equipment of electronic load meter in order to carry out the inspection of non-incursion.

The inspection department of Dalian Port links with the management department of DFTPZ, the administrative department of port and the port authority by network in order to share the information of both logistic and administrative.

4) Integrated Development

The development of the bounded logistics and the export processing in the port area promotes the accumulative effect of the port and integrates the shipping, port and logistics in the region.

Besides, the development attracts the industries on high value added industries, international transfer and international distribution move to Dalian Port. The development promotes the service and increase the international competition of Dalian Port.

The logistics will satisfies the new production, management, transport, distribution, and trade mode that generally used by most multinational enterprises such as just in time (JIT) inventory, vendor managed inventory (VMI) and seamless business link.

The new business development in DFTPZ integrates and harmonizes the development of processing and logistics in Dalian Port.

5.4.3 Main Facilities

1) Electrical Products Distribution Center

The Electrical Products Distribution Center has a constructive space of 95,000m^2 with total 3 floors. The trucks could be driven up to the 2nd floor via elevated road. The different floors in the center are connected by the elevators.

The customers of the distribution center include the fields such as semi-conductor, precision electrical, equipment and electron and commercial value-added service.

2) Reconsolidation and Transfer Center

There are two floors in the transfer center with a constructive space of 68,000m^2. The trucks could be driven up directly to the 2nd floor via elevated road. The transfer center serves as a container freight station (CFS) and transshipment station.

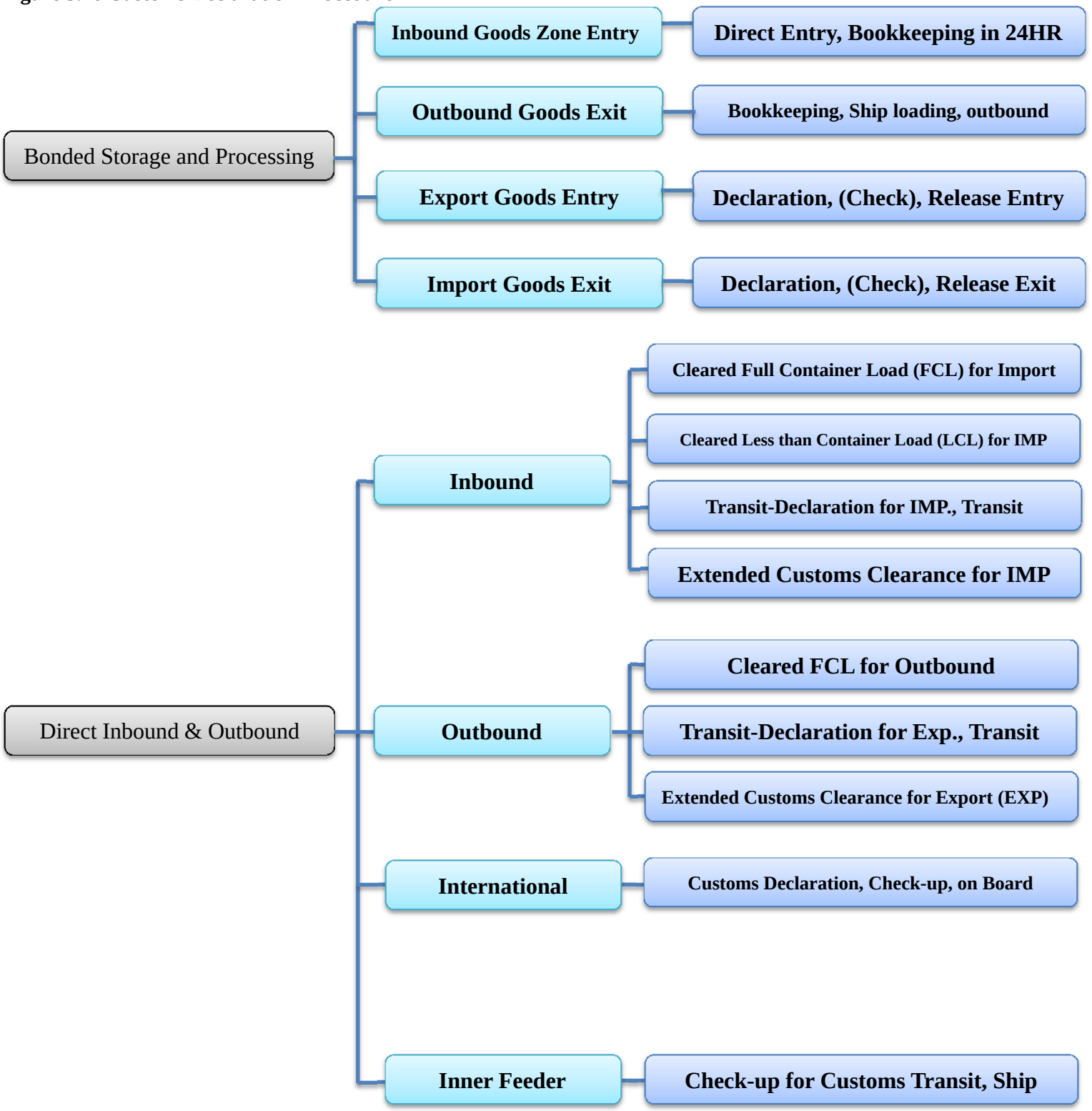
3) Refrigerated Logistics Center

The total planed space of the Refrigerated Logistics Center is 120,000m^2. The Phase-I Project of the center covers 42,000m^2 with a total storage capacity of 40,000 tons. The space of the refrigeration container storage yard is 30,000m^2. The yard can hold 3,000 refrigeration TEUs and 504 special container sockets.

