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## New Eurasian continental bridgehead Lianyungang

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**WORLD MARITIME UNIVERSITY**

Shanghai, China

**NEWEURASIAN CONTINENTAL BRIDGEHED  
LIANYUNGAG**

By

**WU QIAOQIAO**

**China**

A research paper submitted to the World Maritime University in partial

Fulfillment of the requirements for the award of the degree of

**MASTER OF SCIENCE**

**INTERNATIONAL TRANSPORT AND LOGISTICS**

ITL-2009

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## DECLARATION

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

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

(Signature):\_\_\_\_\_

(Date):\_\_\_\_\_

Supervised by

Professor Zong Beihua

Shanghai Maritime University

Assessor

World Maritime University

Co-Assessor

Shanghai Maritime University

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support during my study both at home and on the campus. They are my hero and by best friends.

## ABSTRACT

**Title of Dissertation:** On Research of Lianyungang Port as the Oriental Bridgehead of New Eurasian Land Bridge

**Degree:** Master of Science in International Transport and Logistics

**Abstract:**

This dissertation focuses on Lianyungang- the eastern bridgehead of NELB, and analysis the current situation of this bridgehead under the new economic situation. Many strategies are used to analyze an organization's internal and external environment. PEST is an appropriate strategic tool for understanding the “big picture” of the macro environment of the oriental bridge head. Also by using the forecast method of regression, the strategy making will be drawn to see what the solution will be for the bridgehead to survive the new global economy crisis.

Six chapters are included in this dissertation. The first chapter presents the background of the dissertation and framework as well as methodology introduction will also be included. Chapter two is literature review about relative research of the topic from scholars in the related field. Technology that other scholars use to analysis an organization's environment and forecast methods to predict the container throughput will also be involved. The first part of chapter three is an overview of New Eurasian Continental Bridge's eastern bridgehead-Lianyungang, the

also will use the PEST management theory to analyze its external environment from two perspectives- political, economic. In latter part of chapter three, the author will analyze the internal strategic environment of the bridgehead and look for the existing problems. In chapter four, except the forecast of transit container throughput, the author will also discuss the significance of the bridgehead to show the necessity of building Lianyungang as the oriental bridgehead of NELB. Chapter five shows the strategy making of Lianyungang port based on the forecast of the transit turnover and also the discussion of the internal and external environment study above. The same with most dissertations the last chapter is the conclusion of the dissertation. During the conclusion, the author will gather up the research and recapitulate the dissertation.

**Keywords:** New Eurasian Continental Bridge, Bridgehead, PEST, Liner Regression

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## LIST OF ABBREVIATIONS

ADB	Asia Development Bank
COSCO	China Ocean Shipping (Group) Company
CPC	Communist Party of China
CORREL	Correlation
GDP	Gross Domestic Product
GNP	Gross National Product
MLB	Mini Land Bridge
NELB	New Eurasian Land Bridge
NELBH	New Eurasian Land Bridge Head
NRA	National Railway Ministry
OCP	Overland Common Points
OLS	Ordinary Least Square
OLSE	Ordinary Least Square Estimate
ROK	Republic of Korea
RSQ	R-SQUARE
STEYX	STANDARD ERROR OF ESTIMATE
SST	Sum of Squares Total
SSE	Sum of Squares Error
SSR	Sum of Squares Regression
TCV	Transit Container Volume
UNDP	United Nations Development Program
WB	World Ban

# Chapter1 Introduction

## 1.1 Background of this dissertation

International container multi-model transport is the way where international cargo transportation goes. In recent years, scholars gathered on Beijing, the capital of China, and cities along the New Eurasian Bridge holding seminars to discuss the NELB and its strategic position in the international trade and its significance. During these seminars, good proposals are advanced about the development both the NELB and its bridgehead-Lianyungang Port. Lianyungang is the oriental bridgehead of NELB and plays a specific role in China east opening up and western exploration. It is irreplaceable as the connection between the powerful Asia and Europe market and it is also plays a significant role to gather and integrate resources.

However, the financial crisis in 2008 has great impact on the international shipping industry. Some experts say that the world shipping market is at the end of the world economy. According to the Bullwhip Effect, owing to the financial crisis triggered by the U.S, the world economy leads ten times conduction to the world shipping market. That is 1 percent reduction of the world economy growth rate will cause 10 percent of the world shipping market slowdown. Shipping freight rate is plumping by the sharp decline in volume and leading to sharp fall in popularity. Chinese International Marine Container Freight network shows its study that in the recent three months, the freight rate of three major freight routes in Europe, North America and the Middle East of China's eight major ports are in decline. The world's shipping market People in this area may worry that it will affect transportation of NEW Eurasian Land Bridge. However, the international trade transit volume of NELB is rising. In such a condition that is uncertain, ports along Chinese coast line struggle for the hinterland. Tianjin, who use to be unsure that if it is the eastern

bridgehead of the land bridge declared with great fanfare that "Tianjin is the best bridgehead of the NELB". Also it made use of coastal hinterland by three ways. Another port-Shanghai has special organization to research the NLB and the Shanghai authority launched the program named "Joint Development Strategy Study on the New Continental Bridge and the Yangtze Golden Waterway" during which proposed that "Shanghai is supposed to be the bridgehead of the New Eurasian Land Bridge". Lianyungang authority attached great importance to this situation. And its unique conditional and development prove that it is irreplaceable as the oriental bridge head. As the link of land and the sea, Lianyungang shows competitiveness in its around region and it can also drive the economic development of the costal regions in Jiangsu province and also cities along the land bridge. Lianyungang also has advantages over geographic position, transportation and opening up condition. Possessing deep potentiality, it is correlative and complementary with the cities along the Land bridge and the port has undertaken over 95% of the transit containers of NELB via China. Playing the significant role of NELB, Lianyungang should take on its responsibility to be the outward window of the NELB. In 1991, China promulgated an international transit container traffic management scheme of the NELB. December 1, 1992 is the official opening of the NECB's operating. It is worth noting that the Eurasian Continental Bridge as an important form of mine transport is increasingly concerned by China's coastal ports, such as the Rizhao Port, Tianjin Port, and Dalian Port. and Dalian Port. In addition to well-known NELB route from Lianyungang to Rotterdam, in China there are two Trans-Eurasian "continental bridge", that is, from Dalian to Manzhouli to Rotterdam, in the Netherlands, and the other is form Tianjin Port to Rotterdam passing by Erlianhot. The three Eurasian Continental Bridge is really being open not very long time ago for in the past, it only reached as far as Eastern Europe, not speaking of countries in Western Europe.

In 2 November 2006, China's foreign economic and technological cooperation Corporation of Hohhot Railway Bureau, announced that after more than one year's trial operation, China's first international container train line that across the "Eurasia Bridge" which is named the "ideal number" of has been officially opened. The special train was carrying 100 international standard containers running routes from Hohhot to Frankfurt in Western Europe, across six countries along the "Eurasia Bridge". The transport cycle is about 15 days and nearly covers ten thousand miles. Even though it was the route that covers longest mileage of the current international railway container transport line operating, by contrast, from the Far East to Western Europe, the entire ocean by the New Eurasian Continental Bridge is shorter than through the Suez Canal route for about 8,000 kilometers in distance. And 11000miles shorten in distance than through the Panama Canal.

December 1, 2008, is the 16th anniversary of the new Eurasian Continental Bridge full operation since its official opening. There has been Japan, South Korea, and other 14 countries and regions participated in the International Transport of New Eurasian Continental Bridge. During the 16 years, the volume of transit transport has been climbing. Especially in the current global financial crisis, the new Eurasian Continental Bridge international transport capacity did not fall but rise, we can say that it is a miracle. The reason is mainly conclude as the following aspects: First, the stability of the land bridge transport market, mainly for the railway sector, price, supply and cargo owners, cargo sector is relatively stable; Second, in recent years China increased large-scale investment projects in Central Asia, Russia number of which is a very good opportunity; Third, the international shipping market has rampant piracy, maritime safety factor is small while land bridge transportation safety factor is relatively stable.

Thanks to the efforts of their own advantages and parties, the New Eurasian Continental Bridge international border transport develops in the global economic crisis and the extreme weakness in the shipping market.

The first is parties all favored the new Eurasian Continental Bridge Transport. Since 1992 of the NELB'S opening and operation, countries along the route made joint efforts; particularly the land bridge is rapidly developed by the efforts of the Chinese Government. All parties connected with the land Bridge spare no effort to do multi-research, internal and external coordination, to overcome all kinds of problems leading its momentum of today's success.

## **1.2 The framework and content of this dissertation**

The dissertation aims to support the idea that Lianyungang acting as the oriental bridgehead of NELB, is irreplaceable by showing its achievement and improvement, the author will show the bridgehead's importance. This dissertation will also study its medium-long term development based on the historic statistics and by applying linear regression forecast method to forecast its medium-long term container throughput. Much more attention will be paid to Lianyungang Port and PEST analysis method will apply to study the macro environment of the bridgehead. By collecting the statistics of annual transit containers through Lianyungang, the author will apply forecast method to predict the throughput in the coming years. In addition the author will present strategy making during the end part of the dissertation.

