Erasmus University Rotterdam

MSc in Maritime Economics and Logistics

2017/2018

Analysis of Competitive Position of Chinese Ports as Results of Non-proximity Collaboration in the OBOR Period

by

Guanjiabao Wen

Acknowledgements

The researcher wants to give thanks to all the persons that have supported a lot for this thesis. It is my honour to express my thanks.

First, I would like to thank myself for full of passion and concentration to this study and finally finish the thesis successfully.

To my family, I really appreciated that my father and mother support and believed me unconditionally.

To my supervisor, Professor Dr. Elvira Haezendonck for guiding and helping me from the very start for the proposal until the completion of a thesis with her patience and rich knowledge.

To my classmates, they companied me during whole thesis period; we encouraged and helped each other by updating the progress among our group. Especially Chen Yu, he inspired and taught me a lot with his rich working experience and precisian studying attitude.

To MEL faculty, Renee, Felicia and Martha really did their best to help us with time management and thesis quality, which ensure most of us followed the thesis schedule.

Last but not least, to my boyfriend, Chen Yichao for taking care of me during daily life, enable me to have a stable mental statue to deal with the pressure from the thesis.

Abstract

Since the One Belt and One Road(OBOR) initiative was proposed by China's president, Xi Jinping in 2013, China aims to create the world's largest platform for economic cooperation. In 2015, the OBOR action plan was authorised by the State Council into two main components: The Silk Road Economic Belt and the 21st Century Maritime Silk Road.

During the past decade, there are big changes regarding the geo-economic and geopolitical context for Chinese ports. Since 2013, the OBOR was launched, China positively promotes the international ports strategic alliance from different perspectives. Under the development background of Chinese OBOR, how the objectives, the structures, variations, and geography of non-proximity port collaboration related to the OBOR strategic view will be discussed in this thesis. To have a systematic overview, the Typology of collaboration strategies are applied.

This research will also further explore that since OBOR started, how it influenced the competitive position of certain ports which are mainly involved in the international port collaboration. To attain the results of this part we chose Strategic Positioning Analysis as a research method since it can provide the related statistical information regarding recent change in the competitive position of diverse ports.

Through the research, enable reader has a better insight into the influence of OBOR regarding the international ports collaboration of Chinese seaports system.

Key Words: OBOR, Chinese Seapoorts, International Port Collaboration, Competitive Position

Table of Contents

Acknowledgements 1
Abstract 2
List of Tables 5
List of Figures 6
List of Abbreviations 8
1. Introduction 9
1.1 Research Scope and Objectives 10
1.2 Research Question and Sub-Research Questions 11
1.3 Research Design and Method 11
2. Literature Review 13
2.1 The strategic view of China OBOR initiatives 13
2.2 China Port Governance 16
2.3 Port Cooperation 18
2.4 The recent development of Chinese international port cooperation 21
2.5 Port Performance Benchmarking 28
3. Methodology 31
3.1 Introduction 31
3.2 Typology of collaboration strategies 31
3.3 Strategic Positioning Analysis 32
3.3.1 Product Portfolio Analysis 33
3.4 Research Scope 34
4 Typology of Collaboration Strategies of Chinese seaports 35
4.1 China seaports inter-organisational relationships patterns 35
4.2 Typology analysis of Chinese seaports cross-border collaboration relationships 44
5 SPA of Guangzhou Port and Qingdao Port within OBOR period 48
5.1 Introduction 48
5.2 Product Portfolio Analysis 49
5.2.1 Guangzhou Port 49
5.2.1.1 Portfolio of Ports for Total Traffic (Level 1) 50
5.2.1.2 Portfolio of Traffic Categories for Individual Seaports (Level 2) ... 51
5.2.1.3 Portfolio of Ports for Individual Traffic Categories (Level 3) 52
5.2.1.4 Portfolio of Ports for Individual Traffic Categories, related to these Categories' Share in Port Traffic and Share in the Range (Level 4) 56
5.2.2 Qingdao Port 59
5.2.2.1 Portfolio of Ports for Total Traffic (Level 1) 60
5.2.2.2 Portfolio of Traffic Categories for Individual Seaports (Level 2) ... 61
5.2.2.3 Portfolio of Ports for Individual Traffic Categories (Level 3) 63
5.2.2.4 Portfolio of Ports for Individual Traffic Categories, related to these Categories' Share in Port Traffic and Share in the Range (Level 4) 66

Chapter 6 Conclusion 70
References 73

List of Tables

Table 1 Case with the model of investment or acquisition of Chinese seaport system. 25
Table 2 Case of modes of a strategic alliance between China and overseas. .. 27
Table 3 Illustrative case study of port performance scorecard 29
Table 4 Critical Performance Measures 30
Table 5 Categorization of collaboration objectives 32
Table 6The classification matrix of ports based on Growth Rate and Market Share. 34
Table 7 Categorization of collaboration objectives of Chinese Seaports 36
Table 8 Inter-organizational relationships patterns recorded (Chinese Port management bodies) 43
Table 9 Configuration of objectives patterns of selected seaports 44
Table 10 PPA results comparable table 71

List of Figures

Figure 1 The development of OBOR 9
Figure 2 FDI inflows, global and by a group of economies, 2015-2017 14
Figure 3 FDI inflows, top 20 host economies, 2016 and 2017 15
Figure 4 Port performance scorecard 28
Figure 5 The methodology structure of the thesis 31
Figure 6Configuration of Objectives pursued per port 45
Figure 7Structure of collaboration relationships 46
Figure 8 The geography of non-proximate ports collaboration (1) 47
Figure 9The geography of non-proximate ports collaboration (2) 47
Figure 10Guangzhou port set portfolio of Ports with their Total Traffic in the selected range (2011-2012)-Weighted Analysis. 50
Figure 11Guangzhou port set portfolio of Ports with their Total Traffic in the selected range (2015-2016)-Weighted Analysis 50
Figure 12Traffic Structure of the Guangzhou Port (2011-2012)- Weighted Analysis. 51
Figure 13 Traffic Structure of the Guangzhou Port (2015-2016)- Weighted Analysis. 52
Figure 14Structure of container traffic in the Guangzhou Port set (2011-2012)-weighted analysis. 52
Figure 15 Structure of container traffic in the Guangzhou Port set (2015-2016)-weighted analysis. 53
Figure 16Structure of dry bulk traffic in the Guangzhou Port set (2011-2012)-weighted analysis. 54
Figure 17Structure of dry bulk traffic in the Guangzhou Port set (2015-2016)-weighted analysis. 54
Figure 18Structure of liquid bulk traffic in the Guangzhou Port set (2011-2012)-weighted analysis. 55
Figure 19 Structure of liquid bulk traffic in the Guangzhou Port set (2015-2016)-weighted analysis. 55
Figure 20Analysis of total container traffic (versus total port traffic) of the Guangzhou port set range (2011-2012)- Weighted analysis. 56
Figure 21Analysis of total container traffic (versus total port traffic) of the Guangzhou port set range (2015-2016)- Weighted analysis. 57
Figure 22Analysis of total dry bulk traffic (versus total port traffic) of the Guangzhou port set range (2011-2012)- Weighted analysis. 57
Figure 23 Analysis of total dry bulk traffic (versus total port traffic) of the Guangzhou port set range (2015-2016)- Weighted analysis. 58
Figure 24Analysis of total liquid bulk traffic (versus total port traffic) of the

Guangzhou port set range (2011-2012)- Weighted analysis. 58
Figure 25Analysis of total liquid bulk traffic (versus total port traffic) of the Guangzhou port set range (2015-2016)- Weighted analysis. 59
Figure 26Qingdao Port set portfolio of Ports with their Total Traffic in the selected range (2011-2012)-Weighted Analysis. 60
Figure 27Qingdao Port set portfolio of Ports with their Total Traffic in the selected range (2015-2016)-Weighted Analysis. 61
Figure 28Traffic Structure of the Qingdao Port (2011-2012)- Weighted Analysis. 62
Figure 29Traffic Structure of the Qingdao Port (2015-2016)- Weighted Analysis. 62
Figure 30Traffic Structure of the Qingdao Port (2015-2016)- Weighted Analysis. 63
Figure 31Structure of container traffic in the Qingdao Port set (2015-2016)-weighted analysis. 63
Figure 32Structure of dry bulk traffic in the Qingdao Port set (2011-2012)-weighted analysis. 64
Figure 33Structure of dry bulk traffic in the Qingdao Port set (2015-2016)-weighted analysis. 64
Figure 34Structure of liquid bulk traffic in the Qingdao Port set (2011-2012)-weighted analysis. 65
Figure 35Structure of liquid bulk traffic in the Qingdao Port set (2015-2016)-weighted analysis. 65
Figure 36Analysis of total container traffic (versus total port traffic) of the Qingdao port set range (2011-2012)- Weighted analysis. 66
Figure 37Analysis of total container traffic (versus total port traffic) of the Qingdao port set range (2015-2016)- Weighted analysis. 66
Figure 38Analysis of total dry bulk traffic (versus total port traffic) of the Qingdao port set range (2011-2012)- Weighted analysis. 67
Figure 39Analysis of total dry bulk traffic (versus total port traffic) of the Qingdao port set range (2015-2016)- Weighted analysis. 67
Figure 40Analysis of total liquid bulk traffic (versus total port traffic) of the Qingdao port set range (2011-2012)- Weighted analysis. 68
Figure 41Analysis of total liquid bulk traffic (versus total port traffic) of the Qingdao port set range (2015-2016)- Weighted analysis. 68

List of Abbreviations

OBOR	One Belt and One Road initiative
SPA	Strategic Positioning Analysis
PPA	Product Portfolio Analysis

1. Introduction

Since the One Belt and One Road(OBOR) initiative was proposed by China's president, Xi Jinping in 2013, China aims to create the world's largest platform for economic cooperation (Jinchen, 2016). In 2015, the OBOR action plan was authorised by the State Council into two main components: The Silk Road Economic Belt and the 21st Century Maritime Silk Road. China plans to invest 900bn USD in OBOR projects, which including roads, railroads, pipelines, ports, airports, power stations, industrial plants and entire cities. Until 2016, more than 200 companies have signed cooperation agreements for projects along OBOR's routes. China aims to boost commerce and investment to create new markets for Chinese products, and at the same time, reinvigorating the state-owned industrial base (Kynge, 2017).

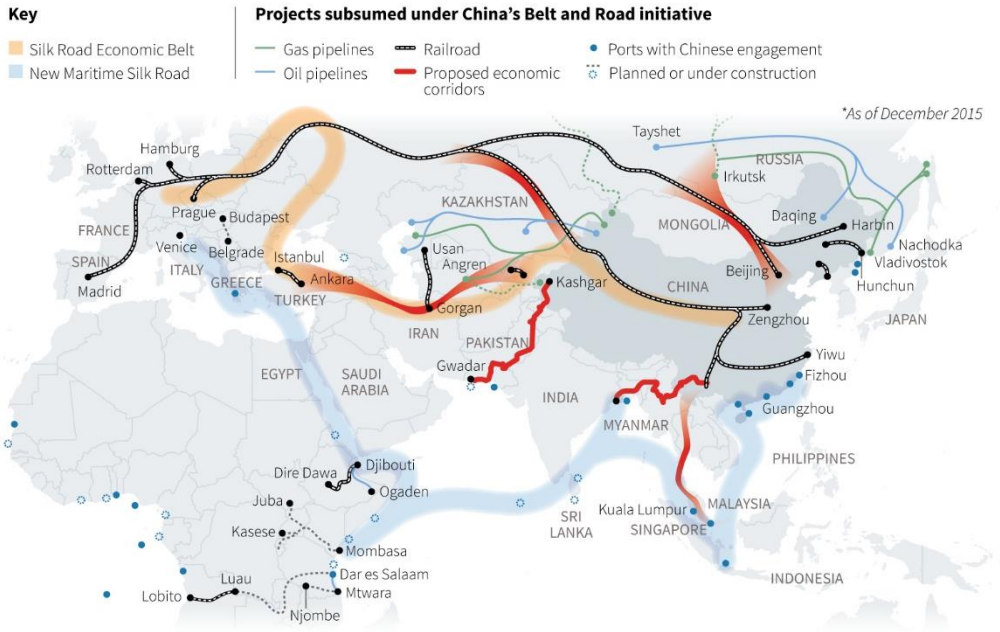

Figure 1 The development of OBOR
Source (Kynge, 2017)

The Silk Road is historically established more than 2000 years ago as silk is China's most important export product at that time. It is a network of trade routes linking China to Central Asia and the Arabian Gulf. Nowadays, the new silk road, which refers to" 21th Century Maritime Silk Road" expand it influence also to Europe. One route is planned to go from China's coast to Europe through the South China Sea and the Indian Ocean, and another one is through the South China Sea to the South Pacific (Belt and Road Initiative, 2015). It contributed to creating connections among waterways, and specific practical achievements are

made. The maritime transportation is the pillar of 21th Century Maritime Silk Road, and the function of ports are mainly reflecting in they are centres and nodes of seaborne trade. There is a vast potential and space for cooperation for involved countries since every country has their geography and resources, on the other hand, their economies are also mutually complementary.

1.1 Research Scope and Objectives

There are five key areas are set as essential goals to promote the OBOR, they are policy coordination, facilities connectivity, unimpeded trade, financial integration and people-to-people bonds. In specific for the shipping industry, due to the newly opened trade routes and the increased infrastructure projects, the demand of raw material such as steel products, iron ore, cement and heavy machinery would go up and subsequently the demand for shipping service.

On June 2017, to further boost trade and establish the inter-organisational relationships between ports of China and Europe, Belgium's Antwerp Port Authority signed a memorandum of understanding (MOU) with the Chinese port of Caofeidian. Caofeidian is a dynamic young port located in the North of Bohai Bay in China. Its handling capacity in 2016 is 260 million tonnes including 36 million tonnes of steel. On the other hand, Antwerp is the most significant steel port in Europe and every year there are 500,000 to 700,000 tonnes of steel is carried between Caofeidian and Antwerp. Under the terms of the MoU, the rail connection between these two parties will introduce which belong to the Logistics& Hinterland part mentioned above, in specific, it contributes to the development of Hinterland and Logistics subject. Secondly, by adding a regular liner service, the shipping transport will also be improved. Also, the training program will have provided by Antwerp /Flanders Port Training Centre to professionals from China port of Capfeidian, which is under the Share& Exchange of Knowhow/Training content. Finally, Antwerp and Caofeidian will collaborate with each other by exchanging information and mutual promotion to achieve the regional growth and port growth (Port of Antwerp, 2017).

It is not the first time that China signed the MoU with Europe. Early in 2014, the port of Shanghai and the port of Antwerp had signed MoU to boost the traffic between the two ports. Coincidentally, in 2015, the ports of Los Angeles, Auckland, New Zealand, and Guangzhou signed a document to establish a tripartite port alliance which share similar economic goals. Since 2013, the OBOR was launched, China positively promotes the international ports strategic alliance from different perspectives. Under the development background of Chinese OBOR, how the objectives, the structures, variations, and geography of non-

proximity port collaboration related to the OBOR strategic view will be discussed in this thesis. This research will also further explore that since OBOR started, how it influenced the competitive position of specific ports which are mainly involved in the international port collaboration. Through the research, enable reader has a better insight into the influence of OBOR regarding the international ports collaboration of Chinese seaports system.

1.2 Research Question and Sub-Research Questions

As such, the research question that this research aims to answer is as follows

What is the impact on the competitive position of Chinese ports as results of the non-proximity collaboration in the OBOR period

To sufficiently answer the research question, the following sub-research questions must be addressed:

1. To what extent the Chinese OBOR related to non-proximity port collaboration?
2. What is the current overview of Chinese port non-proximity collaboration since OBOR was launched?
3. What evaluation tool can be utilised to position the ports' competitive position in different period?

1.3 Research Design and Method

This research will be a qualitative study. The nature of research design is an exploratory study, due to the objective of the study is to explore how OBOR influenced the competitive position of specific ports which are mainly involved in the international port collaboration.

Firstly, the desk research method will be utilized to study the relationship between Chinese OBRO initiatives and the international port collaboration of Chinese seaport system regarding the objectives, the structures, variations, and geography.

To gain a deep understanding of the context of the research and the process being enacted, we take the case study as a research strategy to generate the final answer to the research questions. Furthermore, to construct and compare all ports involved in the ports strategic alliance internationally, the multiple- case studies are utilised in the research which allows the researcher to compare the

findings deriving from each of the cases.

Against the background above, this paper analyses international port collaboration strategy adopted and implemented in China and competitive position influence of international port collaboration under OBOR. It identifies the ports' competitive position before OBOR and current situation of selected ports. This paper is organised as follows. Following the introduction section, we will conduct the literature review on the strategic view of China OBOR initiatives, China port governance, an overview of port cooperation, the recent development of Chinese international port cooperation, and the port performance benchmarking. Section 3 discusses the research methodology that would be used to evaluate the competitive position of ports. Chapter 4 elaborates the findings related to the relationship between OBOR and international cooperation of Chinese ports and choose the most active collaboration ports to continually analysis. Section 5 will present the following competitive influence bring to selected ports. Section 6 draws the conclusion and the managerial implications of collaboration for Chinese ports and terminal operators.

2. Literature Review

2.1 The strategic view of China OBOR initiatives

The “One Belt, One Road” strategic concept is the most critical regional cooperation initiative for China. Also, it is an economical diplomatic strategy with a mass of resource investment from China, and at the same time plays a priority role in Chinese diplomacy. Undoubtedly, the OBOR is also a big challenge for China to utilise and integrate both domestic and international resources to achieve mutual strategic goals.

OBOR and Economic Globalization

According to the *Vision and actions on Jointly building Silk Road Economic Belt and 21st-century maritime Silk Road,* the OBOR is aiming at promoting the freely and orderly flow of economic elements, the high efficient allocation of resources, and depth market collaboration (National Development and Reform Commission, Ministry of Foreign Affairs, Ministry of Commerce of China, 2015). It indicates that China is willing to reach our deeper into the global economic system under the world development mechanism and trend, at the same time play a decisive role in leading global economic development. Simply put, OBOR reflects the nature of inclusive globalisation based on the primary mechanism of economic globalisation, which refers to investment and trade labialisation (Liu, 2015).

As we know, the emergence and development of economic globalisation are inseparable from the prevalence of neoliberalism. After the twice world oil crises in the 1970s, western countries ended the 20 years’ prosperous period and fell into a severe “stagflation”. To get rid of the plight, on the one hand, the United Kingdom and the United States both replace the “Keynesianism” with “neoliberalism” which is reducing the government intervention and achieving the full privatisation. On the other hand, they began to export national capital on a large scale and move industries overseas, and through this way to enter the stage of global capitalist expansion. To satisfy the need of capital export, neoliberalism is regarded as the theoretical basis for the promotion of investment and trade liberalisation. Under the background of neoliberalism economic globalisation, no matter developed countries, like UK and USA, or developing country like China, all thinking about the revolution about how to progress the economic globalisation to the next stage. In this perspective, the OBOR is a salutary attempt (Liu, 2015).

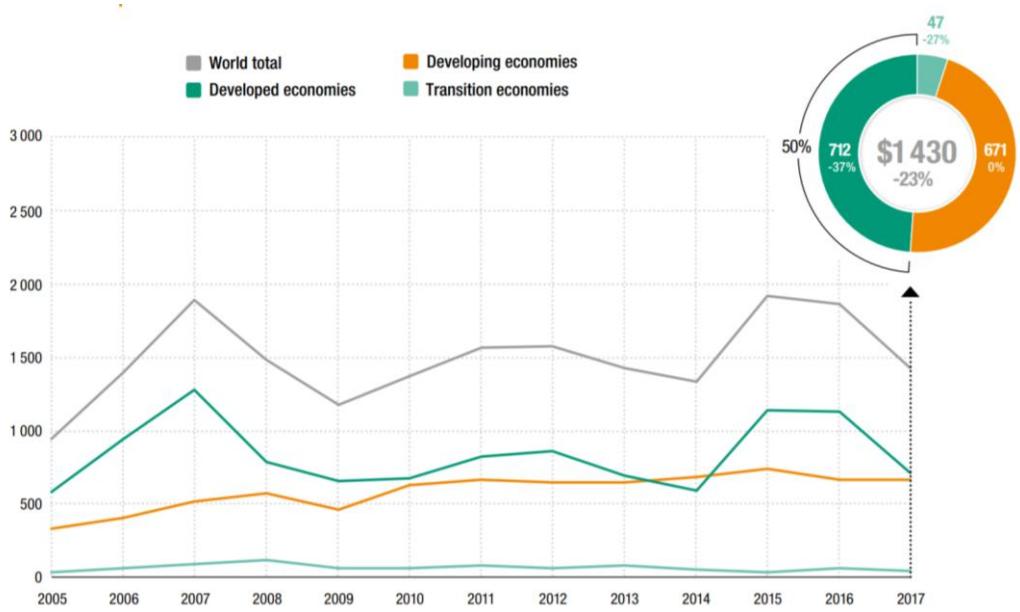

Figure 2 FDI inflows, global and by a group of economies, 2015-2017
Source (UNCTAD, 2018)

See from China's development stage; the Chinese economic growth is entering a "new normal". On the one hand, the "demographic dividend" that lasted for more than 30 years has gradually disappeared, and labour costs also have risen rapidly, which lead to certain labour-intensive industries are losing the competitive advantages. On the other hand, due to the over-optimistic expansion during the past decade, certain Chinese raw material industries have experiences severe overcapacity as the economic growth slowed down. It is worth mentioning that this part of production capacity is not backward technologically, and the situation in supply exceeding demand so need to be transferred outwards. Also, many large enterprises are raised in the Chinese huge consumer market and are becoming transnational companies with multinational investment and global operations capabilities. These factors have promoted China to enter a period of "going out" in large-scale.

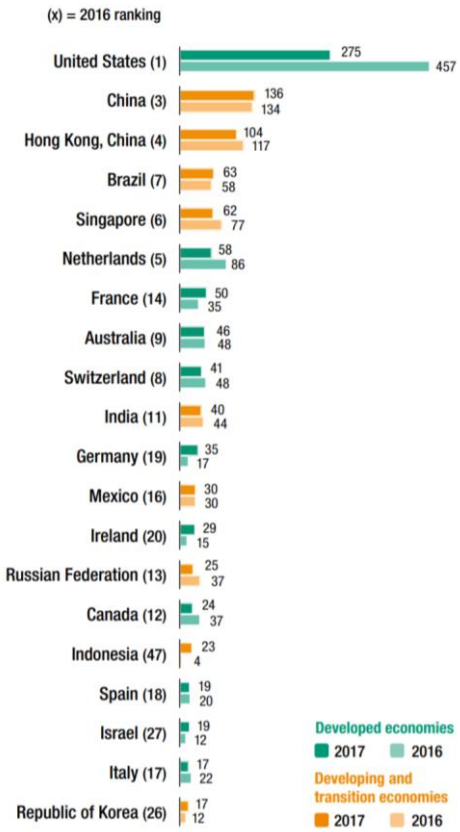

Figure 3 FDI inflows, top 20 host economies, 2016 and 2017
Source (UNCTAD, 2018)

Therefore, overall, building the “Belt and Road “is the economic globalisation in the Chinese version, and it is also an attempt to promote the healthy development of globalisation. What China wants to build is an international cooperation platform that accelerates regional win-win accomplishment.