The basement story is for the fresh keeping storage while the other 4 floors above ground are cold storage. The temperature in these warehouses is between -25 and +5 centigrade. The facility could meet the storage requirement for all sorts of frozen food as well as the refrigerated food.

5.4.4 Customs Declaration Procedure

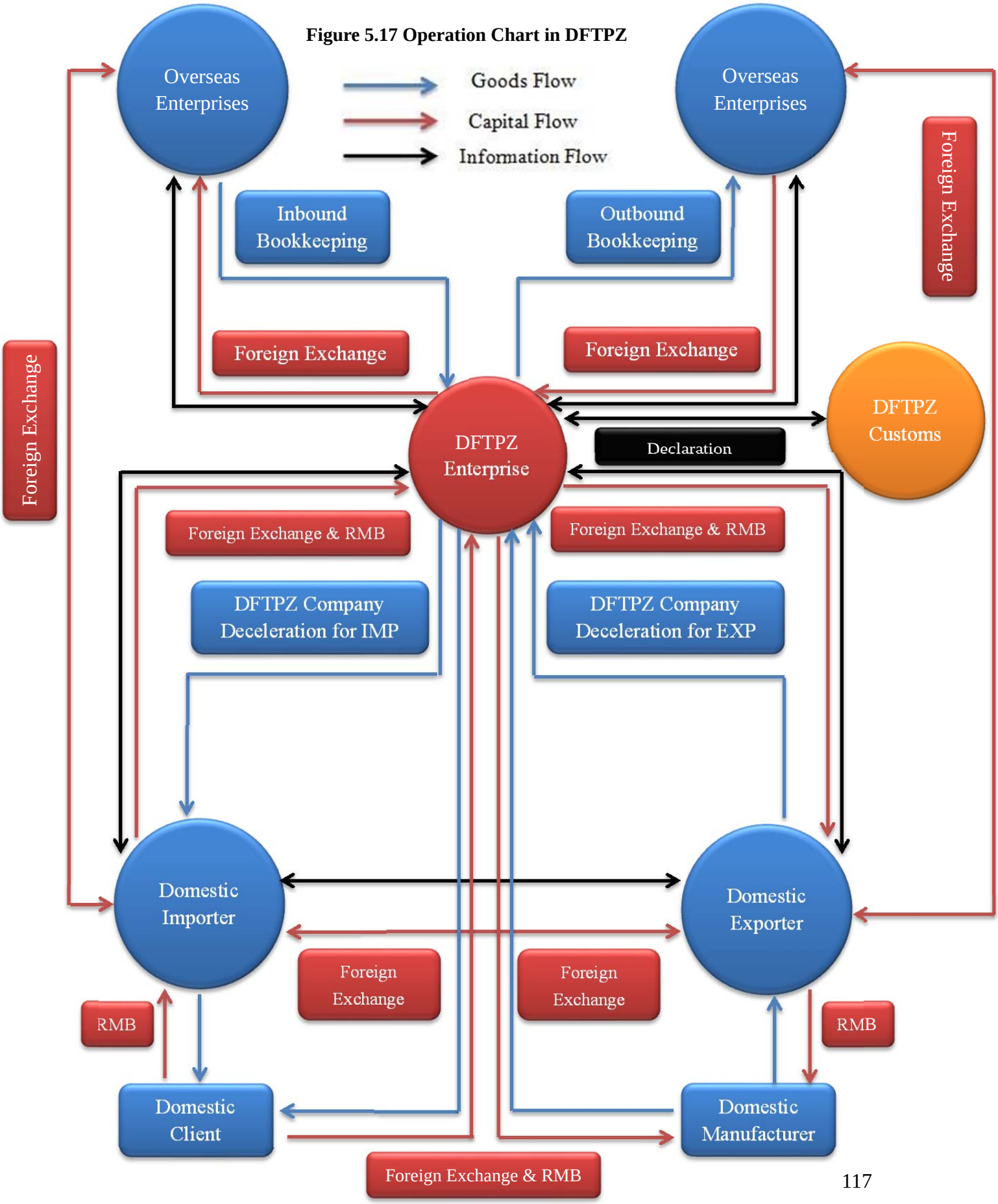
Figure 5.16 Customs Declaration Procedure



Source: Created by the author based on the Courtesy of Dalian Free Trade Zone Administration