## **1.3 Forecast Methods**

In this dissertation, the author will use linear regression forecast method to predict the medium-long term development. Regression analysis is commonly used to predict port container turnover. A principle purpose of it is to predict the value of



one variable from known or assumed values of other variables related to it. The principle reason will make the turn point of value predicted easy to tell and the result to predict will be more trustable. However, the regression analysis needs new materials and qualitative judgments to predict. Chinese port development is related to economy development. For example, container throughput is in connection with trade import and export volume. In such a case, trade volume can be put as variables while container throughput as the derivative to build a regression model.

Often, we try to forecast the value of one variable from value of another. The former variable is named as the dependent variable while the latter is referred to as the independent variable. If the dependent and independent variable are related linearly, simply linear regression can be used to estimate this relationship. (W.L Winston & S.C Albright 1998)

### 1.3.1 The model of linear regression

The model of linear regression relationship between  $x_i$  and  $y_i$  is as follows:

$$y_i = a + bx_i + e_i \quad (1.3.1)$$

In this function,  $x_i$  is the independent variable and  $y_i$  is the dependent variable.

And  $e_i$  is an error term.

In this model if we supports:

$$e_i \sim N(0, \sigma^2), i = 1, 2, \dots, n$$

$$E(e_i e_j) = 0, i \neq j$$

Then we get  $y_i \sim N(a + bx_i, \sigma^2)$ .

If the value of a and b equals  $\hat{a}$  and  $\hat{b}$ , then we get function  $\hat{y}_i = \hat{a} + \hat{b}x_i$ .

If we define the value of x as  $x_1, \dots, x_n$ , then we get value of y as  $y_1, \dots, y_n, (x_i, y_i)$  and  $i=1, 2, \dots, n$  are referred to as sample point.

$$\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i, \bar{y} = \frac{1}{n} \sum_{i=1}^n y_i,$$

$$S_1^2 = \frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2, S_2^2 = \frac{1}{n-1} \sum_{i=1}^n (y_i - \bar{y})^2$$

### 1.3.2 Using a spreadsheet approach

However the approach above is too tedious. Instead we use Excel's regression capabilities which can be formed with the following steps:

Correlation coefficient  $r_{xy}$  is a measure of the linear relationship between x and y. A correlation near 0 indicates a weak linear regression, a correlation near 1 indicates a strong positive linear relationship while a correlation near -1 indicates a strong negative linear relationship between x and y. The correlation between x and y can be showed by Excel's CORREL function.

## Chapter2 Literature Review

### 2.1 Recent research of New Eurasian Land Bridge

Since appearing of land bridge, so many people have studied on the relative topics. Their research can be generally divided into four groups. First is about the definition, which is the basic. There are many forms of land bridge and the New Eurasian Land Bridge are researched by many scholars especially on the opportunities and challenges of it. Some of them are aiming to end up with an advice or a strategy to develop the NELB and also the bridgeheads of the NELB including the oriental one, Lianyungang, which is involved in this dissertation.

#### 2.1.1 Land Bridge Definition

The encyclopedia on the NationMater.com website says“A Land Bridge is a strip of land exposed during periods of low sea level (see Transgression), connecting what are now separate continents or islands”<sup>1</sup>. It is written in a report made by COSCO International Freight Co., Ltd in 2002 that Land Bridge transport refers to the ocean-land union transportation model with railway and highway system as the bridge to link the oceans on each end of the land. Qi Yong and Wang Yan (2007) write in their paper that “Land bridge transportation means transportation from one seaport to another by railway across continents instead of by ocean ship”

From 60th 20 century when land bridge transport has appeared, there were several land bridge transport line between Pacific and Atlantic and have played an important role in the international trade. Qi Yong and Wang Yan wrote in their research paper that at present, there are two common routes for using land bridge transportation in the world. One is Asia—America—Europe land bridge, the other is Europe—Asia land bridge. (Qi Yong and Wang Yan, 2007 ). See Figure 1 and Figure 2 below.

---

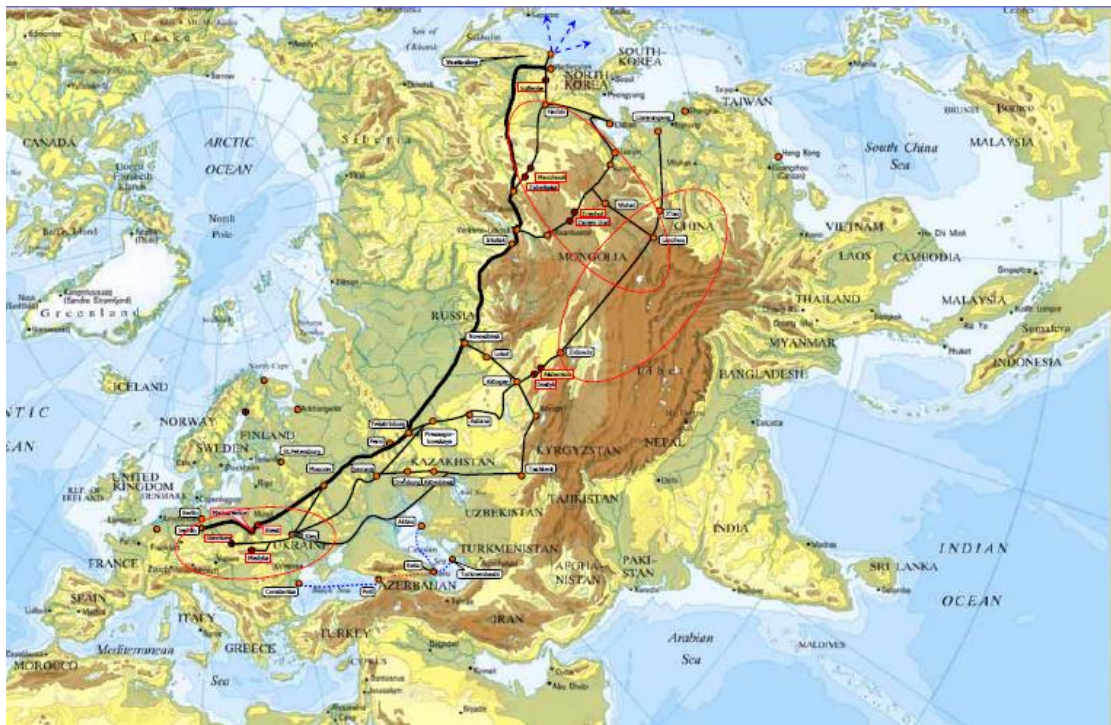
<sup>1</sup> <http://www.nationmaster.com/encyclopedia/Land-bridge>

Figure 1 New Asia-Europe Land Bridge



Sources: [www.56data.com](http://www.56data.com)

Figure 2 The Europe – Asia Land Bridge Parallel structures



Source: <http://www.uic.Oss0.fr>

The Land Bridge Transport originated in North America mainly for convenient, safe and fast transport of goods from Japan to Europe. And then it was followed by relative Land Bridge Transport such as MiniLandBridge transport, MicroLandBridge transport and OverlandCommonPoints (OCP), etc.. (Xuefeng W. 2008)

Table 1 Distances and durations from East Asia to Europe through New Eurasian Continental Bridge, or Siberian Continental Bridge and ocean lines

	Distance(km)	added distance comparing with through Lianyungang Port(km)	added days comparing with through Lianyungang Port(day)
Through New Eurasian Continental Bridge	12000	+0	0
Through Siberian Continental Bridge	15000	+27000	+1
Through Suez Canal	20000	+8000	+7
Through Panama Canal	23000	+11000	+10
Through Cape Town	27000	+15000	+14

Source: [www.silkroad.org.com](http://www.silkroad.org.com)

### 2.1.2 Opportunity of developing The New Eurasia Continental Bridge

Z. Yi (2008) shows the picture of NELB to tell its advantages over the Siberian Land Bridge. First, NELB obtained shorter transport distance which is 10870 miles comparing to the 11880 of Siberian railway.

Second, it radiates over 30 countries and districts linking the Pacific and the Atlantic. Statistics from the UNDP show that over 4,000 km of the Asia-Europe land route lies within China, extending across ten provincial areas. The section passes 4000million people, about five to six days of running for the container regular train. The areas along the China section of the route are the country's most important bases of energy and raw materials. (Z Yi, 2008) (Please refer to Table1 and Figure1)

Third is the integration of economic belt along the NELB route. Y.C Wang, Dan Yu and Y.J. Tian (2006) added that the NELB obtain favorable geographical location and climate condition. Huyong (2001) thought that the globalization will promote NELB to shift One-way opening to Two-way open. The opening of international seminar on economic cooperation along the new Eurasian continental bridge, make the smooth of NELB transportation issue come into the agenda of government along the land bridge and international organizations such as UNDP(United Nations Development Program ), Asia Development Bank, World Bank, Shanghai Cooperation Organization. Thus form a favorable international environment for the smooth operation of land bridge.

