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Reference:

Notteboom Theo, Yang Zhongzhen.- Port governance in China since 2004 : institutional layering and the growing impact of broader policies
Research in transportation business & management - ISSN 2210-5395 - 22(2017), p. 184-200
Full text (Publisher's DOI): <https://doi.org/doi:10.1016/J.RTBM.2016.09.002>
To cite this reference: <http://hdl.handle.net/10067/1499850151162165141>

Port governance in China since 2004: institutional layering and the growing impact of broader policies

Theo NOTTEBOOM a, c, d, e and Zhongzhen YANG b

a China Institute of FTZ Supply Chain, Shanghai Maritime University

b Transportation Management College, Dalian Maritime University

c Antwerp Maritime Academy (Belgium)

d Faculty of Applied Economics, University of Antwerp (Belgium)

e Maritime Institute, Faculty of Law, Ghent University (Belgium)

ABSTRACT

This paper builds further on the work of Cullinane and Wang (2007) and more recent work on (port) governance in China. We argue that the market environment in which Chinese ports operate is quite different compared to ten years ago. The global and domestic economic slowdown and structural changes in the economic base have affected seaport volumes and freight traffic growth. Fears for port capacity shortages have made room for overcapacity. New geo-economic policies such as the 'Go West' strategy and the 'One Belt One Road' (OBOR) initiative, the implementation of modern corporate governance principles and the establishment of Free Trade Zones (FTZs) are affecting the Chinese container seaport system. The above factors have triggered a number of strategic and managerial implications on Chinese ports: (a) an increased focus on seaport integration and co-operation, (b) a strong orientation on hinterland development through corridors and dry ports, (c) a two-way opening up of the seaport sector by combining initiatives to attract foreign investments and trade to Chinese ports with an internationalisation of Chinese port-related companies. We demonstrate that these changes have triggered processes of institutional layering in port governance without breaking out of the development path initiated by the Port Law of 2004 and related policy initiatives.

1. INTRODUCTION

The past 65 years have brought significant changes to China's economic and political landscape and the Chinese society at large. The Communist rule under leadership of Mao brought a centrally planned economy to China in 1949. The central government exerted strong control over all lines of economic life through the so-called 'Lines and Blocks Administrative System' supported by powerful state-owned enterprises (SOE). China slowly started to re-establish international relationships with third countries in the 1980s after the introduction of the 'Open Door Policy' of Deng Xiaoping in 1978. The Chinese economic system embraced the 'Chinese Socialism Market Economy' principle. The eventual goal of Chinese modernization was to build a *xiaokang* 小康, or a well-off society (see e.g. Ash, 2006; Yeung and Shen, 2004). A long series of institutional reforms were effectuated to support the country's rapid industrialization and urbanization and to facilitate the corporatisation and privatization of SOEs. The clear path disruption in China's economic policy brought by Deng Xiaoping's policy in 1978 was followed by a more path dependent and incremental transition towards a market-based economy.

Chinese national reforms and the transfer of power from the central government to local governments had an impact on the governance of seaports. Wang and Cullinane (2007) examined economic reform in China since the introduction of the open door policy with a particular focus on seaport policy and governance reform. They concluded that a three phase development path led to a decentralisation of the port governance system. The Port Law of 2004 could be regarded as the ultimate embodiment of the gradual shift from highly centralised ownership and decision-making to a port governance landscape that offers more room for corporatisation and private sector participation. In the same paper, they argue that "it is still too early to tell whether the latest phase of reforms will prove to be successful in solving China's port problems - particularly the capacity issue" (Wang and Cullinane, 2007: p. 331).

This paper builds further on the work of Cullinane and Wang (2007) and more recent work on seaport governance in China. We argue that the market environment in which Chinese ports operate is quite different from ten years ago. The global and domestic economic slowdown and structural changes in the economic base have affected seaport volumes and freight traffic growth. Fears for seaport capacity shortages have shifted to overcapacity concerns. Moreover, new geo-economic policies such as the 'Go West' strategy and the 'One Belt One Road' (OBOR) initiative, the implementation of modern corporate governance principles and the establishment of Free Trade Zones are affecting the Chinese container seaport system. We argue in this paper that the above factors have triggered a number of strategic and governance implications on Chinese ports: (a) an increased focus on port integration and co-operation, (b) a strong orientation on hinterland development through corridors and dry ports, (c) a two-way opening up of the port sector by combining initiatives to attract foreign investments and trade to Chinese ports with an internationalisation of Chinese port-related companies through investments in foreign ports.

The paper is structured as follows. First, we analyse the market environment of the Chinese seaport system with a specific focus on macro-economic developments, dynamics in cargo flows, the impact of trends in shipping and logistics and the recent evolution of port/terminal productivity and capacity. Section 3 elaborates on a range of broader policies directly or indirectly affecting the governance and functioning of Chinese seaports. In section 4, we provide an overview of the evolution of port governance in China driven by legislative and planning initiatives and processes of institutional layering after the Port Law of 2004. Before moving to the conclusions, part 5 focuses on the strategic and managerial implications of all these developments on the role and functioning of local port groups and port bureaus.

2. DYNAMICS IN THE MARKET ENVIRONMENT

2.1. Macro-economic situation: lower growth but increasing global significance

China experienced a strong and sustained GDP growth since the late 1980s which peaked to a level of 12-14% in the years before the start of the financial and economic crisis. After a historically low growth rates of just above 6% in Q1 2009, GDP growth gradually slowed down from about 10% in early 2010 to 6.7% in the first quarter of 2016 (figure 1). Despite this lowest growth since Q1 2009, there are several indicators (such as industrial production, retail sales and imports and exports) showing that the economy is picking up some speed in early Spring 2016 after two to three years of a clear slowdown.

< insert figure 1 about here >

The Chinese economy is witnessing a shift from industrial production to the services or tertiary sector. This shift has accelerated in the past few years. The data of the National Bureau of Statistics of China shows that the share of the tertiary sector in total GDP rose from 22% in 1980 to 33% in 1990, 40% in 2000, 43% in 2010 and over 50% in Q1 2016. The share of the secondary sector, which includes goods and productions industry and construction, fluctuated between 40 and 45% in the period 1970-2010, but saw a sharp decline from 45% in 2010 to around 40% in early 2016. The primary sector (mainly agriculture) currently accounts for about 9% of GDP.