OBOR and Geopolitics

The “Belt and Road” is a new development concept, an international cooperation model proposed by China to promote the deepening of economic globalisation. Also, the joint construction of OBOR has raised many scientific issues for the academic community. Among them, the topics that need to be strengthened include: the core elements and driving mechanisms of geopolitical relations in the era of globalization, the national geographic research of countries along the OBOR, the theory of direct investment to abroad under the framework of the “Belt and Road”, and the spatial organization of land and sea transportation.
China’s “Vision and Action" document put forward the basic principles of "Co-communicating, Co-building and sharing." The key to effectively promoting the construction of the “Belt and Road” is that countries along the belt and road

should jointly seek common interests and win-win construction projects, which are inseparable from the linkage of relevant policies from involved countries and development plans. It is necessary to deepen understanding the difference among countries in varies aspects, including politics, legislation, administration, culture, religion, population, economy, social structure, resource, environments, and national governance structures to achieve mutual ties and connections, Over the past 30 years, due to the value orientation and strong demand of state-building, the research on world geography of China's geography academic community has been shrinking, leading to the current systematic understanding of many countries along the “Belt and Road” were developed early in decade before, and didn’t update until now. This will affect China's communication and negotiation with countries along the route to a certain extent, and it is not conducive to avoiding unnecessary risks. Therefore, it is imperative to carry out the “One Belt, One Road” national geographical research as soon as possible.

Also, a prominent feature of the “Belt and Road” initiatives is the optimisation of the transportation organisation of trade. For more than a century, due to the continuous development of maritime technology, international trade has mainly been accomplished through maritime transport corridors. The convenience and cost advantage of shipping is unmatched by other modes of transportation, but its drawback is the high time cost of transportation. For example, shipping time from China's coastal ports to Europe is generally more than 30 days. The price and time cost of land (rail) transportation are between sea and air transport, but international rail transport is often cumbersome due to customs clearance through multiple sovereign countries. The joint construction of facilities, interoperability, and trade facilitation in the “Belt and Road” will help improve the comparative advantage of land (railway) transportation.

In fact, in recent years, various "five scheduled trains" opened in various parts of China, such as Yu-Xin-Europe, Rong-Europe Express, and Xi-Xin-Europe, which have already carried out preliminary exploration in this respect. Therefore, how to further optimise the transportation organisation of goods trade along with the “Belt and Road” is worthy of in-depth study by the academic geography community.

2.2 China Port Governance

Due to the globalisation of production and distribution, dramatical changes have taken place in the economic environment and the forms of cargo transportation, which resulted in a revisiting of the nature of seaport governance and the competitive maritime dynamics (Mclaughlin & Fearon, 2013)

In traditional, the port authority played a role of building and managing the infrastructure of seaports, at the same time own the whole property of port and coordinate relations between enterprises and government (Mclaughlin & Fearon, 2013). However, with the increase of the private sector involved, the scope of activities and strategic choices of Pas are adjusted (Pallis & Kladaki, 2016). A quantitative analysis of European port governance pointed out that there are different types of port governance in Europe, they only can be seen as conservators, facilitators or entrepreneurs (Verhoeven & Vanoutrive, 2012). Also, they detect differences not only regarding the size of the port but also geographically defined. Part of the port governance of Antwerp is at a metropolitan level, while the Hanseatic port authorities managing port areas and collaborating with enterprise and the income and investment are directly controlled in a nation and region level (Vanoutrive, 2012). In contrast, the port development and terminal operations of China are intervened actively by national and local governments. However, port authorities took the financial autonomy, and the decentralisation of the administrative authority of government, the real power of the ministry system has been diminished substantially (Wang & Slack, 2004).

Consequently, PAs strategic goal may shift from the macro level to the firm level when they handle more autonomy (Lugt, et al., 2015). So, the more comprehensive strategic scope pushes the PAs to start to consider the internationalisation to set the more business-like goals. It can be detailed in establishing the inter-organisational relationships to enhance competitiveness (Pallis & Kladaki, 2016). The connection can be competition, cooperation, and collaboration between PAs. Collaboration is the most complicated which require high interaction trust to set a negotiated determined objective under an open and information rapidly exchanged situation.

There are three phases of the Chinese port governance reform. The primary strategy of the first phase covering the period 1979-1984 is centralisation. At that time, the whole Chinese ecosystem is centrally planned so as the Chinese seaport system. Everything related to the business activities is controlled by the Ministry of Communications, including ownership, strategy manipulation and revenue collection while the local and provincial public authorities are not involved. The second phase is from 1984 to 2004, with Tianjin port becoming the first pilot to apply the joint management by the central government and local government, the decentralisation started and spread to a significant number of Chinese ports. From that time, all seaports (except Qinhuangdao) are either joint controlled by the central and local government or only local government. The challenges that how to become more market-oriented come together with the regulatory power. The latest phase start in 2004, with issued Port Law and the

related “Rules on Port Operation and Management”. These two policies not only pushed the port authorities to the corporatisation but just carry forward the decentralisation of central government further. Then the Port Administration Bureaus were built to separate the regulators and port operators. Moreover, the central government no longer own the port according to the Port Law, which brought opportunities to foreign investors to invest and operate ports without a domestic partner. At that moment, the plans of local government still need the approval of the central government since they are responsible for the policy formulation and strategic conception.

From 2006 to 2015, China executed the 11th and 12th Five Year Plan and now is working on the 13th one. The Communist Party of China draws up these series plan to boost the economics of China, setting growth targets, and launching reforms (Yang & Notteboom, 2017). During this time, there is no new law to introduce the fourth phase. Instead, the Chinese government started to take institutional plasticity approach to enable optimising movement executed by port management bodies to fit the changing social and economic environment. The corresponding institutional transformation can be illustrated as conversion, layering, stretching and displacement.

Yang and Notteboom (2017) proposed four forces which drove the institutional layering in the Chinese governance framework. Firstly, the port management bodies (i.e. central, provincial and local governments and market players) are to follow scrupulously the reform law launched in 2004 and feel no need to break the current path. Secondly, they do realise the high needs and challenges diversity of Chinese ports and ports region in terms of the economic and social development, spatial dynamics, environment pressure and port-city relations. Third, port actors are aware that when positioning the ports hierarchy and linking the Chinese seaports system with global supply chain, the OBOR, FTZs, the “Go West” policy and other broader policy initiatives can bring important long-term impact on it. Lastly, the central government had given much more power to the local government aims to reduce the potential harmful effects, for instance, the far-reaching port devolution.

2.3 Port Cooperation

The discussion of alternative port development, port collaboration, have been in the public debate for decades due to the considerations of public investment needs and mitigation of environmental interventions. There are limitations of financing the storage capacity of terminals as well as up-to-date ship-to-cranes

due to the congestion caused by traffic peaks. To facilitate policy priorities, refer to the promotion of public investment requirements into land and maritime infrastructure, collaboration schemes between seaports seem a possible to gain benefit from potential synergy effects instead of financing competitive ports. The cooperation can take place in three levels which are the operational, tactical, and strategic level.

Pallis and Kladaki(2016) categorised the collaboration objectives that PAs seek to achieve after an empirical observation. All targets are coded into 10 plus one main category, they are Sustainability(Environmental), Regional Growth, Logistics& Hinterland, Nautical/Technical Services, Infrastructure- Development, Share& Exchange of Knowhow/Training, Port management, Port management: Commercial, Crisis Management, Port Growth and the plus one is the category that to be clarified in the future. Each of the content also contains specific subjects, for instance, under the Share& Exchange of Knowhow/Training, there are Exchange Expertise, Exchange Knowhow, Share Best Practices, Share Strategies and Training Programmes. By utilising the above criteria, can understanding the collaboration agreements effectively.

The costs and benefits of cooperation consist of the business economic viewpoint and social viewpoint (Donselaar & Kolkman, 2010). For the business economic viewpoint, the involved parties expect the efficiency improvement and cost reduction, which refer to the prevention of overcapacity, partitioning of risks, economies of scales and the decrease in transaction costs. Then by accessing each other's competencies and encouraging knowledge exchange, to gain the additionality of competencies. The third point is to benefit the positioning of the company. In details, they can use each other's brand name reputation and at the same time to access a chance to enter the new market.

Furthermore, this cooperation can reduce the competition while creating a market standard and countervailing power. Finally, it can provide joint political production of interest (Donselaar & Kolkman, 2010). The effect on society is different according to the voluntary of two parties. Not all forms of cooperation will lead to the positive development for social efficiency. For instance, the certain collaboration will produce the cartel and restrain competition then drive up the price level.

For the seaports market, the cooperation between shipping companies increased transport and transhipment efficiency and modifies property structures of stevedores increase the competitive pressure dramatically. Under this situation, individual seaports starting to launch cutting-edge attractive port conditions to attract cargo to their ports and to simulate the regional and national economy. As

a result, the port remains an essential element in the logistics chain but no longer holds the natural monopoly of before. So, the PAs formerly bounded to a specific location are beginning to search for other ports in their competitive range, and to non-primality ports to countervail the shipping companies with concentration and cooperation tendency.

The cooperation between PAs brings to the seaport both negative and positive effects. With the link between two ports, they can improve the efficiency of logistical chains that they included. In specific, this bilateral cooperation can active commitment on solutions for hinterland accessibility, on the other hand, it can also create optimum conditions in the field of customs authorities and legislation. Then it could make the investments that are in the interest of all port users and that do not come about spontaneously. Finally, it can examine and stimulate possibilities for more efficient land use (Donselaar & Kolkman, 2010).

Fraunhofer Centre for Maritime Logistics and Service CML (Fiedler & Flitsch, 2016) pointed out specific expected positive effects of port cooperation. Firstly, this strategy can reduce the investment needs. Secondly, not only the superstructure and infrastructure of the port would gain more efficient usage, but also the better utilisation of hinterland transport modes. Then, the cooperation would also bring a lower maintenance cost along with the better streamline of traffic peaks. Finally, through personnel exchanges, the workforce would be more and more flexible.

The involvement degree of port authorities and terminal operators is one of the factors that will decide the types of port cooperation, also the corridor, port function and port location (Fiedler & Flitsch, 2016). There are five types of port cooperation listed by Fiedler and Flitsch (2016). They are Coopetition of ports in proximity, Port integration, Cooperation between seaports and inland ports, Hub port cooperation, and Memorandum of Understanding. For the non-proximity ports that in the close geographical distance, they should build a cooperation relationship under a competitive circumstance. Typically, ports would approach the cooperative marketing and sourcing, share the resource of the workforce as well as equipment but at the same time also invest in terminal facilities. Apart from it, the integration is also a right way through the joint venture of ports. On the other hand, to improve the traffic service performance and enlarge the hinterland region of the seaport to and from the customer, the seaports and inland ports also cooperate with each other. The hub port cooperation is presented by the situation that liner carriers invest in terminals, and at the same time, they are also customers of terminals.

When two or more ports authorities set one primary cooperative commitment on

a single trade line, then it is the Memorandum of Understanding. The primary intention of the MoU is to increase the port throughput by facilitating and intensifying trade links. There are certain practices between countries which can be further benchmarked to analysis the potential impact of MoU. They are (Pallis & Kladaki, 2016):

- ✓ Karachi, Pakistan and Guangdong, China in 2015:
- ✓ Los Angeles, USA, Auckland, New Zealand and Guangzhou, China in 2015;
- ✓ Shanghai, China and Antwerp, Belgium in 2014;
- ✓ Los Angeles, USA and Hamburg, Germany in 2013.

The strategic goals of MoU are promoting the transhipment of cargos including export and import, more efficient customs clearance, the information sharing, joint marketing actions, improving the environmental and security issues and workforce training.

2.4 The recent development of Chinese international port cooperation

Since China joined the WTO in the early 2000s, the broader reform processes are implemented by China to build a more sound and transparent corporate governance policies (Yang & Notteboom, 2017). Not only the role of the state but also the governance system gradually changes to an increasingly market-oriented economy (Yang & Notteboom, 2017). Indeed, certain transformation actions would have a direct impact on the Chinese seaport system since all the Chinese ports are regulated by the local or central government.

During the decentralisation process of port governance, certain potential risks also existed. Currently, the demand is lower growth, which aggravated the overcapacity of the seaport system. So national policy documents refer to emphasise the requirement for more coordination and cooperation among ports and potentially new port actors. The document “National development [2014] No.32 aims at promoting the healthy development of the maritime industry” covers several areas for future actions (The State Council of China, 2014), they are:

- Optimize the maritime fleet structure

Within the industry, build a professional fleet with appropriate scale, reasonable structure and advanced technology. We will vigorously develop energy-saving, environmentally friendly, and economically efficient vessels and actively develop

crude oil, liquefied natural gas, containers, ro-ro, and special transport fleets to improve the international competitiveness of container liner shipping. Furthermore, develop the dry bulk shipping fleets and cruise economy in an orderly manner. Also, consolidate the international preponderance of dry bulk cargo transportation, and nurture regional cruise ship brands.

- Improve the global shipping network.

The port actors should optimize the layout of seaports and routes, at the same time actively participate in the international maritime affairs related infrastructure investment, construction and operations, and expand international trade cooperation. We will strengthen the construction of support capabilities of important international sea lanes, and improve the transportation systems for major cargoes such as coal, petroleum, ore, containers, and grain. Finally, vigorously develop the rail-vessel multimodal transportation, river-to-sea joint transport, and promote the construction of deep-water navigation, and collecting and distributing transportation systems.

- Promote the transformation and upgrading of shipping companies.

Under this category, the government encourage to improve the corporate governance structure of shipping companies, company with the transforming of the concept of development, innovate technologies, products, and services. Accelerate mergers and reorganizations, then promoting large-scale and specialized operations to enhance anti-risk capabilities and international competitiveness. While strengthening the main business of the shipping industry, it is appropriate to carry out diversified operations. Implement of the "Go West" strategy can positively encourage Chinese-funded shipping companies to invest overseas and transnational operation. By orderly developing small and medium-sized shipping companies to promote employment.

- The development of modern shipping service industry

We will promote the transformation and upgrading of traditional shipping service industries and accelerate the development of modern shipping service industries such as shipping finance, shipping transactions, information services, design& consultation, technology R&D, and maritime arbitration. Establish a market-oriented maritime development fund. Bring innovation to shipping insurance, by reducing financing costs to spread risk.

- Deepen the reform and opening of the maritime industry.

We will deepen the reform of state-owned shipping companies, and actively develop the maritime enterprises with state-owned capital, private capital, and other cross-shareholding involved, then continually integrated development of mixed-ownership shipping companies. Adhere to the principle of equality, equal

rights and equal opportunities, and guide and encourage qualified private enterprises to engage in the shipping business. We will steadily promote open-door to the outside world, and under the premise of controllable risks, we will launch a trial for the establishment of foreign-owned ship management companies, joint venture shipping firms etc. in China (Shanghai) Free Trade Pilot Zone.

- Improve the international competitiveness of the maritime industry.

Support the agglomeration of elements and industry, also speed up the construction of transaction and pricing within the industry to build an international maritime centre. Actively participate in the relevant international organization's works, then increase the state ability and level through participation in the formulation of international conventions, rules, standards, and norms, thus establish a responsible image of maritime power. We will deepen bilateral and multilateral cooperation to safeguard the rights and interests of our shipping companies and seafarers. Finally, build a world-class educational institution for ship inspection and shipping research.

- Promote green and sustainable development.

Strengthen safety awareness, improve safety rules and regulations, clarify the responsibilities of each party, and increase inspections of hidden dangers. We will improve the emergency response system for marine emergencies, improve the safety supervision and emergency response capabilities, and strive to improve the monitoring and disposal capabilities for searching and rescue operations on the sea (water) and marine oil spills to further streamline the safety supervision system. Strengthen management of energy consumption of vessel and pollutant discharge, promote the utilization and application of energy-saving emission reduction technologies and clean energy in the maritime industry, through this way to optimize the energy utilization structure.

Yang and Notteboom(2017) concluded in their paper that during the past decade, there are big changes in terms of the geo-economic and geopolitical context for Chinese ports. OBOR have started the process of institutional layering in port governance when the Port Law still identical.

Huo et al. emphasis in their article that there are limited existing studies focus on empirical cases of international port cooperation of China (Huo, et al., 2018). So, they conclude and clear up the Chinese ports international cooperation with another non-proximity region in terms of cooperation modes and entities from the timeline and spatiotemporal path. Base on the objectives of cooperation, there are four modes can be applied, they are an overseas investment in port construction, investment holding or merger and acquisition, sister ports

agreements and port cooperative networks (Zhao, et al., 2016).The overseas investment in port construction will not be taken into the port collaboration as they are mainly conducted by port engineering companies (Huo, et al., 2018).

Below are the two tables to illustrate the investment holding or acquisition and strategic alliance between Chinese seaports system and foreign ports and related parties. According to the following listed information, researcher will further explore the objectives and drivers of each relationships. So, they are vital reference for our first research method, typology of collaboration relationships between China seaports and non-proximate seaports.

Chinese company	Year	Content of port cooperation	Area
Dalian port	2016	Signed the Djibouti Free Trade Zone Investment Agreement. The project was operated by a joint venture invested by Chinese enterprises including CMPort, Dalian port as well as the Djibouti government.	East Africa
Guangxi Beibu Gulf port	2017	On February 21, 2017, the joint venture company- Muara Port Co., Ltd. (51% stake in the hands of Guangxi Beibu Gulf Port Group) took over the operation of the container terminal of Muara port in Brunei.	Southeast Asia
Hebei port	2016	Set up a subsidiary, Qinhai Port Company in Jakarta, Indonesia, to run a local port project in Jambi industrial park in Indonesia, which is the first overseas port project for Hebei port group.	Southeast Asia
Qingdao port	2015	Signed a Memorandum of Understanding (MOU) for the APM Terminals Vado, Italy port project. The detailed terms and investment amount were not released. The MOU will create a new joint venture to invest in and work with other potential partners.Signed a Memorandum of Understanding (MOU) for the APM Terminals Vado, Italy port project. The detailed terms and investment amount were not released. The MOU will create a new joint venture to invest in and work with other potential partners.	Europe
Shanghai port	2015	Shanghai International Port Group (SIPG) won the bid for concession of Bayport terminal, port of Haifa, Israel operations for 25 years from 2021.	Middle East
	2010	Acquired 25% stake of APM Terminals Zeebrugge NV (APMTZ) in Belgium and became the company's second largest shareholder.	Europe

China Merchants Port (used to be CMHI)	2017	Agreed to acquire 90% stake of Terminal de Contêineres de Paranaguá (TCP) in Brazil for about US$920 million to get the terminal operation for CMPort's first investment in Latin America.	South America
	2017	Got 85% stake of Hambantota port in Sri Lanka with a 99-year lease paying US$1.12 billion.	South Asia
	2014	Acquired Newcastle port in Australia, the world's biggest coal ports, paying AU$ 1.75 billion jointly with Hastings Funds Management.	Oceania
	2013	Acquired 23.5% of Port De Djibouti S.A. (PDSA) in February 2013. The core assets of PDSA included the Port of Djibouti, Doraleh Container Terminal, off dock depot and Doraleh Multi-Purpose Port.	East Africa
	2012	Acquired 50% stake of Thesar Maritime Limited (TML) to take over the development and operation of the Lome Container Terminal (LCT) in Togo for 35 years, which was owned by TML before.	West Africa
	2010	Established the joint venture company with China-Africa Development Fund to acquire 47.5% stake of Tin can Island Container Terminal (TICT) in Lagos, Nigeria paying US$ 154 million. CMPort held 28.5% stake.	Africa
COSCO Shipping Ports (used to be COSCO Pacific	2017	COSCO shipping port (Spain) company took a 51% shareholding paying US$ 224 million in JP Morgancontrolled Noatum Ports in Spain, which operates a facility in Bilbao and Valencia and includes two inland terminals in Zaragoza and Madrid.	Europe
	2016	Signed a cooperation agreement on co-investment a new container berths in Singapore with PSA Corporation (PSA) in Shanghai through the joint venture company COSCO-PSA Terminal (CPT) in March 2016.	Southeast Asia
	2016	Acquired 51% stake of Piraeus port paying EUR 280.5 million. Another EUR 88 million will be paid within five years for the remaining 16% stake.	Europe
	2016	Acquired another 35% stake of Euromax Terminal Rotterdam owned by Europe Container Terminals (ECT) in May 2016, paying EUR 125 million.	Europe
	2007	Acquired 20% stake of Suez Canal Container Terminal owned by Egyptian International Container Terminal, which is a subsidiary of A.P. Moller-Maersk Group in November 2007.	Asia, Europe, Africa
	2004	Acquired 25% stake of Antwerp port in Belgium from P&O Ports (acquired by A.P. Moller-Maersk Group) and obtained the port operation rights.	Europe
CMHI, COSCO Pacific, CIC Capital	2015	Formed a consortium to acquire 65% stake of Kumport terminal in Istanbul, Turkey paying US$ 940 million in September 2015. CMHI, COSCO Pacific, CIC Capital Corporation (CIC Capital) had equity stakes of 40%, 40% and 20% respectively in the consortium.	Asia, Europe

Table 1Case with the model of investment or acquisition of Chinese seaport system. Source (Huo, et al., 2018)

Chinese port group	Year	Content of port cooperation	Area
12 Chinese ports	2015-2017	In November 2015, signed the Memorandum of Understanding between Malaysia Port Alliance and China Port Alliance for the Establishment of a Port Alliance. Six Malaysian ports – Port Klang, Malacca, Penang, Johor, Kuantan and Bintulu, are included in the alliance. In 2017, three more Malaysian ports - Kemaman, Kuching and Sabah, joined the China-Malaysia Port Alliance (CMPA). The total number of Chinese ports in the alliance are ports of Dalian, Shanghai, Ningbo-Zhoushan, Beibuwan, Guangzhou, Fuzhou, Xiamen, Shenzhen, Haikou, Taicang, Tianjin and Qingdao.	Southeast Asia
Qingdao Port	2016	Signed a strategic cooperation memorandum with China-Africa Development Fund and the National Development Bank Qingdao Branch to further implement the National Strategy of the Belt and Road Initiative and to share information and resources in view of African ports and related infrastructure.	Africa
	2015	Signed a cooperation memorandum with DP world to deepen the comprehensive strategic partnership.	Africa
	1984-2017	Signed sister port agreements with 21 ports, such as the port of Gwadar in Pakistan, Sihanouk in Cambodia, Kuantan in Malaysia, Antwerp in Belgium, Incheon and Pusan in South Korea, Said in Egypt, Djibouti port in Djibouti, Shimizu port, Shimotsu port, Kochi port in Japan, Miami, Long beach, Seattle in USA, Saint Petersburg Port in Russia, Barcelona in Spain. Thereinto, the cooperation with 12 ports happened after the year 2013.	Around the world
Shenzhen Port	2007-2015	Signed sister port agreements with 18 ports around the world, such as Indonesian International Port Group, Rotterdam port, Hamburg port.	Around the world
Shanghai Port	1992-2015	Signed sister port agreements with 23 ports, such as the port of Marseille, Le Havre and Dunkirk in France.	Around the world

Chinese port group	Year	Content of port cooperation	Area
Shanghai Port	2014	Signed MoU with Antwerp port in Belgium.	Europe
Guangzhou Port	2015	Signed MoU with Los Angeles port in USA and Auckland port in New Zealand.	North America,Oceania
	1982-2017	Signed sister port agreements with 40 ports around the world. Within three years since 2015, the number of ports in the friendship with the Guangzhou port was 20, equivalent to the total number of that more than 30 years before 2015.	Around the world
Guangxi Beibu Gulf Port	2013	Formed a cooperative network of China-ASEAN port cities with the total of 47 ports in ASEAN countries.	ASEAN
	2014	Signed sister port agreements with the port of Sihanouk in Cambodia and Kuantan in Malaysia during the 11th China-ASEAN Expo. The cooperation were in terms of navigation, port construction, port-vicinity industry, international trade, cultural tourism and friendship cities.	Southeast Asia

Table 2Case of modes of a strategic alliance between China and overseas.
Source (Huo, et al., 2018)

2.5 Port Performance Benchmarking

The literature criteria for port performance based on the report published by the United Nations Conference on Trade and Development in 2016. It is a program that mainly sponsored by developing country ports, and they expect the program can support port communities in their effort to achieve efficient and competitive port management (UNCTAD, 2016).