(Kaifu Pu, 2005) Y.F. Bai; W.G. Xie, (2005) said that the development of NELB economic belt is complementary. The land bridge economic belt in the mid-west China and such Central Asian countries as Kazakhstan and Uzbekistan are rich in mineral resources and energy resources but underdeveloped in economy, while Japan and ROK(Republic of Korea) in Northeast Asia are (comparatively) developed but in

lack of such resources. The complementarity especially results from the fact that the former only has an indirect channel to the sea via Chinese railway. (Andy Zhang, 2008) On one hand, it is the resourceful market for developed countries such as Japan and some European countries. On the other hand, there is increasing cooperation between Asia and European countries. ( Yongfeng Bai; WeiGuo Xie, 2004)

### **2.1.3 Challenge on the New Eurasia Continental Bridge.**

Although the development of New Eurasian Continental Bridge economic belt has made rapid progress so far. There are problems existing to be solved. Each part of NECB economic belt takes on a situation of unbalancing development for resource condition, geographic condition, efficiency of resource allocation, industrial structure and so on. (LI Jun-ye, 2002) And in his thesis, LI Jun-ye said that he would study this problem from point of view of demonstration, and brought forward relevant advice and suggestions on how to harmoniously develop NECB economic belt.

Generally speaking, the operation of NELB is not so smoothly. Along the NELB line, there are over ten countries that are willing to take the advantage of NELB to do international transport, but they lack of flexible administration with freight making, way of paying, interests distributing, etc. All of these infect the multi model transportation business of NELB. (Y.F. Bai; W.G. Xie, 2005; Y.C Wang, Dan Yu and Y.J. Tian 2006) High freight and time consuming are other weak point of NELB (Land Bridge Horizon, p29). The NELB international seminar on economic cooperation along the new Eurasian continental bridge proposed slogan of “Smooth Land Bridge”, in order to eliminate this obstacle at the best effort. (Land Bridge Horizon, 1 2005, p29)

#### **2.1.4 Strategies of developing The New Eurasia Continental Bridge**

It is urgency to establish network infrastructure construction to meet the requirement of NELB as well as the human resources exploration. Huyong (2001) also suggests promoting political, economic and technological cooperation and communication among countries and areas along the route. Some scholars share the same opinion with him.

Y.F. Bai; W.G. Xie (2005) suggested that in order to promote the transit cargo transportation of NELB, governments of countries along the route should cooperate with railway departments as well as enterprises doing NELB business to establish a information center providing relative information. Second is to strengthen railway coordinating mechanism of NELB, reinforce the harmony relationship between NELB transport organization and to pick up railroad construction of NELB. Third, expand the international container transportation of NELB and also promote and stretch it. Fourth is to simplify the customs procedure, shorten the delay time of transiting. Last but not the least important is the quick-handling and reduction of the delaying time in port. Y.C Wang, Dan Yu and Y.J. Tian (2006) suggest in more detail: (1) Adjust the transport price and reduce transport cost. (2) Improve railway capacity. Railway capacity bottleneck seriously block the transport efficiency of NELB. It is also pointed out that operate stable, trustable and fast international container direct train is the best way to attract customers. International railway alliance, at that time was actively promoting China-Europe-Northeast America route program. A 1435mm standard channel was suggested in the agreement to open a China-Europe container direct regular train among railway, customs and relative departments of China, Kazakhstan, Russia and European Union countries.



### **2.1.5 Lianyungang Port-eastern bridgehead of NELB**

Lianyungang, as the east bridgehead of the NEACB, is the direct way to sea of the Chinese section. Evidently, the feasibility of choosing it as the Chinese port deserves concern and research. (Andy Zhang, 2008)

There are some other scholars keep in their mind that “The 10,900-km new Eurasian continental bridge, the cheapest and fastest Asia-Europe land rail route, starts from China's coastal city of Lianyungang to the east, and goes westward to its terminal at the Port of Rotterdam in the Netherlands to the west.”(People daily 2005)

Lianyungang, which took an active part in constructing a platform of cooperation in regions along the Bridge, organizing viaduct transit shipment and giving full play to the integrated transportation of its harbor, railroad and companies, has promoted regional economic development along the Bridge. However, the development therein is restricted by such elements as the relative backwardness in economy, the weak consciousness of logistics, the backwardness of logistic infrastructure and the low level of logistic information.<sup>1</sup>

Zhu-Xi Li (2006) suggests that China should include the construction of the new Eurasian Continental Bridge transportation channel into the Western Development Strategy, and try to formulate an authoritative and internationalized transport coordinating mechanism. In this case, the Bridge can expect super rapid development and the strategic position of Lianyungang as the east bridge head can be highlighted with such a national policy taking effect.

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<sup>1</sup> [www.66yj.com/html/news/485726.html](http://www.66yj.com/html/news/485726.html)23K

As part of the development of strategies and plans to enable the organization to achieve its objectives, then that organization will use a systematic process known as corporate planning. PEST can be used as a basis for the analysis of business and environmental factors.

## **2.2 Other People's Research on Methodology**

### **2.2.1 PEST Analysis of External Environment**

PEST is made up of initial letters from Political, Economics, Social and Technology. It is a strategic management tool for analyzing external micro-environment of an organization. It is to say that PEST is an appropriate strategic tool for understanding the "big picture" of the environment in which business operates. By looking to the outside environment to see the potential forces of change looming on the horizon the company can see a longer horizon of time, and be able to clarify strategic opportunities and threats that the company faces.<sup>1</sup> Generally, an organization's marketing environment is made up of: The internal environment, the micro-environment and the macro-environment e.g. Political (and legal) forces, Economic forces, Socio-cultural forces, and Technological forces. These are known as PEST factors.

Before beginning the marketing process, it is very important for an organization to consider its environment. Kotler (1998) claims that PEST analysis is a useful strategic tool for understanding market growth or decline, business position, potential and direction for operations. In analyzing the macro-environment, it is important to identify the factors that might in turn affect a number of vital variables that are likely to influence the organization's supply and demand levels and its costs

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<sup>1</sup><http://www.coursework4you.co.uk/pest.htm>

(Kotter and Schlesinger, 1991; Johnson and Scholes, 1993). In fact, environmental analysis should be continuous and feed all aspects of planning. The“radical and ongoing changes occurring in society create an uncertain environment and have an impact on the function of the whole organization” (Tsiakkiros, 2002).

### **2.2.2 Forecasting Method of Transit Container Throughput**

There are many methods used to forecast container volume. Winklman said container throughput of Europe is connected with GDP, foreign trade volume, fixed assets of port investing, interest rates and exchange rates. In the past twenty years, Chinese GNP, foreign trade, fixed assets of contain ports have grow fast. Bing Liu, Guodong Liu, Chao Liu, 2003) wrote in their research paper that Chinese container port turnover obey the same rule with the developed countries. That is to say it is related to the GNP, foreign trade and fixed assets of contain ports. In this dissertation, the author will apply the liner regression model to forecast the bridgeheads medium-long term transit container throughput.

## **Chapter3 Environmental Scanning of the Bridgehead**

### **Lianyungang**

#### **3.1 Macro environment Analysis**

##### **3.1.1 Economic Factors**

The world financial tsunami originated in Wall Street is hitting the world economy, greatly impact on the global logistics industry, especially the international shipping industry. Financial crisis will have impact on the port's foreign import and export trade. Import and export volume will decrease for a short run but development opportunities still exist under the difficult conditions. In other words, transportation of Land Bridge in 2008 has not been greatly impacted, which also highlights its advantage. The same is true to Lianyungang. First of all, the eastern bridge head Lianyungang Port is supported by the national, provincial and municipal government. It is a downturn of shipping market this year, while many liner companies' capacity surplus. This new opportunity is as long as there are goods there will be liner companies call the port in Lianyungang.

##### **3.1.2 The Policy of Chinese Government**

As early as in the 90th in 20century, the Chinese Government when programming the Ninth Five-Year Plan and Long Term Goals for 2010 pointed out the Yangtze Delta Area with Shanghai as the leader and Economic Belt along the Yangtze River region; the Coastal Economy Area in south-east China led by The Pearl River Delta and South Fujian; Bohai economic circle which is mainly Liaodong Peninsula, Shandong Peninsula, Beijing, Tianjin and Hebei; as well as the economic belt linked

by the Eurasian Continental Bridge and the Beijing-Kowloon Railway line.<sup>1</sup>

It was also clearly pointed out in the country's Tenth Five-Year Plan that *“Relying on the transport links and central cities of Eurasian Continental Bridge and the Yangtze River waterway, to String of points to lines and drive points to surface so as to promote the formation of economic zones such as West Longhai, Lan-Xin line economic belt and the upper reaches of the Yangtze River economic belt.”*

At the same time, Jiangsu Government make great effort to development North Jiangsu, and continue advancing “Sea of East Jiangsu” program and accelerate Suzhou-Lianyungang, Coastal economy belts and economy belts along the Yangtze River as well as the East Longhai Industry Belt.