Export growth has been a major component supporting China's rapid economic expansion. The shift to the services industry combined with a weaker global trade situation have put a downward pressure on the value of exports since 2014. Still, China is becoming an ever more important player in the world economy. The share of China in global exports rose from 12.3% in 2014 to 13.8% in 2015. The major exported goods in terms of value include mechanical and electrical products (41%), high tech products (20%), clothing, textiles, footwear, furniture, plastic products and ceramic (16%), motors and generators (5%) and integrated circuits (5%). The United States (18% of total exports) and the EU (16%) remain the most important trading partners in value terms.

According to 2014 figures reported in UNCTAD (2015), China accounted for 68% of global maritime iron ore imports in tonnes compared to 10% for Japan and 9% for Europe. This is mainly the result of China's share of 50% in the world steel production. Moreover, China represents 20% of the global coal imports and is the world's most important importer for a wide range of agricultural products, energy and minerals. The recent slowdown in the Chinese economy has contributed greatly to lower commodity prices on the world markets, thereby affecting the economic situation in some of the mining countries such as Brazil, Australia and South Africa, and to historically low freight rates and time charter rates in the dry bulk markets. In value terms, China's main imports are mechanical and electrical products (34% of the total value of imports in China) and high tech goods (23%) according to data of the National Bureau of Statistics.

2.2. The demand for cargo handling in ports

Figure 2 provides an overview of the main seaports in China and the major multi-port gateway regions. The allocation of ports to specific regions is based on the multi-port gateway region concept as defined by Notteboom (2010), and has been cross-checked with the spatial insights on the Chinese seaport system presented in Yap et al. (2006), Pan et al. (2014), Lin and Notteboom (2013) and Wang et al. (2015). Extant literature in port economics and port geography includes a wealth of papers dealing with competition and development dynamics in specific multi-port gateway regions in China. For

example, Comtois and Dong (2007), Cullinane et al. (2005a), Rimmer and Comtois (2009) and Fu and Chen (2012) discuss the specific nature of competition and seaport development dynamics in the Yangtze River Delta. Wang and Slack (2000), Wang et al. (2012), Liu et al. (2013), and Homosombat et al. (2015) deal with similar themes for the Pearl River Delta.

< insert figure 2 about here >

< insert table 1 about here >

The Chinese seaport system saw a spectacular growth in the past four decades in line with the rapid development of the Chinese economy. Table 1 provides the cargo throughput evolution since 2008 for the 13 Chinese seaports which were ranked in the global top 20 ports in 2015. The year-on-year growth figures point to a weak 2009 and a more modest growth between 2012 and 2014, although major differences can be observed when comparing the growth paths of the listed ports. The mentioned seaports together realized a growth of 56% between 2008 and 2014, with Dalian, Rizhao and Tangshan recording the highest figures. In general, the recent throughput increases remain quite modest when compared to the strong 1990-2002 throughput growth figures reported in Cullinane and Wang (2007). In 2015, the overall throughput of the listed ports even decreased by 0.8% compared to 2014, mainly caused by traffic losses in dry bulk port Qinghuangdao and diversified hub port Shanghai and a drop in Hong Kong's container activities. This observation provides indications that the fast development phase which started in the early 1980s has evolved to a period of less steep throughput growth with even some tendency towards weak growth.

The above conclusions on regional differences and an overall slower growth pattern are supported when analysing throughput dynamics in the Chinese container seaport system. Containerisation has played a key role as enabler of China's rise as a major global exporter of manufactured goods and the development of China's container seaport system has greatly contributed to global container trade. Only 25 years ago the container seaport system in mainland China was still in its infancy stage. During that time, Hong Kong acted as the only container gateway to China and Taiwanese ports Kaohsiung and Keelung benefited from Taiwan's economic success in international trade. In May 1980, the Chinese government established the Shenzhen Special Economic Zone, the first special economic zone in China. By the late 1980s, mainland Chinese ports in the Pearl River Delta saw the first fruits of this opening up policy. Growth dynamics slowly started to shift from Taiwan to the Delta following seaport development in Shenzhen, Guangzhou and later also in other ports. As a result, the Pearl River Delta recorded an average annual growth of 19.3% between 1985 and 1995. The market share of the Delta peaked in 1995 at 55% (figure 3). In the following ten years the Delta's growth remained high with traffic increases of between 12 and 13% per year.

< insert figure 3 about here >

The Chinese government developed a strong focus on Shanghai in the mid-1990s under president Jiang Zemin. As a result, the Yangtze River Delta emerged as the most prominent container growth region in China reaching an elevated average annual growth of 30% in container throughput between 1995 and 2005. The region increased its market share in combined China/Taiwan/Hong Kong container traffic from 5.6% in 1995 to 30% in 2008, with Shanghai and Ningbo as the main growth engines. In the early 1990s, the Shanghai Port Authority started to convert general cargo terminals into container terminals, building dedicated container terminals at the Waigaoqiao area. Efforts were also made to

build the Waigaoqiao area into a procurement and distribution centre for the Asia Pacific Region. The capacity problem and the lack of deep-water berths in the beginning of this millennium were solved by the construction of a new port at the Yangshan islands, 100 km south of Shanghai and 30 km offshore. In December 2005, phase one was opened. Phase four is planned to be completed in 2017 and should bring the port's container handling capacity to 40 million TEU.

The centre of gravity in container growth is no longer only in the Yangtze River Delta. Strong growers are now also found in northeast China, more in particular in the Bohai Bay area consisting of the Shandong, Jin-Ji and Liaoning port regions. This not only includes larger ports such as Dalian, Tianjin and Qingdao, but also a lot of relatively new players in the container business such as Yingkou, Dandong, Yantai, Rizhao and Tangshan. At the same, we see a recovery in the relative importance of the Taiwan Strait, mainly driven by growth in the mainland Chinese port of Xiamen and spurred by the start of direct cross-Strait sea transport services in December 2008. The Taiwanese Ministry of Transportation and Communications (MOTC) reported that in 2014 direct cross-Strait container traffic amounted to 2.48 million TEU compared to 1.56 million TEU in 2009 the year after the opening up of direct services.