5.4.5Operation Chart in DFTPZ

Figure 5.17 Operation Chart in DFTPZ



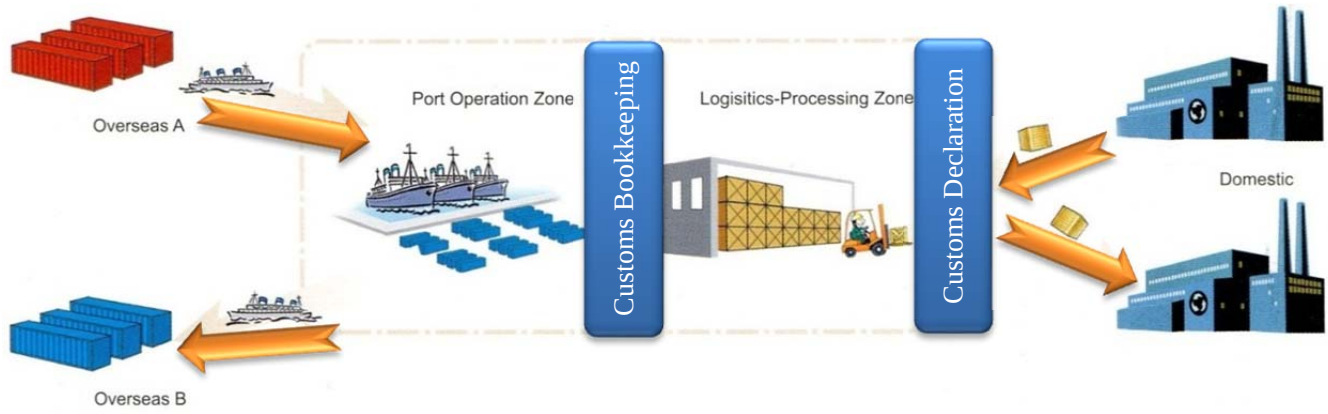
Source: Created by the author based on the Courtesy of Dalian Free Trade Zone Administration

5.4.6 Business Model in DFTPZ

1) International Procurement/ Export Consolidation

The cargoes from both overseas and domestic markets are concentrated in the port area, and then the cargoes are dispatched to the foreign or domestic markets after the consolidation or commercial processing (see Figure 5.18).

Figure 5.18 International Procurement/Export Consolidations



Source: Created by the author based on the Courtesy of Dalian Free Trade Zone Administration

VAT of the cargoes is refunded in two weeks earlier than the common goods that are outside the port area. The pre-distribution cost is only about 1/8 to 1/10 compares to that in developed countries.

The goods that entry customs declaration in batches, the consolidation shipping and customs clearance are convenient in the port area.

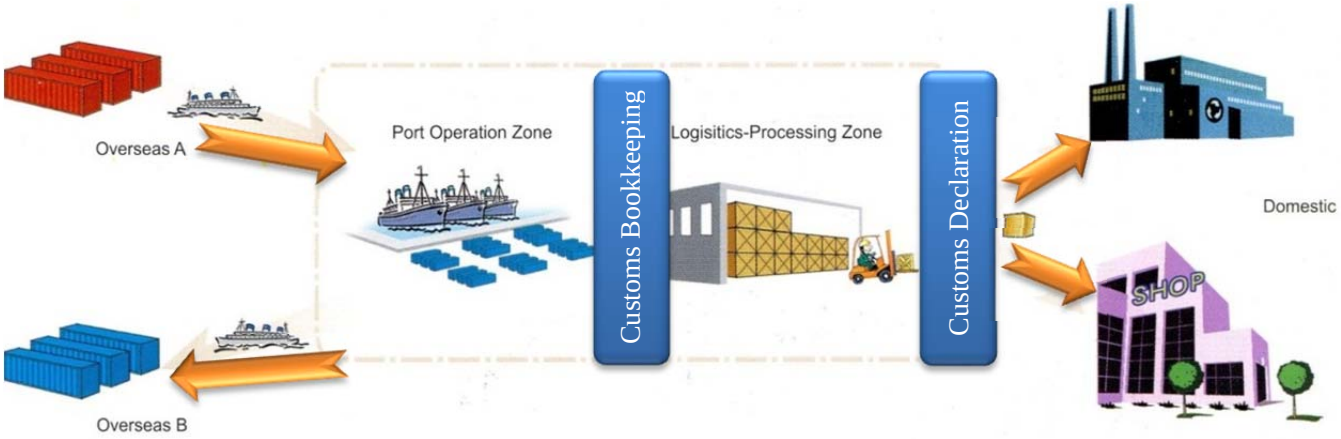
2) International Distribution/Importation Distribution

The imported cargoes are sorted and processed in the port area, and then they are dispatched to the foreign or domestic customers (see Figure 5.19).

The business model reduces the financing depositing of logistic in the port area by 27%

and the pre-distribution cost is only about 1/8 to 1/10 compares to that in developed countries.

Figure 5.19 International Distribution/Importation Distributions



Source: Created by the author based on the Courtesy of Dalian Free Trade Zone Administration

The goods that export via customs declaration in batches, the consolidation shipping and customs clearance are convenient in the port area.

