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**WORLD MARITIME UNIVERSITY**

Shanghai, China

**EFFECT OF THE CONSTRUCTION OF FTZ  
UPON THE DEVELOPMENT OF SHANGHAI  
INTERNATIONAL SHIPPING CENTER**

By

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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**

**MSC. IN INTERNATIONAL TRANSPORT AND LOGISTICS**

Class of 2015

# DECLARATION

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

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

**ZhouYun**

**1<sup>st</sup> July 2015**

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## **Abstract**

From the international point of view, one of the major differences between Shanghai and London, Singapore is the lack of an efficient free port policy or free trade area.

Facing the development trend of the world economic integration and the globalization of trade, the international container hub port and regional international shipping center competition has reached a white hot level. But our country to cope with the competition measures is to speed up the construction of Shanghai international shipping center, therefore, the construction of Shanghai international shipping center has become the current development of China's economic system, perfect the primary task, has been referred to the strategic height.

This paper is on the basis of summarizing the domestic and foreign research achievements on free trade zone and combining with the current situation of the development of Shanghai Shipping industry, as well as the actual situation of Shanghai FTZ policy. From the basics we analyze the factors that the establish of free trade zone will affect the development of shipping industry in Shanghai. Given the coverage of the shipping industry and related industries is very complex, and the influence of the free trade area has too many uncertain factors, this paper chooses to use AHP to set up index system with the selected representative seven indicators and twenty secondary indexes.

**Key words:** FTZ, Influences, Shipping center, Singapore, London,

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## **1. Introduction**

Building the international shipping center in Shanghai sounds new for most of us. However, it is not new at all. Facing the development trend of the world economic integration and the globalization of trade, the international container hub port and regional international shipping center competition has reached a white hot level. But our country to cope with the competition measures is to speed up the construction of Shanghai international shipping center, therefore, the construction of Shanghai international shipping center has become the current development of China's economic system, perfect the primary task, has been referred to the strategic height. Under the desperate international economical environment, the trading capacity jumps a lot and the state council of china decided to bring an entirely new look on this construction of shanghai shipping industry.

From 1990s, with the open of Shanghai Pu dong area, Shanghai has been on the way to become the center of not only alongside the Yangtze river, but also of China or even of the world. During these years, all of the world put their attention to China, this potential market, and shanghai no wonder become one of the most important part. As the requirement of government, shanghai is trying to develop to the world economy center, financial center and trading center, that's why, building international shipping center here need to be put on the daily agenda.

The second step is that after china joined the WTO, the globalization involved china into the world economy. At that time, shanghai together with the Yangtze river delta become the leader of the whole china's economy. China becomes the third biggest trading country and her total GDP goes up to the Second in the world. And also in that period of time, the shipping industry of Shanghai goes up to an amazing peak. Shanghai port becomes the biggest container port in the world and her handling capacity comes to the second.

However, since 2008, the economy crises gives shanghai shipping industry a hard beat. The bubble economy spread on the asset, the demand for credit and at the same time, including shipping industry. Just before 2008, shipping industry had walking

through the longest prosperous period in its history, but because of the economic crises, shipping industry together with the global trade enter their hibernation. The freight rate and BDI keep going down like there is no end, under which the integration of the resources and the improvement of shipping service become increasingly important.

Since China joined the WTO, we have noticed the significance for us to have an area for free trade. So in 2001, when we made the “15” program, it clearly announced that participating in the multilateral trade system and international regional economic cooperation is one of the most essential method to improve the level of opening up. Under the guidance of the plan, the goal of the development of international trade becomes clearer and the construction of FTA has come to an obvious effect. On the one hand, the open of shanghai FTA has made shanghai a better financial environment, natural environment and political environment. On the other hand, an exchange free, efficient and convenient FTA really helps to realize the transformation from the "INSIDE" to the "OUTSIDE", and vigorously promote the development of enter-port trade, make it play a more active role in the process of global resource allocation and arrangement.

As the Shanghai FTA is on the way constructing, there is no doubt that this decision will bring shanghai lots of opportunities. Shanghai, the biggest container terminal in the world, its handling capacity keep the first for three years, with the open of FTA, it is obvious that FTA will push the construction of international shipping center. However, each coin has two side, shanghai is still not mature in the shipping service, law tax, finance, and culture. So this research aimed to use analyze the pros and cons that FTA will bring to shanghai, and at the same time, demonstrate the new environment that this open area will create for shanghai shipping center.

This dissertation will use some economic principles and some relative theories of FTA and shipping. By using the system analysis and the factors analysis to study and sum up all the relative literatures. Qualitative and quantitative analysis have been used on the factors that FTA will bring to shanghai, and use Singapore and London as example to contractively analysis the effects of the construction of FTA upon the



development Shanghai International shipping center.

## **2. Literature review**

Building the international shipping center in Shanghai sounds new for most of us. However, it is not new at all. Facing the development trend of the world economic integration and the globalization of trade, the international container hub port and regional international shipping center competition has reached a white hot level. But our country to cope with the competition measures is to speed up the construction of Shanghai international shipping center, therefore, the construction of Shanghai international shipping center has become the current development of China's economic system, perfect the primary task, has been referred to the strategic height. Under the desperate international economical environment, the trading capacity jumps a lot and the state council of china decided to bring an entirely new look on this construction of shanghai shipping industry.

William Villalon (2004) made his conclusion that financial service is the basic to build the international shipping center according to his study on the relationship of international shipping center and financial service. And at the same time he suggests we would better expand investment promotion, develop shipping insurance, or broaden financial channels. Not only William but also Jean Gottmann, who believe that international shipping center is a shipping hub that has open abundant logistic services, prosperous shipping market, and developed financial and economical environment.