Chinese container ports are feeling the full impact of the Chinese economic slowdown and the weak global economic situation. Figures 4 and 5 show the evolution of container throughput and the year-on-year growth rates in the three main container port regions in China. We compare these volume dynamics with some key seaport systems in North America and Europe: the seaport system along the North American West Coast including ports such as Seattle/Tacoma, Vancouver, LA, Long Beach and Oakland; East coast ports such as Norfolk, Charleston, New York/Ney Jersey, Baltimore, Savannah and Halifax; the Hamburg-Le Havre port range consisting of key north-European container ports such as Rotterdam, Antwerp, Hamburg, Bremerhaven, Le Havre, Zeebrugge and Wilhelmshaven; and the West Mediterranean including Spanish, French, Italian and Adriatic Med ports.

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The Pearl River Delta shows a much lower growth rate than the two other Chinese port regions. Since 2004, its growth pattern is very similar to the one observed in the Hamburg-Le Havre range. Actually, after the financial crisis year 2009 year-on-year growth in the Pearl River Delta was even slightly weaker than in the considered European and North American seaport systems. It remains the most important container seaport region in the world, but recorded a small traffic decline of 0.7% in 2015 mainly as a result of the weaker performance of Hong Kong. Shenzhen is now the largest port in the Pearl River Delta, and even Guangzhou is fast closing in on Hong Kong.

The Yangtze River Delta recorded elevated annual growth rates of 15 to 40% before the economic crisis. Since 2011 container volumes increased by 4 to 7% per annum. In 2015 growth reached 5.2% with Shanghai +3.6% and Ningbo +6% and slightly higher growth rates for river ports Nanjing and Suzhou. The Yangtze River Delta handled over 65.2 million TEU in 2015 and is now just behind the Pearl River Delta which recorded a throughput of 65.6 million TEU.

The Bohai Bay region has been one of the fastest rising container regions in the world in recent years. However, its growth pattern shows a sudden and strong downward trend since 2010. In 2015 container traffic grew at 'only' 3.2% in this region with growth in major ports Tianjin (+3.2), Qingdao (+4.9%) and

most other medium-sized ports, but a traffic decline of 6.7% in Dalian. With this result, growth in the Bohai Bay region is getting close to the growth figures recorded by more mature port regions such as the Pearl River Delta, the Hamburg-Le Havre range (-1.6% mainly caused by traffic decline in Zeebrugge, Hamburg and Bremerhaven) and the US West Coast. Still, the Bohai bay region strengthened its position as the third most important container port region in the world handling 55.8 million TEU in 2015.

The above discussion underlines that it is important to focus on regional dynamics when talking about the development of the Chinese seaport system. The world's top three container handling regions are in China, each handling 55 to 65 million TEU in 2015. To put the container figures of these three Chinese port regions in perspective: the entire North American container seaport system handled about 50 million TEU in 2015 (based on figures AAPA) while the entire European container seaport system reached just over 100 million TEU in the same year.

Still, 2015 was a weak year in the container port industry, also in China. Compared to the temporary slowdowns observed during the Southeast Asian crisis (1997-1998), the Dotcom crisis (2001) and even the financial crisis (late 2008-2009), the volume slowdown of the past five years is visible in all port regions considered.

Furthermore, the link between GDP growth and container growth in China is changing (figure 5). For a very long time, the GDP multiplier was well above one, meaning that any increase in GDP coincided with a much higher container throughput growth. In the past five years, the GDP multiplier is below one for most of the port regions in China. This illustrates that the seaport system is affected by some structural changes in the Chinese economy such as an increased focus on the services sector and a growing dependency on domestic demand instead of external trade.

2.3. Terminal capacity and productivity in light of dynamics in shipping and logistics

Next to macro-economic considerations, Chinese ports are affected by developments at micro- and meso-economic level. Ports are challenged to adapt to dynamics in shipping and logistics (Notteboom and Winkelmann, 2001) as exemplified by rounds of alliance formation in container shipping, scale increases in vessel size, consolidation in the shipping and logistics industry, an increased focus on information flows and the reconfiguration of distribution networks. Changes in supply chains have forced ports and terminals to seek effective integration in these supply chains when delivering value to shippers and third-party logistics service providers (Robinson 2002; Mangan et al. 2008). Song and Panayides (2008) provide a conceptual contribution to the measurement and quantification of such integration efforts.

In the container business, shipping lines and alliances thereof are imposing ever higher requirements on ports in terms of the ship turnaround time, service quality and competitive price levels. Given China's pivotal role in the global container network, ports and terminals are challenged to make sure the necessary port and terminal capacity is in place to accommodate cargo and ships, while at the same time delivering a high and consistent terminal productivity (e.g. in terms of moves per ship per hour). The 2012 figures of JOC Group (2013) in table 2 relate to the global ranking of ports based on the average berth productivity for all container ship sizes, container vessels larger than 8000 TEU and ships with a unit capacity below 8000 TEU. The database included 354 ports globally. JOC defines berth productivity as the number of total container moves (on-load, off-load, and re-positioning) divided by the number of hours during which the vessel is at berth (i.e. the time between berth arrival and berth

departure) without adjustments for equipment and labour down time. It can be concluded that the berth productivity of many Chinese container ports ranks among the highest in the world.

< insert table 2 about here >

In the past decade, there was sufficient container terminal capacity in place in the vast majority of Chinese ports to cope with the demand evolution in container handling. Already before the start of the financial crisis in late 2008, there were serious concerns about the overbuilding of terminal infrastructure in Chinese ports (Fairplay, 2007) despite strong economic growth in this pre-crisis period. These overcapacity concerns have become stronger since 2009. Table 3 provides an overview of terminal utilisation degrees for a sample of 47 Chinese container terminals based on data reported in Drewry (2014) and port and company websites. Note that Drewry estimates capacity figures for each terminal based on operational capacity, not design capacity. This explains why the capacity utilisation for some terminals exceeds 100%. The global average terminal utilization level amounted to 67% in 2013 (Drewry, 2014). Some 80% of the terminals in Jin-Ji, Shandong Bay and Yangtze River Delta show a utilization degree above the world average. Only 20% of the terminals in the Yangtze River Delta are below the 50% level. The situation in the Pearl River Delta is somewhat mixed with half of the terminals above the 85% mark (mainly located in Nansha and Hong Kong) but also 21% of the facilities below 50%. The Taiwan Strait region shows the lowest figures with 57% of its terminals not able to utilise half of the annual operational capacity. The wide ranging utilisation levels demonstrate that the capacity utilisation discussion cannot be generalized for the whole of China as the situation is very dependent on the port or even individual terminal. Li et al. (2013) analysed the efficiency of coastal container terminals in China using a three-stage DEA model. Using 2010 data, the analysis points to a 35% input excess or overcapacity for the Chinese container seaport system as a whole. However, their results also show strong regional differences with the Yangtze River Delta showing the best results and the southeast coast the lowest efficiency level.