In recent years China increased large-scale investment projects in Central Asia, Russia number of which is a very good opportunity. January 2007, Premier Wen Jiabao inspected Lianyungang. On the level of national strategy, he portrayed an inspiring blueprint for Lianyungang’s future,

*“Lianyungang plays an important role not only in the economic development of North Jiangsu, but also in linking the south and the north, the east and the west, as well as in promoting regional coordinated development, to make Lianyungang an important tie that integrates the economic development between the area along Longhai railway line and the coastal area.”*

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<sup>3</sup> <http://www.coursework4you.co.uk/pest.htm>

Lianyungang has become the flagship and powerhouse of the development of North Jiangsu, Central China, and the Western China. The booming of Lianyungang economy brings Punan considerable business opportunities. The Premier pointed out that: First, Lianyungang firstly must have a good planning; second, Lianyungang must speed up local development to play an important role both in the economic development of North Jiangsu, but also in linking the south and the north, the east and the west, as well as in promoting regional coordinated development, to make Lianyungang an important tie that integrates the economic development between the areas along Longhai railway line and the coastal areas. To implement the regional coordinated development strategy, The CPC Jiangsu Provincial Committee and the provincial government have greatly concerned Lianyungang's development. In March 2007, a resolution has been made to exhaust all efforts of Jiangsu province to support Lianyungang's development in a special conference held by the standing committee of CPC Jiangsu committee to discuss the development of Lianyungang city. The conference instructed that Lianyungang must become the powerhouse of revitalizing North Jiangsu, the new growth pole of the opening up and development provincially, and an important economic hub linking the south and the north, the east and the west.

Various ministries vowed full support for Lianyungang. Domestic and international corporations have begun to discuss projects on new shipping routes, the construction of new docks and facilities, and different ways to set up new industries. Famous corporations such as Yihai Group, a subordinate of Wilmar Singapore, China Shipping, and COSCO are among those involved. The provincial government has also moved Lianyungang affairs to the priority of its agenda. Starting from July 2007, after defining guiding principles, consultation and citizen appraisal, bidding international planning, there emerged the Strategic Development Plan of

Lianyungang City It is a crystallization of collective wisdom of eight foreign and domestic planning institutions. It includes every aspects of Lianyungang's future development and covers the city construction plan of "one center three poles" in order to introduce first-rate planning to lead constructing Lianyungang city. It also includes the industrial development plan of the port plan of "large combined port composed of one body two wings", "T-shape distribution composed by one vertical and one horizontal", , tourism development plan, and cultural industry development plan, etc.

### 3.1.3 The Opportunities of the Oriental Bridge Head.

According to the Consideration of the State Council in 2006 named "The Layout Plan of Chinese Layout of Coastal Ports" listed Lianyungang Port, Ningbo Port and Shanghai Port as the main ports of port group in Yangtze River Delta region based on Shanghai International Shipping Centre. Lianyungang has been one of the members of Yangtze Delta and Bohai economic circle. It will provide great opportunity for Lianyungang's development. Shanghai International Shipping Centre was north to Lianyungang. The development of Lianyungang is listed in the China's overall development layout and become the key hub and gained great developing opportunity.

#### **3.1.3.1 Support from local industries**

Meanwhile local industries will grow more improved structures with diversification. This will serve as a constructive complement to the harbor sector adding another dimension to the development of the oriental bridge head.

Sino-trans Land Bridge Transportation Co., Ltd is a comprehensive and multi functional international freight forwarding enterprises. It has been reformed from the main operator of the New Eurasian Land Bridge transportation and Sino-trans Lianyungang Company . After the confirm of Lianyungang as the start of the New Eurasian Land Bridge and the leading port of the nine coastal opening ports, the company participating in and organized the send out of the first train of the New Eurasian Land Bridge. The company made great effort and greatly improved the transit containers volume through Lianyungang. In June and December1998, the company open the inter-route container line from Lianyungang to Qingdao and to Shanghai. The company's transit containers hit the record time after time. Thus, the containers cargoes from Lianyungang transited all over the world.

The oriental container company in Lianyungang will make effort to open the market. Domestic trade as of the main customers in the ports takes a large proportion of the all customers. There are garlic, vegetables, aluminum ingots, tomato sauce and other large customers. The company mainly focuses on exploration Longhai regular train in order to explore market in 2009. The company will be well prepared to start the European and Russian regular train. And open Houma, Lanzhou, Yinchuan regular train, etc before the end of March. The company focuses on national good source and use the national trade to promote the foreign trade. The loss of supply will be back.

Lianyungang Port will shine as a comprehensive port for world trade at the coast of the China's Yellow Sea, and offers high-quality services to promote the economic and trade cooperation between Asia and Europe and the economic development along the New Eurasian Continental Bridge.



### 3.1.4 Threat from External Competition among Coastal Land Bridges

Since 1992 the initial stage of opening and operation of the New Eurasian Land Bridge, Lianyungang is only port unit that participate in international transit transportation of the Land Bridge. As advantages of international transit transportation of the Land Bridge become more and more prominent, Chinese coastal port unit are in the rush to intermarriage with the “Bridge” to be connected with the Mid-Asia and Europe. Port of Tianjin, Rizhao and Shanghai thronged to declare that there is one of the east bridge heads of the NELB. There form a competitive group of bridge heads. (See table 2 & 3)

Table2 Annual throughput of Lianyungang Port

Year	Tonnage	Tonnage
2008	100,000,000	
2007	85,060,000	
2006	72,320,000	
2005	60,160,000	
2004	43,520,000	
2003	37,510,000	131%
2002	33,160,000	
2001	27,082,000	
2000	20,160,700	13.6%
1999	20,160,000	
1998	11,140,000	
1997	15830000	-7.86%

Source: Author’s Collecstion

Table 3 Container throughput of Lianyungang Port

Year	TEU	
2008	3,000,000	49.8%
2007	2,000,000	54%
2006	1302000	30%
2005	872000	
2004	501000	
2003	205100	30.2%
2002	157500	
2001	120000	8.7%
2000	110500	20.6%
1999	110000	
1997	89558	36.75%

Source: Author's Collection

Figures above tell that Lianyungang still is leading among the ports of eastern land bridge group which participating the transit transportation of Eurasian Land Bridge in 2008 with 64000TEU which is more than 40 percent of the whole transit containers. However Lianyungang's status of hegemony has been shaken compared with before which is over 90 percent. It is felt that the smell of gunpowder between their competitions is so strong. See table 3.2.3.

Table 4 Transit Container Value of Four Railway Department

Port Department	Lianyungang	Qingdao	Tianjin	Shanghai
Transit Containers	64000Teu	40101Teu	11833Teu	10770Teu

Port	Nanjing	Fuzhou,	Guangzhou,	Rizhao

Transit Containers	6012Teu	1314Teu	11260Teu	0
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Source: Horizontal Land Bridge, 2009

The author would like to point out that Qingdao port, whose transit container volume is 40101 TEU in 2008. It is an alarming increase for it has increased by 56% which is 14313TEU compared to 25788TEU in 2007. Although it ranked in second place, its growth rate may tell that what Qingdao's objection to participating the Land Bridge transit transportation in 2009.

### **3.2 Micro environment**

#### **3.2.1 The strength of the oriental bridge head and opportunity**

##### **3.2.1.1 Unique location**

As what President Jiang Zemin said when visiting Lianyungang last year:

*"A long journey starts with the first step."*

This vigorous city connects the overland Silk Roads and the ancient maritime. Today, it is the starting point of the New Eurasian Continental Bridge. Trade, development and prospects all start from this strategic area.

Lianyungang Port originated from the mixture of river-sea, railway-sea, and sea-air combined transport and it enjoys unique advantages as a strategic resource of Lianyungang city. In the light of the combination and cluster strategies, the city will enhance one body while develop two wings by developing the "one body two wings" combined port structure along the 176 km coastline, aiming to accelerate its

expansion of total scale, upgrade its function, and play a better role in driving the local economic development as well as strengthening its core competitiveness.

### **3.2.1.2 Resourceful Hinterland**

“Longhai – Portland” new economic zone is known as the heart of China's rich natural resources. The general consumer market has a strong cohesion and digestion. Lianyungang has a vast and stable economic hinterland, that is, the entire “Longhai – Portland” new economic zone. Northeast Jiangsu Province is one of China's most vital economic and technological development zones. Lianyungang is port for more than 10,000 tons of existing berths 30. Just past 2008, and is one of the top ten ports. Lianyungang Port completed a total of 100,115,500 tons of cargo throughput. 6.7 kilometers to stop the sea dike, so that the port formed a basin of 30 square kilometers calm. There create a million tons of handling capacity by Hundreds of parking spaces for the building. In the world more than 160 countries and regions have more than 1000 ports in a close relations and trade links with Lianyungang. Lianyungang has become an important hub of a comprehensive international trade port function.

### **3.2.1.3 Fast development**

There used to be over 95% of the transit containers via China undertaken at Lianyungang with cargo moves in both directions instead of single west going. In 1997, Lianyungang port handled transit containers of 30,016 TEUs involving 14 countries and regions. This continental bridge transportation business involved Japan, South Korea, Germany, Australia, Kazakhstan, Russia, Uzbekistan, USA ,Singapore, Hong Kong, Taiwan and etc. There are nearly 30 kinds of cargoes transported along the bridge. these cargoes include machinery, chemicals, electrical equipment and

other industrial and agricultural products .