Firstly, there are four strategic dimensions are adapting to evaluate a modern port's performance, they are finance, operations, human resources and market. Also, specific benchmark variables listed as port/mode size, service portfolio, governance/economic regulation, economic development (gross domestic product, gross national income per capita), region, distance, connectivity, economic and political institutions, and transit role (UNCTAD, 2016). They use the scorecard to determine and explain the critical indicators of port performance. It is a management tool same as Kaplan and Norton balanced scorecard, by linking the strategy with performance to generate and examine the generic measures that will or should be developed by all port authorities. The comparison will not only be limited in ports nationally but also internationally.

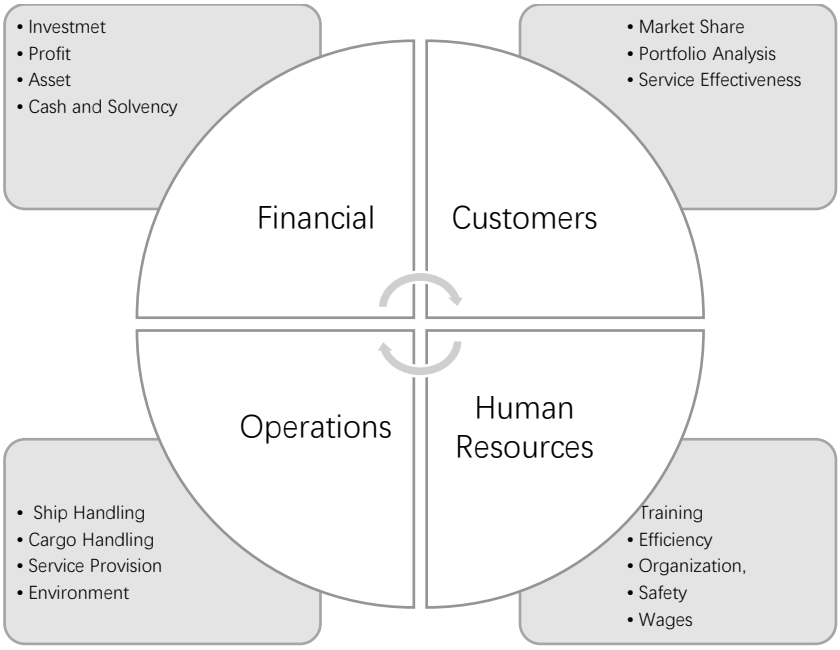

Figure 4 Port performance scorecard
Source (UNCTAD, 2016)

The transport nodes like ports always require long-term investment cycles with a complex mix of public and private services. With the nature of competitive transport service, most of the raw data are confidential to protect the data's owner's interests. So, a proxy performance measure is utilised to solve this problem. For instance, the ability of cargo handling operation can be measured as the averaging loaded and unloaded TEU per working hours instead of the number of crane lifts which is mostly gathered and held by an operator and put it

as confidential data, and at the same time it will also indicate the productivity of labour and ship. This logic is applicable across all scorecard dimensions.

The financial performance is mainly based on the monetary value, for instance, the average port dues per ton of throughput at a port, or the average earnings per full-time equivalent employee. Also, listing the proportions of vessel dues, Cargo dues, fees and licences, other revenue, and rental income then analysis the percentage of port dues revenues to gain insight of the income profile for a port authority. Another benchmark value is earnings before interest, tax, depreciation and amortisation/revenue; it shows the relative profitability of port operations. When compare across time and other ports in the network, it expressed as a proportion of sales as a measure. Last but not least, training/ wages and wages/revenue would be combined as labour cost measures.

The vessel operations performance is based on the vessel type segmentation while focusing on minimising the time in port and ensuring the adequate infrastructure for the vessel type and size. Vessel draft, waiting time and vessel productivity are critical competitive factors for ports.

The evaluation of cargo operations performance involves a comparison of efficiency indicators in term of time and land usage, which refer to the handling rates per hour and throughput regarding land available for processing and the length of berths available for handling. The best-known productivity data linked to containers expressed as handling rates are 8 to 35 boxes per hour (UNCTAD, 2016).

Below is an illustrative case study to show the port performance scorecard:

Port entity only	Indicators (23)	N value (p x t)	Mean	Minimum	Maximum	Port X				
						2010	2011	2012	2013	2014
Finance	EBITDA/revenue (operating margin)	44	38%	-75%	83%	49%	58%	60%	59%	
	Vessel dues/revenue	42	18%	1%	32%	16%	16%	14%	15%	15%
	Cargo dues/revenue	41	38%	10%	63%	40%	40%	42%	42%	59%
	Rents/revenue	39	10%	1%	57%	1%	1%	1%	1%	7%
	Labour/revenue	38	23%	7%	63%	19%	18%	18%		10%
	Fees and the like/revenue	30	6%	0.1%	23%	0.1%	0.4%	0.4%	0.3%	1.0%
Human resources	Tons/employee	34	38 435	4 202	204 447	20 174	21 683	21 809	21 873	7 074
	Revenue/employee	38	$179 971	$138	$1 039 739	$101 599	$113 418	$128 492	$138 730	$17 963
	EBITDA/ employee	33	$93 556	-$16 696	$555 835	$50 265	$65 587	$76 965	$81 464	
	Labour cost/ employee	24	$23 863	$4 489	$93 589	$19 198	$20 962	$23 580		
	Training costs/wages	33	0.95%	0.03%	4.60%	0.2%	0.2%	0.2%	1.0%	
Vessel operations	Average waiting time (hours)	62	17	0	89	0	0	0	0	4
	Average overall vessel length per vessel (m)	55	136	44	289					67
	Average draft per vessel (m)	55	8	2	22			3	3	3
	Average gross tonnage per vessel	66	14 260	552	43 216	2 212	2 066	2 555	2 710	2 219
Cargo operations	Average tonnage per arrival – all	41	4 739	201	20 510	335	382	400	412	
	Tons per working hour, dry or solid bulk	28	116	20	350	24	24	24	24	20
	Box per hour, containers	46	18	8	35	20	20	20	20	25
	Twenty-foot equivalent unit dwell time (days)	29	7	3	18	6	6	6	10	11
	Tons per hour, liquid bulk	16	42	17	63	40	40	40	40	
	Tons per hectare – all	41	173 986	75 772	425 800	221 914	233 865	239 895	240 604	
	Tons per berth metre – all	41	3 920	890	7 439	6 264	6 601	6 771	6 791	
World development indicator data	Quality of port infrastructure	Year 2014	3.8	2.7	5.2	2.8	3.0	3.3	3.4	3.5
	Liner shipping connectivity index		21.9	11.8	33.6	15.2	18.6	17.2	18.1	20.3
	Burden of customs procedures		3.5	1.8	4.4	3.0	3.0	3.2	3.2	3.5
	Female participation rate		21%	6%	44%					11%

Table 3 Illustrative case study of port performance scorecard
Source (UNCTAD, 2016)

Finally, UNCTAD gives the conclusion that the performance assessment is narrowly associated with terminal efficiency, but with the increasing interests on PA performance, more and more criteria will be built to evaluate the efficiency and effectiveness of port authority. Also, there are varies of critical performance measures are highlighted below, and many of the indicators represent strong performance in the context of their size and service profile.

Indicators	Data
The average container dwell time	Seven days
The average operating margin	38%
The average ratio of cargo dues to vessel dues	2:1
The average waiting time for a vessel to berth	17 hours
The average yearly wage of the employees	$23,863
The average training expenditure	Less than one per cent of total payroll costs

Table 4 Critical Performance Measures
Source (UNCTAD, 2016)

As we can conclude, evaluating a port performance could be an enormous and complicated work. Based on our current academic level and resource limitation situation, we will select one specific aspect to analysis the impact from international port collaboration. The selected method should be typical and convincing which also ensure the required data are easily access.

3. Methodology

3.1 Introduction

The methodology framework of this thesis is consisting by two parts, typology analysis and Strategic Positioning Analysis. The reason we chose SPA is that the data required for this method is easily accessed. We found the yearly traffic throughput for Chinese seaports are all collected and presented in China Port Year Book, which can ensure we can apply the SPA with enough data. There are certain seaports are involved in the non-proximate collaboration. It unrealistic that we applied SPA to all ports to give a quantitative conclusion about impact. So, another method is applied to evaluate how deep the port involved in the collaboration. Then we will take the top two active ports as research sample objects, to explore the impact on competitive position of them during the OBOR period. So, the research methodology framework will be:

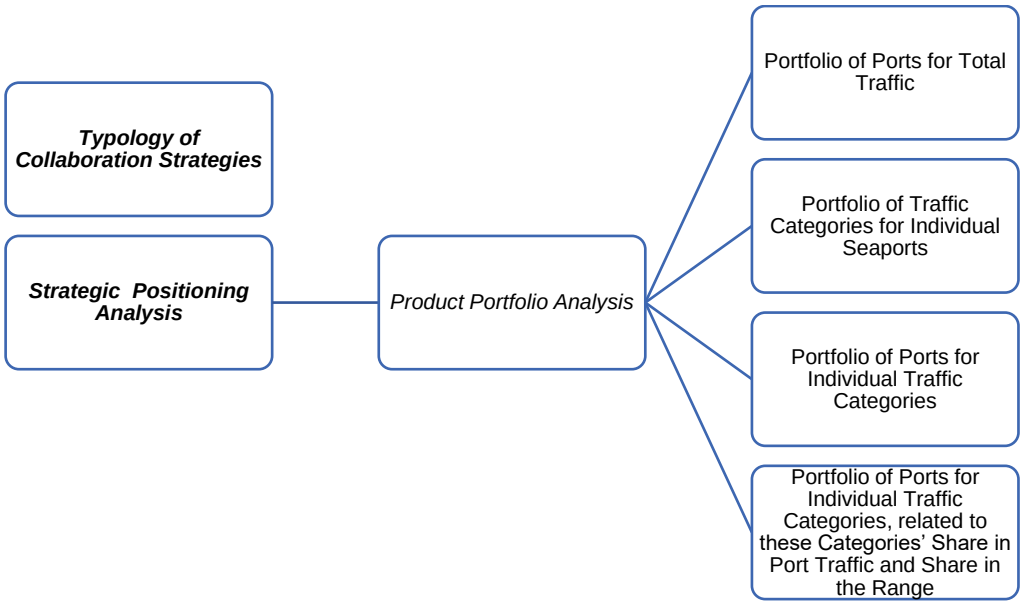

Figure 5 The methodology structure of the thesis
Source: Concluded and developed by the author

3.2 Typology of collaboration strategies

Pallis and Kladaki(2016) researched the typology of collaboration strategies and activities developed by European port management bodies with the non-proximate port. The typology includes the objectives, structures, variations and geography of the series of European international port collaboration practices. In their research, they categorized and encoded the objectives of the collaboration of ports based on the empirical observation. There are 10 plus one main category,

and under different topic, certain objects are also listed as below:

Category	Objective	Category	Objective
CAT.1Sustainability (Environmental)		**CAT6Share& Exchange of Knowhow, Training**	
CAT.1.1	Economic fuel development	CAT6.1	Exchange Expertise
CAT.1.2	Environmental Policies	CAT6.2	Exchange Knowhow
CAT.1.3	Renewable Energy	CAT6.3	Share Best Practices
CAT.1.4	Sustainability (Environmental)	CAT6.4	Share Strategies
		CAT6.5	Training Programmes
CAT. 2 Regional Growth		**CAT7Port Management**	
CAT2.1	Job growth	CAT7.1	Monitoring & Reporting Processes
CAT2.2	Boost Regional Economies	CAT7.2	Port Business Plan
CAT3Logistics& Hinterland		**CAT8Port Management: Commercial**	
CAT3.1	Expertise in Logistics	CAT8.1	Marketing
CAT 3.2	Hinterland and Logistics		
CAT4Nautical/Technical Services		**CAT9 Crisis Management**	
CAT4.1	Very Large Vessels' Handling	CAT9.1	Disaster Prevention
CAT5Infrastructure - Development		**CAT10 Port Growth**	
CAT5.1	Greenfield Projects	CAT10.1	Promote Trade
CAT5.2	Port Development		
CAT5.3	Port Infrastructure	**CAT11 To be clarified**	

* The part that initiated the collaboration has not yet clarified any specific purpose/ objective.

Table 5Categorization of collaboration objectives
Source (Pallis & Kladaki, 2016)

Based on these criteria, they coded all the European port management bodies' collaboration practices and corresponding objectives. Then according to the configuration of objects patterns to compare and analysis the collaboration strategy of different European ports. Furthermore, they also gave the conclusion about the type of inter-organisational relationships formats, the geography. We will utilise this criteria and method to analyse the same topic but change the objects to Chinese port management bodies. By conducting this research to have a deep insight into current Chinese international port collaboration relationships. Then link the research results about the Chinese international port collaboration development strategy with OBOR initiatives to answer the second sub-research question. Finally, by applying the Strategic Positioning Analysis for ports to compare the competitive position before the OBOR and the current situation to draw the conclusion about the impact on Chinese seaport competitive position with the results of OBOR initiatives.

3.3 Strategic Positioning Analysis

SPA, which refers to the Strategic Positioning Analysis, is developed by Elvira Haezendonck, Alain Verbeke and Chris Coeck. It is a tool that describes the evolution of a port's competitive position in terms of growth, market share, diversification and value added (Haezendonck, et al., 2018). There are certain functions of this tool: firstly, it can provide the related statistical information in terms of recent change in the competitive position of diverse ports; secondly, it

can help make prediction regard of ports potential economic and future development; finally, it also enables more alternatives for strategic decision making. The required data for this approach is easily obtained, for instance, the actual traffic flows, so it is can be an advantage. However, the selection of competitors, traffic categories, and observation period should be taken prior to conducting the actual SPA (Haezendonck, et al., 2018).

To determine the competitive position, three analytical approaches are included, they are product portfolio analysis(PPA), shift-share analysis(SSA), and product diversification analysis(PDA). In this paper, we only take PPA as an analysing tool to study the competitive position of selected Chinese seaports.

3.3.1 Product Portfolio Analysis

The original PPA utilized two variables to interpret the performance of business and business units; they are market share and growth in a growth-share matrix. There is the big normative guidelines difference between a seaport's traffic portfolio and a company setting. For a normal company, the growth rate is coming from a number of investment and divestment decisions combined with the cross-financing to gain profit in specific business. But for port management bodies, they take the high market share, and the related traffic categories with a high value added as a critical growth rate. In conclusion, the overall recovery at the level of the whole port is important for port management bodies.

Base on the BCG-matrix, the strategic business units are translated into certain port sectors, for instance, the different traffic categories, like liquid bulk, dry bulk, containers, Ro-Ro and conventional cargo. They are considered as" strategic traffic units" (STUs) (Haezendonck, et al., 2018). There are four levels are used to indicate the versatility of PPA instrument. They are considered different ways of data analysis instead of a hierarchy of importance. But, the analysis starts from entire port system to a port then to a specific traffic category is a hierarchy between the STUs.

The first 'level' is comparing overall market shares and total growth rates of the selected ports. It provides an overall traffic evolution of ports. When it presents in the BCG-matrix, the vertical axis is the average growth ratio per year while the horizontal axis is the average market share.

The target objects of a second 'level' are the traffic structure of each port, which refer to the internal positioning analysis. Because in this level, although the research factors are still the share and growth rate, the range narrow down to traffic category in the port's total traffic. So, it will bring the conclusion about traffic flows of each seaport.

At the third 'level', the commodity group will be the researched portfolio while the ports that both involved in the certain product trade are objects. The results also present as market share and growth rate.

Finally, the fourth level is simply changed the vertical axis with the share of a

specific category instead of the share of this commodity in this range, which means how many shares of the each STUs within the seaport are being examined. This additional dimension enables both internal and external positioning analysis to be present in one figure at the same time. The four levels PPAs would give the researcher a deep insight into the competitive position of each seaport in the range and a dynamic analysis over a different period can be presented. A more specific conclusion about the changes can be drawn. There are four new terms defined by
Haezendonck et al. (2018) to describe the four possible positions of seaports in the matrix, which is shown as below:

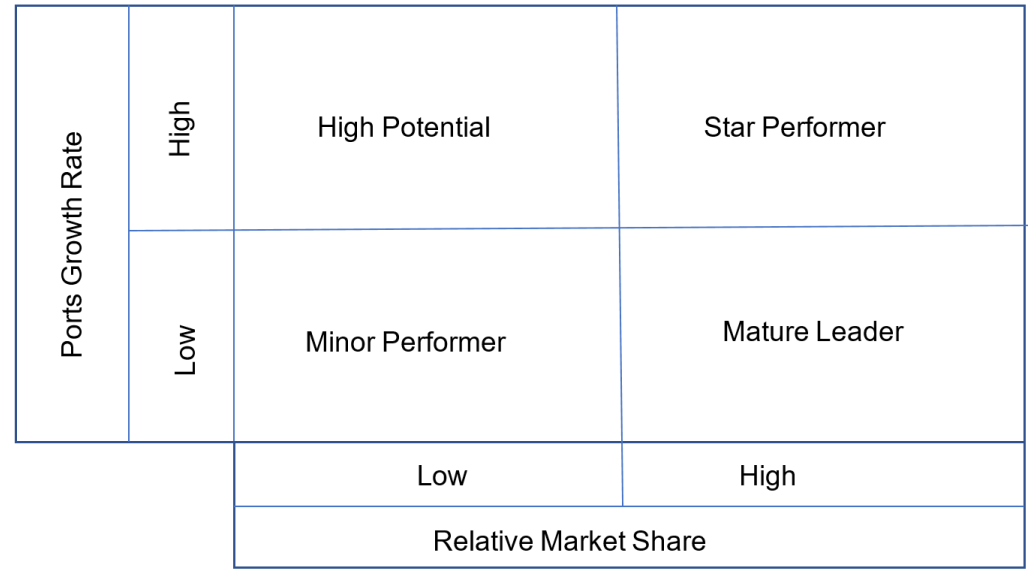

Table 6The classification matrix of ports based on Growth Rate and Market Share. Source (Haezendonck, et al., 2018)

3.4 Research Scope

As above illustrated, the research objects of this paper will be Chinese seaports who is involved in the international port collaboration during the OBOR period. The comparison and analysis will arrange firstly horizontally among the collaboration objectives categories while the scope is limited in the non-proximity collaboration relationships between China seaports and foreign ports. To ensure the collaboration relationships practical samples are enough for typology analysis of Section four, we scoped the time from 2012 to 2017 to list all the data available cases.

Secondly, because the OBOR initiative was first launched in 2013, so the year 2012 is taken as the research point present the situation before OBOR. Furthermore, since 2013, certain agreements are signed to promote the port international port cooperation, even until the latest days, plenty of policies and papers are issued. The latest data of seaport that we can access is in the year 2016, so the period 2012-2016 is our research scope for the section 5, the competitive position analysis.

4 Typology of Collaboration Strategies of Chinese seaports

4.1 *China seaports inter-organisational relationships patterns*

To develop a typology analysis of Chinses port collaboration beyond proximity, we followed Pallis and Kladaki (2016) ‘s methodology to collect the data firstly. Utilising the content analysis of certain port reports and desk research, the dataset related to the international collaboration relationships between Chinese port management bodies and other non-proximate ports or institutions is constructed. Every inter-organisational initiative is coded under date, part A (Chinese seaports), part B (the collaboration party), country B, location B, a form of international collaboration, and objectives. Only relationships established under OBOR initiatives period are selected.

As illustrated in chapter 3, Pallis and Kladaki (2016) categorised and encoded the objectives that the involved parties aim to achieve into 10 plus one main category, then further break them down into two-digit subcategories.

Base on their work and basic categorization structure and combined with the empirical practices of Chinese seaports cross-border relationships, we made a certain appropriate adjustment of the objectives. For instance, we deleted the CAT4 Nautical/Technical Services and CAT9 Crisis Management, since these two didn’t involve in any inter-organisational initiatives hosted by China and collaboration party. Then, because in certain agreements, they only mentioned about the objective to build the green ports in the future without detailing about though economic fuel development, environmental policy or renewable energy, so we conclude the original subcategories as Emission Reduction and Green Ports. Besides, under the CAT Port Management, the Monitoring &Reporting Processes are replaced as Process Optimization. Finally, the Development of Cruise Service is added under the CAT Port Growth, due to more than three agreements mentioned about this objective. So, below is the table of categorization of collaboration objectives in terms of the relationships between Chinese seaports and foreign seaports.

Category	Objective
CAT1	**Sustainability (Environmental)**
CAT1.1	Emission Reduction
CAT1.2	Green Ports
CAT2	**Regional Growth**
CAT2.1	Job Growth
CAT2.2	Boost Regional Economies
CAT3	**Logistics & Hinterland**
CAT3.1	Expertise in Logistics
CAT3.2	Hinterland and Logistics

CAT4	**Share& Exchange of know-how, Training**
CAT4.1	Exchange Expertise
CAT4.2	Exchange Knowhow
CAT4.3	Share Best Practices
CAT4.4	Share Strategies
CAT4.5	Training Programs
CAT5	**Infrastructure-Development**
CAT5.1	Greenfield Projects
CAT5.2	Port Development
CAT5.3	Port Infrastructure
CAT5.4	IT-Smart Port
CAT6	**Port Management**
CAT6.1	Process Optimization
CAT6.2	Port Business Plan
CAT6.3	Port Security
CAT7	**Port Commercial Management**
CAT7.1	Marketing
CAT8	**Port Growth**
CAT8.1	Promote Trade
CAT8.2	Cruise Service
CAT9	**To be clarified**

Table 7Categorization of collaboration objectives of Chinese Seaports
Source (Pallis & Kladaki, 2016) *part elaborated by the authors.*

The dataset is constructed with a total of 36 collaboration initiatives by Chinese seaports with non-proximate ports, or other commercial entities and institutions. But it is not all the international collaborative relationships built since 2013. Some of them lack objectives information so can't be taken to code. Also, the collaborative relationships with courtiers in Africa are relatively less compared with other lands in the dataset due to the lack of data.

The situation presented in table x revealing that Port Qingdao and Port Guangdong are the two most animate ports that actively involved in the international port relationships development. Below, we will present the Chinese seaports inter-organisation relationships patterns recorded table first, then the related analysis will follow.