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3. BROAD POLICY INITIATIVES AFFECTING THE CHINESE SEAPORT SYSTEM

In section 4 we will discuss the evolution of port governance in China by analysing legislative and planning initiatives directly focused on ports. However, the Chinese seaport system is feeling the impact of a range of broader policies directly or indirectly affecting the governance and functioning of seaports. In this section we discuss four recent key policy initiatives: corporate governance reform, the Go West policy, the One Belt One Road initiative and the establishment of Free Trade Zones.

3.1. Policies to modernize corporate governance in China

Cullinane and Wang (2007) provide a detailed description on the broader reform processes that took place in China aimed at more sound and transparent corporate governance policies following China's entry into the WTO in the early 2000s. OECD (2005) analysed in great detail how China was transforming its system of governance, the role of the state and its institutions to an increasingly market-oriented economy.

In the past decade, the process of corporate governance reform has only accelerated. The Chinese government feels governance reform is needed given its ever more important role on the global political and economic stage and given the many fiscal, financial, social and environmental challenges

it is confronted with. Many of the envisaged actions in the area of corporate governance are having a direct impact on the functioning of the actors involved in the Chinese seaport system. In the next paragraphs we discuss the areas of change in corporate governance which we believe are having the greatest impact on seaports.

First, China is continuing to engage in enterprise reform mainly via improvements in corporate governance in general, and of listed companies in particular and via the establishment of the government as a full or part-owner of enterprises rather than as a manager. Reforms have been carried out to allow enterprises and their managers to concentrate on their business separated from the state. A distinction should be made between traditional state-owned enterprises (TSOEs), which basically are SOEs as they existed under the planned economy, and enterprises organized under the Company Law that happen to be wholly state owned or controlled by the state. On top of that, there is a range of public service units (PSUs) which are operating in close alignment with the government but are separated from other SOEs. Over the past decade, the policy with respect to TSOEs was aimed at abolishing this form by corporatizing them, i.e., converting them into some form of company governed by the Company Law. Clarke (2003) identifies three possible forms for such a corporatisation process. First, the limited liability companies (LLC) in which shareholders typically are not responsible for their debts. Next, companies limited by shares (CLS) which are similar to large stock corporations in Western terms. Finally, the wholly state-owned limited liability company (WSOLLC) which basically are LLCs wholly owned by a state agency. With the corporatization process the government tried to reach a number of objectives such as supporting growth of the non-state sector, capital raising and more efficient management of state assets. As we will demonstrate later, also port governance structures have been largely affected by this broader corporatisation policy.

Second, China's accession to the WTO exposed Chinese firms to more intense international competition under the WTO rules. This has urged the Chinese government to take measures so that companies can operate according to international trade rules, and to make progress in developing a sound intellectual property rights (IPR) system (Fan et al., 2013). At present, Chinese IPR rules and regulations are largely in conformity with international practice and standards, while challenges remain in making the existing laws and their enforcement more effective in terms of promoting economic progress and innovation. Ang et al. (2014) demonstrated that effective enforcement of IPR at the provincial level is critical in encouraging R&D. In the few cases of criminal enforcement of IPR in China, Liu (2015) found that the role of such criminal enforcement mainly served political goals of protecting the socialist market order. These developments are relevant to the port industry given its strong international focus and dependence on trade growth.

Third, the combination of rapid economic growth and the rise of corruption in China is seen as a paradox by some (Wedeman, 2012). While corruption exists in China, Ramirez (2014) found that it is not at alarmingly high levels, compared to the historical experiences in other countries going through a similar growth phase. Still, corruption is to be avoided as it hinders China's economic growth and social reform. Jiang Zemin was the first president to put the fight against corruption on the political agenda. The initiatives taken to deal with corruption intensified under Hu Jintao, but gained even stronger momentum under Xi Jinping (Kwong, 2015). The fight against corruption has affected administrative processes, reporting practices and the mobility of government officials, also in ports. For example, the managing bodies of ports are facing more rigorous reporting procedures in terms of cargo flow information, safety and security, staff training and business or government events. Fourth, all resource allocations during the planned economy stage in China were specified in the plans. Budgets were merely considered as a secondary accounting device. The shift to a market-based economy heralded major transformations of public expenditure policies and processes. Over the past two

decades, China has reformed its budgeting system affecting the entire cycle from budget formulation, approval, implementation and audit, also affecting seaport infrastructure investment procedures. For example, the financial flows related to seaport investments are now subject to higher requirements in terms of transparency and economic feasibility considerations.

A last governance item relevant to seaports relates to the collection and reporting of statistical data on economic and social issues. In the past decades, Chinese official statistics offices and reporting units have made major advances in moving from a statistical reporting system of a centrally planned economy to a modern system following international statistics collection and reporting methods. Despite the progress made, several authors and organizations still question the data quality of Chinese economic statistics (such as real GDP figures) and the overall organisation of China's statistical offices and agencies (Koch-Weser, 2013; Fernald et al, 2013; Bradsher, 2016; Wu, 2016). The discussion on statistics reporting is also relevant to seaports. For example, more than once questions have been raised during academic or business gatherings about the comparability between Chinese port throughput data and traffic data of other seaports around the world.

3.2. 'Go West' policy

The introduction of the open door policy in the late 1970s made coastal cities open to foreign trade. China's foreign trade has shown a rapid growth through the subsequent expansion of open cities since 1992. The west lagged behind as the coastal areas in the east were chosen as pioneers for the country's reform and opening up policies. Over years of accumulation, the disparity grew to a dangerous level. In the late 1990s, the ever-widening development gap became between eastern and western areas of China caught the eye of the government. In 2000, the Central Government in Beijing initiated the 'go west' policy in view of energizing the local economies and improving people's living standards in the western parts of China. The western region of China consists of 11 provinces and autonomous regions as well as the municipality of Chongqing. Compared with coastal areas, the west suffers from a poorer economic foundation, which can be attributed to historical reasons and geographical factors.