Among the domestic specialists, some of them believe that ports are the main symbol of the container hub and global trade. It should have advantageous nature conditions such as deep water channel, shipping exchange market and even more complete logistic center. For example Diao chengbao and Sun hong believe that shipping center can together with the area that it located, realize the rational allocation of the resources and nevertheless keep a balance between the areas inside the shipping

center. Lots of the dissertations or researches will cover the conditions for an area to require when constructing the shipping center. For instance, Li junjun and Zhang binghan think that the formation of shipping center keeps changing, it combines cargo flow with information flow, finance flow and knowledge flow. And it still need an open market series and vast economical hinterland.

### **3. The effects of construction of FTZ upon shanghai shipping center**

#### **3.1 The background and current conditions of FTZ and shipping center**

##### **3.1.1 The background of shanghai FTZ**

Nowadays, the global trading competition has become more and more intense. The USA is trying to get rid of the WTO which seems not as beneficial as before to him and he wants to start another one that can bring him more advantages. At present, USA, Europe and Japan is trying to make a new rule for international trade and services through TPP, TTIP and PSA in order to replace WTO, and for sure China will be forced to join in. There are now more than 12 countries which joined the TPP, which covers 50% of the global GDP and at the same time 21 countries start the PSA negotiations which covers not only finance, express, transmission, telecommunication but also travel, transportation and internet. If these 3 treaties are made, China will be confronted with an environment that is more challenging than before.

For those treaties like TPP or RCEP, China should be optimistic to them because they do can stimulate the development of the economy and society for Asian countries so that we can have some initiatives in global competition. However, it is very difficult for the whole country to join, that's why it is wise for Shanghai to open the FTZ so that all the countries can have the options to invest in China. If it succeed, we can reflect it to the whole countries and even we fail, the influence can be reduce inside the area without getting worse.

What's more, we really need a revolution in our own economy. As we all know, TPP and other treaties are just like a cage to kill China's manufacturing. In the past several years, China relies on its monopoly pricing to realize the capital

accumulation. The low-cost infrastructures, issuing money and state monopoly made it difficult for China to survive the TPP for its rules on increasing the price of different factors and reduce the influence of the national action.

However, we cannot say that the rules that the developed countries made are totally wrong, because it indeed match the regulations of the social development and some of them are corresponding with the direction of China's development, and that's why China should be optimistic and positive when we are facing them. In order to realize the domestic revolution, we should be more brave and open in the open of FTZ to show the determination of our countries in economic revolution.

Additionally, even though China has become one of the biggest manufacturing countries, and the second biggest country of consumption, we are still in the position that is not advantageous to us in the global currency competition. In 2009, our country made its decision on the Cross-border use of RMB and it received much effect. The totally amount in HK is up to almost 1000 billion and in Taiwan, the amount is around 400 billion, not speaking of London, New York or Singapore. However, it still covers very small proportion in the whole world, in 2013, the share of global foreign exchange transactions rose from 0.9% in 2010 to 2.2%. It seems that we really achieved much success, but China is the second biggest trading country in the world, which makes the number become disquieting. We really want to have more cash flow in the overseas but to be honest, if we do not meet the capital return profit motive, total overseas currency can not be bigger. The construction of the recirculation loop requires huge, deep and wide financial markets (base and derived) to accommodate.

The biggest advantage of Shanghai is that it has more Exchanges, banks and markets than any other cities in China so that Shanghai will for sure become the largest destination and distribution center for the return of RMB. If we have the FTZ, we can establish a large financial asset buffer to control the risk that may happen and improve the status of RMB in the global stage.

### 3.1.2 The current conditions of China's shipping industry

Our country has 18 thousand km of continental coastline, 14000 of island coastline and 1230000 km of inland river ports. Just because of such huge water system which give a great basic for the development of shipping in China.

In 2011, the port handling capacity is around 10 billion tons, and the container handling capacity is up to 0.164 billion tons, which makes China one of the biggest shipping trade country in the world.

However, China's Shipping industry still has some problems.

- (1) Even though our people have put more and more attention in the development of shipping industry, and the shipping infrastructure have been greatly improved. We still have a large gap between other developed countries.
- (2) We are lacked of enough shipping financial institutions, so that the shipping finance system remains a low level. Although the national requirement of shipping are increasing at an astonishing speed, the shipping insurance institutions are still in the start stage. For examples, the number of the shipping institutions, the international visibility, the level of shipping management, etc.
- (3) The top-level talents are always required. Because we are lack of knowledge of the oceans and it will take a long time to train specific shipping talents which result in the lack of shipping talents and had some bad impact on China's shipping future.
- (4) Laws are always the basic of the development of one business to keep it operate in a safe, regular, healthy way. But in China, we still don't have a professional and comprehensive laws to lead the development of shipping industry so that it is difficult to lead nowadays' complex shipping business.
- (5) Currently, in most of the developed countries, the shipping are tightly connected with information. But in our country, the information systems and the public information service platform are not as good as other countries so that It is hard to realize the efficient sharing of shipping information domestically and internationally.

For Shanghai shipping center, Shanghai is located in the entrance of Yangtze river, and it is in the center of eastern coastal, together with the support of the government and the import of advantage management experience, which makes Shanghai the most important harbor city in China.

Shanghai is facing a lot of challenges, one the one hand, undeveloped transportation system cannot satisfy the developing port business and will call for better warehousing ability and port handling ability. On the other hand, The port business will be affected by the international competition which will require better port competitiveness.

### 3.2 The experiences borrowed from London and Singapore port

As we all know, London is an international financial center. The LIBOR is the standard rate of interest for loans between financial institutions and it is also the standard in the global ship financing lease market.

What's more, London is an international information hub. Lots of famous shipping companies or related companies choose to settle down there. For example Drewry, Clarkson, Lloyd's Register, etc. And they stands for the most up-dated, and competed information in the shipping field.

In 2006, the shipping loan that only happen in London covers 18% of total loaning cases. And the insurance incoming occupies 23% of total.

London has the most important shipping exchange in the world. The BALTIC SHIPPING EXCHANGE has been the most essential shipping market for hundreds years. 60 companies, more than 2000 representatives covers 3/4 of bulk trading in the world.