Year	Part A	Part B	Country B	Location B	Project (If any specific)	Form of international relationship	Objectives seeking to be achieved	1-digit
2013	Qingdao Port	Pusan Port	Korea	Asia	-	Strategic Cooperation Agreement	CAT1.2 CAT4.2 CAT 6.1 CAT7.1	1,4,6,7
2013	Shenzhen Port	Halifax Port	Canada	North America	-	Sister Ports Agreements	CAT2.2 CAT8.1	2,8
2013	Beibu Gulf Port	47 ports in ASEAN countries	ASEAN	Asia	-	Cooperative network	CAT3.2 CAT5.2 CAT8.1	3,5,8
2014	Qingdao Port	Antwerp Port	Belgium	Europe	-	Sister Ports Agreements	CAT1.2 CAT3.1 CAT3.2 CAT5.1 CAT4.2 CAT4.5 CAT6.1 CAT 7.1	1,3,4,5,6,7
2014	Qingdao Port	DP World (Port of Jebel Ali & Port of Mina Rashid)	United Arab Emirates	Asia	joint venture partners	Strategic Framework Agreement	CAT1.2 CAT5.2 CAT4.5 CAT6.1 CAT6.2 CAT8.2	1,5,6,8
2014	Shanghai Port	Antwerp Port	Belgium	Europe	-	MOU	CAT4.2 CAT4.5 CAT3.2 CAT8.1	3,4,8

Year	Part A	Part B	Country B	Location B	Project (If any specific)	Form of international relationship	Objectives seeking to be achieved	1-digit
2014	Guangzhou Port	Tarragona Port	Spain	Europe	-	Sister Ports Agreements	CAT2.2 CAT3.1 CAT4.5 CAT5.2 CAT6.1 CAT8.1	2,3,4,5,6,8
2015	Qingdao Port	Gwadar Port	Pakistan	Asia	-	Sister Ports Agreements	CAT3.2 CAT5.3 CAT4.2 CAT4.3 CAT4.4 CAT8.1	3,4,5,8
2015	Qingdao Port	Sihanoukville Port	Cambodia	Asia	-	Sister Ports Agreements	CAT1.2 CAT5.2 CAT4.5 CAT6.2 CAT 6.1 CAT8.1	1,4,5,6,8
2015	Qingdao Port	Kuantan Port	Malaysia	Asia	-	Sister Ports Agreements	CAT1.2 CAT5.2 CAT4.4 CAT4.5 CAT6.1	1,4,5,6
2015	Beibuwan Port Fujian Fuzhou Port Guangzhou Port Jiangsu Taicang Port Ningbo Port Port of Dalian Shenzhen Port Port of Haikou Shanghai Port Xiamen Port Qingdao Port	Bintulu Port Johor Port Kuantan Port Malacca Port Port Klang Penang port	Malaysia	Asia	Port Alliance Membership	MOU	CAT4.3 CAT5.2 CAT5.5 CAT 8.1	4,5,8

Year	Part A	Part B	Country B	Location B	Project (If any specific)	Form of international relationship	Objectives seeking to be achieved	1-digit
2015	Shenzhen Port	Port Klang	Malaysia	Asia	-	Sister Ports Agreements	CAT4.2 CAT6.1 CAT1.2 CAT5.2 CAT5.5 CAT6.3	1,4,5,6
2015	Shenzhen Port	Indonesia Port Corporation II	Indonesia	Asia	-	Sister Ports Agreements	CAT4.2 CAT6.1 CAT1.2 CAT5.2 CAT5.5 CAT6.3	1,4,5,6
2015	Shenzhen Port	Djibouti Port	Djibouti	Africa	-	Sister Ports Agreements	CAT4.2 CAT6.1 CAT1.2 CAT5.2 CAT5.5 CAT6.3	1,4,5,6
2015	Guangzhou Port	Los Angeles Port Auckland Port	USA New Zealand	North America Australia	-	MOU	CAT1.1 CAT2.2 CAT4.1 CAT4.3 CAT4.4 CAT5.2 CAT8.1	1,2,4,5,8
2015	Guangzhou Port	Laem Chabang Port	Thailand	Asia	-	Sister Ports Agreements	CAT4.3 CAT8.1	4,8
2015	Guangzhou Port	St. Petersburg Port	Russia	Europe	-	Sister Ports Agreements	CAT1.1 CAT4.5 CAT6.1	1,4,6

	Part A	Part B	Country B	Location B	Project (If any specific)	Form of international relationship	Objectives seeking to be achieved	1-digit
2015	Guangzhou Port	Antwerp Port	Belgium	Europe	-	Sister Ports Agreements	CAT4.5	4
2015	Guangzhou Port	Port Klang	Malaysia	Asia	-	Sister Ports Agreements	CAT8.1	8
2015	Guangzhou Port	Mundra Port	India	Asia	-	Sister Ports Agreements	CAT4.1 CAT5.2 CAT5.3 CAT6.1 CAT6.2 CAT8.1	4,5,6,8
2015	Haikou Port	Port Klang	Malaysia	Asia	-	Sister Ports Agreements	CAT4.2 CAT4.5 CAT5.2 CAT5.3 CAT8.1	2,4,5,8
2015	Beibu Gulf Port	Port Klang	Malaysia	Asia	-	Sister Ports Agreements	CAT4.2 CAT4.5 CAT5.2 CAT5.3 CAT8.1	4,5,8
2015	Taicang Port	Port Klang	Malaysia	Asia	-	Sister Ports Agreements	CAT3.1 CAT4.2 CAT4.5 CAT8.1	3,4,8
2016	Qingdao Port	Wilhelmshaven	Germany	Europe	-	Strategic Framework Agreement	CAT3.2 CAT6.1 CAT4.5 CAT3.1 CAT5.1 CAT1.2 CAT8.1	1,3,4,5,6,8

Year	Part A	Part B	Country B	Location B	Project (If any specific)	Form of international relationship	Objectives seeking to be achieved	1-digit
2016	Qingdao Port	Miami Port	USA	North America	-	Sister Ports Agreements	CAT1.2 CAT3.2 CAT5.1 CAT5.2 CAT4.5 CAT6.1 CAT8.2	1,3,4,5,6,8
2016	Guangzhou Port	Hamburg Port	Germany	Europe	-	Sister Ports Agreements	CAT1.2 CAT2.2 CAT3.2 CAT4.5 CAT5.4 CAT8.1	1,2,3,4,5,8
2016	Guangzhou Port	Savannah Port	USA	North America	-	Sister Ports Agreements	CAT1.2 CAT2.2 CAT3.2 CAT4.2 CAT4.4 CAT4.5 CAT8.1	1,2,3,4,8
2016	Guangzhou Port	New Jersey Port	USA	North America	-	Sister Ports Agreements	CAT1.2 CAT2.2 CAT3.2 CAT4.2 CAT4.4 CAT4.5 CAT8.2	1,2,3,4,9
2016	Guangzhou Port	Malacca Port	Malaysia	Asia	-	Sister Ports Agreements	CAT4.5 CAT3.1 CAT5.3 CAT5.4 CAT8.1	3,4,5,8

Year	Part A	Part B	Country B	Location B	Project (If any specific)	Form of international relationship	Objectives seeking to be achieved	1-digit
2016	Beibu Gulf Port	Muara Port	Brunei	Asia	-	Joint Venture / Investments	CAT2.2 CAT3.2 CAT5.3 CAT5.4 CAT6.2 CAT7.1 CAT8.1	2,3,5,6,7,8
2017	Qingdao Port	St. Petersburg Port	Russia	Europe	-	Sister Ports Agreements	CAT1.2 CAT5.1 CAT4.3 CAT4.5 CAT6.1 CAT6.2	1,4,5,6
2017	Shenzhen Port	Inchon Port	Korea	Asia	-	Sister Ports Agreements	CAT1.2 CAT4.5 CAT5.3 CAT5.4 CAT6.1 CAT6.3	1,4,5,6
2017	Guangzhou Port	Quebec Port	Canada	North America	-	Sister Ports Agreements	CAT1.2 CAT3.1 CAT4.5 CAT5.4 CAT6.1 CAT8.1	1,3,4,5,6,8
2017	Guangzhou Port	Indonesia Port Corporation II	Indonesia	Asia	-	Sister Ports Agreements	CAT4.3 CAT2.2 CAT4.5 CAT8.1	2,4,8

Year	Part A	Part B	Country B	Location B	Project (If any specific)	Form of international relationship	Objectives seeking to be achieved	1-digit
2017	Guangzhou Port	Aleksandr polis Port	Greece	Europe	-	Sister Ports Agreements	CAT1.2 CAT3.2 CAT4.5 CAT5.4 CAT4.3 CAT8.1	1,3,4,5,8
2016/2017	Shenzhen Port	Antwerp Port Busan Port Gdansk Port Inchon Port Kelang Port Rotterdam Port Taranto Port Barcelona Port Colombo Port Hamburg Port Riga Port Sohar Port Zeebrugge Port Jakarta Port Copenhagen-Malmo Port Halifax Port	Belgium Korea Poland Malaysia Netherland Italy Spain Sri Lanka Germany Indonesia Latvia Oman Denmark Canada	Asia Europe North America	Strategic Port Chain	Joint Declaration	CAT1.2 CAT2.2 CAT4.2 CAT4.3 CAT5.4 CAT8.1	1,2,4,5,8

Table 8 Inter-organizational relationships patterns recorded (Chinese Port management bodies)
Source: Elaborated by the author, based on several sources

4.2 *Typology analysis of Chinese seaports cross-border collaboration relationships*

Grounded in chapter 4.1, we depicted the "objective patterns" that each collaboration agreement is aiming to form. Firstly, we will present the frequency of these objectives. Most of the relationships aimed to achieve multiple collaboration results, and certain patterns are mentioned with an extremely high frequency.

	Number of times each objective (encoded in categories)								
Port	CAT 1	CAT 2	CAT 3	CAT 4	CAT 5	CAT 6	CAT 7	CAT 8	Tot-al
Qingdao Port	8		4	9	9	8	2	6	46
Shenzhen Port	5	2		6	6	4		3	26
Beibu Gulf Port		1	2	2	4	1	1	4	15
Guangzhou Port	7	6	7	14	8	4		12	58
Shanghai Port			1	2	1			1	5
Taicang Port			1	2	1			2	6
Haikou Port		1		2	2			2	7
Fujian Fuzhou Port				1	1			1	3
Ningbo Port				1	1			1	3
Dalian Port				1	1			1	3
Xiamen Port				1	1			1	3
Total	20	10	15	41	35	17	3	34	

Table 9Configuration of objectives patterns of selected seaports
Source: Elaborated by author

Regards the table above, we can conclude certain trends: CAT4, CAT5 and CAT 8 are mostly chosen among the objectives categories, which refer to *Share &Exchange of know-how, Training, Infrastructure-Development, and Port Growth*. In addition, the patterns diversity of each port will present in the following Fig.6, Port Fuzhou, Port Ningbo, Port Dalian and Port Xiamen will not be included in the graph, since there is only one group to group alliance relationship they are recorded for, so the value for researching the diversity is limited.

There are notable differences between each participant ports' collaboration objectives which also reveals corresponding port development strategy preferences. Port of Guangzhou is the port management entity with the wider range of objectives pursued with its non-proximate collaboration relationships; 58 different goals including seven CATs have been recorded. Coincidentally, Qingdao port also actively raise the cross-border relationships with 46 goals targeted under all CAT categories except CAT2 *Regional Growth*. Both two ports put their key point on CAT4, *Share &Exchange of know-how, Training,* while Qingdao port have CAT5 *Infrastructure-Development* and CAT6 *Port Management* followed and Guangzhou Port more focus on *Port Growth* (CAT8).

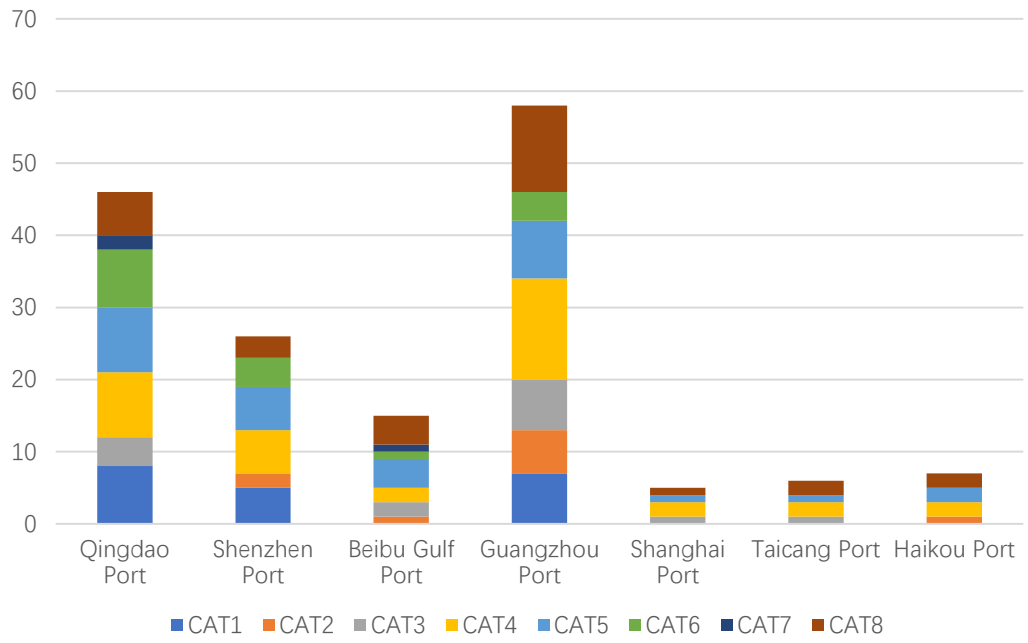

Figure 6Configuration of Objectives pursued per port
Source: Elaborated by author

Another element worth explored is the type of relationship among the selected data set. From Fig.7, there are seven types of inter-organisational relationships formats that observed by the researcher, they are:

-Strategic Cooperation Agreement
-Sister Ports Agreements
-Joint Declaration
-MOU (Memorandum of Understanding)
-Cooperative network
-Joint Venture /Investments
-Strategic Framework Agreement

Comparing with the strategic cooperation agreement, the framework agreement is more extensive, it only enables both parties to reach a consensus for collaboration, as for the detailed projects or KPI still need to sign a strategic cooperation agreement. The strategic framework agreement only provides a simple rule, an intention, and a principle to avoid conflict and share benefit. In contrast, the strategic cooperation agreement is contracted document that signed by both sides with the clear definition of duties and obligations. In this point of view, the latter presents a tighter relationship in terms of port inter-organisations collaboration. Both two agreements not only can be signed between two ports, but ports also signed with domestic banks, shipping companies or terminal operators.

The MOU also only provide a general collaboration intention and still need the following strategic framework and cooperation agreement to promote the corporation. As for the most adopt relation, Sister ports agreement is the first step

the Chinese seaports take to start to link with the non-proximity port. Certainly, plenty of detailed agreements related to single objectives will be signed in coming years.
All the agreements in the dataset are an official agreement signed by both parts involved. Fig .7 present the forms of these relationships as developed by each port collaboration patterners. As we can see, the Sister Port Agreement is the main form for collaboration between the two parties. Except for Shanghai Port, every port in the dataset has one or more sister port agreements signed during the OBOR period. But it doesn't illustrate that Shanghai Ports doesn't have sister ports. Only because most of the relationship already had been built before OBOR initiatives launched, which beyond the research scope of this paper.

As it might have been expected, Guangzhou Port is the most active port management body with most relationships established. But under this dimension, Qingdao Port has more sophisticated forms of collaboration comparing with Guangzhou Port, and still, the sister port agreements place a relatively big part of all collaboration practices. Lastly, it is worth mentioning that although Beibu Gulf port only has 4 collaboration partnerships recorded in the dataset, all the four relationships are varied, which appeal that the port authority actively attempts to different possible collaboration forms to promote the port development.

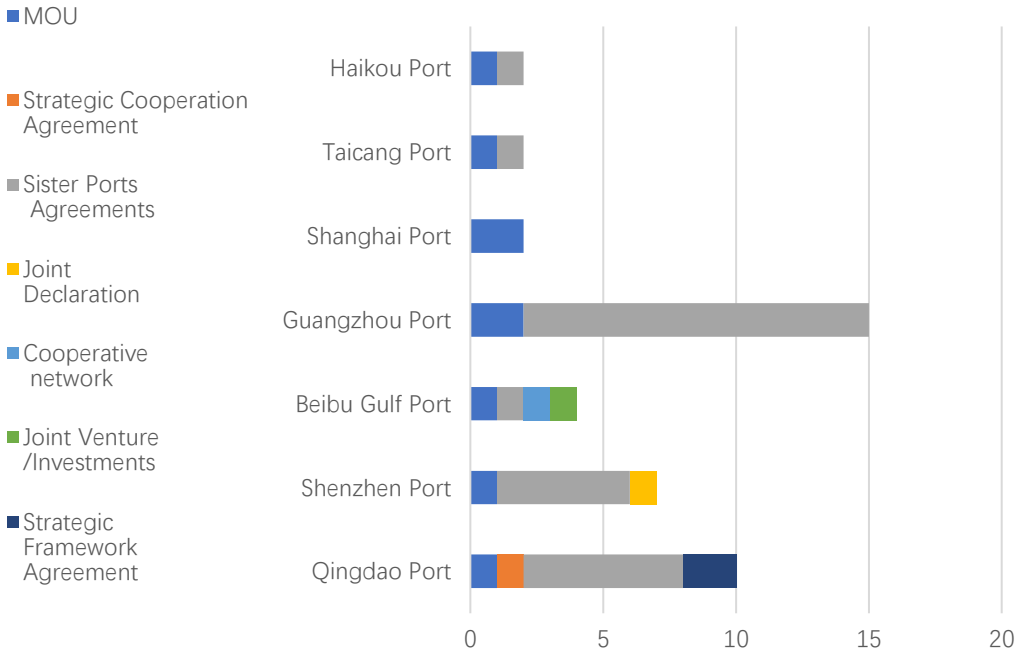

Figure 7Structure of collaboration relationships
Source: Elaborated by the authors

For the geography of the established relationships, Fig.8 enables us to observe a geography distribution of collaboration relationship of Chinese seaport which will certainly in accordance with the strategic view of OBOR initiatives. Asia countries most closely with China seaports and they play vital roles in the building of One Belt and One Road. So, compared with another continent, Asia has built the most relationships with China with Europe and North America followed. In addition, Asian counties also place the biggest collaboration port scope since the

port alliance between China and Malaysia included 11 Chinese seaports at once.

Then switch the X axis and Y axis, we can see from Graph 4, both Shenzhen port and Guangzhou Port have the non-proximate collaboration relationships with four continents.

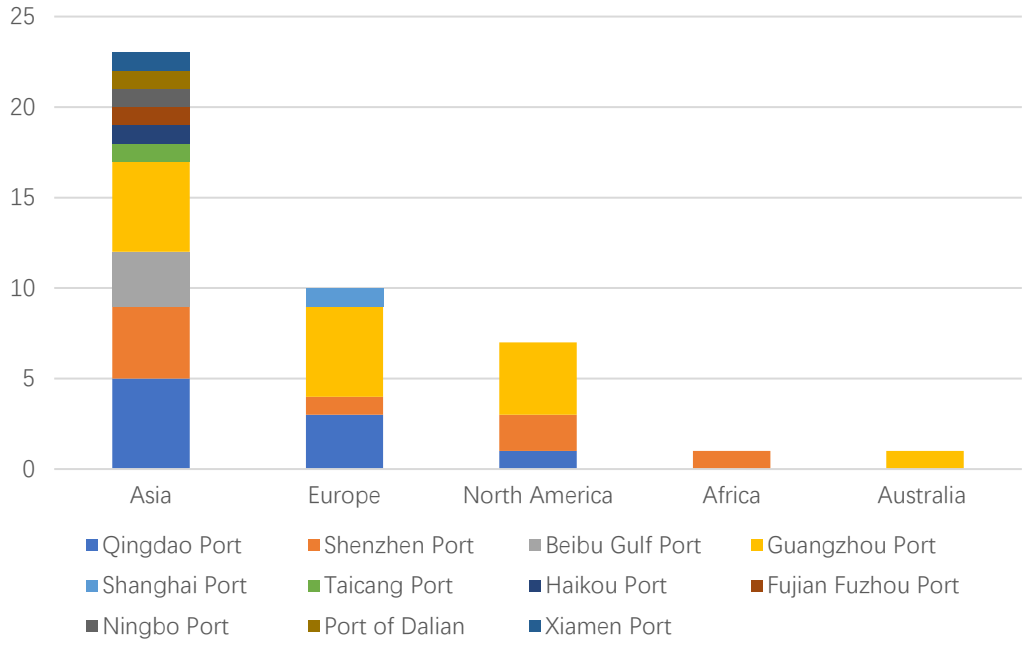

Figure 8 The geography of non-proximate ports collaboration (1)
Source: Elaborated by author

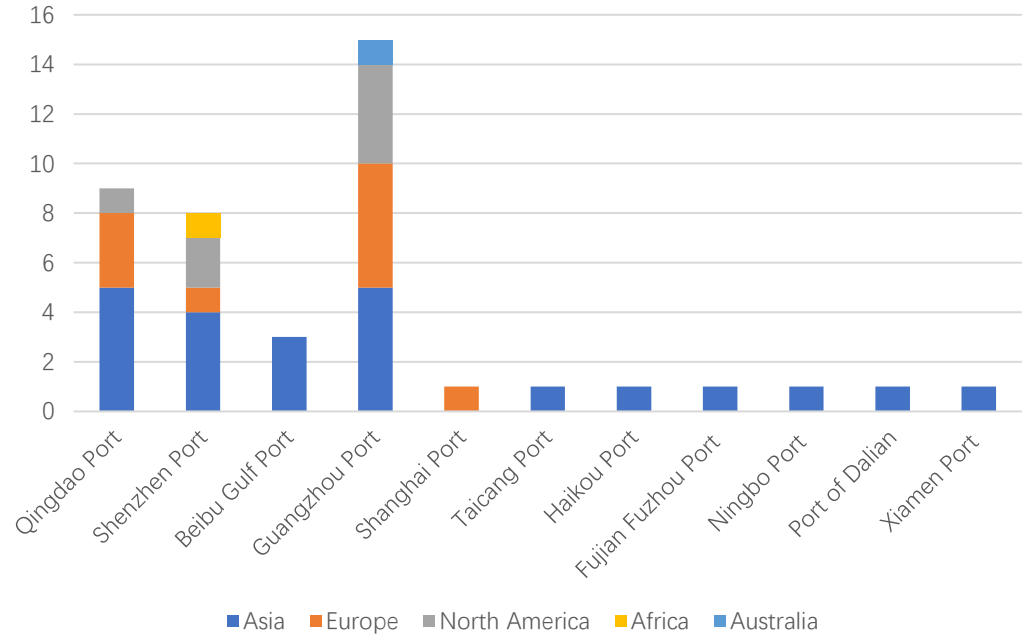

Figure 9The geography of non-proximate ports collaboration (2)
Source: Elaborated by the authors

5 SPA of Guangzhou Port and Qingdao Port within OBOR period

5.1 *Introduction*

According to the above typology analysis of all relationships, we choose two of the most active ports who most involved in the port cross-border collaboration, Guangdong Port and Qingdao Port to continue the analysis. the PPA analysis will be applied to appeal the impact on ports' competitive position during the OBOR on the results of an international collaboration of China. Other ports that have less collaboration cases were not chosen as research objects because they also didn't take international relationship development as main operation strategy, so the link between international cooperation and impact on port competitive position is weaker compared with Guangzhou port and Qingdao Port.

Guangzhou Port, as one of China's top five largest ports, can handle container vessels up to 20,000 TEU in size (Lloyd's List, 2017). Also, Guangzhou Port is actively seeking out new trade links and collaborative relationships to boost commercial opportunities as a part of OBOR initiatives. There is a three-year plan implemented by Guangzhou Port to help itself develop into an international shipping hub. The plan includes, for instance, allowing Cosco Shipping to set up its South China headquarters; signing the agreement with Guangdong province's transportation department to develop the Guangzhou Shipping Exchange (centres for exchange information, big data analysis, and port and shipping economics operation monitoring centre) (Lloyd's List, 2017). Lastly, from 2015 to 2017, Guangzhou port has signed the sister port agreements with over 20 ports, and for now, the friend circle of Guangzhou Port have increased to 41 ports.

Hundreds of years ago, Qingdao was the start point for the northern line of the Maritime Silk Road. Nowadays, Qingdao becomes the only sea-land "double-positioning "city in the "Belt and Road" initiative: it is the main hub city of the New Asia-Europe Continental Bridge Economic Corridor, moreover, the fulcrum of the 21st Century Maritime Silk Road. As one of the biggest ports in China, Qingdao port is not only boomed as a reginal hut with its special location, but also become an internationalized port with the pushing of OBOR initiatives. It links over 700 ports among about 180 countries and regions to become the world 7th ports no matter in tonnage or container TEU. It mainly engaged in handling containers, crude oil, iron ore, coal, grain and international passage transportation service.

According to the typology analysis in section 4.1, we conclude that Qingdao port can be one of the most active collaboration ports due to its 21 sister agreements with foreign ports all around the world. Especially 12 of them are signed since 2013, which aligned with our research time scope. So, below, the SPA of Guangzhou port and Qingdao port will be applied based on data in 2012 (before OBOR) and data in 2016 (the latest published data) to further explore the competitive position situation since OBOR started in 2013.