The 'Go West' policy caters to the goal of building a xiaokang or a well-off society. Explicitly incorporated into the concept of a xiaokang society is the idea that economic growth needs to be balanced with sometimes conflicting goals of social equality and environmental protection. The revival of the concept was in part a criticism of social trends in mainland China in the 1990s under Jiang Zemin, in which many felt China was focusing too much on the newly rich and not enough on mainland China's rural poor. Its use has been associated with Hu Jintao and Wen Jiabao as a goal for mainland China to reach by the year 2020. Also Xi Jinping supports the 'Go West' policy by partly embedding it into the One Belt One Road initiative (see next section).

Accompanying the 'go west' policy campaign have been large-scale investments from the central budget, lower tax rates and a series of other preferential policies, which have injected tremendous momentum for local economic development and social progress. Among the significant infrastructure projects are the Qinghai-Tibet Railway, and the west-east natural gas pipeline project, starting from the Tarim basin of the Xinjiang Uygur Autonomous Region to Shanghai.

Despite recent achievements, western areas are still confronted with grave challenges in development, and they still have a long road ahead to catch up with their eastern counterparts. Data of the National Bureau of Statistics of China show that the average Gross Regional Product in the west is still much lower than in the eastern areas. The infrastructure facilities need further upgrading, and the deteriorating ecological situation is a major concern.

3.3. The 'One Belt One Road' initiative (OBOR)

The 'One Belt One Road' initiative (OBOR) was launched in September/October 2013 by President Xi Jinping to foster economic cooperation from the Western Pacific to the Baltic Sea and to break the connectivity bottleneck in Asia through infrastructure investments. The OBOR program is a centrepiece of Xi Jinping's foreign policy and domestic economic strategy. In March 2015 the Chinese government unveiled an OBOR initiatives action plan (Kennedy and Parker, 2015). The initiative covers a land-based (in essence rail-based) Silk Road Economic Belt (one Belt) including a zone of influence on both sides of the Belt, and a 21st century Maritime Silk Road (one Road). Figure 6 shows the routes of the OBOR initiative as presented by the Xinhua News Agency in early 2014. The land-based Belt begins in Xi'an in central China before stretching west through Lanzhou (Gansu province), Urumqi (Xinjiang), and Khorgas (Xinjiang), which is near the border with Kazakhstan. The Silk Road then runs to Duisburg in Germany via Iraq, Syria, Turkey, Bulgaria, Romania, the Czech Republic, and Germany. From Duisburg it connects to major north European ports such as Rotterdam, Antwerp and Hamburg. The Belt runs south to Venice in Italy where it meets up with the Maritime Silk Road. The Maritime Silk Road will begin in the port of Quanzhou in Fujian province, and also calls at Guangzhou, Beihai (Guangxi), and Haikou (Hainan) before heading south to the Malacca Strait. Then it connects to India/Pakistan and East Africa before entering the Mediterranean with key stops in the port of Piraeus in Greece and in the port of Venice. In the meantime, the number of routes has been extended and now covers six economic corridors: the China-Mongolia Russia economic corridor, the New Eurasia Landbridge economic corridor, the China-Central Asia-West Asia economic corridor, the China-Pakistan economic corridor, the Bangladesh-China-India-Myanmar economic corridor and the China-Indochina Peninsula economic corridor. Since the announcement of the OBOR initiative, the number of countries involved keeps expanding (already 60 countries with a joint population of 4.4 billion people).

< insert figure 6 about here >

The OBOR initiative is supported by a range of funds and financial institutions. The Silk Road Fund (USD 40 bn), China Development Bank (CDB – USD 50 bn) and the Export-Import Bank of China (China Eximbank) all have a key role to play. CIC Capital, a subsidiary of China's sovereign wealth fund, will also finance OBOR projects, as will other commercial banks. The state-owned conglomerate CITIC Ltd. has announced that it would mobilize up to USD 113 bn to support the OBOR development (Zhang and Miller, 2015) while the Bank of China committed USD 100 bn. Also the multilateral Asian Infrastructure Investment Bank (AIIB) with a registered capital of USD 100 bn (of which USD 50 bn from China) and 57 founding members will have its role to play to finance infrastructure in Asia.

China's motives to launch the OBOR initiative are of a cultural/historical, geo-economic and geo-political nature. The historical and cultural motives are linked to the ancient trade routes connecting China to the Middle East and Europe that were established during the Han dynasty (period of 207 BC to 220 AD). Xi'an served as the starting point and end point of the historical Silk Road (Christian, 2000). The geography of the Maritime Silk Road has some resemblance with the historical exploits of Admiral Zheng He (1371-1433) who made maritime journeys between 1405-1433 with a reported fleet of some 300 ships (Lin, 2011). Next to ship visits in South Asia, India and the Middle East, he sailed to Somalia and Kenya in 1418 (Wade, 2005).

The geo-economic motives are mainly linked to: (a) China's search for (renewed) economic growth (see section 2), also in its more western and central provinces (see 'Go West' policy); (b) to develop stronger economic ties with trading partners and emerging nations in Asia, Central Asia and Africa; (c) to help to resolve the overcapacity situation in various industries within China, for example in steel, cement and alumina (Roland Berger, 2015); (d) to streamline/channel foreign investments of Chinese

companies (Hanemann and Huotari, 2016), and (e) to enhance capital convergence and currency integration of the Chinese Yuan (RMB).

The geo-political motives relate to China's ambition to increase its zone of influence and to adopt a leadership role in the world by making stronger use of economics in shaping diplomatic relationships. Still, there are diverging views on whether China is using the OBOR policy as a counter weight against the US-backed Trans-Pacific Partnership or TPP (Hearn and Myers, 2015) and as a means to somewhat bypass Russia economically, politically and geographically, i.e. thinking of OBOR as a geopolitical strategy to establish strong economic ties with former Soviet states such as Kazakhstan, to strengthen energy security and to develop a new Eurasian landbridge not involving transit through Russia via the trans-Siberian railroad. Wilson (2015) argues that the OBOR initiative exemplifies the (latent) tensions and growing power disparities between Russia and China. The OBOR initiative can further facilitate cooperation between China and other states on conflict management and resolution of territorial and boundary disputes, although Kong (2015) underlines these effects should not be overestimated. There is also a domestic geo-political component as China is determined to preserve its territorial integrity. The inclusion of Xinjiang province in the OBOR initiative as a hub to Central Asia should help to meet this objective.