Additionally, London is a gathering center for national or non-governmental shipping institutions. There is at least 15 international shipping organizations located in London, and the international maritime organizations (IMO) also set up its headquarter in London. Meanwhile, the biggest shipbroker company is also in London with his great achievement in covering around 40% of bulk transportation

contracts.

We cannot deny the fact that London is also the legal service center in the world. When dealing with maritime cases, the England laws are the most widely used compared to other laws.

Singapore is a city that lives with her port. We can say that it is her port business that makes her prosperous. After decades of running on her port, she has become the most important port in the world. Connecting 200 shipping companies in the world and 600 shipping ports in 123 countries. Singapore can deal with 60 vessels, 8000 trailers and 50000 containers in a day. In 2004, the containing handling capacity is 23,200,000TEUs, we have calculated that there will be 1 transit container among 5 in the world. And the Changyi airport is the busiest airport in Asia area. With the development of the port of Singapore, the logistic industry has contributed 8.6% GDP in total. So we can say that logistic industry has become the pillar industry of Singapore.

The Port of Singapore refers to the collective facilities and terminals that conduct maritime trade handling functions in harbors and which handle Singapore's shipping. Currently the world's second-busiest port in terms of total shipping tonnage, it also trans-ships a fifth[2] of the world's shipping containers, half of the world's annual supply of crude oil, and is the world's busiest transshipment port. It was also the busiest port in terms of total cargo tonnage handled until 2005, when it was surpassed by the Port of Shanghai. Thousands of ships drop anchor in the harbor, connecting the port to over 600 other ports in 123 countries and spread over six continents.

There are several characteristics when Singapore is developing as an international shipping center.

#### 1. Port handling efficiency

As we all know, Singapore is a typical example in port handling. It says that Singapore can have the lowest port conjunction rate and it will shorten the loading and discharging time into 10 hours. But usually, for example Malaysia, it will take almost 5 days to L/D, and that's why we can say that Singapore is the

most efficient port in the world, and also that's why Singapore can be the most important shipping center in the world even it is a country with small land.

Some data shows that the port handling speed of Singapore is 3 times of Xiamen port and 1.3 times of Shanghai port. Meanwhile, Singapore signed the FTA(Free Trade Agreement) with several countries in the world and guarantee that it can be the most convenient and fast country when the cargoes are in the custom. Because of the use of modern logistic technology, the port of Singapore increased not only the port handling efficiency but also the port cost, and that why Singapore is also the most popular port in the world.

## 2. High level of technology

The Singapore government pays a lot of attention in the development of infrastructures in the port and calls for high level of automation equipment to guarantee the long-time efficiency in the port. 35 supervision institutions, forwarding companies, suppliers, shipping companies, and 3PLs, warehouses, insurances companies, banks, etc. have been gather together onto the same information platform so that the information will be shared publicly and quickly. It is also proved that the accuracy in the port is up to 99.99% which is really astonishing in the world to have such high quality of shipping service.

## 3. High aggregation extent of logistic service.

In the port of Singapore, or some other airports, it is so common to have a free trade zones or logistic park near those transportation hinges to provide concentrated logistic services. Usually, you can find transportation, warehouse, distribution from one single logistic services provider conveniently and quickly.

## 4. Competitive integrated logistic companies

In Singapore, it located 17 among top 25 logistic companies in the world, and most of them set up their headquarters in Singapore. Since 1990s, those logistic companies, together with Singapore, expanded a lot in order to meet the requirement of the development of Singapore as an international shipping center. Because that Singapore is an international city with lots of muti-national enterprises there, so that she has enough experiences in dealing with foreign

companies, which makes Singapore logistic companies become trustworthy in China, India, and Brazil. And just because of those logistic companies, the competitiveness of Singapore has been greatly improved and so does its status as the international shipping center.

First of all, to see the similarities. London and Singapore both have very complete laws for their shipping industry. As I mentioned previously that laws are the basic for the economic actions in order to help them to develop in a healthy and correct way, and if some incident happens, they can be efficiently solved on the basis of laws. However, the legal system is not as matured as these two countries and I think it is one factor that needs our concern.

Secondly, we can not deny the fact that the gathering of huge multi-national logistic or shipping companies can devote a lot to a city. So do London and Singapore. Both of them benefit a lot from the contributions from the support of logistic companies and at the same time, London and Singapore also gives them much convenience. The government provides them a great political environment, for example some free trade areas or the logistic part. So we can say that the prosper of London or Singapore and the development of the logistic companies inside is a win-win game. Both of them are beneficial to the other.

Thirdly, they have very comprehensive shipping services system. London and Singapore focus not only the shipping transportation, but also, as we said, shipping finance, shipping laws, shipping arbitrations, shipping insurances, warehouse, etc. only when all of these relative services are developed enough, the shipping center can upgrade in a healthy way. Or it will soon or later, be confronted with many difficulties.

The last but not least, human beings are always the leading part in the society. The training of specific talents in particular field is extremely important. the training to the shipping talents is a long-term investment and it will for sure have positive impact on the development of a city. They can bring better management methods, new ideas, or stimulate technology innovations. All of above is the impetus of a city. but in our country, the education institutions are not so professional and for a very



long time we are lack of shipping talents. Especially nowadays, the automization of the modern container port, it needs more professional workers to hand with increasing number of containers in the port. And also too many kinds of vessels in the port makes the port condition complex so that we need the people working in the port be more professional.

### 3.3 The effects FTZ bring to shanghai shipping center

In 2007, 2,182 domestic and international sailings called at Shanghai Port each month including 1,057 sailings of international voyages; Shanghai had business relation with more than 500 ports in over 200 nations and regions. Totally 1,263 enterprises engaged in international maritime transport and its auxiliary service set their premises in Shanghai with 65 international liner operators. Shanghai Port accomplished 60,000 vessel/time pilotage including 26,000 vessel/time of container ships and the average berthing time at port was shortened to merely 0.38 day. The volume of international transshipment containers reached 1.28 million TEUs plus entry and exit of 100,000 person/time of international passengers.