For all considered seaports, three different traffic categories are distinguished; they are abbreviated as Dry Bulk(DB), Liquid Bulk(LB), and containers(CONT).

The reason that why we chose these three categories is among the selected ports, these three categories of data are all available. Certain ports have the throughput of another type of cargo, but if not all port has the data of this cargo, the SPA will be invalidated. The data of traffic figures are collected from the China Ports Year Book, which is published by China's Ministry of Transport, to ensure the data is reliable for effectively applying the PPA-instrument.

5.2 *Product Portfolio Analysis*

In this part, we will present the results of 2012 and 2016 at the same time to attain the direct description of the impact. All the results figures are weighted based on “Range rule”, which refer to three tons of containers equal to five tons of dry bulk and 13 tons of liquid bulk (Haezendonck et al., 2000). During the data collection process, we found that all the container data of individual China Port is provided in TEU. Only the container tonnage throughput of the whole country is provided. But in the PPA model, the weight of containers is required. There is not an official convert rate between tonnage and TEU in China, so we based on the available data from China Port Year Book, use the total container tonnage throughput of whole country data in 2011,2012,2015, and 2016 divided by the container TEU, then calculate the average conversion rate is close to 11. So, during the model calculation present below, we will take 11 as the convert rate from TEU to Tonnage for each port.

All the results are shown graphically by several figures; the different level analysis is presented. In each diagram, a bold horizontal line is the data of average growth rate of a port set or the traffic category while the bold vertical line presents the market share within range or in individual port’s traffic.

5.2.1 *Guangzhou Port*

Guangzhou Port is the biggest comprehensive port in south China. In 2016, with the total 520-million-ton throughput become the top one among Pearl River Delta region. In addition, its container throughput ranks second within the region, which refers to 18.58 million TEU. The superior location, a strong hinterland and a complete set of supporting facilities enable Guangzhou Port to become a port management body with high competitiveness. According to the year report of Guangzhou port (Guangzhou Port, 2017), their main competitors are located within Pearl River Delta region, which refers to Shenzhen Port, Hongkong port, Zhuhai Port, Huizhou Port. The report pointed that within the Pearl River Delta region (PRD), the ports patterns are constructed that the pivotal port, Hongkong port along with main ports, Guangzhou port and Shenzhen Port, linked with feeder ports, Zhanjiang Port, Zhuhai port and Huizhou Port. Because we cannot find the validate throughput data of Hongkong Port, so except it, the above-mentioned ports formed the port portfolio of the following PPA to present the competitive position results of Guangzhou Port. They are abbreviated as, Guangzhou port (G), Shenzhen Port(S), Zhanjiang Port(ZJ), Zhuhai port(Z) and Huizhou Port(H).

5.2.1.1 *Portfolio of Ports for Total Traffic (Level 1)*

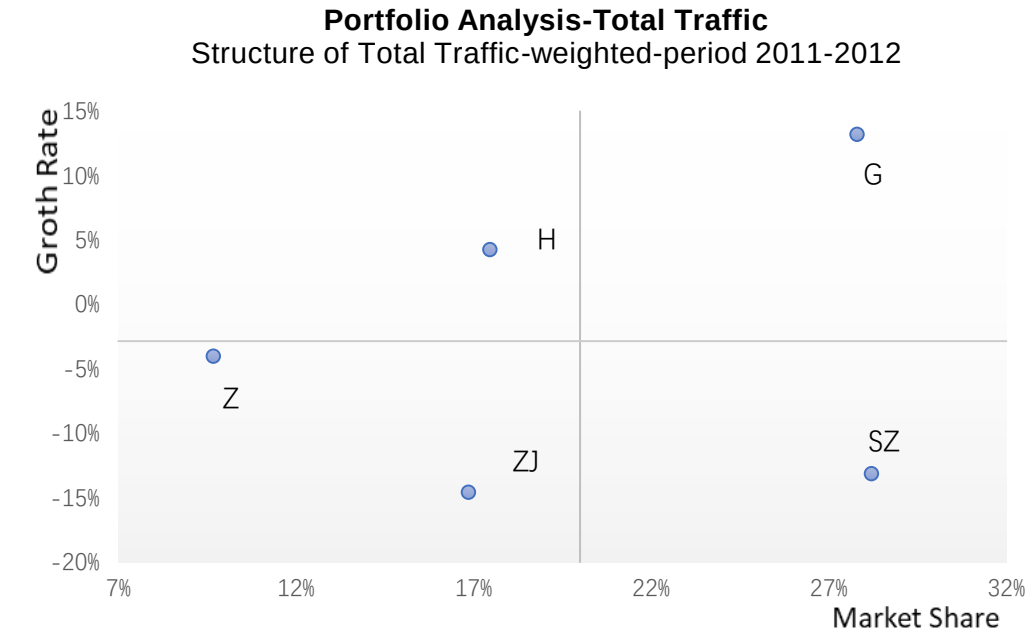

Figure 10Guangzhou port set portfolio of Ports with their Total Traffic in the selected range (2011-2012)-Weighted Analysis.
Source: Calculations Based on Port Statistics.

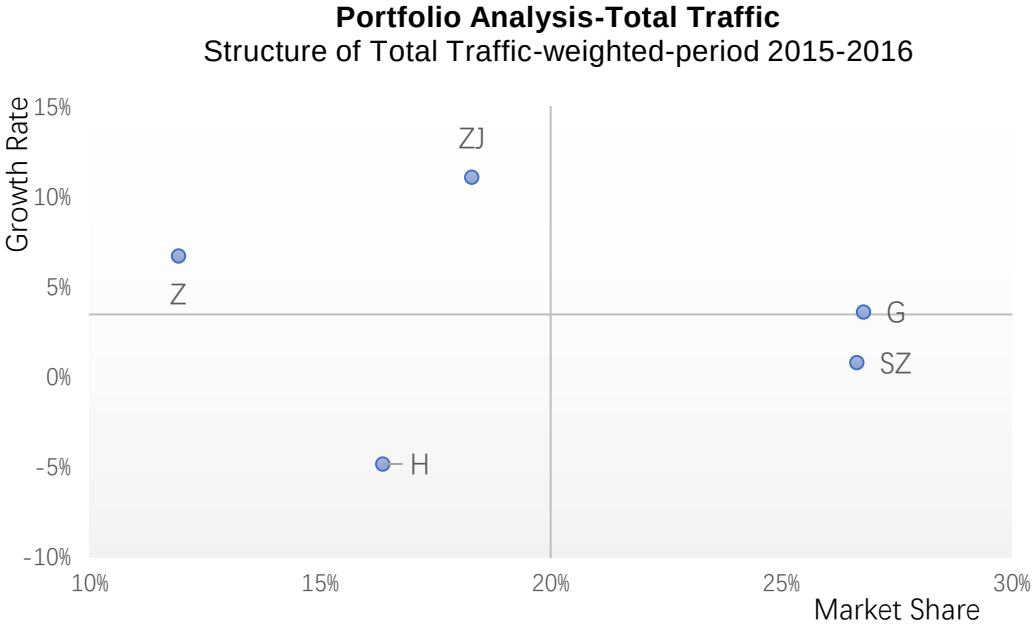

Figure 11Guangzhou port set portfolio of Ports with their Total Traffic in the selected range (2015-2016)-Weighted Analysis
Source: Calculations Based on Port Statistics.

In Fig. 10 and Fig. 11 presented the Guangdong port and its competitors as a portfolio of ports. Based on their market share in the total port range and the annual

growth rate of traffic volume of the year 2012 and year 2016, these five ports are positioned in the growth-share matrix. The weighted analysis showed that in 2012, Guangzhou Port positioned itself as “Star Performer” with its relatively high market share and growth rate. When turning to 2016, its position located between “Star Performer “and” Mature Leader”, but we can still observe the development trend that Guangzhou could be the “Mature Leader” in the future.

5.2.1.2 *Portfolio of Traffic Categories for Individual Seaports (Level 2)*

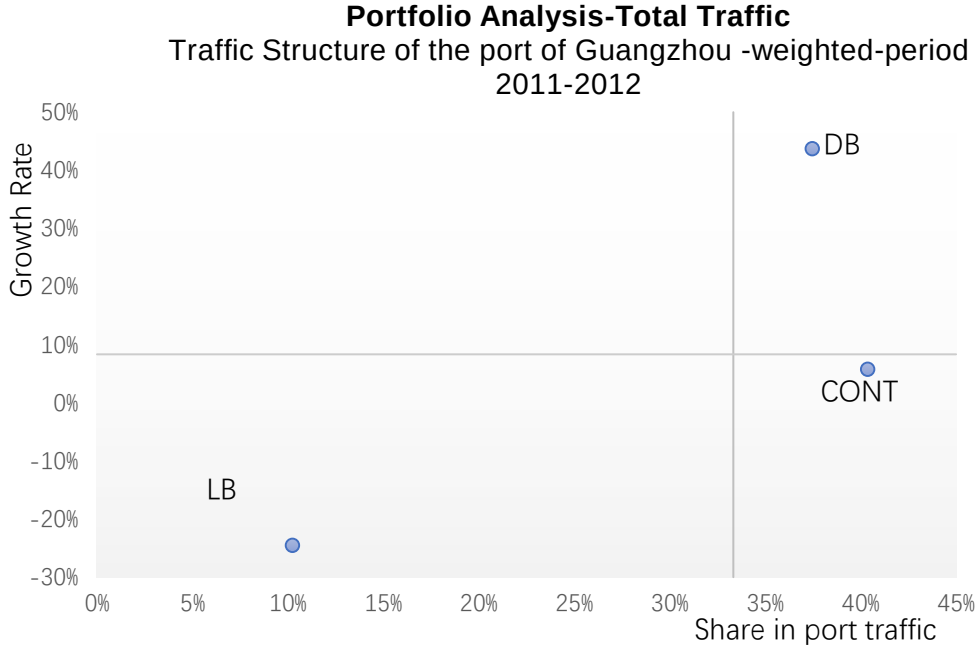

Figure 12Traffic Structure of the Guangzhou Port (2011-2012)- Weighted Analysis.
Source: Calculation based on port statistics

Fig.12 and Fig.13 show the weighted traffic structure of Guangzhou Port in 2012 and in 2016. Following the rule that the value of3 tons containers equal to 5 tons dry bulk and 13 tons liquid bulk. Three traffic categories are selected, which are liquid bulk, dry bulk, and container. In addition, the X-axis present the relative share of each category in the total traffic while Y-axis related to growth rate. Guangzhou Port has clearly been fast growing for containers. From 2012 to 2016, the containers traffic moved from a “Mature Leader” to “Star Performer”, with apparently higher growth rate. At the same time, liquid bulk also has an apparently better growth rate. In contrast, share in port traffic or growth rate, the dry bulk both has a dramatic decline, which shifts it from “Star Performer” to “Minor Performer”.

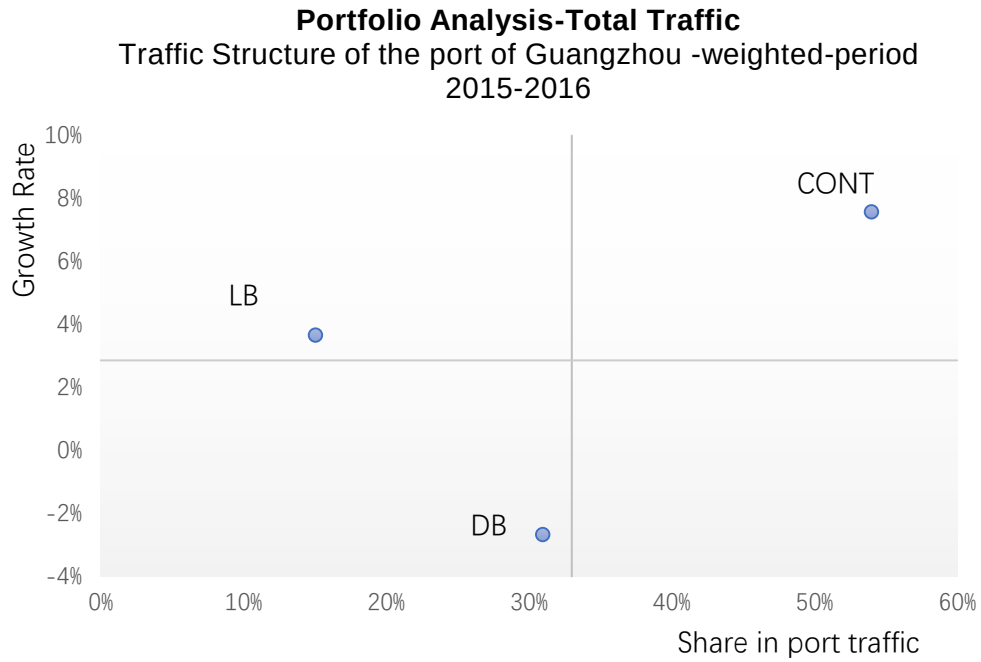

Figure 13 Traffic Structure of the Guangzhou Port (2015-2016)- Weighted Analysis.
Source: Calculation based on port statistics

5.2.1.3 *Portfolio of Ports for Individual Traffic Categories (Level 3)*

In Fig.14to Fig.19, the third level of PPA is shown graphically. We analysed the Guangzhou port set for the container, dry bulk and liquid bulk categories. Within each traffic category, both the competitive positions of individual ports is presented of the year 2012 and year 2016.

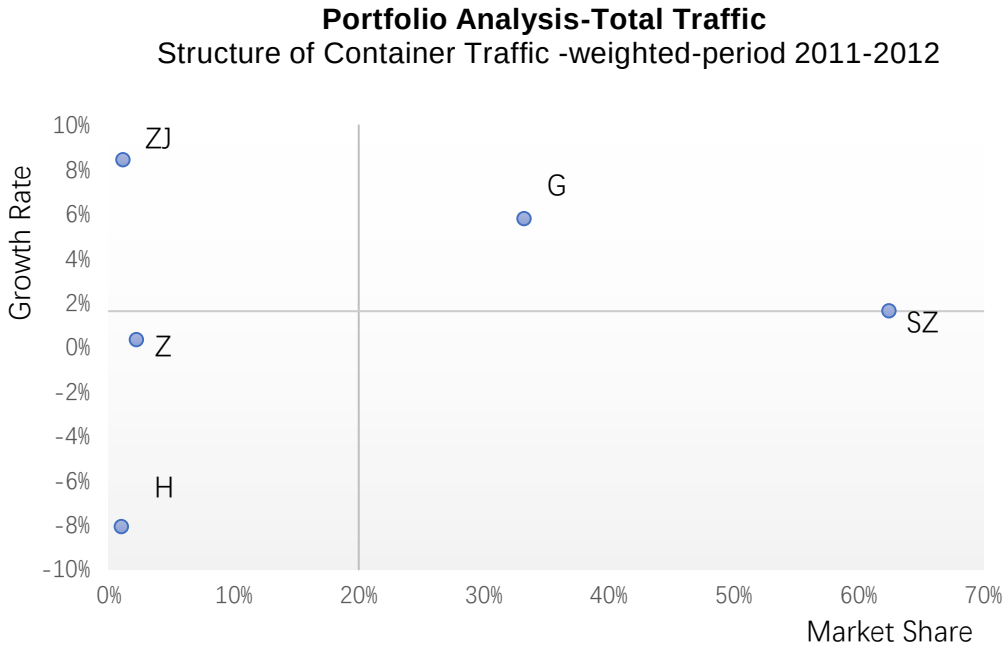

Figure 14Structure of container traffic in the Guangzhou Port set (2011-2012)-

weighted analysis.
Source: Calculations based on port statistics.

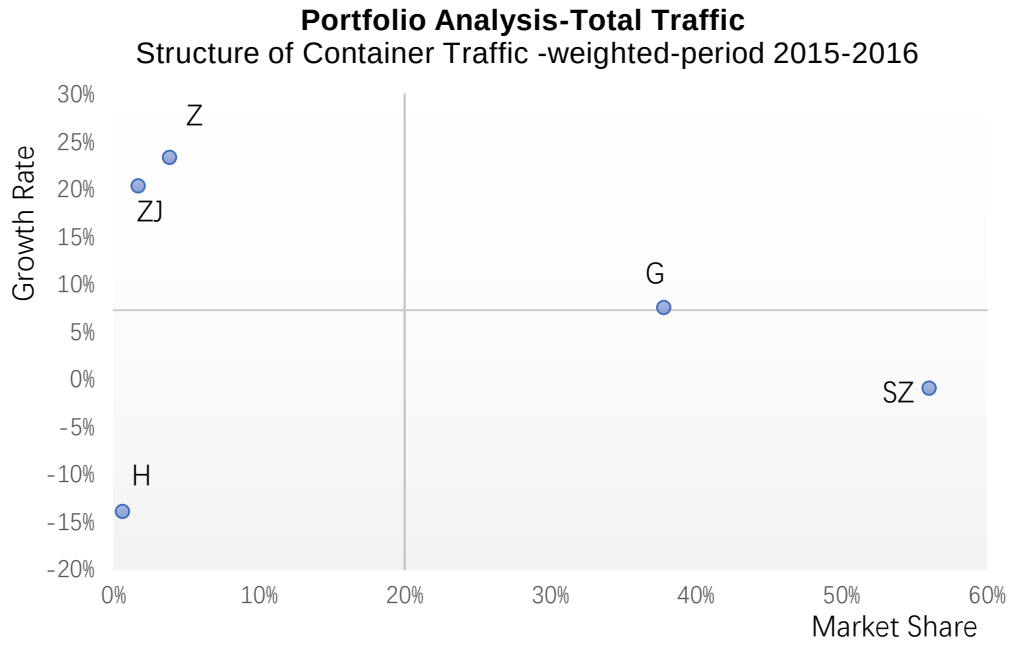

Figure 15 Structure of container traffic in the Guangzhou Port set (2015-2016)-weighted analysis.
Source: Calculations based on port statistics.

As showed in Fig. 14 and Fig.15, the position of Guangzhou Port is similar to the total traffic position. Containers traffic is the main cargo type could be related to it. From 2012 to 2016, the market share of Guangzhou 's containers is boosted, which also keep Guangzhou Port stay at the right side. But the position is always "Star Performer", and in 2016 moves to the boundary of "Star Performer" and "Mature Leader". Fig.16 and Fig.17 show that in terms of dry bulk, it has the same situation as containers, the difference is that in 2016, Guangzhou Port was totally becoming a "Mature Leader" within range.

The last category is liquid bulk, no matter in 2012 or 2016, the market share of Guangzhou Port always below the average value. But, the liquid bulk of Guangdong Port is "Minor Performer" before OBOR, while based on the latest data it becomes "High Potential" with a higher growth rate.

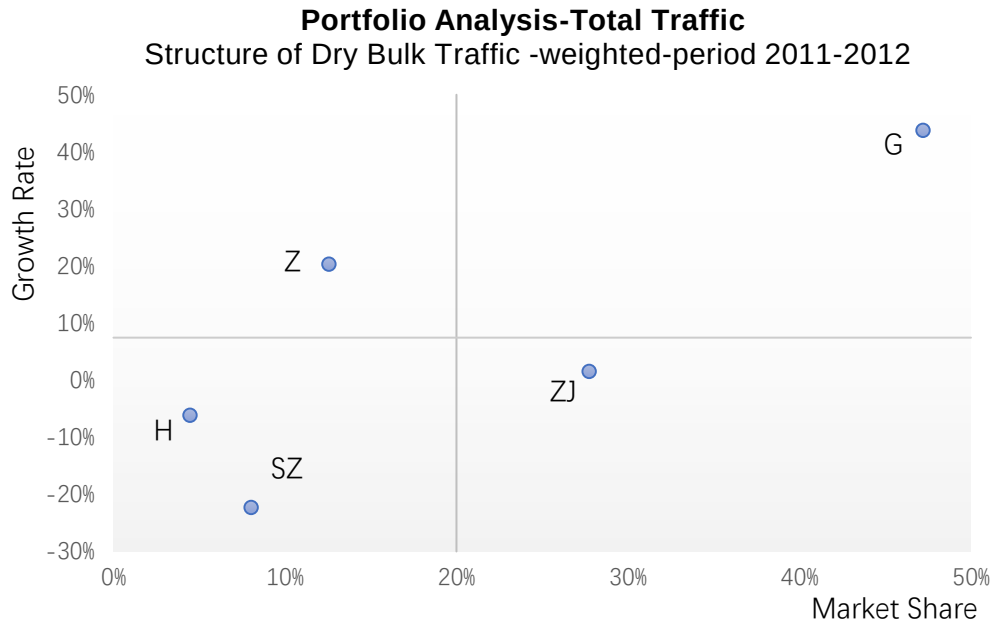

Figure 16Structure of dry bulk traffic in the Guangzhou Port set (2011-2012)-weighted analysis.
Source: Calculations based on port statistics.

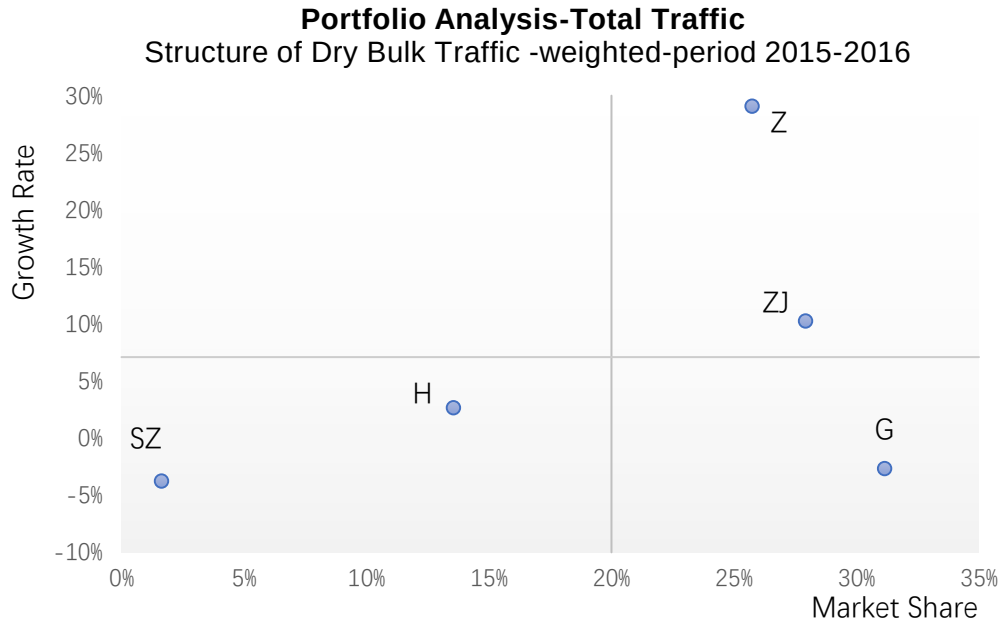

Figure 17Structure of dry bulk traffic in the Guangzhou Port set (2015-2016)-weighted analysis.
Source: Calculations based on port statistics.