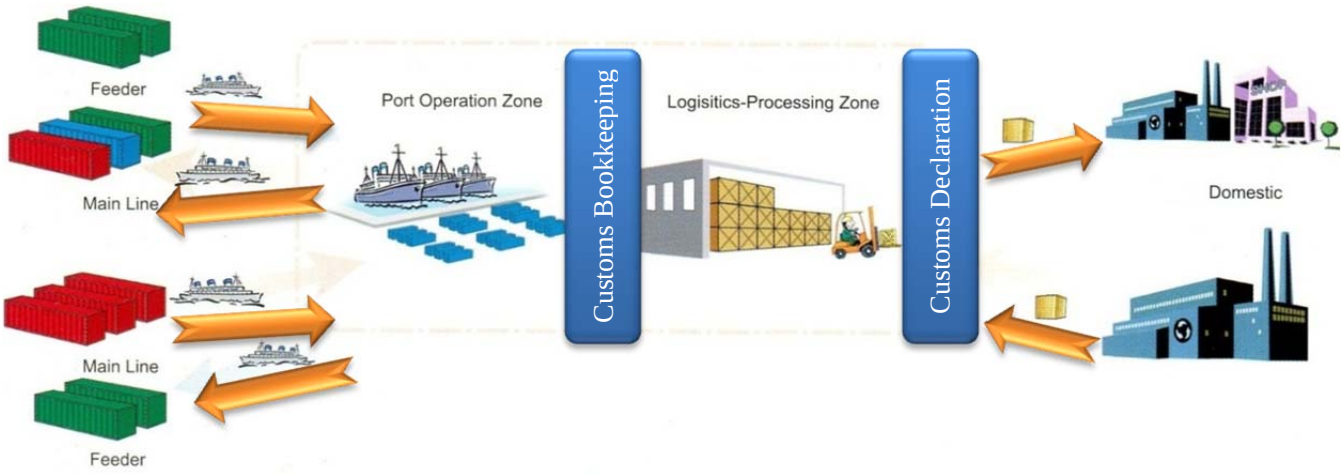
3) International Transfer/Reconsolidation

The goods from both overseas and domestic market are concentrated in the port area and they are sorted and consolidated as the same destination in order to be shipped conveniently (see Figure 5.20).

This business model has changed the current situation that the container for transshipment could not be opened and repacked in the port area.

In addition, the new model has promoted the international transshipment by FCL and LCL with providing CFS service.

Figure 5.20 International Transfer/Reconsolidation



Source: Created by the author based on the Courtesy of Dalian Free Trade Zone Administration

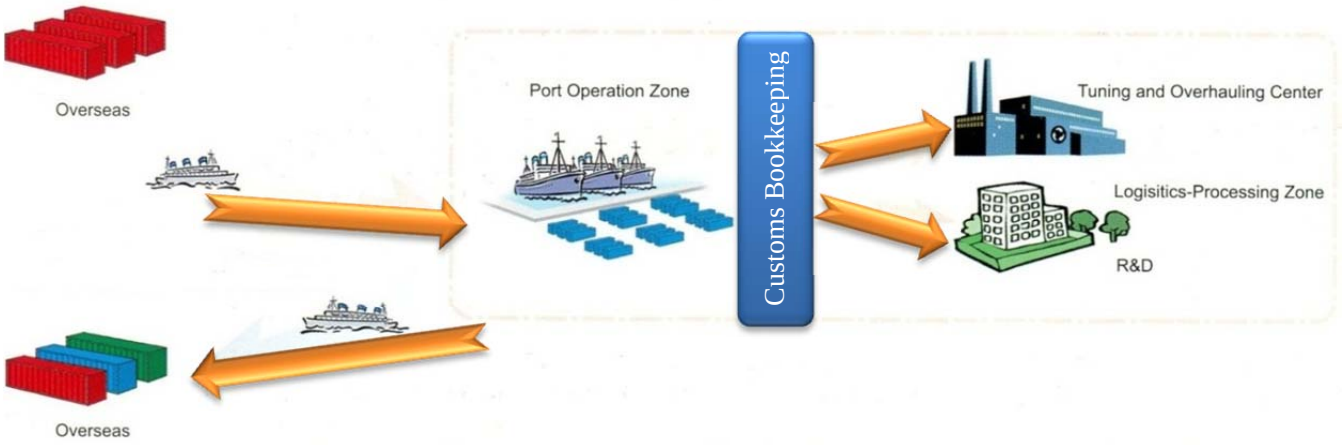
In addition, the new model has promoted the international transshipment by FCL and LCL with providing CFS service.

4) Manufacturing and Processing/ Testing and Maintenance

The port area has set up a service system for processing trade with integrating the research, processing, producing, inspecting and maintenance after sale service (see Figure 5.21).

The VAT will be refunded if the raw materials enter to the port area, besides, the goods that enter the port area from overseas are free of duties and exempted from bank deposit account and the contract verification as well as the standard management for unit cost.

Figure 5.21 Manufacturing and Processing/Testing and Maintenance



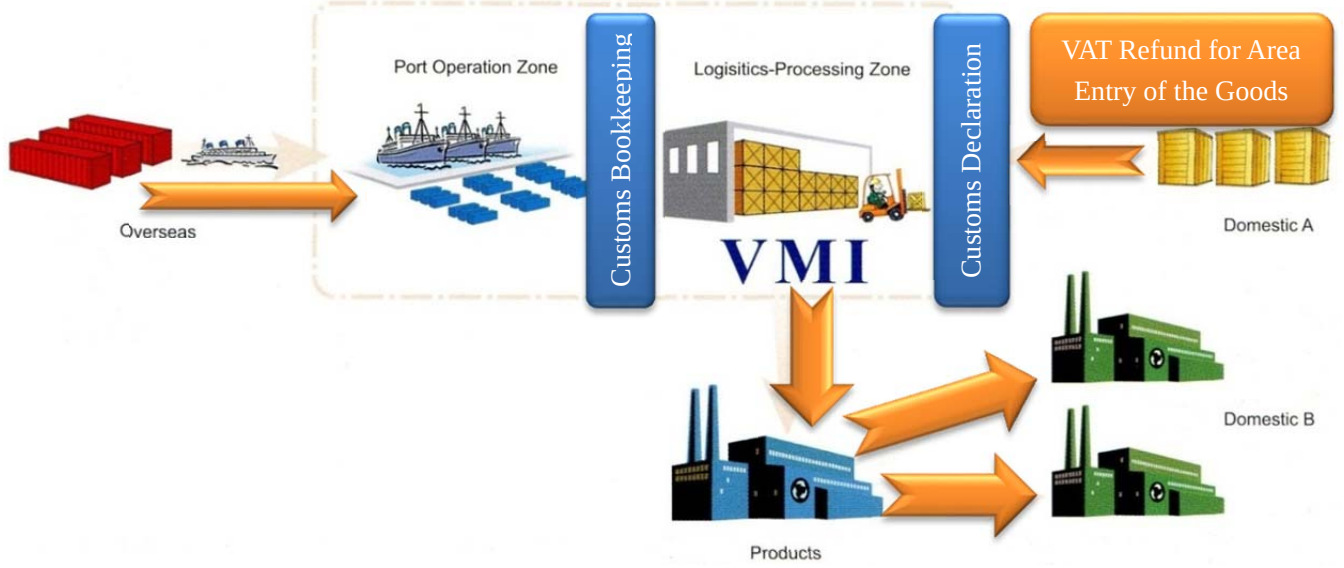
Source: Created by the author based on the Courtesy of Dalian Free Trade Zone Administration