However, each coin have two sides. While shanghai shipping center is on his way development, the problems show up gradually.

Shipping center is a complex, flexible area and sometime the practice does not match the theories that we know. We cannot just copy from other countries because China is so different between others. Currently different people have different ideas of shipping center, because they have different situations in the composition of shipping industry. Some people believe that internatnioal shipping center depend on the facility of the port for example, the size of the port, the handling capacity, the container handling capacities, the numbers of vessels in and out the ports. The others believe that shipping center is made up of shipping service industry, they call for the development of some relative business like shipping finance, trading, information exchange systems, etc.

In my opinion, both of them have their reasons but neither of them are correct. Shipping is an international business, to build a shipping center of course it will need

good conditions in the harbor. The infrastructures and facilities should meet the requirement of the market so that the whole process can be done without any problems. But it is not that simple, shipping center is not only a transportation hub, but also a financial center, an economy center. The soft powers in the shipping center also count a lot. So we can say that shipping center is an area that combines shipping transportation, shipping services and shipping logistic industry.

In 2010, when shanghai become the biggest container port in the world, it had a breakthrough in its hard power compared to other ports in the world. And also in some other factors, shanghai also paid attention to the development of its soft powers.

Until 2005, shanghai port has attract more than 70 shipping companies in container business and companies on shipping transportation and services are up to 846. Lots of ship classification society choose to set their offices in shanghai, and additionally, the shipping procurement platform, shipping e-commerce system, free trade zones are all on processing.

However, it still exist some problems.

1. The basic functions in the port cannot totally satisfy the need of modern transportation, it is still weak in shipping finance, insurance, legal consulting, etc. but those service are extremely important in the continuous development. We can say that the current situation of shanghai port is:
  - (1). The service is one-way service.
  - (2). The number of shipping services is small.
  - (3). The customers do not have many options.
2. the informationalized level of the shipping companies varies a lot. We do not have a information sharing platform to cover the whole port so that it is super difficult to realize the efficient communication between companies. And also, just because we do not have consolidated information system makes it difficult for the supervision institutions to audit those enterprises, so we cannot realize the integration of information and resources.
3. The lack of shipping talents is always a big problem while contrasting a new

shipping center, the same in shanghai. Especially some national shipping companies like COSCO, CSC, they are facing double pressure from both the loss of talents and the retiring of old employees. And the situation becomes more severe since 2008, while the shipping market become desperate, and lots of companies are not in a good financial conditions, lots of new graduates choose to jump out of the shipping field, because they don't know when the market will recover and feel upset to continue their shipping career.

4. The problem of the efficiency in the custom is also very serious. The clearing systems in shanghai custom is very complex and it affect a lot to the efficiency in the port. Lots of documents need to be approved while too many department being involved inside. And the working procedure in China's customs still need improve, or it is difficult for shanghai to build a real efficient port. That still need the government's support.

### 3.3.1 The benefits and shortcomings of FTZ to shanghai port

To look from a macro aspect, the biggest problem to shanghai, compared to other shipping centers like Hongkong, Singapore, London, is that we did not have a efficient free trade port or free trade zone. And that is why our country set this goal to build the free trade zone to narrow the gap between other developed countries.

(1). As we all know, there are lots of preferential policies inside the FTZ, and that will for sure be beneficial to the port construction. On the one hand, for example, because of the low tax in the FTZ, the value of import and export will increase, so that the use rate of port will increase too, according to the economy of scale, the more we use the port, the less average cost it will be per unit, and shanghai port will be attractive to other customers and it can be a good option if the customers want to L/D cargoes nearby.

(2). Because of the special custom supervision policy inside the FTZ, it will not only increase the container handling capacity in shanghai ,but also attract cargoes near around, so that the port handling capacity will increase, and shanghai port can be more popular on the international stage. This is a virtuous circle, for the good

reputation in the world can be a good pushing strength while compete with others, and at the same time the increase of its competitiveness will bring better international reputation.

(3). Shanghai is the financial center in the world and it plays a very important role in china also. The develop of FTZ will stimulate the development of the companies inside, and the shipping services there will be more comprehensive. Other cities around like Kunshan, Ningbo, Suzhou,Zhangjiagang will also benefit from it. Meanwhile, shanghai as the economic center also rely on the its hinterlands, they can have mutual benefits and reciprocities if they continuously work together. Additionally, the development of economy will lead the development of the society, people living here can have better employment environment, which will make the situation much better.

However, it still some several advantageous.

(1). The lag of publishing relative laws

To borrow the experience from other countries, the launch of laws is always the basic. It will make it clear for the FTZ to develop in a way that we want. However, in our country, we don't have such special laws for the FTZ, so some problems become vague. We don't have enough legal procedures when we are facing some problems, and the function of different department of the management institutions are not clear, so problems may happen while they are make the policies toward companies in FTZ, and the advantages of FTZ cannot be made full use of.

(2). The faultiness of export processing

In 1994, we have a clearance for the function of Free trade zone that the FTZ should require three main functions- export processing, carrying trade and bonded warehouse. These three help each other forward. But the Waigaoqiao free trade zone is far from the international shipping lane, which restrict its development on its export processing and bonded warehouse.

(3). Complex documents

Even though, we had some new methods to stimulate the construction of FTZ, the document of custom clearance still remains inefficient. This cockamamie procedures

give the supervision institutions much pressure and they cannot improve their working efficiency. At the same time, it to some degree, limited the development of the FTZ, and we cannot expand the integrated logistic functions inside the FTZ.

#### (4). The Waigaoqiao FTZ separates from the shanghai ports

Even the waigaoqiao FTZ is built near the port, but they do not connect to each other. It will have some bad effects. Firstly, the shanghai port cannot directly affect the Waigaoqiao FTZ, and its benefits will reduce a lot according to the distance. Secondly, the cargoes cannot directly go to the port, and they will be transported though the multi-model transportation. It is not good because we cannot prevent those cargoes from going through another custom inspection, which will waste a lot of time. Thirdly, the Waigaoqiao FTZ cannot have efficient management to satisfy the requirement of modern transportation and it will influence, for instance, the forwarding business, shipping agencies, warehousing business, financial and insurance and other business.