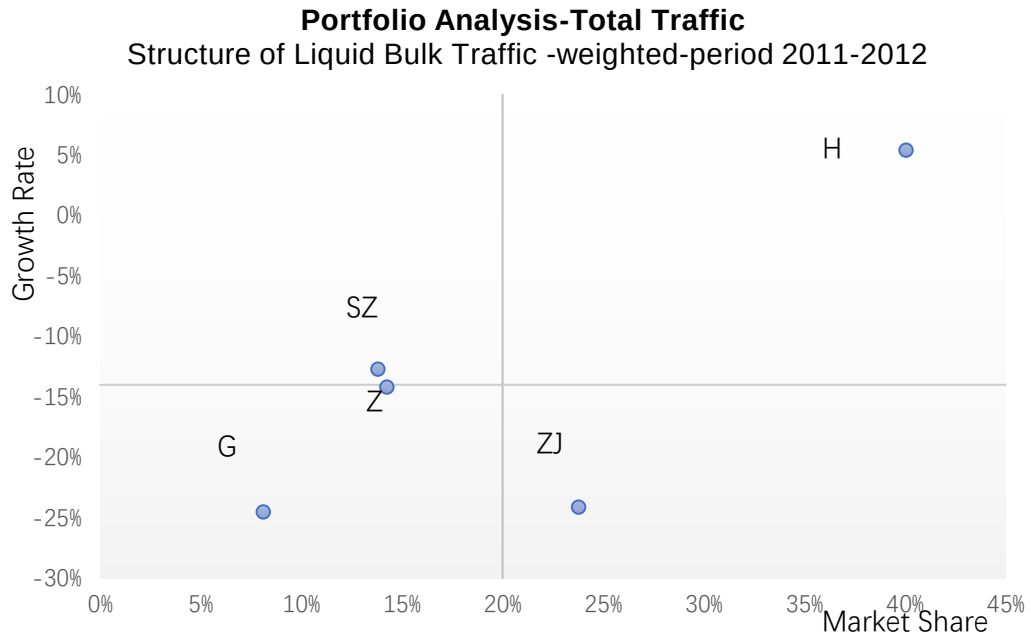

Figure 18Structure of liquid bulk traffic in the Guangzhou Port set (2011-2012)-weighted analysis.
Source: Calculations based on port statistics.

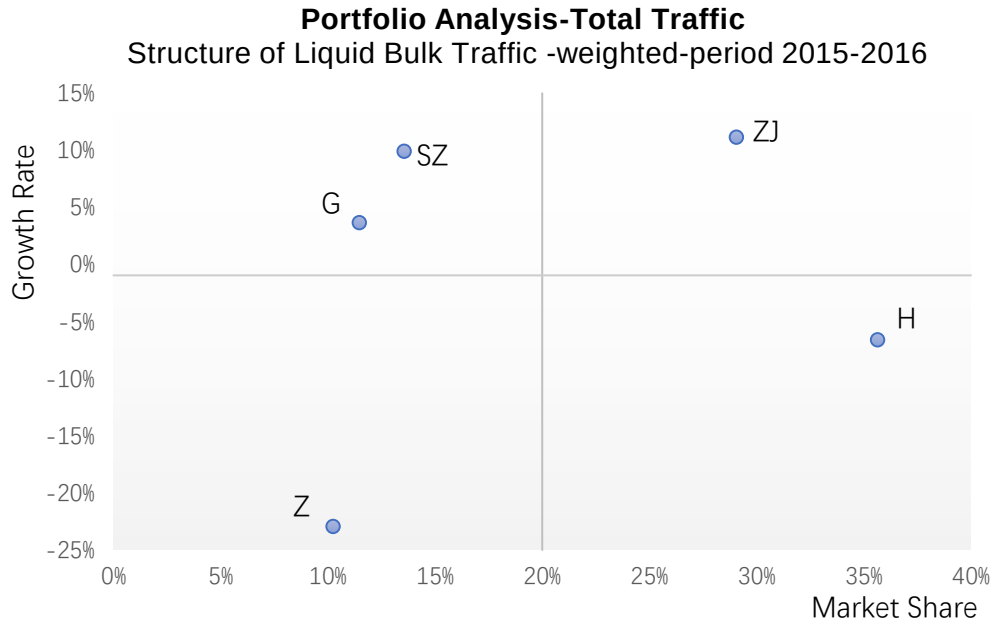

Figure 19 Structure of liquid bulk traffic in the Guangzhou Port set (2015-2016)-weighted analysis.
Source: Calculations based on port statistics.

5.2.1.4 *Portfolio of Ports for Individual Traffic Categories, related to these Categories' Share in Port Traffic and Share in the Range (Level 4)*

Fig. 20 to Fig. 25 are a visualization of the "fourth level". Different with level 3, in level 4 the X-axis represents the share of a specific category within a port. The third dimension of this level is the size of the bubble which shows the percentage of ports' traffic volume in terms of selected port range. Same as before, the vertical and horizontal bond line are the average value.

Compared with strong competitor, Shenzhen Port, the container traffic market share of Guangzhou Port always lower than Shenzhen port, but the size of the bubble is increased during OBOR which means the market share of Guangzhou Port also has developed. In addition, Guangzhou port is continually a "Star Performer", which is aligned with the conclusion of Level 3.

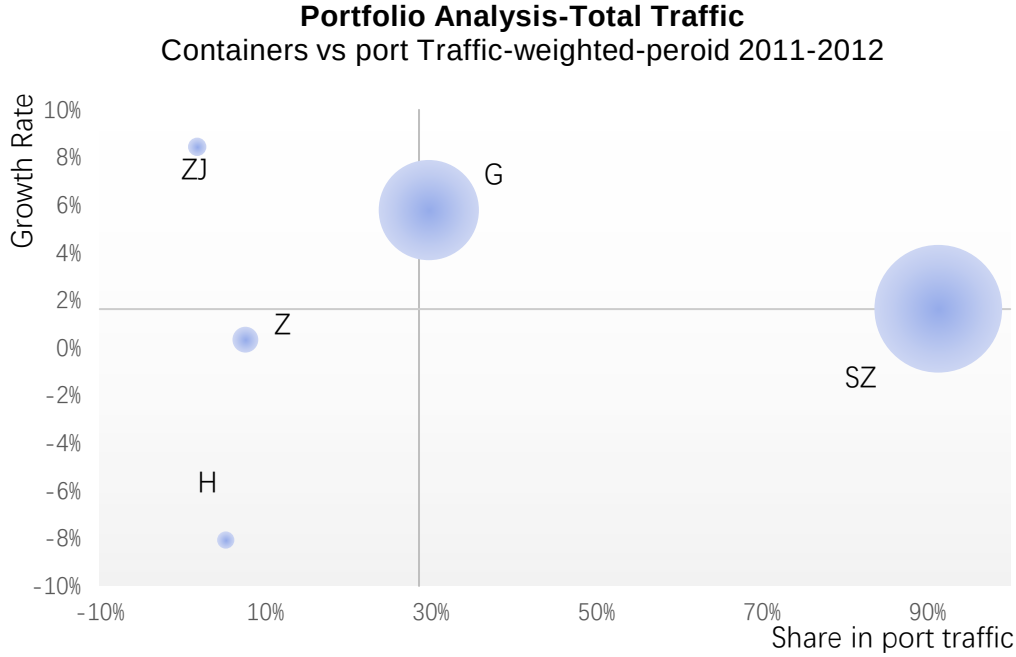

Figure 20Analysis of total container traffic (versus total port traffic) of the Guangzhou port set range (2011-2012)- Weighted analysis.
Source: Calculations based on port statistics.

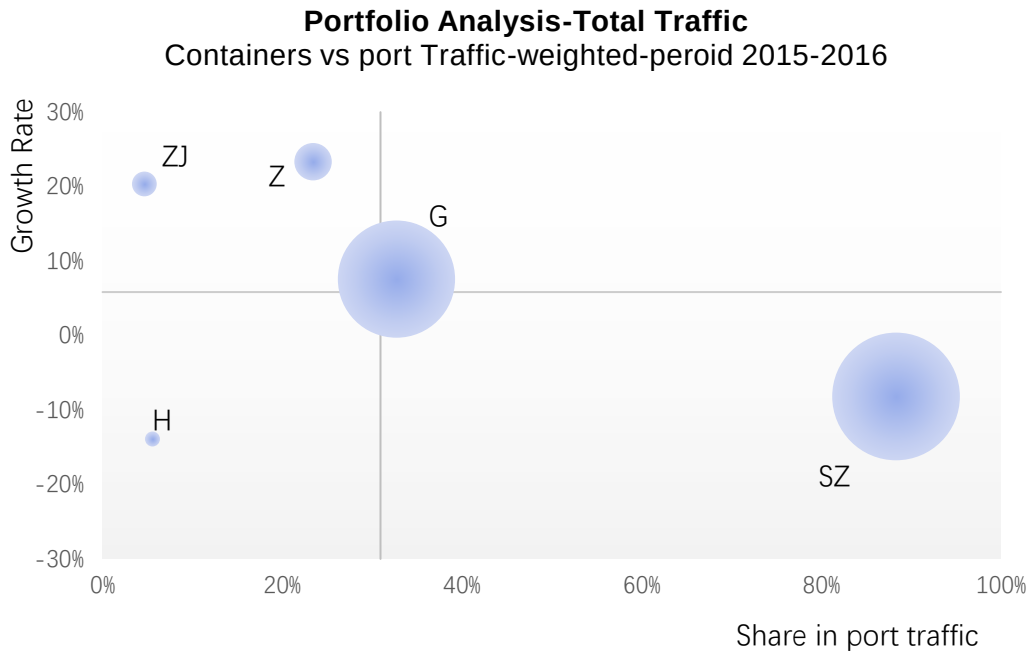

Figure 21Analysis of total container traffic (versus total port traffic) of the Guangzhou port set range (2015-2016)- Weighted analysis.
Source: Calculations based on port statistics.

Fig.22 and Fig.23 are the graphics of dry bulk. Guangzhou Port, with its relatively high port volume market share, the position of dry bulk traffic transferred from "High Potential" to "Minor Performer", which revealed that the OBOR didn't bring better development for Guangzhou Port in terms of dry bulk traffic.

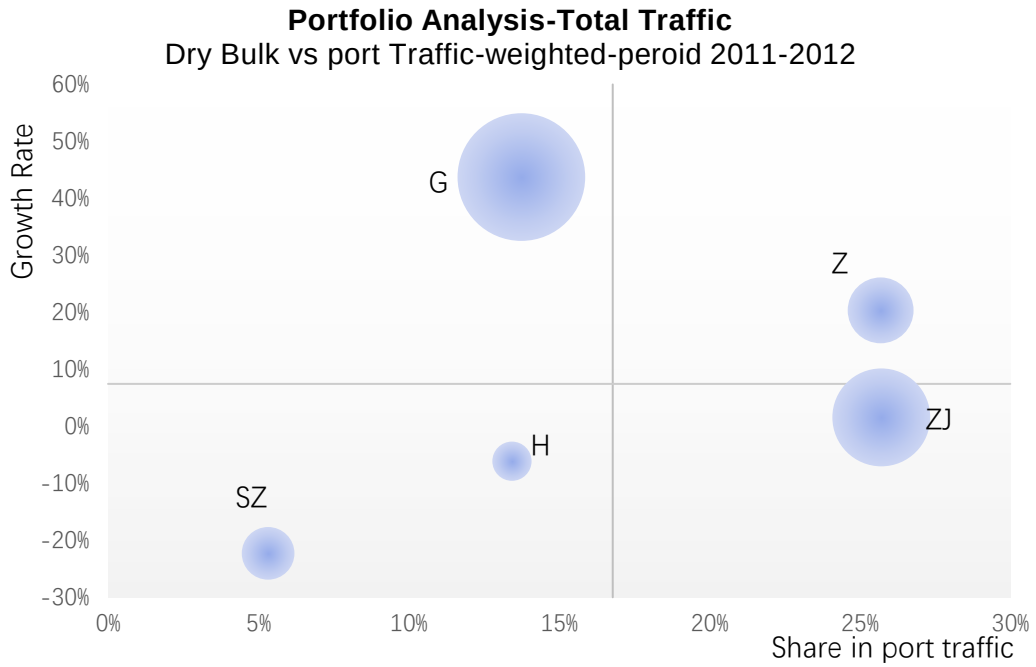

Figure 22Analysis of total dry bulk traffic (versus total port traffic) of the Guangzhou port set range (2011-2012)- Weighted analysis.
Source: Calculations based on port statistics.

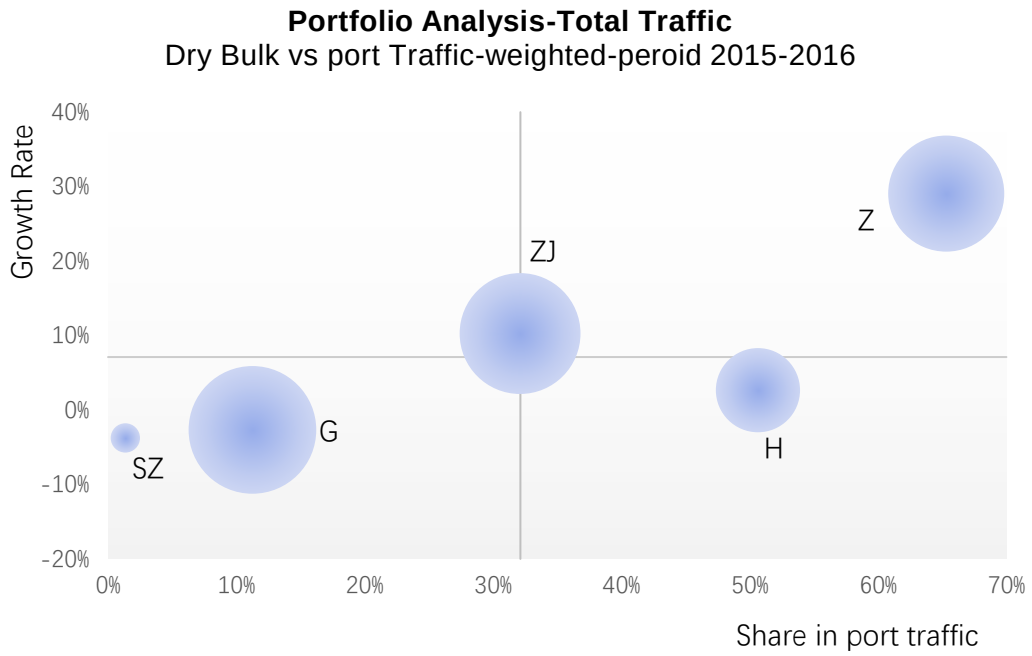

Figure 23 Analysis of total dry bulk traffic (versus total port traffic) of the Guangzhou port set range (2015-2016)- Weighted analysis.
Source: Calculations based on port statistics.

Fig. 24 and Fig. 25shows the liquid bulk traffic position of port range. Guangzhou port has an improvement of position, which is from “Minor Performer” to “High Potential” with a higher growth rate in 2016.

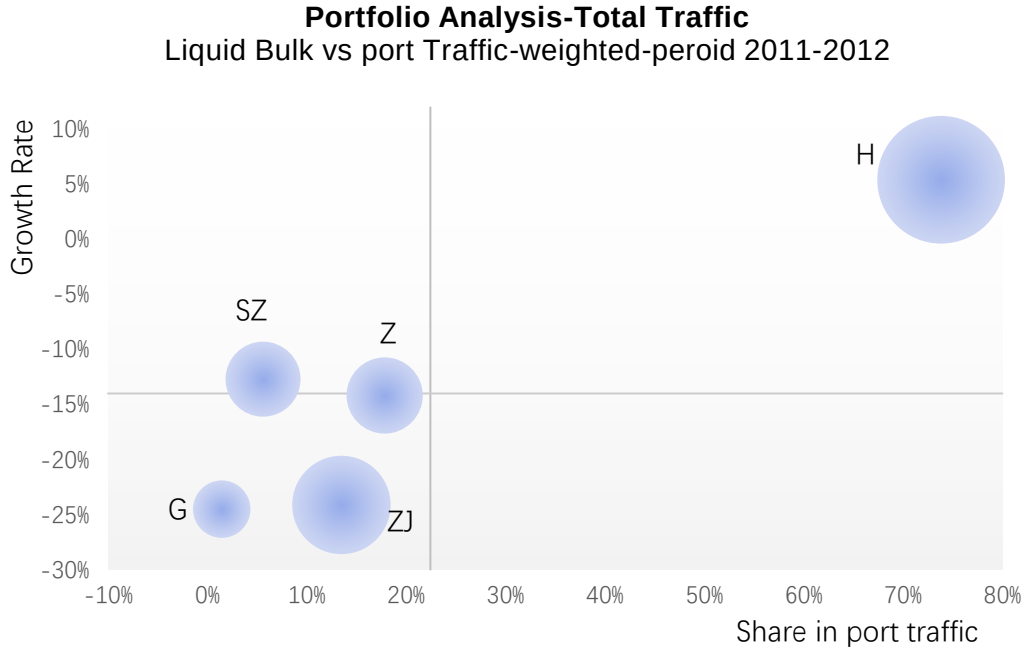

Figure 24Analysis of total liquid bulk traffic (versus total port traffic) of the Guangzhou port set range (2011-2012)- Weighted analysis.
Source: Calculations based on port statistics.

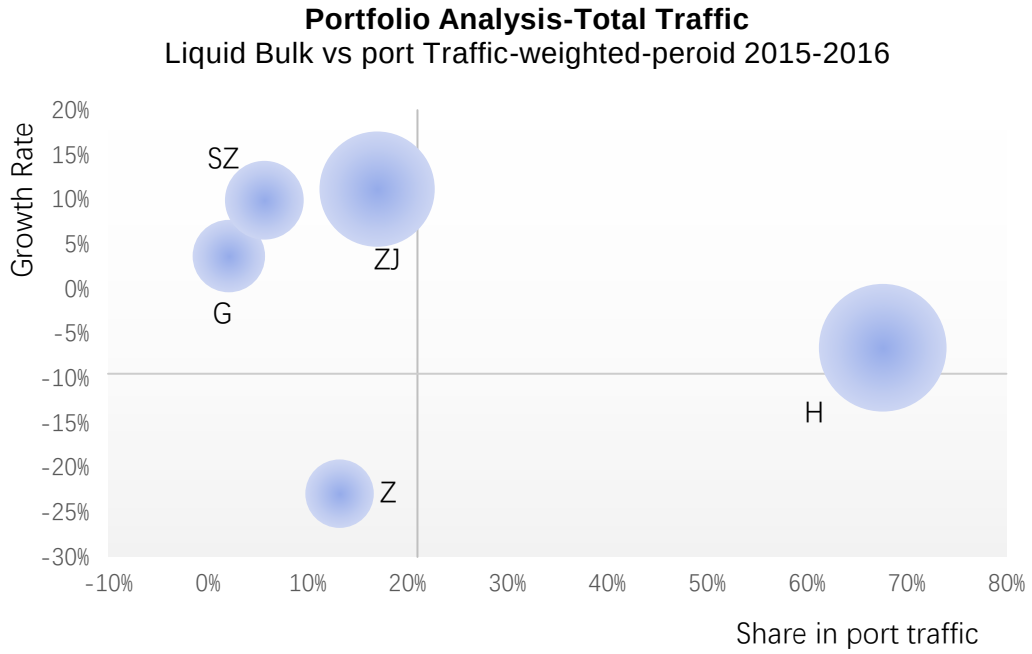

Figure 25Analysis of total liquid bulk traffic (versus total port traffic) of the Guangzhou port set range (2015-2016)- Weighted analysis.
Source: Calculations based on port statistics.

5.2.2 *Qingdao Port*

In the past 40 years of development, the average annual net profit of Chinese seaports has reached 10%. But, UBS Securities reported in 2017 that with the overcapacity of ports, the increased competition and the price war leads the port's profit margin to continue to decline. Another fact is that China's economic growth has slowed down, and China's development strategy started to switch from pursuing high-speed growth to high-quality growth. In addition, the economic development focus has begun to shift from foreign trade to domestic demand.
In the face of this change, Qingdao Port intends to transform from a loading dock to a logistics service provider and a business trader.

As we know, terminals and cargo source are the driving force behind port development. Qingdao port selected iron ore, crude oil, container and coal from its hundreds of import and export goods as its pillar business (Zhou, 2018). Because they believed that these cargos have sufficient markets in China. Indeed, Qingdao port is not the only port focus on these cargos.

In 2009, a series of investment plans by Brazil's Vale, the world's largest iron ore producer, in China became a business opportunity for all ports. For the port, the establishment of large ship mooring, and iron ore distribution centre not only increased the supply of goods, increased the port bonded and mixed processing income, but also expanded the upstream and downstream trade chain. Dalian Port and Qingdao ports are both taken as Vale's potential business partners, and both of them began to positively invest in the expansion of infrastructure. Qingdao port won this chance in the end with high operation capacity and better logistics

system.

Dalian Port, on the north side of Qingdao port, is also a partner of Vale. Qingdao port and Dalian port both are approved by the Ministry of Transportation that can dock 400,000-ton ore vessels. Same as Qingdao port, Dalian port also established a northern distribution centre for vale with the capacity of 10 million tons of mixed minerals. So Dalian port is selected by the researcher to become one of the port range for PPA.

Besides, Bohai Rim region has a high density of ports. Shandong province does not have the leading port, Qingdao port, also has relatively competitive ports, Yantai Ports and Rizhao Ports. Also, they are both the “brother ports “of Qingdao ports, which will also involve in the port range.

The last one is Tianjin Port, mentioned in the Qingdao Yearly Port as a “powerful competitor” in the north of China, is the last port included in the port portfolio. All the analysis objects are abbreviated as Qingdao Port(Q), Dalian Port(D), Yantai Port(Y), Rizhao Port(R), and Tianjin Port(T).

5.2.2.1 *Portfolio of Ports for Total Traffic (Level 1)*

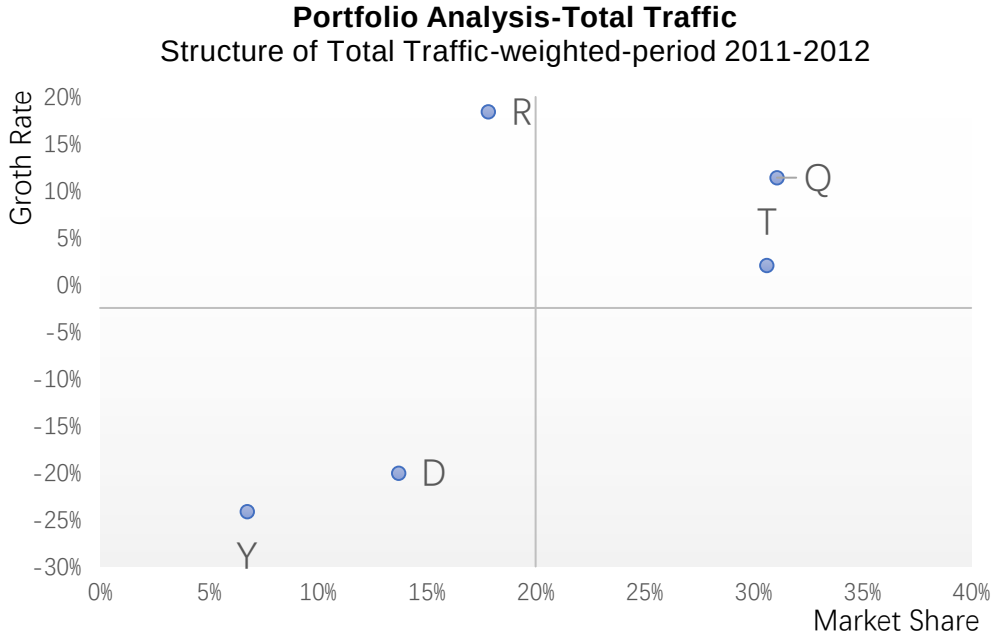

Figure 26Qingdao Port set portfolio of Ports with their Total Traffic in the selected range (2011-2012)-Weighted Analysis.
Source: Calculations based on port statistics.