While the OBOR initiative offers great potential for economic cooperation and development, its implementation is not without risks. Some of the key regions involved face political instability. Infrastructure development faces some governance risks such as the need for financial discipline, careful budgeting and fair tender procedures to avoid any waste of resources. Another key issue is the need for a further development of knowhow and expertise on infrastructure planning and financing in some of the less developed regions along the Belt and Road.

3.4. The establishment of Free Trade Zones

A free trade zone (FTZ) within a nation can boost imports and exports and wider growth by lowering the barriers to economic development through the removal of bureaucratic red tape and tariffs (Tiefenbrun, 2012). In China, FTZs are a particularly interesting proposition for the Chinese government to boost trade-related activities in a period of economic slowdown. In 2013, the Chinese government initiated a policy aimed at the development of pilot free trade zones in some coastal port cities. This development is part of more comprehensive initiatives to strengthen local governments by offering economic support.

The first FTZ was launched in Shanghai in September 2013. The China (Shanghai) Pilot Free Trade Zone (SHFTZ) is comprised of four areas under the special administration of Customs: Waigaoqiao Free Trade Zone, Waigaoqiao Free Trade Logistics Park, Yangshan Free Trade Port Area and Pudong Airport Free Trade Zone. Except for the latter, all zones are located in or near the seaport terminal activities of Shanghai. Therefore, the FTZs should support Shanghai's further development into an international shipping centre. These zones are open to foreign market players and offer the possibility to set up distribution systems for a broader Asian market without the burden of having to pay customs duties in China. The impact of the Shanghai FTZs has been rather modest when viewed from a national perspective. The Chinese State Council extended the initiative in April 2015 by opening three additional FTZs in Guangdong, Tianjin and Fujian. The Guangdong FTZ is comprised of Hengqin in Zhuhai (near Macau), Qianhai and Shekou in Shenzhen (near Hong Kong) and Nansha in Guangzhou. Part of these sections are bonded zones. A bonded zone is a designated zone whereby imports do not clear customs and therefore pay duties until such time as they leave the zone, and if they are re-exported then duties are not required. At the same time, the Shanghai FTZ was expanded to incorporate three new areas,

i.e. Lujiazui in downtown Pudong, Jinqiao and Zhangjiango. A third group of FTZs was announced in early Spring 2016.

The FTZs have become some sort of proving grounds of the Chinese government to test new sets of economic policies and governance reforms. With the additions of more urban FTZs (such as Lujiazui) in Shanghai, the Chinese State Council has developed a package of measures to support the development of more advanced manufacturing activities and financial and trade-related services in these FTZs. The Tianjin FTZ is specifically focused on the intensification of trade relations with South Korea and Japan. The FTZ in Fujian is a proving ground for the development of cross-Strait economic cooperation between mainland China and Taiwan. One of the aims of the Guangdong FTZ is to enhance integration with Hong Kong, particularly in the financial sector. Hong Kong banks are now allowed to set up branches in the FTZ and make RMB loans to mainland companies in the zone. While FTZs play a role as proving grounds for nationwide policy, many of the zones are intended to drive regional growth by encouraging selected industries to cluster in these areas.

Since 2014, FTZ development also comes with a so-called Negative List, i.e. a list of sectors in which foreign investment in FTZs is restrained. The latest Negative List dates back to May 2015 and includes 122 prohibited or restricted business areas (compared to 139 in the initial 2014 list). The reduction in the number of restrictions points to a further opening up to foreign investors. With the 2015 list, mining, medical and pharmaceutical product manufacturing, and telecoms became also open to foreign investors. A planned 'Foreign Investment Law' should broaden the application of a negative list for foreign investment to the whole country.

In summary, the FTZ policy of the Chinese government has introduced an unprecedented degree of openness in relation to foreign investment and international trade in both goods and services. While the creation of FTZs is helping China to increase economic activities in designated regions of the country, it is important that the experiences gathered through FTZ policy can serve as input for the formulation of further nationwide social, economic and governance reforms.

4. EVOLUTION OF PORT GOVERNANCE POLICY IN CHINA

4.1. From 1949 till the Port Law of 2004

Cullinane and Wang (2007) identified three distinctive phases in port governance reform in China. In this section, we briefly summarize the main characteristics of these three phases.

The first phase covers the period 1979–1984 which was characterised by a centrally planned economic system with strongly centralised decision-making. Also the Chinese seaport system was subject to central control by the Chinese government through its Ministry of Communications. Local and provincial public authorities did not take part in the port industry. The ownership of the entire seaport system, the collection of revenues and the decision-making, strategy formulation and financing of port development were centralised in the Ministry of Communications. This approach facilitated the formulation of national port plans, although the budgets to implement these plans were often very limited. Furthermore, the spatial disconnection between the policy-makers in Beijing and the more operational port environment made that little efforts were made to improve port efficiency. The combination of insufficient funds for port development and lagging efficiency improvements caused severe port capacity problems in the early 1980s.

The second phase covers the period 1984-2004 and started with the joint management of the port of Tianjin by the central government and the local government. This local pilot in port governance reform marked the start of a process towards decentralisation that in subsequent years was implemented in a large number of Chinese seaports. With the exception of Qinghuangdao (which stayed under central government control), all other ports ended up being controlled either by central and local governments or by only the local government. The port authorities received regulatory powers, but at the same time their status as state-owned enterprises (SOE) pushed them to become more market-oriented, for instance in terms of investment decisions. The devolution process opened new channels for port development funding, i.e. via local governments, foreign investors (i.e. via joint ventures as long as the investor's stake did not exceed 49%) and commercial banks. The new governance system resulted in a gradual entry of foreign private investors in Chinese ports, particularly in the container business as exemplified by the investments of HPH and PSA. However, the government *de facto* remained in the driver's seat when it came to port planning and secured the biggest share of the revenues collected from port terminal operations.