Accompanied by the continuous development of import and export volume of international container, there have been sea-rail international container liners since 1996 to be transited in Alashankou, transferred in Dolstyk to countries such as Kazakhstan. Due to unfixed run time, unfixed organization, and inefficient transportation organization, there has been a poor long-term condition of working but not smooth. In 1997, the freight is lowered and more favorable conditions are possible for big lot cargo for A special regular train has been put into operation at that time. The train started from Lianyungang and ended at Abarhan-Pass. It is safer and faster transport and quicker feedback information is ensured for it takes only 5.13 days for the 4131 km China's section rather than 15 days as before. The train is of fixed stops, fixed freight, fixed number, fixed time and fixed route. It was approved by the National Railway Ministry on April 4th 1998, for the Railroad Container Forwarding Center of Lianyungang simplifies the procedures and reduces the expenses for the intermodal transport, and provides a better service for cargo owners. In order to optimize the new Eurasian continental bridge to improve transport, China's Railway Administration implemented "express train" mode of transport in 2006, which reduced the time of inter-China transport to 4.5 days. In 9th October, 2007, Chinese railway department and China Shipping opened the Lianyungang- Russia five-fixed international container regular train. As a result, it takes 14 days to transport the 8310 mile distance between this two places and thus the direct transit container transport of the new Eurasian continental bridge extended to Europe from Central Asia. These initiatives contributed greatly to the development of a land bridge transport and to China's western development strategy.

Last year, under the concern of railway administration and the correct leadership of the company, the line of "three points four lines" direct sea-rail express train opened from November 26. This year, "4.18" plan fixed the line as inter-bureau "five fix" Container Express train liner. The course included 48 groups. They charged in the port of Lianyungang and clear in the entire column in Alashankou customs, and there are solution operations in the way. The whole 112 hours running time is about 4.7 days. As a result of the introduction of new products has advantages over a fixed-point, fixed time, direct and through, relatively fast, safe and environment friendly, and heavily loaded from and return , quality service, all of which are welcomed by customers and promote the rapid growth of the Land Bridge Transit container volume. October 9 this year, the company joint with the China Shipping Group holding a ceremony of Lianyungang to Moscow international railway container. From January 317 trains has started out in average of 1.04 per day, with an additional 97 trains; 30418TEU has been loaded, with a year-on-year increase of 25.1 percent.

Currently, 30kinds of goods are transported including machinery, chemical, mechanical and electrical products, light industry, agricultural and sideline products involved 14 countries and regions including Japan, Korea participated in the New Eurasian Continental Bridge international transport. Adding to this, Cargo moves now in both directions instead of single west going. During the 16 years official opening of the new Eurasian continental bridge, the volume of transit transport containers climbing. It reached 30,016 TEUs in 1997, climbed to 49,900 TEUs in 2006, achieved to 59,400 completed in 2007 TEUs and in 2008, capacity exceeded 60,000 TEUs.

#### **3.2.1.4 Accessing port construction and investing**

From 2001 to 2006, Lianyungang port has invested 5.42billion. Among these 1.6billion was in container terminal and 700million is in bulk cargo terminal while 700million is in handling facilities and 50million about electric. In the single year of 2007, it has invested 3.9billion. According to the blue plan, 5 port areas would be formed including Old port area, Miaoling port area, Xugou port area, North port area and Eastern port area, the quay line will be over 25 kilometers and more than 100 berths will be constructed, the annual throughput capacity will be between 60 million and 100 million tons .

In the meantime, Lianyungang is cooperating with central Asian and east European countries in the economic and commercial domain. On the basis of its convenient transport and abundant natural resources, Lianyungang has established a series of pillar industries, including textiles, pharmaceuticals, foodstuffs, electronics, chemicals and building materials.

Generally speaking, under the big world condition, it is favorable to the development of NELB and its bridgehead Lianyungang. From the analysis of its macro and micro environment, it is clear to prove that Lianyungang is irreplaceable as the oriental bridge head and as the connection between the powerful Asia and the link of land and the sea. Comparing to the other Chinese coastal ports who are striving for the name of east bridge head, Lianyungang shows competitiveness in a large sense. However, coming along with its strength and opportunities, there are undeniable threats and weakness for Lianyungang's development, which should be greatly concerned.

## Chapter4 Necessity of Establishing Lianyungang to be the Bridgehead

### 4.1 Historical statistics and forecast of transit container throughput

We can see from the table (table 5) that the first year in 1992, there only 50Teu transit containers, then up to 12000, 30000 TEU in year 1996 and 1997 respectively. In 1997, Lianyungang port handled transit containers of 30,016 TEUs involving 14 countries and regions in the continental bridge transportation business as Japan, South Korea, USA, Kazakhstan, Russia, Uzbekistan, Germany, Australia, Singapore, Hong Kong, Taiwan and etc. There are nearly 30 kinds of cargoes transported along the bridge such as machinery, chemicals, electrical equipment and other industrial and agricultural products.

It reached 30,016 TEUs in 1997 achieved to 59,400 and the volume of containers began to decline year by year for the 1998 world financial crisis. By 2002, it dropped to four thousand TEUS. Along with the economy recovery, the volume rose in the year 2003. , climbed to 49,900 TEUs in 2006. Up until 2007, international transit containers has reached 223,000 TEUs, and Lianyungang took more than 90% of the volume of inter China transit containers of this land bridge. In the year 2008 for the global world crisis, the volume in December is decrease by 2300 TEUS compared to November and its capacity exceeded 60,000 TEUs.

Table 5 Annual TCV including West-going and East-going

Item	Year	TCV	west going	east going
1	1992	50	50	



2	1993	0	0	
3	1994	61	61	
4	1995	257	78	
5	1996	12118	9357	2761
6	1997	30016	15339	14677
7	1998	12194	6499	5695
8	1999	10514	4793	5721
9	2000	4893	3414	1479
10	2001	7526	4110	3416
11	2002	4175	2575	1600
12	2003	6150	5580	570
13	2004	8329	6873	1456
14	2005	29004	22498	6506
15	2006	43454	33741	9713
16	2007	57160	37452	19708
17	2008	63997	45840	18157
18	Jan-Apr. 2009	20191	13224	6967

Source: provided by Oriental Container Terminal Company

However, in the first four months in 2009, the volume increased month by month. The world crisis brings it with uncertain factors to forecast transit container volumes and it is difficult to use a specific mathematical model to predict the volume in short term. Some experts forecast the volume based on supply and demand, the transport capacity, link capacity and related freight rate. Here, the author use the simple regression to predict the container volume in a medium-long time period.

## 4.2 Transit container volume prediction based on the liner regression model

### 4.2.1 Model of Liner Regression

Table 6 Data for Transit Container Volume

B <sup>1</sup>	C	D	E
WORKSHEET FOR REGRESSION CALCULATION FOT TRANSIT			
2 <sup>2</sup>	CONTAINER VOLUE		
3	YEAT	GDP	TCV
4		MILLION	TEU
5	1997	19.6	30016
6	1998	21.7	12194
7	1999	23.2	10514
8	2000	24.9	4893
9	2001	26.9	7526
10	2002	29.7	4175
11	2003	33.3	6150
12	2004	39.2	8329
13	2005	45.6	29004
14	2006	52.7	43454
15	2007	61.5	57160
16	2008	75	63997

Source: By author's calculation

Step 1 Name Ranges.

The range includes the dependent variable and the independent variable. We name the range from D5 to D16 GDP which includes the independent variable and name the range from E5to E16 TCV which includes the independent variable.

<sup>1</sup> Note: B, C, D are the Rows in the Excel Worksheet

<sup>2</sup> The number 2 to 9 are the columns in the Excel Worksheet

### Step 2 Intercept and Slope

By using the Excel INTERCEPT and SLOPE functions. Enter the formulas

= INTERCEPT(y, x)

and

= SLOPE(y, x).

Enter the formulas in this case

= INTERCEPT(y, x) =INTERCEPT (D5:D16, E5:E16)

and

= SLOPE(y, x) =SLOPE (E5:E16, D5:D16)

As before, this leads to the regression

$$\hat{y}_i = \hat{a} + \hat{b}x_i$$

### Step 3 Predictions.

The prediction costs can be found by entering the x values into the regression line.

Using Excel's TREND function is an easy way to do this.

The result is as Table 7:

Table 7 Prediction in Excel Worksheet

WORKSHEET FOR REGRESSION CALCULATION FOR TRANSIT CONTAINER VALUE			
YEAT	GDP	TCV	PREDICTION
	MILLION	TEU	
1997	19.6	30016	20311.70
1998	21.7	12194	22485.64
1999	23.2	10514	24038.45
2000	24.9	4893	25798.30
2001	26.9	7526	27868.72
2002	29.7	4175	30767.30

2003	33.3	6150	34494.058
2004	39.2	8329	40601.780
2005	45.6	29004	47227.119
2006	52.7	43454	54577.098
2007	61.5	57160	63686.930
2008	75	63997	77662.240

Source: By author's calculation

#### Step 4 Other quantities.

Other quantities frequently obtained in regression analysis are as follows: the R-SQUARE VALUE, the STANDARD ERROR OF ESTIMATE, and the CORRELATION.

The formula are as RSQ(Y, X), STEYX(Y, X) and CORREL(Y, X) respectively.

RSQ(Y, X) =RSQ (E5:E16, D5:D16)

STEYX(Y, X) =STEYX (E5:E16, D5:D16)

CORREL(Y, X) =CORREL (E5:E16, D5:D16)

Quantities output is showed in the table8.