### 3.3.2 The evaluation factors of shanghai shipping center

The build of FTZ will be beneficial to the development of shipping industry in shanghai without any doubt. When the FTZ is on constructing, the shipping capacity keeps increasing and will help the upgrade of shanghai shipping industry. With the support of special policies inside the FTZ, lots of factors in the FTZ has come up to an international level, and they are listed as below

#### (1). The infrastructure in Shanghai Port

The level of port infrastructures directly affect the efficiency of shipping, so it is important to reasonably design the infrastructural there. Now, a good news is that the equipment in shanghai port are very developed, but we still have some gap between top ranking ports. According to the international experience, the build of FTZ will stimulate the development of Shanghai shipping center, and improve the collecting and distributing system, the warehousing equipment, and L/D efficiency. And the collecting and distributing system is the most import factor to guarantee the efficiency of shanghai port.

And here I would like to choose warehouse ability, loading and discharging ability, equipment Qty and collecting and distributing as the alternatives.

#### (2). Shipping trade

Trading is the basic of shipping industry, and it will also influence shanghai's hinterlands. We can say that the more trade in the world, the more prosperous shipping will be as shipping is one of the most important transportation methods in the world. The build of FTZ will simplify the clearance procedures in customers and attract more traders to shanghai and also some cargoes form south-east Asia.

And in shipping trade, I want to analysis the influences on container handling capacity, registered ship ton, Qty of transit good and the development of coastal industry.

#### (3) Human resources

People are always the control of one industry and they are the leading factor for its development so does shipping. But as I mentioned previously that shanghai shipping center has been lacking good shipping talents and the workers here are a low level, most of them are in some traditional shipping services industry. In navigation technology, shipping information analysis, shipping management, shipping fiancé and insurance, maritime law, etc, the workers are not so well qualified. The building of FTZ will attract some more shipping experts from other countries to shanghai, together with new ideas, management methods and technologies, which require us to improve the working environment in shanghai shipping center to keep those talents in shanghai and contribute their energy here.

So, in human resources, I think it will influence the numbers of talents and people with bachelor degree or above as my second layers

#### (4) Shipping financial market

Shipping is a capital intensive business, which needs continuous financing, trading and accounting. The government will for sure publish more financial policies to encourage more financial institutions to expand their shipping financing business so

that the shipping industry will be more prosperous. Additionally, shipping itself will make an enormous cash flow, and it is a part of international financial activities. So we can find that Shanghai FTZ will of course influence the financial industry and attract more related enterprises, such as financial or insurance companies, to increase the total producing amount of financing and insurance business.

In financial aspect, I consider FTZ will affect shipping financial environment of Shanghai, Market strain capacity and total value of output.

#### (5). Basic market index

The basic market index can to some degree, shows the development level of shipping industry, one most important factor is the shipping service level, with continuous development of Shanghai FTZ, it will change the level of shipping services, shipping market management and market strain capacity. And those three I will also analyze in the next section.

#### (6) Shipping information services

The whole international business is full of information, and the same as shipping, an capital intensive business, cannot prevent itself from the sharing of information. And market is a very sensitive beacon to reflect the relationship between supply and demand in shipping market. We need to most updated information to lead the management of shipping companies or to supervise the activities in shipping market. The construction of FTZ will for sure bring in more shipping companies, and modern technologies will come into Shanghai. To some degree, the accuracy and promptness of information will save much cost while operating, and the quality of shipping services will greatly improve. So we can say that a good information system is the key for the shipping industry upgrade.

Here, the use of new technology and the level of information system will counts in my analysis.

#### (7) Politic environment

To pullulate in a healthy and effective way, we also need strong support from the government, and also call for better service from the government. Positively, our government already provide a good environment for the FTZ, but there are still things that need to be solved. For example, relative laws, arbitration, legal consulting. And additionally, the efficiency of the government still need to improve, like the speed when doing the clearance in the custom or the procedures in shipping arbitrations. The last but not least, the transparency of the law is also very important to make all the cases justice and equity. Even though it is a long way to go, it is still necessary for all of us to chase for.

So here, I choose politic environment and laws and regulations as my alternatives, so that I believe building FTZ will affect those two factors in recent years

### **4.The effects analysis based on AHP model**

#### 4.1 The reasons of choosing AHP model

The analytic hierarchy process (AHP) is a structured technique for organizing and analyzing complex decisions, based on mathematics and psychology. It was developed by Thomas L. Saaty in the 1970s and has been extensively studied and refined since then.

It has particular application in group decision making,[1] and is used around the world in a wide variety of decision situations, in fields such as government, business, industry, healthcare, shipbuilding[2] and education.

Rather than prescribing a "correct" decision, the AHP helps decision makers find one that best suits their goal and their understanding of the problem. It provides a comprehensive and rational framework for structuring a decision problem, for representing and quantifying its elements, for relating those elements to overall goals, and for evaluating alternative solutions.

Users of the AHP first decompose their decision problem into a hierarchy of more easily comprehended sub-problems, each of which can be analyzed independently. The elements of the hierarchy can relate to any aspect of the decision



problem—tangible or intangible, carefully measured or roughly estimated, well or poorly understood—anything at all that applies to the decision at hand.

Once the hierarchy is built, the decision makers systematically evaluate its various elements by comparing them to one another two at a time, with respect to their impact on an element above them in the hierarchy. In making the comparisons, the decision makers can use concrete data about the elements, but they typically use their judgments about the elements' relative meaning and importance. It is the essence of the AHP that human judgments, and not just the underlying information, can be used in performing the evaluations.

The AHP converts these evaluations to numerical values that can be processed and compared over the entire range of the problem. A numerical weight or priority is derived for each element of the hierarchy, allowing diverse and often incommensurable elements to be compared to one another in a rational and consistent way. This capability distinguishes the AHP from other decision making techniques.