The analysis indicates that the advantage of DFTPZ is low cost and high because of the integration of the DFTZ and DFTPZ.

5) Vendor Managed Inventory (VMI)

Suppliers provide the inventory management and control on the production, trading, inventory information and other requirements of the clients based the bonded distribution function that DFTPZ offers (see Figure 5.22).

Figure 5.22 Vender Managed Inventory (VMI)



Source: Created by the author based on the Courtesy of Dalian Free Trade Zone Administration

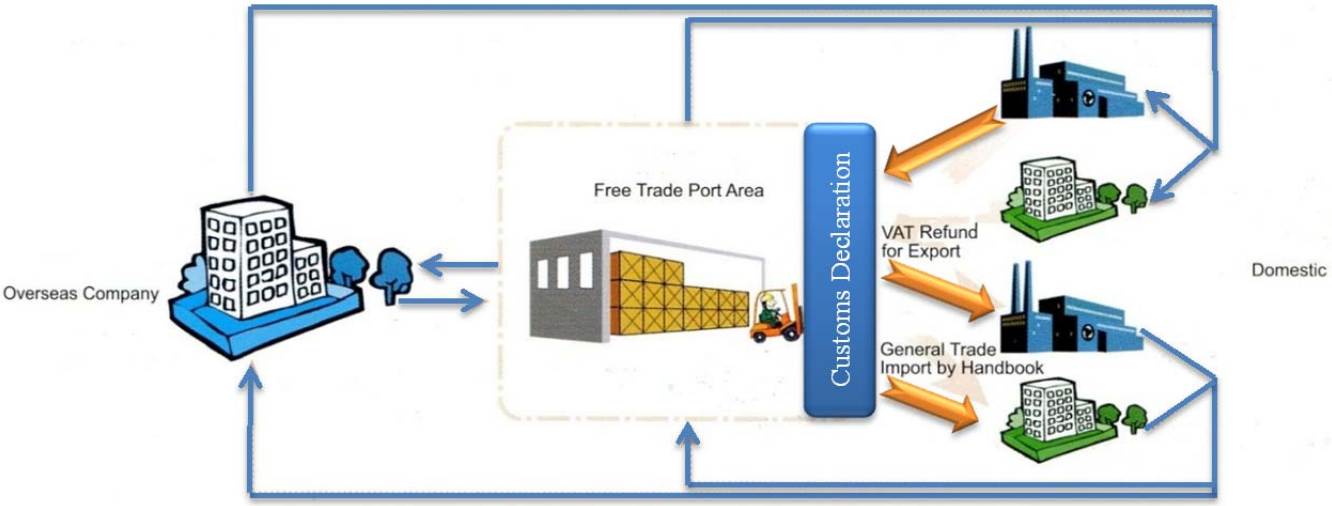
The business model reduces the financing depositing of logistic in the port area by 27% and the transfer of the proprietary right of inventory is also prolonged.

The transition from produce for stock to produce for order, the integrated shipment and the consecutive supply in the port area are the key factors that increase the compactness of supply chain and promote the management of JIT.

6) U-Turn

The business model is convenient for the domestic enterprises export the goods to DFTPZ as well as the buyers in domestic area import the goods mentioned above from DFTPZ.

Figure 5.23 U-Turn



Source: Created by the author based on the Courtesy of Dalian Free Trade Zone Administration

In this business model, the VAT will be refunded if the raw materials enter to the port area in order to reduce the cost on taxation. Moreover, the logistics cost is also reduced for 40% to 80% in the model.

5.5 Summary

This chapter presents the development of DETDZ from the year 2003 to 2010 and introduces the policies and functions of both DFTZ and DFTPZ, which are the strong

backing forces for the logistics development in Dalian Port.

The analysis presented above shows that DETDZ was developing rapidly in the revitalization period, especially in the "*11th Five-Year Plan*" period. These analyses on DETDZ focus on GDP, industrial output of large–scale enterprises, trade development, foreign investment and the problems in the development. The analyses on these cases are mainly based on the data analysis and comparison. In addition, this chapter also introduces the facilities, policies, functions and business models of the inseparable parts of DETDZ–DFTZ and DFTPZ.