The third and last phase identified in Cullinane and Wang (2007) started with the Port Law of 2004 and the related 'Rules on Port Operation and Management'. Both pieces of legislation led to a further decentralisation of port governance in China and opened the path to processes of corporatisation of port authorities and the introduction of modern corporate governance principles in the seaport system. In order to end the dual role of port authorities as both regulator and port operator, the new governance framework aimed at strictly separating these functions via the establishment of so-called Port Administration Bureaus and separate port business companies or groups. Moreover, the Port Law made an end to port ownership by the central government. The ceiling of 49% for foreign investors was abolished which opened possibilities for foreign players to invest in and operate ports, even without needing a local Chinese partner. Policy formulation and strategic port planning falls under the responsibility of the central government and the respective provincial governments, so any plans of local governments need to be approved by these higher authorities.

Also other scholars have proposed development stages in the Chinese seaport system, but most of them are focused on the development speed of Chinese ports, not on port governance issues. For example, Xu (2005) distinguishes three stages, i.e. the period 1949-1972 characterised by recovery and development; the period 1973-1978 marked as the initial developing state and, a fast development stage since 1979. Xu and Zhang (2006) proposed a five stage development pattern, i.e. 1949 till early 1970s (technical update and slow development), 1970s (improvement of throughput capacity and functional development), 1980s (high speed development based on the 6th and 7th Five-Year Plans), 1990s (development of deepwater commercial ports) and early 21st century (development of a broader range of large-scale ports and focus on service level improvements).

Still, there are some academic papers focusing on port governance reform in China. Li et al. (2012) compare port system development in China and the USA against the backdrop of changing port management regimes in the two countries. Xu and Shin (2012) present three stages in the port governance system in China which largely correspond with the stages presented in Cullinane and Wang (2007). The first period (1949-1984) was characterised by integration and control by the Ministry of Communications (MOC). In the second period (1985-2001) port management became a joint responsibility of MOC and local port authorities. The third period (starting in 2002) mainly involved a port management shift to local port administration bureaus. While Cullinane et al. (2007) use the Port Law of 2004 as the pivotal point in the transition from the second to the third phase, Xu and Shin (2012) argue that the process towards the third phase in port governance already started a few years earlier, namely right after China's accession to the World Trade Organization (WTO) in November 2001.

The port governance reforms had an impact on the speed of port infrastructure and terminal capacity additions in Chinese seaports. Before the opening-up policy, port and terminal development was restrictive and fully controlled by the central government. The lack of deep-water container terminal capacity meant that Chinese cargo passed via Hong Kong to reach the world markets. The devolution of port management to local government facilitated the mobilisation of resources for port construction mainly focused on the construction of large hub ports such as Shanghai and Shenzhen (Pan et al., 2014; Cullinane et al., 2005b). At the start of the new millennium also secondary ports with a strong hinterland market and a favourable nautical access profile, and ports outside of the Pearl River and Yangtze River Deltas, were offered the possibility to strongly develop their infrastructures.

The sheer size of the Chinese market meant that the strong demand growth generated large absolute increases in volumes. As a result, capacity had to be added rapidly and usually in very large projects. In the next section, we examine the current progress in the implementation of the principles introduced by the Port Law of 2004. Furthermore, based on recent developments and extant literature we assess the validity of the proposed three phases from the perspective of the current port context. More in particular, we examine whether there is room for introducing a fourth phase in port governance in China.

4.2. Recent trends in port governance in China: towards a fourth phase?

Since the work by Cullinane and Wang (2007), the Chinese government has executed the 11th (2006-2010) and 12th (2011-2015) Five-Year Plans and worked on the preparation of the 13th Five-Year plan (2016-2020). China's Five-Year Plans are a series of social and economic development initiatives drawn up by the Communist Party of China. The plans map strategies for economic development, setting growth targets, and launching reforms. During the past decade, the port governance principles as laid down in the Port Law of 2004 were still standing. The Chinese government has not introduced any major trend breaks, but followed a more incremental port governance evolution path which started in the early 2000s. In other words, we see no justification for introducing a distinctive fourth phase in the port governance evolution in China, despite the fact that from a port demand perspective the high growth phase in port throughput has made room for more moderate growth.

Instead, the Chinese government and other port-related actors have embraced an approach of 'institutional plasticity' without necessarily breaking out of the existing governance path that was initiated in the early 2000s. The concept of institutional plasticity was introduced by Strambach (2010) with a first application to a port governance context presented in Notteboom et al. (2013). Plasticity means that actors succeed in stretching existing institutions and institutional arrangements through deliberate action and flexible interpretation. The corresponding institutional transformation can manifest itself via processes of conversion, layering, stretching and displacement. We argue that port governance evolution in China in the past decade has particularly been influenced by processes of layering by which new rules, procedures, functions and mandates are gradually added to existing institutions and institutional arrangements (Martin, 2010; Notteboom et al., 2013). While individual changes might be incremental, extensive and long processes of layering in a port governance context can ultimately lead to a gradual mutation of the role of the actors involved in port governance without breaking the existing development path. As such, institutional plasticity in a port governance context refers to the degree of flexibility and dynamism in the governance framework to enable change by actors in view of optimising it to fit the changing social and economic environment.

We propose four forces that, in the past decade, have been the drivers of processes of institutional layering in the Chinese port governance framework.

First, the actors involved (i.e. central, provincial and local governments and market players) continue to support the last major port governance reform of 2004 which brought processes of corporatisation of port authorities and the introduction of modern corporate governance principles in the seaport system. While they typically feel no need to break the existing path, they insist on the practicality of the port law to cope with a fast changing market and geo-economic policy context.

Second, the actors involved understand that the Chinese seaport system is not homogeneous, but consists of many ports and port regions each with specific needs and challenges in terms of economic and social development, port-city relations, spatial dynamics, environmental pressures, etc. A rigid nationwide one-size-fits-all approach poses great restrictions in effectively dealing with the regionalism in the Chinese seaport system. Ultimately, such rigidity can undermine the dynamism at the more local port level. Processes of layering at the regional and local level allow actors to add some regional touches to port governance practices, without disconnecting from the national policy nor breaking out of the existing path. Section 5.1 will illustrate these processes by analysing regional differences in port integration and coordination.

Third, port actors are aware that a series of broader policy initiatives, such as OBOR, FTZs and the 'Go West' policy, can have a significant long-term impact on the position of the respective ports in the Chinese port hierarchy and in accommodating global supply chains. Processes of layering in terms of port governance emerge when local port administrative bureaus or port business groups seek to implement new or more extensive roles and managerial competences in view of explicitly incorporating these broader policies in strategy formulation and operational practice.