In the final step of the process, numerical priorities are calculated for each of the decision alternatives. These numbers represent the alternatives' relative ability to achieve the decision goal, so they allow a straightforward consideration of the various courses of action.

Several firms supply computer software to assist in using the process.

## 4.2 The buildup of AHP model upon the evaluation factors

According to AHP analysis and my introductions, I picked out the criteria and the alternative that will influence Shanghai Shipping center, there are 7 criteria and 20 alternatives.

Table 4.1 Factors caused by FTZ affecting Shanghai shipping center

Port Infrastructure	Human Resources	Shipping Trade	Marketing Basic Index	Shipping Financial Market	Government Support	Shipping information system
Warehouse Abilities	Numbers of talents	Container Handling Capacity	Shipping Service System	Shipping Financial Environment	Politic Environment	The use of new technology
L/D Abilities	People with BD or above	Registered ship ton	Market Strain Capacity	Market strain Capacity	Laws and Regulations	Information level
Equipment Quantity		Qty of Transit goods	Shipping Service Level	Total Value of Output		
Collecting and distributing		Coastal Industry				

When I made the questionnaire, I choose my professors in our university to give scores for my factors according to division as below, and totally I got 20 questionnaires and made average for each factors.

And here is the final weight that I calculated according to the questionnaires.

Table 4.2 Questionnaire results on the weight of different factors

Evaluation index	Port instrument	Human resources	Shipping trade	Marketing basic index	Shipping financial market	Government support	Shipping information system
Port instrument	1	2	1/4	1	1/3	3	1/3
Human resources	1/2	1	1/5	1/2	1/3	2	1/4
Shipping trade	4	5	1	3	3	4	2
Marketing basic index	1	2	1/3	1	1/2	2	1/2
Shipping financial market	3	3	1/3	2	1	4	1/2
Government support	1/3	1/2	1/4	1/2	1/4	1	1/5
Shipping information system	3	4	1/2	2	2	5	1

### 4.3 The determination of different layers based on AHP model

#### 4.3.1 Weight analysis from perspective of qualitative evaluations

First of all , I made a questionnaire on 7 criterions and 20 alternatives and ask the professors in our university to score them and the form is attached at the end of the research.

Here, with all the scores that I choose to use excel to complete the problems and here is the judgment matrix and the weight of B layer to A layer.

Table4.3 the judgment matrix and the weight of B layer to A layer

Evaluation index	Port instrument	Human resource	Shipping trade	Marketing basic index	Shipping financial market	Government support	Shipping information system	A	B	Wi
Port instrument	1	2	1/4	1	1/3	3	1/3	0.2	0.8	0.089
Human resources	1/2	1	1/5	1/2	1/3	2	1/4	0	0.5	0.058
Shipping trade	4	5	1	3	3	4	2	1440	2.8	0.323
Marketing basic index	1	2	1/3	1	1/2	2	1/2	0.3	0.9	0.098
Shipping financial market	3	3	1/3	2	1	4	1/2	12	1.4	0.163
Government support	1/3	1/2	1/4	1/2	1/4	1	1/5	0	0.4	0.043
Shipping information system	3	4	1/2	2	2	5	1	2.0	2.0	0.227

#### 4.3.2 Weight analysis from perspective of quantitative evaluations

with the same method in the excel, we can also score B1,2,3...7 layers. And all the result is as below.

$$CI = \frac{\lambda_{\max} - n}{n - 1}$$

According to the formula.  
for further analysis.

we can calculate the CI

Table 4.4 Judgment matrix and the weight of clayer to B1layer

Evaluation index	Warehouse ability	L/D ability	Equipment ability	Collecting and distributing	A	B	Wi
Warehouse ability	1	1	1/2	1/5	0.1	0.6	0.116
L/D ability	1	1	1/2	1/4	0.1	0.6	0.122
Equipment ability	2	2	1	1/2	2.0	1.2	0.245
Collecting and distributing	5	4	2	1	40.0	2.5	0.517

CI= 0.0023, so we can find that the most important factors for port infrastructures is the collecting and distributing. And then is the equipment Qty, L/D ability and warehouse ability.

Table 4.5 Judgment matrix and the weight of layer to B2 layer

Evaluation index	Numbers of talents	Numbers of talents	A	B	Wi
Numbers of talents	1	1/3	0.3	0.6	0.250
People with BD or above	3	1	3.0	1.7	0.750

CI= 0.0000, so we can find that the most important factors for human resources is people with bachelor degree or above and then is the numbers of shipping talents.

Table 4.6 Judgment matrix and the weight of clayer to B3 layer

Evaluation index	Container handling capacity	Registered ship ton	Qty of transit goods	Coastal industry	A	B	Wi
Container handling capacity	1	1	2	1/2	1.0	1.0	0.227
Registered ship ton	1	1	2	1/2	1/0	1.0	0.227
Qty of transit goods	1/2	1/2	1	1/3	0.1	0.5	0.122
Coastal industry	2	2	3	1	12/0	1.9	0.423

CI= 0.0039, so we can find that the most important factors for shipping trade is coastal industry, and then is container handling capacity, registered ship ton, and Qty of transit goods.

Table4.7 Judgment matrix and the weight of clayer to B4 layer

Evaluation index	Shipping service system	Market strain capacity	Shipping service level	A	B	Wi
Shipping service system	1	5	3	15	2.5	0.648
Market strain capacity	1/5	1	1/2	0.1	0.5	0.122
Shipping service level	1/3	2	1	0.7	0.9	0.230

CI= 0.0036, so we can find that the most important factors for shipping market is shipping service system, and then is shipping service level and market strain capacity.