The analysis on GDP of DETDZ indicates that the economy in zone kept stable increase in the revitalization period. Though affected by Lehman Shock, the GDP kept positive increase in recent three years, but the growth rate was decreasing in the period.

The indexes of industrial output of large–scale enterprises show that the main enterprises in DETDZ were seriously influenced by Lehman Shock in 2008. The average growth rate had fall to 7.06% from 2008 to 2010 while it was 28.94% from 2003 to 2007.

Both of the export and import had a negative increase in the year 2009 due to the influence by Lehman Shock. The changes of both indexes have the same trends from 2008 to 2010. The analysis shows that Lehman Shock affected the international trade in DETDZ.

The analysis on export of foreign and domestic enterprises shows the trend that is similar to the results of export and import. Besides, this analysis also indicates that the foreign enterprises are the important part and a strong force for economic growth and international trade in the zone and the domestic enterprises are still in the early

developing statue.

From the results of the analysis on foreign investment in DETTZ indicate that Japan is the largest trade partner of Dalian Port. Hong Kong has been the other major since the year 2010.

The foreign investment structure shows the top three industries in DETTZ are electronic product, machinery and petrochemical product which account for 50.06%. of total investment. The phenomenon indicates the orientation of industrial development in DETTZ is technology intensive industry. The other advantage in DETTZ is the low cost of labor force. For the foreseeable future, the high quality and cheap labor forces as well as the high added value products that made by the high-tech are the competitive advantages of the export goods from DETTZ.

There are some problems in development of DETDZ, such as the petrochemical accidents and the awful construction accident of the breakwater at the P-Xylene Plant in DETTZ. These accidents that happened in recent years revealed the safety problems in the rapid development.

The facilities and special zones such as warehouse, automobile logistics center, exporting processing zone and distribution center that have been built in both DFTZ and DFTPZ promote the logistics development in Dalian Port. Besides, the policies about the trade, taxation customs duties and supervision are also the pivotal force for promoting the development of global logistics in the region. The new business models reduce the taxation the cost of logistics for 27% to 80%.

The developments of the three special zones are not only support the logistics in Dalian Port but also lay a foundation for the establishment of Dalian International Shipping Center. The study in next chapter will present the importance of the

establishment of Dalian International Shipping Center, which is the future development target of Dalian Port.

CHAPTER 6 THE IMPORTANCE OF THE ESTABLISHMENT OF DALIAN INTERNATIONAL SHIPPING CENTER

6.1 Introduction

This chapter presents the importance of the establishment of Dalian International Shipping Center in three aspects, including “the Improvement of the Opening of Northeast China”, “the Key Development Element of Economic Relationship between Northeast and Southeast China” and “the Promotion of the Competition of Dalian Port”.

6.2 The Improvement of the Opening of Northeast China

The international shipping center will significantly improve the opening to the world for the region. With the development of the international shipping center, Northeast China will attract more foreign capital, international technology, and qualified personnel.

6.2.1 The Attraction of Foreign Capital

From the current economic situation of the world and the pitfalls of global financial flow, the direction of the inexorable law of international capital flow is to the higher return to capital.

Dalian Port has been a port-vicinity industry city in Northeast China, the economy of Anshan, Fushun, Benxi, Liaoyang and Yingkou will be the strong supports of the industrial zone in Liaoning Province, which focus on the fields of petrochemical, steel and iron, automobile, equipment manufacture and electronic information. The revitalizing period provides an excellent opportunity for the economic development of Northeast China. The new profits that are from the development in the region will attract more foreign capitals.

Nowadays, the international finance centers are always locates at the cities that are the combination of both international trade and global logistics such as Hong Kong and Singapore. The international trade and finance will be improving in Dalian Port through the development of shipping in the port city.

6.2.2 The Attraction of International Technology

The technology transfer has been the crucial power to promote the economic development. The high-tech products have been the leading force in the improvement of international trade. Under the circumstance, the expansion of modern technical trade that bases on high-tech products and high technique and the international technical service that focuses on the information exchange and technical service have been the basic of the change of the structure of international trade. As a result, the international technology transfer and global economic and technical cooperation have expanded to a new international cooperation model that focuses on technology products.

The establishment of Dalian International Shipping Center will be benefit for not only the economic exchanges between Northeast China and world but also for attracting international technology to the region. In addition, the rapid development in Northeast China as well as Dalian Port will create more profit for international technology.

6.2.3 The Attraction of Qualified Personnel

The human resource and the knowledge capital have been the core factors for the development of the enterprises in 21st Century. The economic development and the increase of capital in a region have been the attractive factors of the talent flow.

The shipping center is also an international exchange and cooperation platform between Northeast China and other countries and regions in Northeast Asia. The opportunities of both revitalization in Northeast and the establishment the

International Center in Dalian Port will bring more huge demands of human resources.

6.3 The Bridge of Economic Relationship between Northeast and Southeast China

The International Shipping Center will be benefit for not only the global trade between Northeast China and foreign countries, but also the domestic trade. It will improve the economic relationship between Northeast and Southeast China, and lay a foundation for the region development in the future.

Influenced by the unbalanced economic development, the economy in Southeast China is much better than that in Northeast China. The supplies of goods are always transporting from Northeast China to Southeast China.

The cargoes that transported by containers from Northeast China to Southeast China are mainly focusing on grain, chemical products, ore, building materials and paper pulp.