Table 8 Quantities output

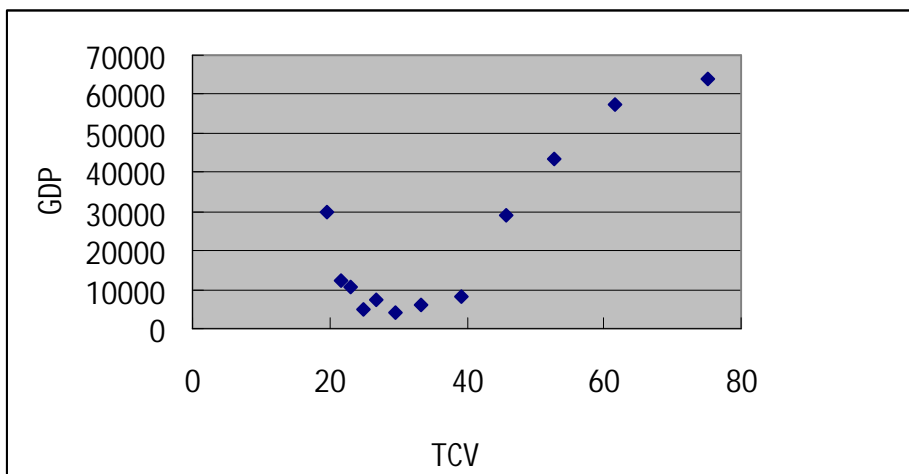
INTERCEPT	21.62172522
SLOP	1035.208284
RSQ	0.723343066
STEYX	11813.71123
CORREL	0.850495776

Source: By author's calculation

### Step 5 Finish the scatter plot

First we select the Insert/Trend/On New Sheet menu item, and then follow the ChartWizard steps. Second we can create the scatterplot which will be shown on a new sheet. Then creating the chart, click on any of the points on the scatterplot. After that we select the linear box and choose the Insert/Trend line menu item. Every least squares line has two properties.

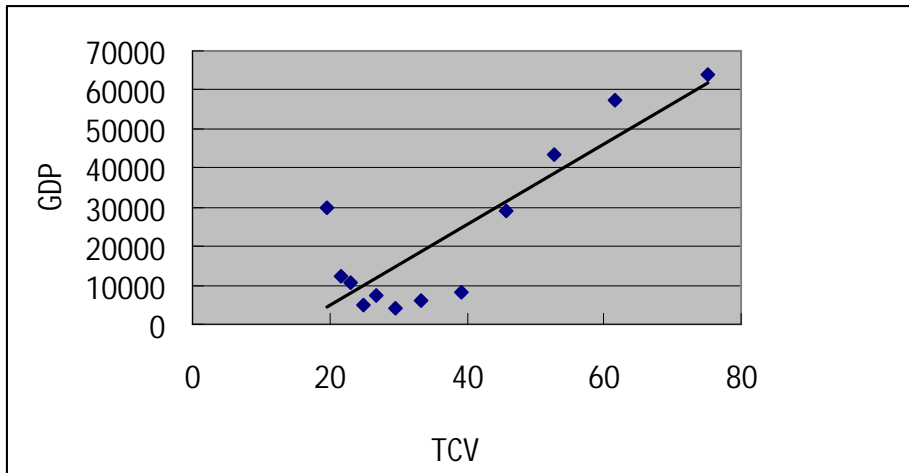
Figure 3 Scatter Plot of Transit Container Value in Lianyungang Port



Source: By author's calculation

And then select the Insert/Trend line menu item and choose the linear box.

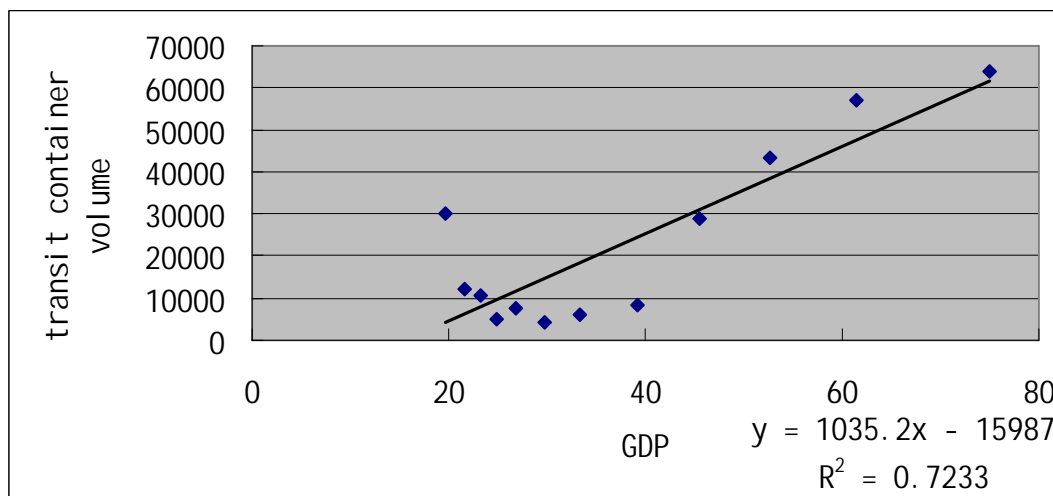
Figure 4 Trend line of liner regression



(Source: By author's calculation)

The next we get the R-square and the function as show in the following figure.

Figure 5 R-square and function



Source: By author's calculation

If the scatter plot trends to be a liner, we suppose that variable y and x satisfy that

$$Y = a + bx + \varepsilon \quad (1.3.1)$$

The  $\varepsilon$  is random error, we suppose that the  $\varepsilon \sim N(0, \sigma^2)$ . And input  $(x_i, y_i) \quad i=1, 2, \dots, n$

into the function 1.3.1 then we can the simply regression model

$$\begin{cases} y_i = a + bx_i + e_i & i=1,2,\dots,n \\ e_i & (i=1,2,\dots,n) \text{ i.i.d.}, N(0, \sigma^2) \end{cases} \quad (11.2)$$

$$Q(a,b) = \sum_{i=1}^n e_i^2 = \sum_{i=1}^n [y_i - (a + bx_i)]^2$$

The minimum  $(\hat{a}, \hat{b})$  of function  $Q(a,b)$  is called the OLSE of  $a$  and  $b$ .  $\hat{a}$  and  $\hat{b}$  value minimize the sum of squared residuals are referred as OLS, Ordinary Least Square.

The process of getting the minimum is as follows:

$$\begin{cases} \frac{\partial Q}{\partial a} = -2 \sum_{i=1}^n (y_i - (a + bx_i)) = 0 \\ \frac{\partial Q}{\partial b} = -2 \sum_{i=1}^n (y_i - (a + bx_i)) x_i = 0 \end{cases} \rightarrow \begin{cases} na + n\bar{x}b = n\bar{y} \\ n\bar{x}a + (\sum_{i=1}^n x_i^2)b = \sum_{i=1}^n x_i y_i \end{cases}$$

$$D = \begin{vmatrix} n & n\bar{x} \\ n\bar{x} & \sum_{i=1}^n x_i^2 \end{vmatrix} = n(\sum_{i=1}^n x_i^2 - n\bar{x}^2) = n(\sum_{i=1}^n (x_i - \bar{x})^2) = n(n-1)S^2 \neq 0$$

$$\text{Then we get } \begin{cases} \hat{a} = \bar{y} - \hat{b}\bar{x} \\ \hat{b} = \frac{\sum_{i=1}^n x_i y_i - n\bar{x}\bar{y}}{\sum_{i=1}^n (x_i - \bar{x})^2} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^n (x_i - \bar{x})^2} \end{cases}$$

We define that

$$l_{xx} = \sum_{i=1}^n (x_i - \bar{x})^2 = (n-1)S_1^2 = nS_1^2$$

$$l_{yy} = \sum_{i=1}^n (y_i - \bar{y})^2 = (n-1)S_2^2 = nS_2^2$$

$$l_{xy} = \sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y}) = \sum_{i=1}^n x_i y_i - n\bar{x}\bar{y}$$

Then we get 
$$\begin{cases} \hat{a} = \bar{y} - \hat{b}\bar{x} \\ \hat{b} = \frac{l_{xy}}{l_{xx}} \end{cases}$$

$$\begin{cases} \bar{x} = \frac{1}{n} \sum_{i=1}^n x_i, \bar{y} = \frac{1}{n} \sum_{i=1}^n y_i, \\ S_1^2 = \frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2, \\ S_2^2 = \frac{1}{n-1} \sum_{i=1}^n (y_i - \bar{y})^2 \end{cases}$$

In order to test how fine the least squares line fit our data points, three components of variations are needed: SST, SSE AND SSR.

The relationship among these three variations are  $SST=SSE + SSR$ .

SSE will be small for a goodness of fit. We define the coefficient of determination  $R^2$

$$\text{as } R^2 = \frac{SSR}{SST}$$

As we have measured before that a correlation near 1 indicates a strong positive linear relationship. And after using Excel's CORREL function we get the correlation value.

Table 9 Correlation value

CORREL	0.850495776
--------	-------------

Source: By author's calculation

We can conclude that the linear relationship between the GDP and TCV of Lianyungang is positive.



First we select the Tools/Data Analysis menu item as show in the figure6.