Table 4.8 Judgment matrix and the weight of clayer to B5 layer

Evaluation index	Shipping financial environment	Market strain capacity	Total value of output	A	B	Wi
Shipping financial environment	1	1	3	3.0	1.4	0.429
Market strain capacity	1	1	3	3.0	1.4	0.429
Total value of output	1/3	1/3	1	0.1	0.5	0.143

CI= 0.0000, so we can find that the most important factors for shipping financial market is shipping financial environment and market strain capacity, and then is total value of output.



Table 4.9 Judgment matrix and the weight of clayer to B6 layer

Evaluation index	Politic environment	Laws and regulations	A	B	Wi
Politic environment	1	1	1	1	0.5
Laws and regulations	1	1	1	1	0.5

CI= 0.0000, so we can find that the most important factors for government support is politic environment and laws and regulations.

Table 4.10 Judgment matrix and the weight of clayer to B7 layer

Evaluation index	The use of new technology	Informational level	A	B	Wi
The use of new technology	1	1/6	1.2	0.4	0.143
Informational level	6	1	6.0	2.4	0.857

CI= 0.0000, so we can find that the most important factors for shipping information is informationization level, then is the use of new technology.

#### 4.4 Result analysis based on factor evaluations

Table4.11 AHP result

Bn	BI	Alternatives	Cn	Relative	Result
Port instrument	0.091	Warehouse Abilities	0.1159	0.0105	20
		L/D Abilities	0.1223	0.0111	19
		Equipment Quantity	0.2447	0.0223	15
		Collecting and distributing	0.5171	0.0471	8
Human resources	0.0583	Numbers of talents	0.2500	0.0146	17
		People with BD or above	0.7500	0.0437	9
Shipping trade	0.3228	Container Handling Capacity	0.2272	0.0733	3
		Registered ship ton	0.2272	0.0733	3
		Qty of Transit goods	0.1225	0.0395	10
		Coastal Industry	0.4231	0.1366	2
Marketing basic index	0.0965	Shipping Service System	0.6479	0.0625	7
		Market Strain Capacity	0.1222	0.0118	18
		Shipping Service Level	0.2299	0.0222	16
Shipping Financial market	0.1645	Shipping Financial Environment	0.4286	0.0705	5
		Market strain Capacity	0.4286	0.0705	5
		Total Value of Output	0.1429	0.0235	12
Government support	0.045	Politic Environment	0.5000	0.0225	13
		Laws and Regulations	0.5000	0.0225	13
Shipping Information system	0.2219	The use of new technology	0.1429	0.0317	11
		Information level	0.857	0.1902	1

After all the works that I did previously, I made the excel form below to show the ranking for these 20 alternatives on the importance that to the Shanghai shipping center.

We can find that the construction of FTZ will first of all influences the level of information according to the table, and then is the development of coastal industry, the third ones are container handling capacity and registered ship ton.

Unexpectedly, the warehousing ability and loading and discharging ability hasn't been influenced a lot.

Just like Singapore and London that I mentioned, those two shipping center has been greatly developed, the similarities between them are not very big port or lots of port facilities, but the impeccable shipping management system and matured shipping service level.

From the table we can find that, just like we assumed previously, the most different thing between shanghai and other developed shipping center is not the facilities or infrastructures, but the soft power of the shipping center and the hinterland support.

So we can say that, as shanghai is already the biggest container port in the world, to build international shipping center, shanghai should pay more attention to the shipping soft powers, like information level, or shipping financial environment, and at the same time complete the shipping service level to make shipping industry grow in a healthy way.

## **5. Suggestions of improve shipping center based on AHP final results**

### **5.1 The actuality and improvement of Information level in shipping center**

As we all know, the shipping e-commerce becomes quite popular in recent days, especially the constructing of FTZ makes shipping more active than ever. With the development of the internet, online trading is growing with irresistible force.

In one of the first measures introduced as part of Shanghai FTZ, the General Administration of Customs launched a cross-border E-commerce platform. This was intended to stymie the widespread evasion of customs duty and smuggling that have emerged amidst China's booming e-commerce market through online vendors such as Taobao. Products on the new site, which will be monitored by the GAC, are sold by vendors who have conducted recording-filing with the customs authorities, thereby avoiding the risk of fake products and lowering product prices through the use of bonded warehouse. From this we can find that the e-commerce on shipping business is growing vigorously.

However, it is not enough to only develop shipping trade online. To make shipping center operate in order we need not only develop shipping business, but also improve the information systems between shipping companies, it is critical to have a information system for them to share useful information especially inside the shipping colony, and also the government can supervise them by using its own management system to increase the efficiency.

What's more, the management inside the shipping companies is also very important, a good shipping company can make full use of the information in the market and take good use of the ones that they need, that's why a good information system is critically important for a shipping company. And also, the company can realize the management of shipping material, shipping equipment, seafarers, operating cost together by using a standard system.

## 5.2 The actuality and improvement of coastal infrastructures in shipping center

according to operating status of shanghai port in 2013, The total value of import-export goods through Shanghai ports in 2013 reaches US\$1,073.87 billion with an year-on-year increase of 1.5% and accounted for a quarter of the nation's total, which strikes a new record high and highlights the going-around of the ports through the seasons.

Records are also created in the figures of cargo and container throughput, with a year-on-year increase of 5.2% in annual cargo throughput to 379.638 million tons and an increase of 2.4% in container throughput to 28.836 million TEUs. The import-export cargo throughput in air ports reaches 2.582 million tons, a year-on-year drop of 1.3%, with Shanghai Pudong International Airport ranking the 3rd largest cargo shipping port in the world for the sixth consecutive year.

The annual exit-entry passengers climbs to 26.419 million with a year-on-year increase of 8.4%, with 25.526 million (an increase of 6.9%) through air ports, 749,000 (an increase of 113.5%) in shipping ports, and 144,000 (a decrease of 4.3%) in railway ports.

The annual exit-entry (in-out port) passenger liners see a year-on-year increase of 62.1% and reach 394 vessels, 142 in Shanghai Port Passenger transportation Center and 252 in Shanghai Wusongkou International Cruise Port. Over the year, 336 cruise ships have their home ports set in Shanghai, a year-on-year increase of 107.4%.