The goods from Southeast China to Northeast China are the light industrial products, which are mainly shipped through the ports that locate at South and East China. These goods are transported to the hinterlands of Northeast and North China by shipping-railway intermodal transportation.

The products from East China to Northeast China are machinery and electronics, paper, cathode ray tube (CRT), and home appliance.

From a logistics point of view, the shipping center will raise the logistic efficiency for domestic trade and transportation between Northeast and Southeast China, and increase the economic cooperation of the two regions after it will be established and

put into service.

6.4 The Promotion of the Competition of Dalian Port

The development of Dalian Port will be promoted by the establishment of the shipping center. A shipping center will attracts more industries that supported by port cities. The industry clusters of international trade, logistics, service and finance will enhance the competition and the comprehensive strength of Dalian Port.

6.4.1 The Promotion of Port Functions

Dalian Port will intensify the investment in order to establish a shipping network that links to the main ports in all over the world. The aims of attracting the investment are the famous international shipping companies and the domestic large-scale enterprises. The port and shipping markets in Dalian Port will be further open in order to make more increase of the capital.

The new policies have stated that the foreign container and shipping companies can establish enterprises in Dalian Port with their own capital. Thus, the new shipping enterprises could set their logistics centers, distribution centers, R&D centers and regional headquarters in Dalian Port so as to increase the share of transfer shipping.

The competitive port enterprises from other provinces in China can join the management of Dalian Port through tenancy, investment and acquisition. Besides, Dalian Port encourages the social capita to invest to the programs that focus on ventures, joint operations and project financing. What is more, the management rights and property rights of the established ports that invested by government can be transferred according to the laws and policies to other enterprises. These measures are implemented in Dalian Port in order to develop the shipping center.

6.4.2 The Agglomeration of Industry

The agglomeration of industry (also called industrial cluster) is some enterprises that are in the same industry and their matching and related service companies are gathering together in the same region.

The global logistics center is the core industry of an international shipping center, besides, it is also the development support of Dalian Port. According to the development plan, there are six main agglomerations of industries will be established in Dalian Port in order to support the establishment of the international shipping center, at the same time, the agglomerations are also the important promotions to Dalian Port brought by the international shipping center.

1) **Port**: the port areas around Dalian Port including the port areas in Dayaowan Bay, Shuangdaowan Bay, Changxing Island, Pikou, Zhuanghe, Yangtouwa, Jinshitan and Changhai County.

2) **Electronics Information and Software Base**: including the Digital Media, Integrated Circuit, Automobile Electronics, Photo Electronics and Display Device, Communication and Network Device, Computer and Peripheral Equipment and Medical Electronics.

3) **Petrochemical Industry Base**: consist of three industrial zones, comprising of Tianshuitao Petrochemical Industry, which mainly produces ethylene, Haiqingdao Petrochemical Industry, which focuses on the epoxy resin and fine chemical products, and Shuangdao Bay Petrochemical Industry, a refining and polyvinyl chloride (PVC) production industry zone.

4) **North Shipbuilding Base**: including Dalian Shipping Group and Changxing Island Shipbuilding Industry Park. The main kinds of the shipping are very large

crude carriers (VLCC), large warships, the new generation container vessel, the oil platform, chemical tanker, liquefied gas carrier and Ro-on/Ro off ship (Ro/Ro Ship).

5) **Equipment Manufacturing Industry Base**: including the Locomotive Industry Park and Machine Industry Park in Jinzhou New Zone, the Heavy Machinery Park in Gexin Pu and the Automobile Spare Parts Industry Park in Jingang Port Area.

6) **Regional Headquarters Zone**: consisting of three regional headquarters zones for the multinational enterprises that locate at Dalian Port. The zones will be established at Dalian East Port Area, Suoyu Bay Area and Xiaoyaowan Bay.

6.5 Summary

This chapter presents the importance of the establishment of Dalian International Shipping Center. The importance focuses on three aspects, including “the Improvement of the Opening of Northeast China”, “the Key Development Element of Economic Relationship between Northeast and Southeast China” and “the Promotion of the Competition of Dalian Port”.

In the Improvement of the Opening of Northeast China part, the contents show that the shipping will attract more foreign capital, international technology and qualified personnel, which are pivotal for the revitalization and development of a region

The part “the Key Development Element of Economic Relationship between Northeast and Southeast China” presents the economic relationship and the main types of domestic trade merchandises between the two regions.

And the last part introduces six agglomerations of industries that will be established in Dalian Port in order to support the development of Dalian Port and the international shipping center.

The establishment of Dalian International Shipping Center is a long-term plan in revitalizing Northeast China. The results of the studies presented above indecates that the international shipping center will play a crucial role in the development of Dalian Port and the revitalization of Northeast China.

CHAPTER 7 CONCLUSION AND SUGGESTIONS

7.1 Introduction

The main goal of the study is to research the logistics development strategies of Dalian Port in revitalizing Northeast China. Historically, Dalian Port has been playing a crucial role for the economic and social development for the region since it was funded more than one century ago. The port city has been listed in the revitalizing plan as a key development part for its pivotal logistics function in the region.

This studies attempt to describe the development of logistics in the port in order to answer the questions: “How much has Dalian Port developed in the revitalizing period yet?”, “What role does Dalian Port play in the revitalizing plan?” and “What kind of strategies is suitable for the logistics development in Dalian Port?”