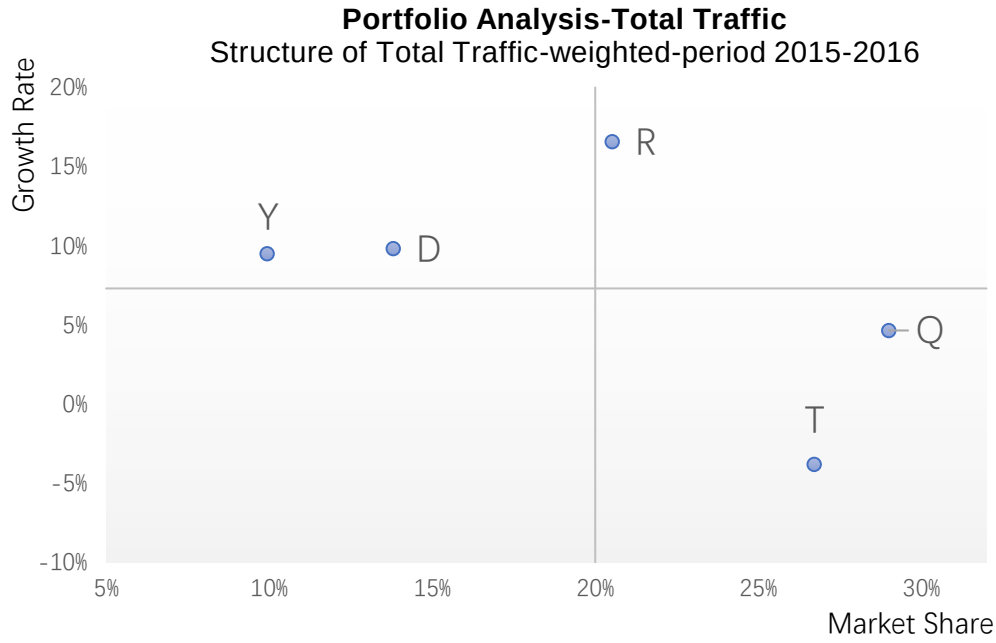

Figure 27Qingdao Port set portfolio of Ports with their Total Traffic in the selected range (2015-2016)-Weighted Analysis.
Source: Calculations based on port statistics.

In Fig. 26 and Fig. 27 presented the Qingdao port and its competitors as a portfolio of ports. Based on their market share in the total port range and the annual growth rate of traffic volume of the year 2012 and year 2016, these five ports are positioned in the growth-share matrix.

The weighted analysis showed that in 2012, Qingdao Port positioned itself as “Star Performer” with its relatively high market share and growth rate. When turning to 2016, its position shift to” Mature Leader” while its growth rate is lower than average value.

5.2.2.2 *Portfolio of Traffic Categories for Individual Seaports (Level 2)*

Fig.28 and Fig.29 show the weighted traffic structure of Qingdao Port in 2012 and in 2016. Following the rule that the value of 3 tons containers equal to 5 tons dry bulk and 13 tons liquid bulk. Three traffic categories are selected, which are liquid bulk, dry bulk, and container. In addition, the X-axis present the relative share of each category in the total traffic while Y-axis related to growth rate.

The position of the traffic category of Qingdao Port didn’t change comparing Fig.28 and Fig.29 below. Liquid bulk is the “Mature Leader”, dry bulk is the “Star Performer”, and liquid bulk is “Minor Performer”. We can observe from Fig. 29 that from 2012 to 2016, the container traffic is closer to the average growth rate, may have the potential to become the “High potential” in coming years.

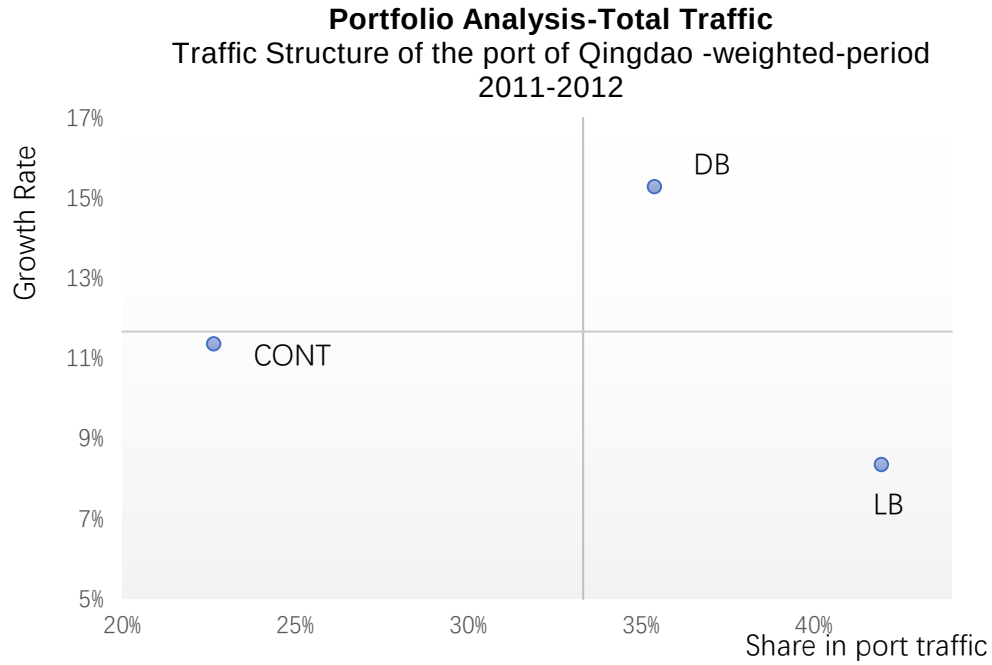

Figure 28Traffic Structure of the Qingdao Port (2011-2012)- Weighted Analysis. Source: Calculations based on port statistics.

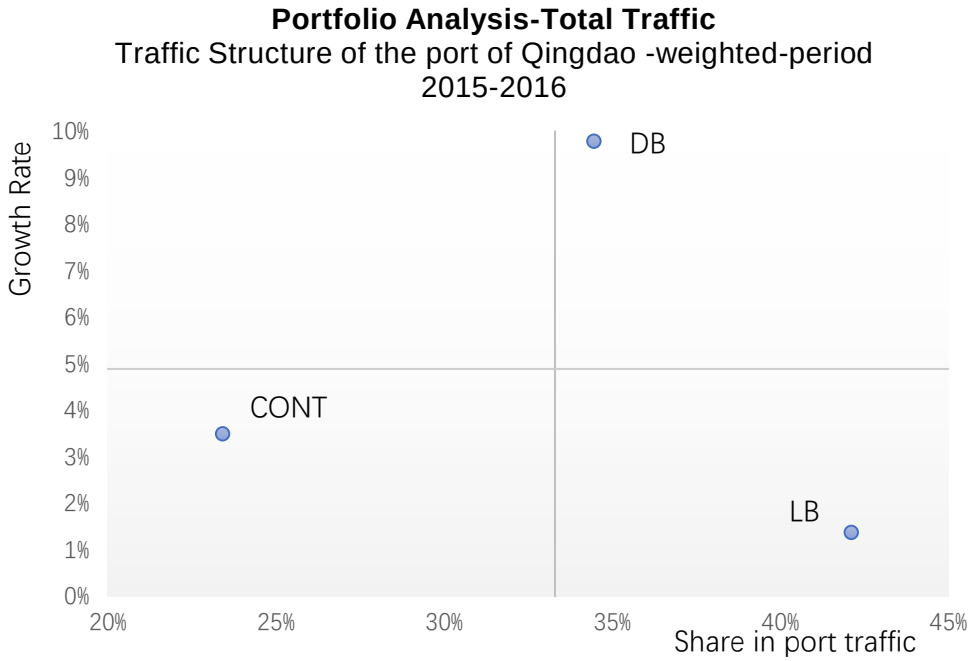

Figure 29Traffic Structure of the Qingdao Port (2015-2016)- Weighted Analysis. Source: Calculations based on port statistics.

5.2.2.3 *Portfolio of Ports for Individual Traffic Categories (Level 3)*

According to the Figure 30 to Figure 35, we concluded that from the year 2012 to the year 2016, the position of container traffic is persistent “Mature Leader”, the position of dry bulk and liquid bulk both shift from “ Star Performer” to “ Mature Leader”.

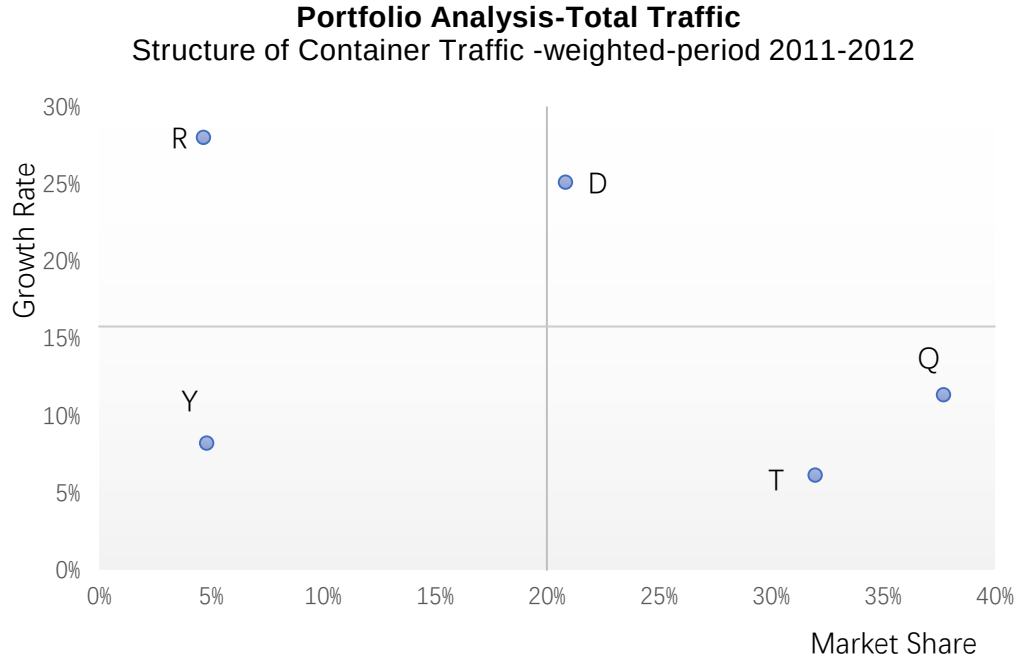

Figure 30Traffic Structure of the Qingdao Port (2015-2016)- Weighted Analysis.
Source: Calculations based on port statistics.

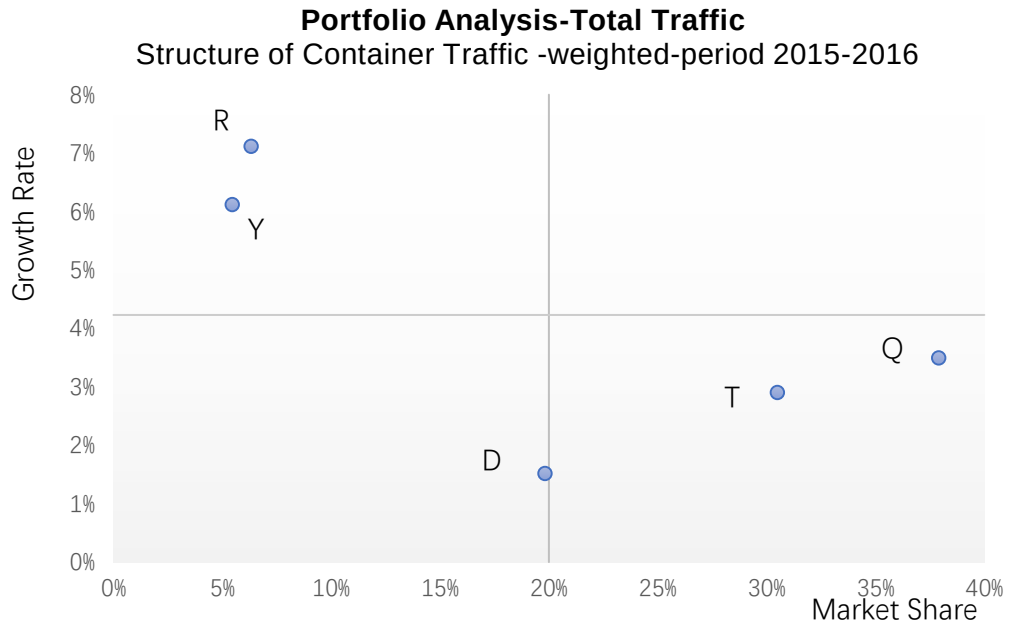

Figure 31Structure of container traffic in the Qingdao Port set (2015-2016)-weighted analysis.
Source: Calculations based on port statistics.

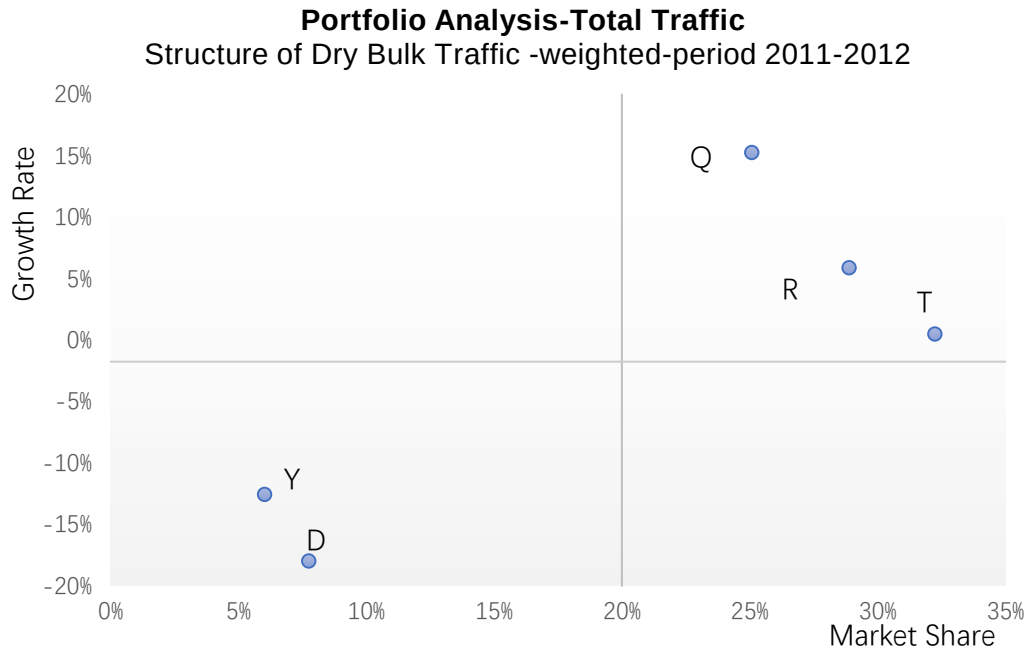

Figure 32Structure of dry bulk traffic in the Qingdao Port set (2011-2012)-weighted analysis.
Source: Calculations based on port statistics.

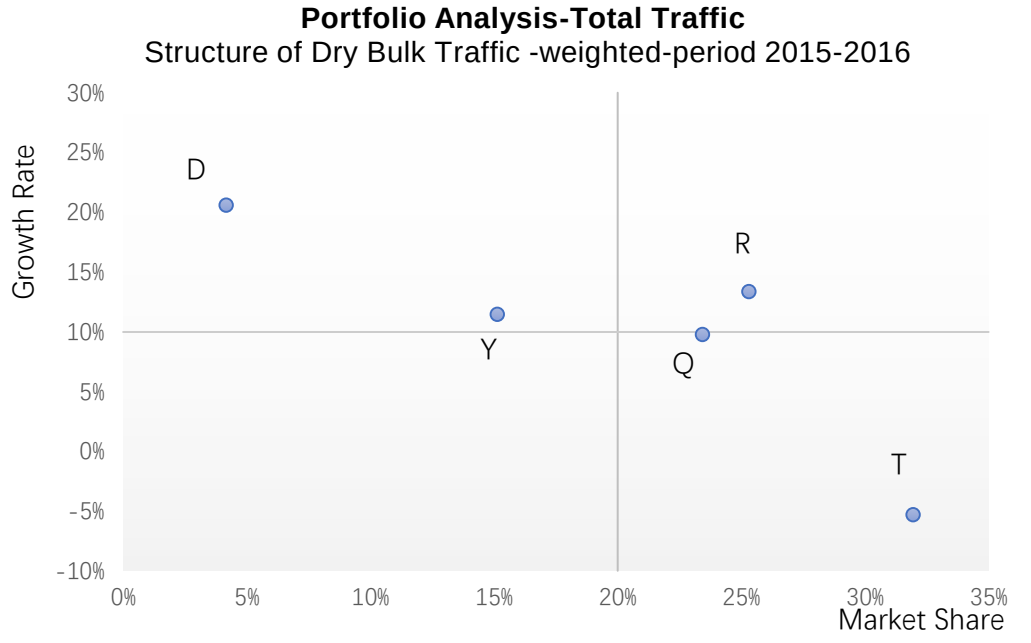

Figure 33Structure of dry bulk traffic in the Qingdao Port set (2015-2016)-weighted analysis.
Source: Calculations based on port statistics.

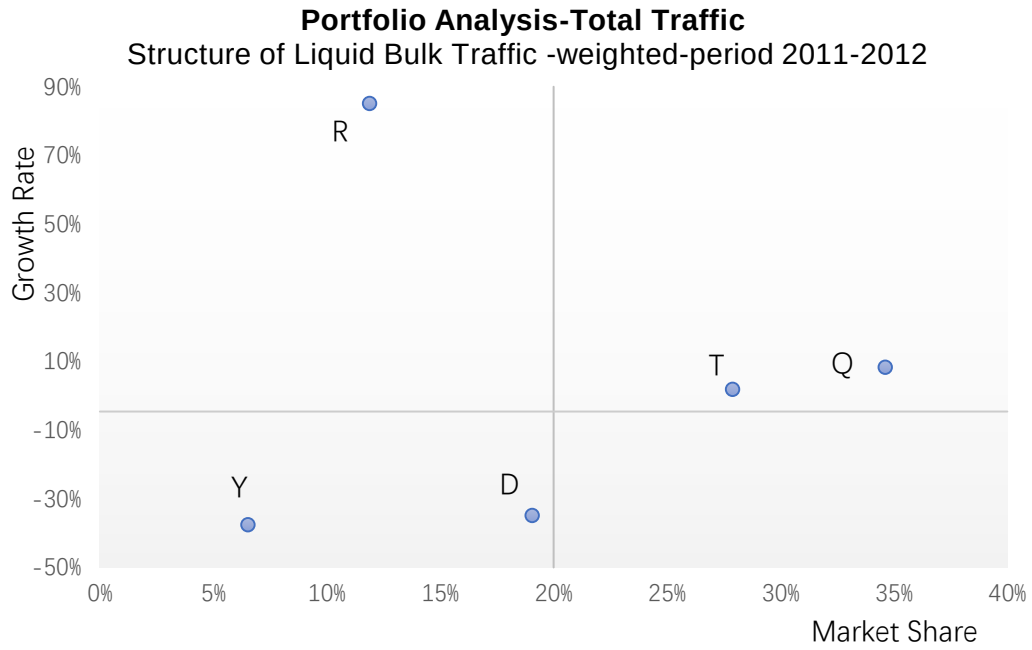

Figure 34Structure of liquid bulk traffic in the Qingdao Port set (2011-2012)-weighted analysis.
Source: Calculations based on port statistics.

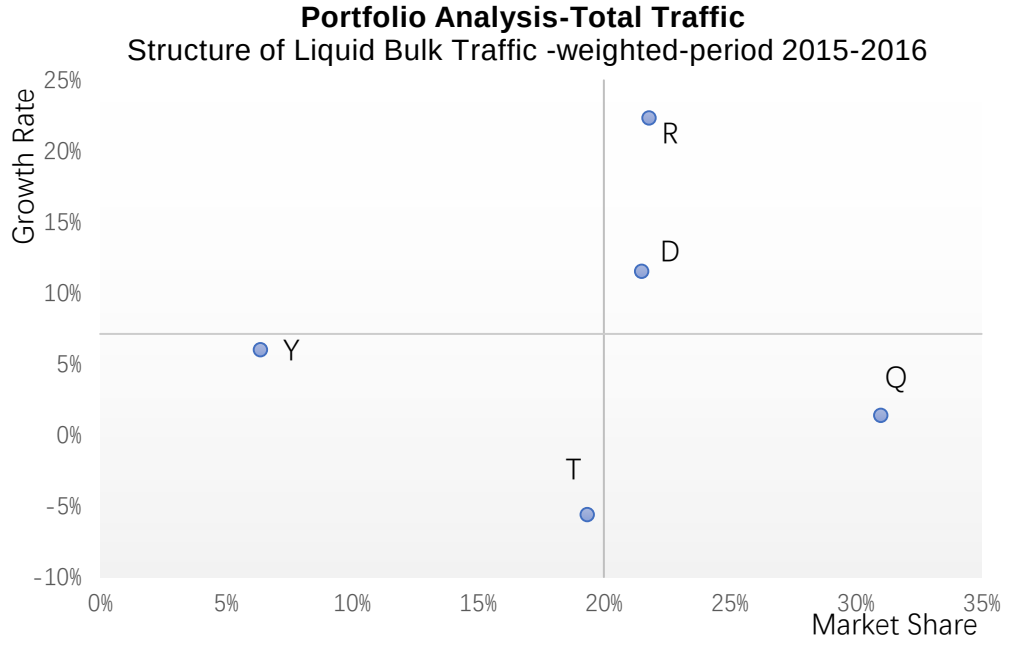

Figure 35Structure of liquid bulk traffic in the Qingdao Port set (2015-2016)-weighted analysis.
Source: Calculations based on port statistics.

5.2.2.4 *Portfolio of Ports for Individual Traffic Categories, related to these Categories' Share in Port Traffic and Share in the Range (Level 4)*

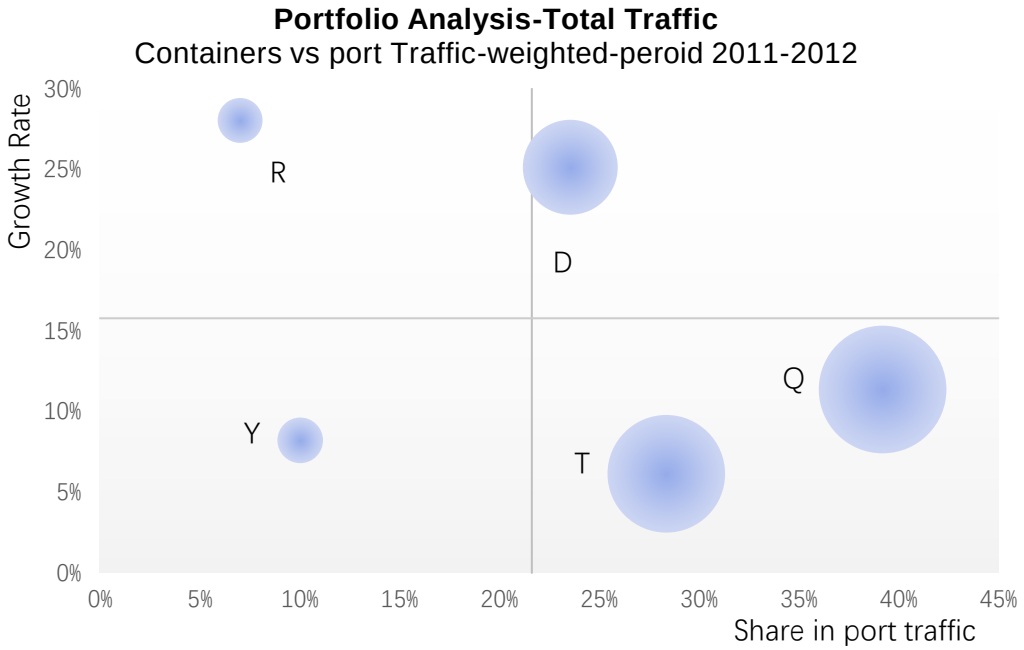

Figure 36Analysis of total container traffic (versus total port traffic) of the Qingdao port set range (2011-2012)- Weighted analysis.
Source: Calculations based on port statistics.