Figure 6 Regression Output from Data Analysis Tool for TCV

**SUMMARY OUTPUT**

**REGRESSION STATISTICS**

Multiple R	0.850495776
R Square	0.723343066
Adjusted R Square	0.695677372
Standard Error	11813.71123
Observation	12

**ANOVA**

	do	SS	MS	F	Significance F
Regression	1	3649013445	3649013445	26.1458498	0.000455111
Residual	10	1395637730	139563773		
Total	11	5044651175			

	Coefficients	SE	t Stat	P-value	Lower 95%	Upper 95%
Intercept	-15987.32627	8373.626832	-1.909247521	0.08531079	-34644.92947	2670.276927
X Variable 1	1035.208284	202.4539981	5.113301262	0.00045511	584.1126672	1486.303901
					Lower95%	Upper 95.0%
					-34644.929	2670.276927
					584.112667	1486.303901

**RESIDUAL OUTPUT**

Obersavation	Predicted		
	TCV	Residuals	SE
1	4302.756101	25713.2439	2.282794729
2	6476.693498	5717.306502	0.507576454
3	8029.505924	2484.494076	0.220570769
4	9789.360007	-4896.360007	-0.434693688
5	11859.77658	-4333.776576	-0.384748123
6	14758.35977	-10583.35977	-0.939579541
7	18485.10959	-12335.10959	-1.095098046
8	24592.83847	-16263.83847	-1.443886461
9	31218.17149	-2214.171491	-0.196571814
10	38568.15031	4885.849691	0.433760593
11	47677.98321	9482.01679	0.84180347
12	61653.29505	2343.704953	0.208071659

Source: By author's calculation

And we get these figures.

Figure 7 Probability Output

PROBABILITY

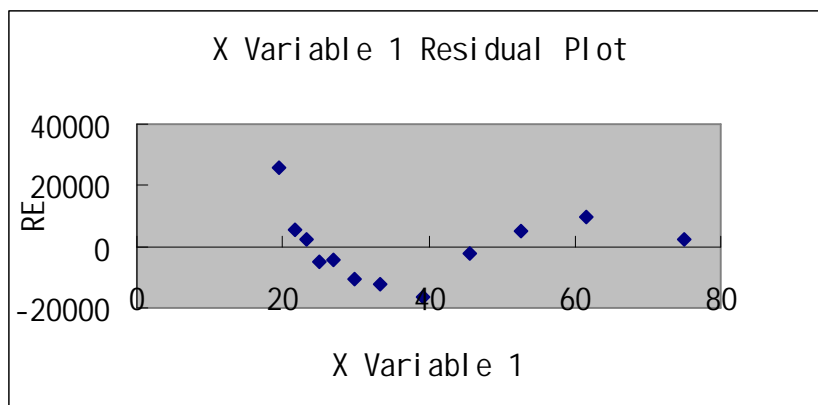
OUTPUT

percent order	Y
4.166666667	4175
12.5	4893

20.83333333	6150
29.16666667	7526
37.5	8329
45.83333333	10514
54.16666667	12194
62.5	29004
70.83333333	30016
79.16666667	43454
87.5	57160
95.83333333	63997

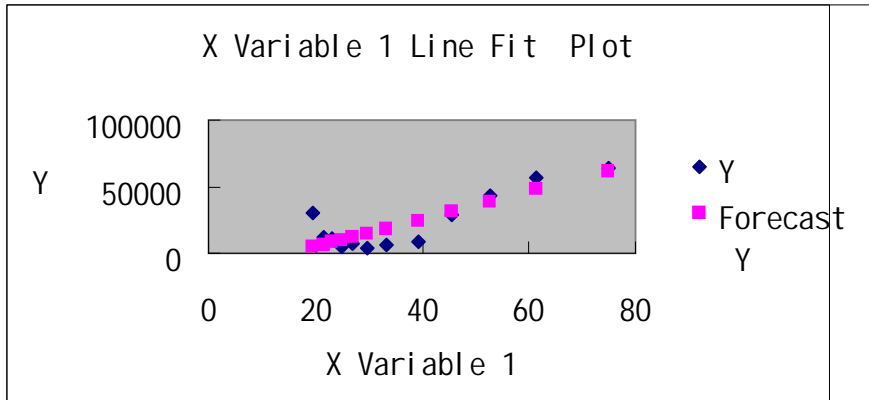
Source: By author's calculation

Figure 8 Residual Plot



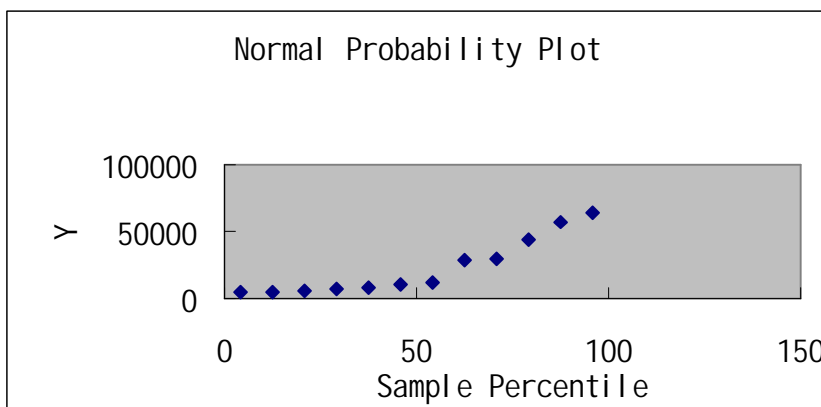
Source: By author's calculation

Figure 9 X Variable 1 Line Fit Plot



Source: By author's calculation

Figure 10 Normal Probability Plot



Source: By author's calculation

#### 4.2.2 Result of the liner regression prediction

It predicted that the volume would be about 63000 TEUs for the whole year. Without the impact of the financial crisis and the opening of Moscow Regular Train, we predict that the volume will increase ten thousand to fifteen thousand yearly.

### 4.3 Significance of the Bridgehead

#### 4.3.1 Advance the central and western exploration

Regional economy of New Eurasian Continental Bridge is Longhai, Lanxin new economy belt in China mainland, as well as a breakthrough of the western development strategy. Xinjiang ketchup, Shanxi's coal exports, imports of alumina in Gansu all choose to transit in Lianyungang port. Coal, alumina, fertilizer, grain and other five main kinds of bulk which transited in Lianyungang port become the well-known brands of bulk cargo in China's coastal ports.

Transport increase of foreign trade between the central and western regions injects new vitality into development of Lianyungang port. Sixty percent of Lianyungang port's throughput comes from the central and western Chinese regions. Lianyungang has become the best juncture of two major historical event-- development of the western region and China's accession to the WTO.

#### **4.3.2 Serve the Yangtze River Delta Development**

"Layout planning of national coastal port " has been examined and approved by the State Council China in August 16, 2006. After, the national coastal ports will be divided into five groups of ports including the Bohai Sea, Yangtze River Delta. Lianyungang is positioned as one main port of the port group that based on the Shanghai international shipping center in the Yangtze River Delta region. Clearly, Lianyungang port possesses important status in the Yangtze River Delta port cluster. Lianyungang initiatively integrated the Yangtze River Delta. And operate transit transportation on iron ore, coal and other bulk cargo from sea to the Yangtze River since 2003.

At the beginning the Port is managed by the Ministry of Transportation and Communications. Now it is decentralized to the local. Lianyungang City and Jiangsu Province consider Lianyungang port with a sense of responsibility and urgency, as resources to promote local economic development to enhance further service for the Yangtze River Delta, to serve for "the two lead-in" policy in Jiangsu, to re-frame new harbor, with a characteristics of container transport, accelerating Lianyungang's construction pace into the international coastal ports manifestation, to stand for the level of major coastal ports with foreign trade strength in North Jiangsu province as soon as possible. Become the large logistics platform to draw international capital to undertake manufacturing and expansion of the Yangtze River Delta region.

#### **4.3.3 Outward Window of the NELB**

Currently, 14 countries and regions including Japan, Korea participated in the New Eurasian Continental Bridge international transport, 30kinds of goods are transported including machinery, chemical, mechanical and electrical products, light industry, agricultural and sideline products. Adding to this, Cargo moves now in both directions instead of single west going. As result of the 16 years official opening of the NELB, the volume of transit transport containers climbing. Lianyungang Port will shine as a comprehensive port for world trade at the coast of the China's Yellow Sea, and offers high-quality services to promote the economic and trade between Europe and Asia as well as the economic development along the New Eurasian Continental Bridge.

The role played by the Lianyungang- Eastern Bridgehead of NELB is irreplaceable. And the prediction also shows that its transit container volume will increase by large.

As the link of land and the sea, Lianyungang shows competitiveness and deep potentiality, it is correlative and complementary with the cities along the Land Bridge.

## **Chapter5 Strategy Making of the Bridgehead Lianyungang**

### **5.1 Guideline of strategy making**

The objective of “two take-leadings” and the implementation of the strategy of revitalizing the North Jiangsu provide policy Security and development opportunity for promoting the competitiveness of Yangtze River Delta economic belt and accelerating the exploration of coastal industry belt. “Chinese 21 Century Agenda” include cities along the new Eurasian continental bridge as the first selection of sustainable development projects. “Chinese Ocean Exploration Project” clearly listed Lianyungang as one of the three especial exploration oceans.