The following fields, also the related studies objectives, have been studied in the research in order to draw the conclusions and put forward the suggestions:

i The development targets of logistics in Dalian Port;
ii The development achievements of logistics in Dalian Port;
iii The main problems of logistics development in Dalian Port;
iv Dalian Economic Technology Development Zone;
v Dalian Free Trade Zone;
vi Dayaowan Free Trade Port Zone.

This is an empirical research which based on field study, interview and data collection and analysis. The secondary information is also used for the studies. The data were collected through the field study and interviews conducted in Dalian Port, DETDZ and DFTZ.

7.2 Conclusion

The period from 2003 to 2011 is the early stage of the revitalization in Northeast China. The development of logistics in Dalian Port has achieved remarkable success in the nine years, especially in the "*11th Five-Year Plan*" period though affected by Lehman Shock in the year 2008. At the same, the contradiction between economic and stainable development manifested in some accidents that happened in the port.

7.2.1 Development of Logistics

The logistics in Dalian Port is developing rapidly in the beginning stage (2003-2011) of the revitalization period. According to the development plan, six shipping center has been established as well as a number of logistics infrastructures including highways, ports, railway ferry, container terminals, oil wharf and berth in Dalian Area. Besides, some dry ports that link to Dalian Port in hinterland have been developed in the same time. These facilities are the important supports for the establishments of Dalian International Shipping Center and the logistics network in Northeast China.

The development of international trade in Dalian Port is rapid in the period. The foreign investments to the new port areas, shipping enterprises and trade companies improve the logistics and economy in Dalian Port.

In addition, the developments of Dalian Economic Technology Development Zone, Dalian Free Trade Zone and Dayaowan Free Trade Port Zone promote the logistics efficiency in Dalian Port. As a result, though affected by Lehman Shock severely in the year 2008, the logistics and trade in the port recovered quickly and kept a steadily increase in the recent three years. The phenomenon indicates that the foreign traders and investors hold an optimistic attitude to the future development in Dalian Port.

7.2.2 Problems in Development

Subjectivity, the overheated development in Dalian Port has resulted in some

problems since the revitalization plan implemented in the region.

The high annual GDP has been the development target in all the areas in China. In the year 2005, Dalian scheduled a target that the average annual GDP in the "*11th Five-Year Plan*" period should come to 13%, which was much higher than the national target of average annual GDP 7.5% in the same period.

Dalian Port introduced the Petrochemical and PX programs in order to accomplish the target. But the disordered security management system of CNPC Dalian Branch directly caused the explosions. The poor construction quality of the breakwater put the PX Plant in great danger, though Fujia Group is also a real estate development company in Dalian City.

7.3 Suggestions

7.3.1 Suggestions for Logistics Development Strategies

i Dalian International Shipping Center is the future development target of Dalian Port in revitalizing plan. The local government should make a plan that conforms to the objective laws of the development in a port city in order to avoid the needless and repetitive constructions.

ii From the view of sustainable development, the resources of the bays and coastal areas in Dalian Area should be divide into three types as follows:

- Coastal areas that should be developed for logistics and economic development in future 50 years;
- Coastal areas that should be reserved for at least 50 years in order to be developed by the future generations with the advanced concepts and technologies;
- Coastal areas that should be protected from any development for ecological equilibrium of the sea in the area.

7.3.2 Suggestions for Economics Development

1) Economy Development

i For the sustainable development, the petrochemical and chemical industries should not be developed near the living area in any city port cities. Dalian Area is rich in good coastal resources for establishing the good ports. The current petrochemical and chemical plants should be relocated to a new port areas where are specialize in the logistics of petrochemical and chemical;

ii Under no circumstances should a city seek temporary economic development, e.g. GDP at the expense of the environment and natural resources;

iii Think about the generations and make Dalian a better living area for the children and future generations.

2) Development of Petrochemical Industry

i Strengthen the security management of crude oil storage;

ii CNPC should take the safe distance between the oil plants and living areas as a key factor into consideration when it establishes new petrochemical plants in the future,

iii CNPC should train the skilled staffs, especially the employees who will work in the front line of production or operation in order to guarantee the safety production;

iv Reduce or minimize the losses based on the former experiences in case of further accidents.

3) Development of PX Plant and other Chemical Industry

i Relocate the plant to a safe place according to the international standards of PX Plant;

ii The new location of the plant should be away from the living areas for at least 70 kilometers and on the leeward;

iii The new plant should keep away from costal area in order to avoid polluting the

sea;

iv As a real estate development company, Fujia Group should do its best to avoid of the awful quality constructions. Besides, the enterprise should establish the new standards for its projects and build the qualified protection constructions in order to prevent the plant from the nature calamities.

7.3.3 Suggestions for Future Studies

The findings of the studies indicate that the future logistics development in Dalian Port is not an independent topic. The future studies and researches on this field should establish the development relationship between logistics and stainable for making long-term development strategies and benefits for Dalian Port. In addition, the railway transportation in Dalian Port should be another key point for the studies due to the railway system in China is operating independently of transportation system. The future studies should include the contents as follows:

i The port development strategies;
ii The design of establishing logistics network in Northeast China;
iii The development of railway transportation in Dalian Port;
iv The eco-system protection in logistics development;
v The studies on environmental issues that caused by the logistics and economic development;
vi The stainable development in Dalian Port

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