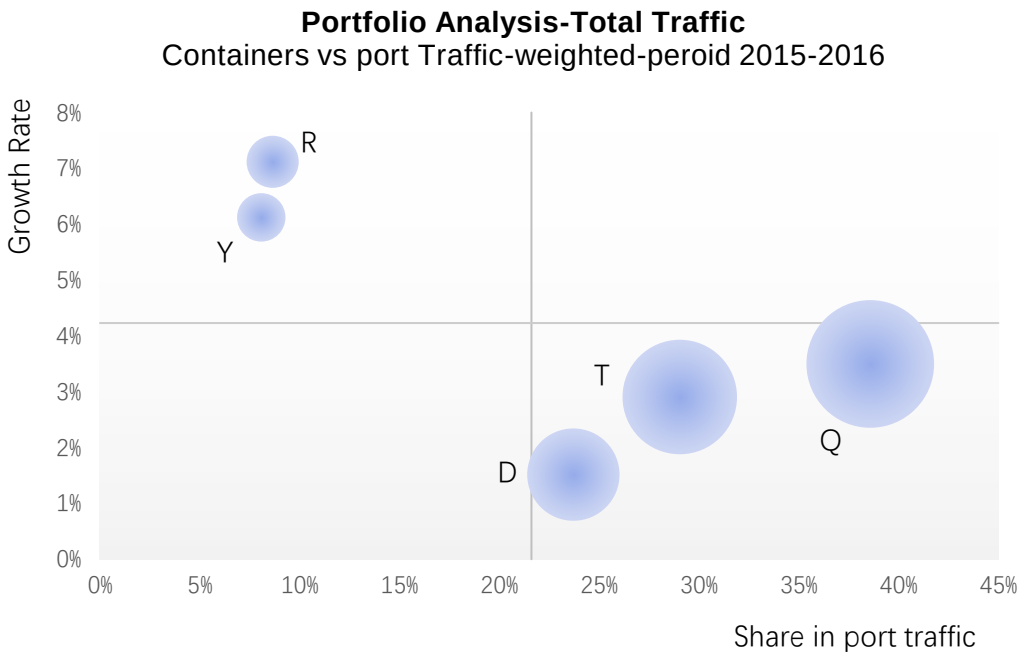

Figure 37Analysis of total container traffic (versus total port traffic) of the Qingdao port set range (2015-2016)- Weighted analysis.
Source: Calculations based on port statistics.

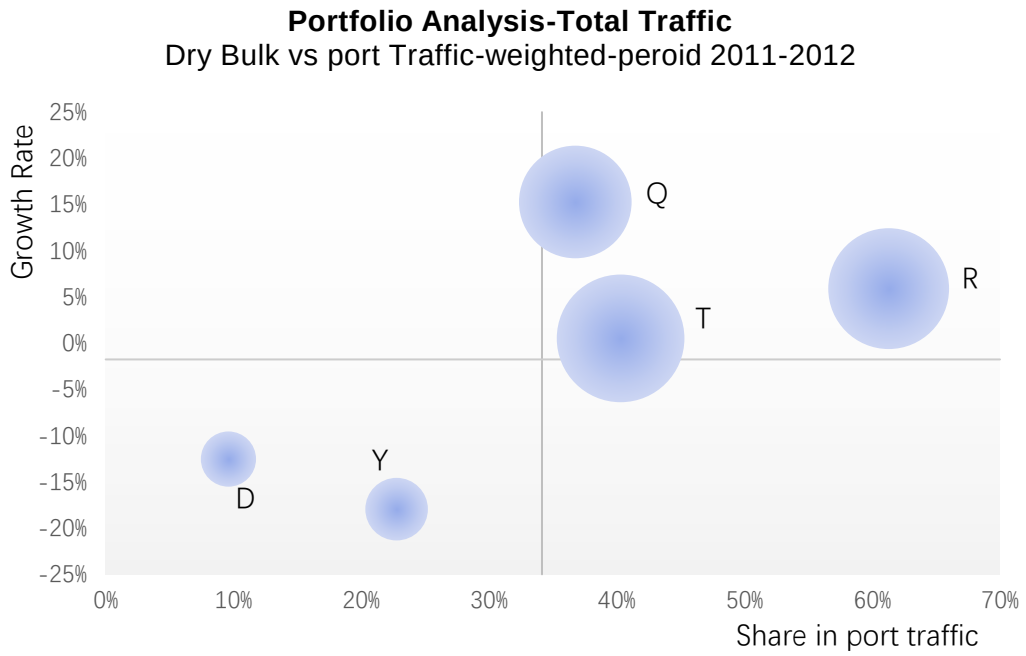

Figure 38Analysis of total dry bulk traffic (versus total port traffic) of the Qingdao port set range (2011-2012)- Weighted analysis.
Source: Calculations based on port statistics.

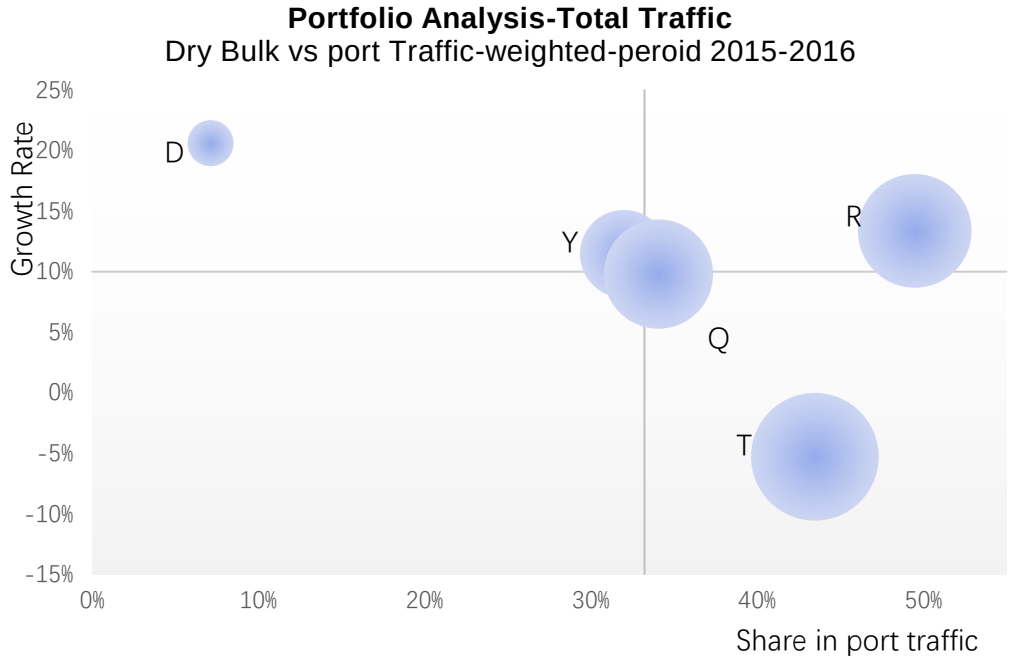

Figure 39Analysis of total dry bulk traffic (versus total port traffic) of the Qingdao port set range (2015-2016)- Weighted analysis.
Source: Calculations based on port statistics.

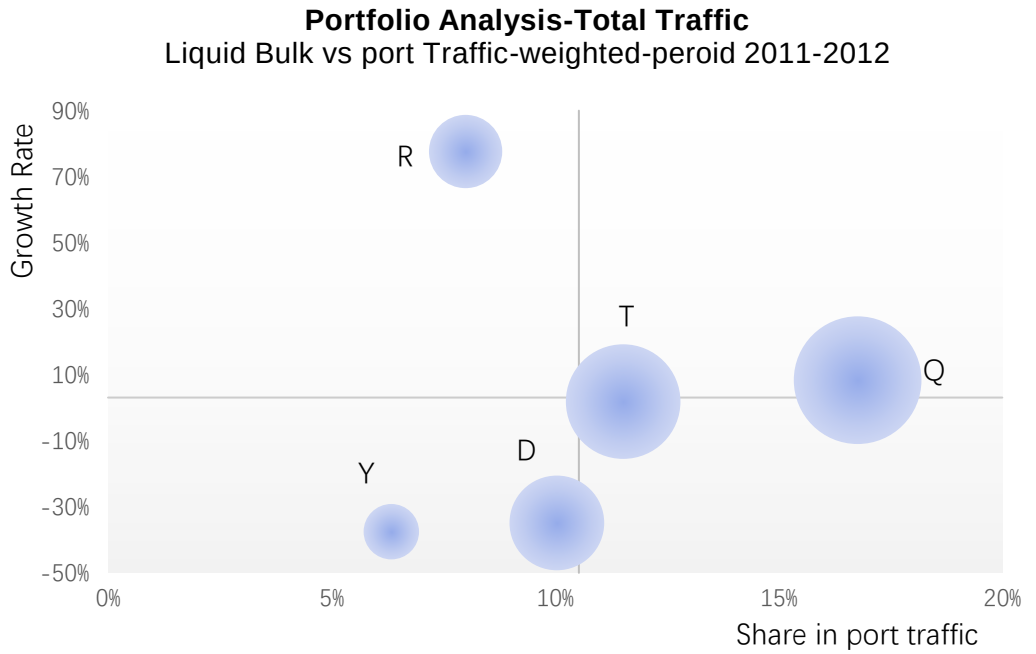

Figure 40Analysis of total liquid bulk traffic (versus total port traffic) of the Qingdao port set range (2011-2012)- Weighted analysis.
Source: Calculations based on port statistics.

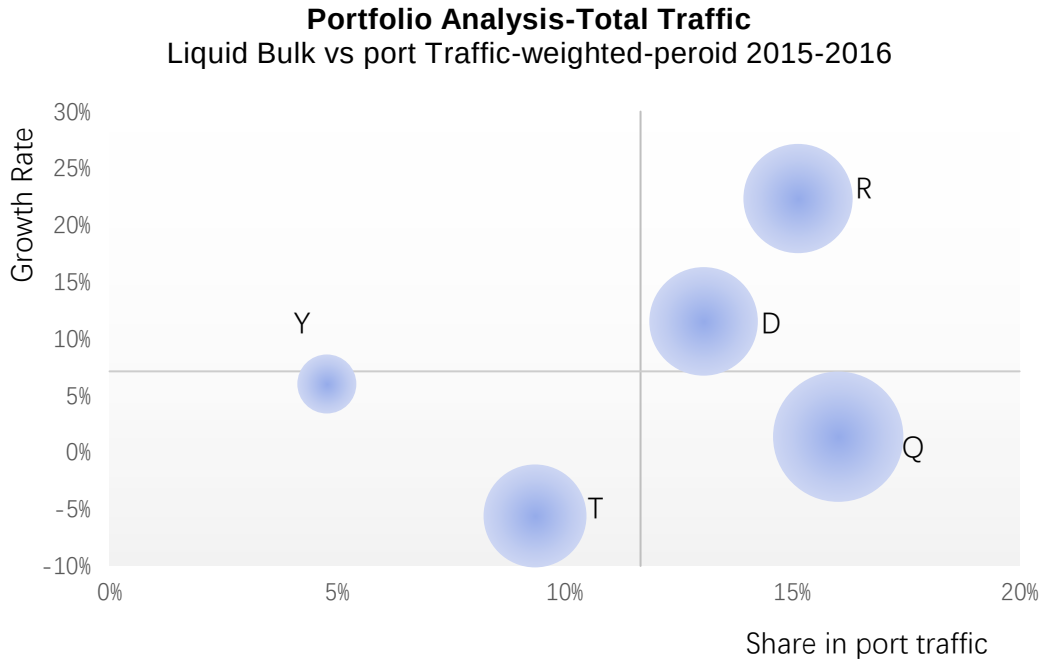

Figure 41Analysis of total liquid bulk traffic (versus total port traffic) of the Qingdao port set range (2015-2016)- Weighted analysis.
Source: Calculations based on port statistics.

Fig.36 to Fig. 41presented the results of level 4 of the PPA method. As is shown, in 2016, Qingdao Port position itself at “Mature Leader” in terms of containers, dry bulk and liquid bulk. Thereinto, only container traffic is shifted from “Star Performer”, and other two traffics kept them position since 2012.

Chapter 6 Conclusion

In this thesis, we combined two methodologies to explore our topic, “Competitive Position of Chinese Ports as Results of Non-Proximity Collaboration in the OBOR Period”. Firstly, we went through a mass of public published reports and papers to generate a list of non-proximity collaboration relationships of Chinese seaports since 2013, when OBOR is put forward. There are 37 relationships are recorded and coded while 12 domestics ports are involved. The patterns not only included the collaboration type, collaboration parties and countries but also coded the collaboration objectives according to Categorization of collaboration objectives. There are total 8 plus 1 categories with subcategories patterns under them. By coding and clearing up the list date, we generate the conclusion below.

Share &Exchange of know-how, Training, Infrastructure-Development, and Port Growth are mostly chosen among the objectives categories. There are notable differences between each participant ports’ collaboration objectives which also reveals corresponding port development strategy preferences. Port of Guangzhou is the port management entity with the wider range of objectives pursued with its non-proximate collaboration relationships; 58 different goals including seven CATs have been recorded. Coincidentally, Qingdao port also actively raise the cross-border relationships with 46 goals targeted under all CAT categories except CAT2 Regional Growth. Both two ports put their key point on CAT4, Share &Exchange of know-how, Training, while Qingdao port have CAT5 Infrastructure-Development and CAT6 Port Management followed and Guangzhou Port more focus on Port Growth (CAT8).

There are seven types of inter-organisational relationships formats that observed by the researcher, they are:

-Strategic Cooperation Agreement
-Sister Ports Agreements
-Joint Declaration
-MOU (Memorandum of Understanding)
-Cooperative network
-Joint Venture /Investments
-Strategic Framework Agreement

The depth of collaboration is different within 7 relationships. They presented the step by step collaboration progress between two parties. At first, two ports would become sister ports through sister port agreements. Then, an MOU will be signed to promote the collaboration progress by finalising an elementary direction. Next, the strategic framework is agreed followed with final strategic cooperation to reach an agreement in terms of collaboration specific aspects. The Joint Declaration, Cooperative network and joint Venture/investment will enable more parties to join the collaboration to consolidate the relationship. According to Fig.7 Structure of collaborative relationships, the Sister Port Agreement is the main form for collaboration between two parties. So, we believe that most of the international collaboration relationships of China seaports are in preliminary stages since OBOR, and more father agreement would be signed in coming years. Among all collaboration practice, Asian and European countries are most

chosen by Chinese seaports to develop cooperation.

We use the conclusion of the first part to select two ports as researched objects for the second part, strategic position analysis. Due to the whole collaboration relationships, samples are not enough to support the quantities regression for exploring the relevancy between non-proximate collaboration strategy and traffic-related competitive position of ports. We did certain research of the development strategies of Guangzhou Port and Qingdao Port, generated that under the vision of OBOR, both two ports were focusing on international collaboration to boost trade and the development of infrastructure. So, we simply assumed the change od competitive position of traffic volume and traffic structure could reflect the impact of international port collaboration to some extent.

The whole shift results of object ports are list below:

		2012		2016	
		Guangzhou	Qindao	Guangzhou	Qingdao
Level 1		Star Performer	Star Performer	Star Performer /Mature Leader	Mature Leader
Level 3	CON	Star Performer	Mature Leader	Star Performer /Mature Leader	Mature Leader
	DB	Star Performer	Star Performer	Mature Leader	Mature Leader
	LB	Minor Performer	Star Performer	High Potential	Mature Leader
Level 4	CON	Star Performer	Mature Leader	Star Performer	Mature Leader
	DB	High Potential	Star Performer	Minor Performer	Mature Leader
	LB	Minor Performer	Star Performer	High Potential	Mature Leader

Table 10 PPA results comparable table
Source: Elaborated by author

For Guangzhou Port, during the OBOR, its competitive position within the range gradually move to “Mature leader “from “Star performer”, so as the Qingdao Port. We believe the slowdown of Chinese economic development also could be one reason for it. Within each port, Guangzhou’s traffic structure has huge differences during OBOR period. Container traffic becomes “Star Performer” in 2016 while in 2012, the dry bulk traffic took that position before, now is the “Minor Performer”. In contrast, the traffic position of Qingdao port didn’t change under OBOR. Among the Guangzhou port set, the only liquid bulk position changed from “Minor Performer” to” High Potential”, both dry bulk and Liquid bulk are shifting from “Star Performer” to” Mature Leader”. All the traffic types of Qingdao ports had their position changed from “Star Performer” to “Mature leader” between the year 2012 to the year 2016. So, we can conclude that during the OBOR period, the growth rate of traffic volume in terms of containers, dry bulk and liquid bulk have a common decline which leads to the change of competitive position. The different port has a various competitive position change according to their original traffic structure and development strategy of port management body.

By conducting this thesis, the sub- research questions mentioned in chapter one could be answered now. OBOR is consisted by two parts, The Silk Road Economic Belt and the 21st Century Maritime Silk Road. Among, the port construction plays a vital role in the 21st Century Maritime Silk Road inititive. As a matter of fact, the affairs involved in the 21st Century Maritime Silk Road are more singular, mainly to make improvement about the ocean, emphasizing the

work of port construction, transportation channels, and marine development and security. The core is to build a community of marine system. China postively linked the demostics seaports with other countris either through investement or sister ports agreement is aimed at building the 21st Century Maritime Silk Road as an intergrated traspotation ecological system around the world.

Since OBOR firstly annoced, the collaboration with Asia area has made considerable progress and the focus of cooporation has started to shift to European ports. Based on this thesis, further research could be conducted to gain more profound insight into Chinese port collaboration. For instance, during the development of the connection between China seaports and non- proximate seaports, the integration of China Seaports is also part of 21st Century Maritime Silk Road plan. The degree of association or the linkbetween the international port collaboration, the port intergration process, and the collaboration with demostic ports or inland ports could be other research topics to futher explored.
Last but not list, the limitation of this thesis still need to be mentioned. We only picked two ports which relatively active in building international port collaboration to apply PPA and gained conclusion. We assumed the results could present the general impact on port competitive position. Also, there are certain other factors could also be the drivers for the position shift we didn't take account in. The degree of association between collaboration and position change is less analysed due to its difficulty level.

References

Port of Antwerp, 2017. *Port of Antwerp to collaborate closely with a port in China.* [Online]
Available at: http://www.portofantwerp.com/nl/node/26313
[Accessed 6 1 2018].

Belt and Road Initiative, 2015. *Vision and Actions on Jointly Building.* [Online]
Available at: http://www.beltandroad.gov.hk/visionandactions.html#I
[Accessed 22 3 2018].

China-Malaysia Port Alliance, 2015. *Background of China-Malaysia Port Alliance.* [Online]
Available at: https://cmpa.asia/index.php/en/about-us/background
[Accessed 13 7 2018].

De Lombaerde, P. & Verbeke, A., 1989. Assessing international seaport competition: A tool for strategic decision making. *International Journal of Transport Economics,* 2(16), pp. 175-192.

Donselaar, P. W.-V. & Kolkman, J., 2010. Societal costs and benefits of cooperation. *Maritime Policy & Management,* 37(3), pp. 271-284.

Fiedler, R. & Flitsch, V., 2016. *PORT COOPERATION BETWEEN EUROPEAN,* Hamburg: Fraunhofer Center for Maritime Logistics and Services CML.

Guangzhou Port, 2017. *广州港:差异化竞争的内贸综合大港.* [Online]
Available at: http://gu.qq.com/finance/3696507.html
[Accessed 12 8 2018].

Haezendonck, E., Coeck, C. & Verbeke, A., 2000. The Competitive Position of Seaports: Introduction of the Value Added Concept. *International journal of maritime economics,* 2(2), pp. 107-118.

Haezendonck, E., Verbeke, A. & Coeck, C., 2018. *Strategic Positioning Analysis for Seaports,* s.l.: s.n.

Huo, W., Zhang, W. & Chen, P. S.-L., 2018. The recent development of Chinese port cooperation strategies. *Research in Transportation Business & Management,* pp. 67-75.

Jinchen, T., 2016. *'One Belt and One Road': Connecting China and the world.* [Online]
Available at: https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/one-belt-and-one-road-connecting-china-and-the-world
[Accessed 1 1 2018].

Kynge, J., 2017. *China's New Silk Road Initiative and its Geopolitical Risks.* [Online]
Available at: https://www.merics.org/en/events/merics-china-lounge-james-kynge
[Accessed 21 3 2018].

Liu, W., 2015. Scientific understanding of the Belt and Road Initiative of China and related research themes. *Progress In Geography,* 5(34), pp. 538-544.

Lloyd's List, 2017. *07 Guangzhou (China).* [Online]
Available at: https://lloydslist.maritimeintelligence.informa.com/LL109040/07-Guangzhou-China
[Accessed 26 7 2018].

Lugt, L. v. d., de Langen, P. & Hagdorn, L., 2015. Beyond the landlord: worldwide

empirical analysis of port authority strategies. *International Journal of Shipping and Transport Logistics,* 7(5), pp. 570-596.
Mclaughlin, H. & Fearon, C., 2013. Understanding the development of port and regional. *Maritime Policy & Management,* pp. 278-294.
Minister of Foreign Affairs,Malaysia, 2016. *MOU of China-Malasia Port-Alliance.* [Online]
Available at: https://cmpa.asia/phocadownload/MOU/MoU%20Port%20Alliance.pdf
[Accessed 13 7 2018].
National Development and Reform Commission, Ministry of Foreign Affairs, Ministry of Commerce of China, 2015. *Vision and actions on jointly building Silk Road Economic Belt and 21st-century maritime Silk Road,* Beijing: Foreign Languages Press.
Pallis, A. & Kladaki, P., 2016. *Port Collaboration Beyond Proximity: Inter–.* Hamburg, IAME Conference.
Shi, Y., 2017. *China's Top Ports: An Index for Importers and Exporters.* [Online]
Available at: http://www.china-briefing.com/news/2017/09/28/chinas-top-ports-an-index-for-importers-and-exporters.html
[Accessed 26 7 2018].
The State Council of China, 2014. *国务院关于促进海运业健康发展的若干意见.* [Online]
Available at: http://www.gov.cn/zhengce/content/2014-09/03/content_9062.htm
[Accessed 26 6 2018].
UNCTAD, 2016. *Port Performance-Linking Performance Indicators,* Geneva: UNCTAD.
UNCTAD, 2018. *World Investment Report,* Geneva: UNCTAD.
Vanoutrive, T., 2012. *THE CHANGING SPATIALITY OF PORT GOVERNANCE: THE CASE OF ANTWERP.* [Online]
Available at: http://www.regionalstudies.org/uploads/funding/conferences/presentations/european-conference-2012/presentations/vanoutrive.pdf
[Accessed 2 1 2018].
Verhoeven, P. & Vanoutrive, T., 2012. *A quantitative analysis of European port.* [Online]
Available at: https://link.springer.com/content/pdf/10.1057%2Fmel.2012.6.pdf
[Accessed 2 1 2018].
Wang, J. J. & Slack, B., 2004. Regional governance of port development in. *Maritime Policy & Management,* pp. 357-373.
Yang, Z. & Notteboom, T., 2017. Port governance in China since 2004: Institutional layering and the. *Research in Transportation Business & Management,* pp. 184-200.
Zhao, X., Wang, X. & Zhou, Q., 2016. Study on port cooperation mechanism in the background of " Marine Silk Road" strategy. *China Soft Science ,* Volume 12, pp. 5-14.
Zhou, X., 2018. *青岛港变身：打算从装卸码头变为物流服务商和贸易商.* [Online]
Available at: http://finance.sina.com.cn/chanjing/gsnews/2018-02-08/doc-ifyrkzqq9635823.shtml
[Accessed 14 8 2018].