### **5.2 Strategies Making by Case Study**

#### **5.2.1 Case study of Sino-trans Land Bridge Transportation Co.,Ltd**

Sino-trans Land Bridge Transportation Co.,Ltd participated in and organized the send out of the first train of the New Eurasian Land Bridge after confirm of Lianyungang as the begin of the New Eurasian Land Bridge and the leading port of the nine coastal opening ports. In June and December1998, the company open the inter-route container line from Lianyungang to Shanghai and to Qingdao. The company’s transit containers hit the record time after time and the effort the company made greatly improve the transit containers volume through Lianyungang. The containers cargoes from Lianyungang transited all over the world. In the year 2002, the company opened the transit transportation channel radiated north to Mongolia, Myanmar in Southeast Asia, Kyrgyzstan to Kashgar and realized extending in all directions, to apply the spirit of the International Symposium with the theme of NELB regional economic cooperation and become the new landmark of the New Silk Road.



### **5.2.2 Case study of the oriental container company**

The oriental container company in Lianyungang will make effort to open the market. The company mainly focus on exploration Longhai regular train in order to explore market in 2009. The company will be well prepared to start the European and Russian regular train. And open Houma, Lanzhou, Yinchuan regular train, etc before the end of March. The company focuses on national good source and uses the national trade to promote the foreign trade. Domestic trade as of the main customers in the ports takes a large proportion of the all customers. There are garlic, vegetables, aluminum ingots, tomato sauce and other large customers. The loss of supply will be back.

### **5.2.3 Case study of China railway container Co.ltd**

Since Lianyungang as the Bridge Head managed by the shanghai authority, the Chinese Railway company in shanghai attach great concern to the development of Lianyungang as the bridge head. The companies take policy to support the development of the international board transportation of NELB.

The New Land Bridge International channel entered into a new New World since April 2004, for China Railway and China Railway Container International Multimodal Transport Co., Ltd. have opened a line of Lianyungang, Qingdao Port and Tianjin Port - Almaty international container model train. Since Nov 27, 2006, the Railways Ministry started further to optimize the previous "five-fix" rail liners, direct Express train line between Lianyungang and Alashankou. It promote fast-growing of the mainland bridge transit container volume, after speed-up in April 2007. In that year, the Ministry of Railways fixed the lines from Lianyungang to Alashankou, Qingdao to Alashankou, Tianjin to Alashankou, train line as an inter-bureau "five fix" Container Express train.

At the same time, in order to smooth the bridge as well as improve transit efficiency, Chinese railways have been continuously improving in the international railway container port infrastructure. It built a largest indoor container equipped library in Asia; realize a day out to transfer the whole container, both of which greatly enhanced efficiency of container transfer. Second is timely Response cause the steady growth of international transit volume. When the world shipping industry is cutting prices when facing the world financial crisis have and even implement a zero tariff policy, the railway operating departments took immediate measures to ensure that the new Eurasian Continental Bridge develop steadily. To this end, in accordance with the market situation and international trade, the operator has to adjust prices, and some prices even fall by 25%. The downward adjustment of sea-rail combined container transport is up to 50%.

At present, the China Railway Container Company cooperates with Russia, Kazakhstan Railway in international Container Transport. The two sides are actively preparing for the establishment of Sino-Kazakh, Chinese and Russian joint venture, which will strengthen future transit transport organizations, improve transport efficiency.

### **5.3 Existing Problems of Implementing the Land Bridge Strategy and Proposals**

#### **5.3.1 Main Existing Problems**

Return of empty containers has become a bottleneck restricting the Land Bridge transportation. As far as Bridge linked enterprises concern, the strongest problem is the return of the empty containers. At present, east going cargo volume is ten times of the west going cargo volume transported through the Land Bridge. The unbalance

between these two areas causes the problem that the west going containers should be returned empty. The tension of source in Urumchi railway authority is one of the reasons. Transportation of empty container transport cost of the entire route. As a result, many containers which are loaded while difficult to go back even may be abandoned. Recently there were reports that Western scavengers cut containers into scrap metals to sell.

### **5.3.2 Proposals**

#### **5.3.2.1 Proposals for Main Existing Problems**

Experts and companies are heating over the issue of how to solve the empty container in the western area. The author thinks that the main point is to make more effort to find the eastbound goods resources. At present, although the eastbound goods from Europe and central Asian counties are rich, they choose to transport in seaway. The transport distance of the ECLB is shorter than seaway transport, however, owners choose the latter way for the land bridge transport is not so smooth and they are also troubled by freight and price. Another point is to make unified rules of the NECB. Today, Incoterms 2000 is commonly use in global shipping industry. It concludes 13 trade terms that are commonly use in international trade field. These terms clearly define related costs, liabilities, risk allocation and transfer of goods ownership. The land bridge is lack of relative system and set of clear and specific provisions of the terminology. So, it is urgent to make unified transportation rules of the NECB to solve cumbersome procedures, high costs and unsmooth problems. In these two ways, the bottleneck of the land bridge-Empty Container Issue can be better solved.

#### **5.3.2.2 Reform of Land Bridge Transportation System**

The land bridge transport system should be reformed to be a carrier trolley that can be unified to face forwarders and owners, coordinated maritime and land transport and coordinate countries along the bridge line. It should be considered as multi-transport carrier, and its main members should be relative strong enterprises and shipping companies and joint with railway companies in Kazakhstan and Russia. Meanwhile, Chinese authorities should accelerate the development and the promotion of logistics infrastructure, technical equipment, management processes and technical standards of information networks in line with the reality, in order to harmonize the standardized modern logistics system to further improve the efficiency of modern logistic.

#### **5.2.2.3 Adhere to the Freight Transit Function**

It is no doubt that Asia Pacific zone will become world economic development center in the future. In particular, East Asia will be more active and prosperous. Since the operation of the NELB, Lianyungang Port has become the eastern land bridge head of the international freight transport route. Its international status has greatly enhanced and there are more chances for international goods transit through Lianyungang Port. In a way, the new situation of integration of international industry chain gives Lianyungang Port a new ear connotation. With the expansion of international freight transition, Lianyungang adheres to the strategy of mainland land bridge union, and plays the role of eastern bridge head of the NELB with transit function.

On one hand, Lianyungang should act as the important social economic development support for the areas along the land bridge. In case of Lianyungang Port, port economic hinterland is bidirectional. So it is necessary to attach high importance to both mainland hinterland and hinterland overseas. In other words, in the course of

developing towards the modern service-orientated international hub port, Lianyungang Port should attach great importance to the overseas hinterland along the NELB, to expand the market of its good sources, stable and improve the supply of foreign trade. On the other hand, Lianyungang Port should also explore its domestic supply, and strengthen cooperation with bulk cargo owners, further expand the internal trade and transport to improve the market share.

#### **5.4 Summary**

Developing the NELB depends on simplifying transit procedures, on implementing signed agreements of its international transport and on avoiding doubt taxation on goods in transit. The competitive transport period calculation, suitable land bridge transport polices and charges standard are expected. There should also be measures on strengthen railways and transport enterprises of countries along the land bridge. Cooperation issues between governments should be put into agenda for issues concerning polices need government' resolve. Lianyungang Port should realize that to be an international hub port, the eastern bridgehead of the NELB is a breakthrough.

## Chapter6 Conclusion

The dissertation mainly discussed the development of Lianyungang as the east bridge head of NELB and after the regression analysis the author clearly identifies the importance and necessity of Lianyungang to be the bridge head.

By using PEST technique and looking into the micro environment of the bridgehead, the author finds out that Lianyungang also has advantages over geographic position, transportation and opening up condition as well as strategic opportunities and threats. Possessing deep potentiality, it is correlative and complementary with the cities along the Land bridge. Lianyungang's unique conditional and development prove that it is irreplaceable as the oriental bridge head and as the connection between the powerful Asia and Europe market and it is also plays a significant role to gather and integrate resources. As the link of land and the sea, Lianyungang shows competitiveness in its around region and it can also drive the economic development of the costal regions in Jiangsu province and also cities along the land bridge. At present the world crisis will effect the shipping industry not let alone port Lianyungang and its container transportation, but more facts such as government policies and other economic factors as well as its internal environments are showed to be favorable to the port development. Lianyungang should take on its responsibility to be the outward window of the NELB.

Moreover by using linear regression technique, the forecast result shows the prosperous future of the bridge head's transit container volume. At the latter half part of the dissertation, strategies are proposed and illustrated to solved the problems existing mainly includes returning of empty container.

Parties are all making effort to deal with the situation. The strategies made by companies selected by author as the cases study are as followings:

Sino-trans Land Bridge Transportation Co.,Ltd

- 1 Participated in and organized the send out of the first train of the New Eurasian Land Bridge;
- 2 Open the inter-route container line from Lianyungang to Shanghai and to Qingdao;
- 3 Opened the transit transportation channel radiated north to Mongolia, Myanmar in Southeast Asia, Kyrgyzstan to Kashgar.

The oriental container company focuses on national good source and uses the national trade to promote the foreign trade:

- 1 Explore Longhai regular train;
- 2 Start the European and Russian regular train;
- 3 Open Houma, Lanzhou, Yinchuan regular train.

China railway container Co.ltd Strategies are as following:

- 1 Decrease of the price of Sea-rail empty container by 50 percent
- 2 Priority of scheme approval for the bridge head transportations
- 3 Priority of using vehicle and the last is the priority of container deployment.

After the study proposals by the author are drawn as:

- 1 Find the eastbound goods resources.
- 2 Reform of Land Bridge Transportation System.
- 3 Adhere to the Freight Transit Function.

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