We can find that the basic infrastructures in shanghai port is developed enough to satisfy the requirement of the port, but in AHP model, it shows that the shipping infrastructure will still be greatly influenced, which demonstrate that the shipping basic facilities still have a lot to improve. For examples, improve the quality of coastal warehousing facilities. Secondly, stimulate the reform of inland shipping lane so that it will be much more convenient when transporting to some inland cities. Thirdly, accelerate the development of coastal infrastructures like highways, railways, airway, etc, which will make shanghai shipping center more efficient,

combining multi-module transportation. The last but not least, try to develop coastal industry, like fabrication, sales, storage and so on, so that shanghai can be a good intermediate center and at the same time greatly cut the cost of daily operation.

### 5.3 The actuality and improvement of shipping services of shipping center

Not like other developed countries, the shipping services in shanghai are still not that matured. The biggest problems for shanghai shipping center are as below.

. (i)The high-value shipping service is hysteretic.

Even though shanghai international shipping center has formed a completed industry chain, it still doesn't have a comprehensive, multilevel shipping service system, and the soft power cannot satisfy the continuous development of international shipping center.

.(ii) The shipping service colony hasn't formed.

Like London and Singapore, they both have a colony for shipping companies, which can make shipping activities more efficient. However, because that shanghai shipping center is on processing constructing, it still need a lot of time for itself to develop.

(iii)Too many small shipping service companies makes market chaos.

We cannot deny the fact that the more companies we have in the shipping center, the more difficult for our government to control. When lots of shipping service companies exists at the same time, some small or nonstandard companies will have some bad impact on the order of shipping center.

According to these problems, we should at first try our best to transfer those nonstandard companies to much more high-level service companies, and pay more attention to ship selling business, ship registering, shipping inspection. Whats more, utilize the beneficial policies and accelerate the formation of shipping colony to make full use of cluster competitive advantages. Besides, we can also establish a communicating system between companies to share experiences and information to

discover the real requirements and existing problems in order to improve their service level.

#### 5.4 The actuality and improvement of financial environment of shipping center

The constructing of FTZ provide a very good financial environment for the shipping center. The shanghai government launched several policies, for example tax free policy, give privilege to foreign companies and banks to settle down inside the FTZ, setting several shipping exchange center to offer different kinds of shipping financial services. We cannot deny the fact that those methods will have a great impact on the shipping financial market in the shipping center.

After borrowing experiences from London and Singapore, we can know that the shipping center and financial center relies on each other, and affect each other, and the financial environment plays an essential role in the development of shipping center. For example, the shipping insurance prevent shipping activities from mush bigger risks, and shipping financing provided a good financial support for shipping center.

With the constructing of FTZ, the government should rise some other appropriate financial policies to expand shanghai shipping financial activities. On the one hand, the government can manage those financial institutions by joint operations. One the other hand, shanghai can take the experience of foreign exchange management to realize the overall convenience of financial investment.

Meanwhile, shanghai government should also call for the trade of shipping derivatives and encourage insurance companies to innovate the shipping insurance model

## **Conclusion**

The constructing of Shanghai Free Trade Area will have different effects upon different factors. According to all the works that done previously, we find that the FTZ will influence the shipping information system most, which require us to strive to develop the shipping information system not only inside the shipping companies, but also connecting those shipping companies together with government supervision system and the shipping market to realize the data free exchange in shipping market in order to make shipping develop better.

Secondly, is the coastal industry, the increasing quantity of shipping trade caused by the constructing of FTZ will give the coastal industry and infrastructures much pressure. On the one hand, shanghai is trying to build himself into a transiting center which requires very matured manufacturing industries inside the harbor district, on the other hand, the increasing requirement of multi-module transportation need shanghai to have very strong inland transportation abilities, which need us to spare no effort to built other relative industries and infrastructures, like manufacturing or fabrication companies, or mature his highway or rail way system.

Additionally, it is also critical to improve the level of shipping service. The constructing of FTZ will require revolutions in traditional shipping activities which need us to contribute on the development of shipping financial activities and strive to develop shipping insurance and shipping finance to provide a capital-intensive environment for shanghai shipping center



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## The Questionnaire Inquiry upon Evaluation Factors

Dear professors,

Good day!

Thanks for your great time to fill the tables of my dissertation.

This form is designed to score different criteria and alternatives. All the analysis is based on AHP methods to show the importance of different factors.

Thanks for your great time and hope for your statements!

### (1). First level evaluation index

First level evaluation index(1)

Evaluation index	Port instrument	Human resources	Shipping trade	Marketing basic index	Shipping financial market	Government support	Shipping information system
Port instrument							
Human resources							
Shipping trade							
Marketing basic index							
Shipping financial market							
Government support							
Shipping information system							

(2) Second level evaluation index

Second level evaluation index(1)

Evaluation index	Warehouse ability	L/D ability	Equipment ability	Collecting and distributing
Warehouse ability				
L/D ability				
Equipment ability				
Collecting and distributing				

Second level evaluation index(2)

Evaluation index	Numbers of talents	Numbers of talents
Numbers of talents		
People with BD or above		

Second level evaluation index(3)

Evaluation index	Container handling capacity	Registered ship ton	Qty of transit goods	Coastal industry
Container handling capacity				
Registered ship ton				
Qty of transit goods				
Coastal industry				

Second level evaluation index(4)

Evaluation index	Shipping service system	Market strain capacity	Shipping service level
Shipping service system			
Market strain capacity			
Shipping service level			

Second level evaluation index(5)

Evaluation index	Shipping financial environment	Market strain capacity	Total value of output
Shipping financial environment			
Market strain capacity			
Total value of output			

Second level evaluation index(6)

Evaluation index	Politic environment	Laws and regulations
Politic environment		
Laws and regulations		

Second level evaluation index(7)

Evaluation index	The use of new technology	Informationization level
The use of new technology		
Informational level		

Interviewee: \_\_\_\_\_

Date: \_\_\_\_\_