Fourth, the central government is determined to reduce any potential negative effects of the far-reaching port devolution which gives much more powers to the local level. A main concern is that the followed process of decentralisation in port governance might spur unhealthy levels of self-interest and ambition at the local port administration and business level and the dismissal of any sort of regional coordination in terms of port development. In the current period of lower demand growth, such behaviour can aggravate the overcapacity situation in segments of the seaport system. Recent national policy documents make reference to the need for more coordination and cooperation among ports and the potentially new roles for port actors. The so-called "National Development [2014] No. 32" of 2014 aims at promoting a healthy development of the maritime industry. The policy covers fifteen areas for further actions: (1) build a modern maritime fleet; (2) optimize the layout of coastal ports; (3) promote the cruise industry; (4) improve the collection and distribution system; (5) actively build green ocean; (6) accelerate ocean science and technology; (7) actively develop modern shipping services; (8) improve security conditions of dangerous goods in port; (9) strengthen safety supervision of dangerous goods in ports; (10) enhance transport safety; (11) strengthen organizational leadership; (12) increase capital investments; (13) improve administrative services; (14) strengthen maritime personnel training; (15) enhance the level of port services. In action area (4) the government advocates stronger coordination in transport planning by integrating the port-related transportation system into overall urban planning, by developing a stronger multimodal approach to planning issues and by encouraging enterprises to develop inland or dry ports. Action area (2) makes explicit reference to the policy objective of avoiding duplication and homogenization of port competition. In the same section of the National Development document, the Chinese government calls for actions that contribute to the development of a rational division of work and coordination between ports. Also the 13th Five-Year plan (2016-2020) aims for more rational and coordinated port investment plans through port cooperation and the promotion of an integration of port resources. In 2014, the Ministry of Transport released a policy document on "Guidance on promoting the transformation and upgrading of ports". The main principles laid down in this document are the following: (1) Promote state-owned

port enterprises to develop mixed ownership; (2) Encourage port enterprises to use capital resources for mergers and reorganization, and to optimize and integrate port resources; (3) Encouraging large port enterprises to change from production-oriented operational management to capital-oriented operational management.

The calls for more port integration and cooperation, and a more multimodal planning approach (including hinterland connectivity) do not undermine the existing port governance path as set out in the Port Law of 2004, but add extra layers to the role and functions of local port business groups.

5. DISCUSSION: STRATEGIC AND MANAGERIAL IMPLICATIONS FOR CHINESE PORTS

The recent policy evolution and directions on port governance in China combined with the broader policies discussed earlier in this paper (i.e. OBOR, FTZs, corporate governance and 'Go West' policy) pose a number of strategic and managerial implications on Chinese ports which affect the role and functioning of the local port groups and port bureaus. In the following sections, we discuss three key developments in this respect: (a) an increased focus on port integration and co-operation, (b) a strong orientation on hinterland development through corridors and dry ports, (c) a two-way opening up of the port sector by combining initiatives to attract foreign investments and trade to Chinese ports with an internationalisation of Chinese port-related companies.

5.1. An increased focus on port integration and cooperation

Port governance changes in the Chinese seaport system have resulted in a more business-oriented competitive environment. Cooperation between competing ports (typically in proximity) is often regarded as a means to avoid destructive inter-port competition (Notteboom et al., 2009; Ng, 2013). Port cooperation and integration has become a hot topic in China against the background of slower traffic growth, increased competition and growing international opportunities. Section 4.2 referred to key policy documents that advocate port cooperation and integration. There is a growing body of literature applying economic modelling approaches to port competition and integration/cooperation in China. For example, Luo et al. (2012) developed a two-stage duopoly model to evaluate port capacity expansion with application to container port competition between Hong Kong and Shenzhen. Zhuang et al. (2014) presented a game theory approach to port specialisation in China. They concluded that if there is a clear market leader, there might be no need for policy intervention. However, if no port has clear market power, then government coordination and intervention may be needed in order to prevent overcapacity and to encourage specialization.

In this section, we discuss recent dynamics in the level of port integration across China. In a recent paper, Wang et al. (2015) provide a detailed analysis of the nature of port integration in China, including associated temporal pathways, spatial patterns and dynamics. As we do not intend to replicate these research efforts, we provide a short synthesis and discussion of the main outcomes by looking at three issues.

First, Wang et al. (2015) find a significant rise of port integration initiatives in China since the early 2000s. We can interpret this result in two different ways. One approach is to conclude that the port devolution process to the more local level has not resulted in excessive self-interest and ambitions of individual ports, but has actually enhanced their sense for cooperation and coordination driven by market-related considerations. Another possible perspective is that the port devolution process made government agencies at higher levels (i.e. national and provincial) work out schemes aimed at avoiding

duplication of facilities, overcapacity and excessive competition in a seaport system characterized by a highly decentralized governance structure (see also the market environment discussion in section 2). In our view, both perspectives have played a role although regional differences exist in the relative contribution of each perspective (as we will demonstrate later in this section).

Second, Wang et al. (2015) identified thirteen spatial pathways of port integration, each with different dynamics. These pathways, which include seaports but some also river ports, are mainly situated in the Bohai Rim, the Yangtze River Delta and basin, Fujian province and Beibu Gulf. It mostly involves a larger (hub) seaport and a series of secondary seaports or river ports. The authors also developed a typology on port integration based on four dimensions linked to the actor(s) who initiated port integration (i.e. the government-driven mode, market-driven mode, government/market-driven mode and strategic alliance) and five functional/spatial categories (i.e. port internal integration, jurisdictional port integration, port integration across neighbouring region, regional port integration and hub-feeder port integration).

Third, the authors point to a number of key factors driving port integration in China. These include legislative tools and spatial planning, the optimization of shoreline resources and port functionality and port competition consideration in serving a shared hinterland. These factors largely correspond to the issues we raised at the end of the previous section.

In the remainder of this section we discuss recent developments in port integration in the coastal provinces of China to demonstrate how the implementation of port integration strategies differs regionally. The discussion is based on a large number of recent policy papers, press releases and other relevant documents.

Liaoning port region - In 2009, the State Council of China released a policy document on “The development plan of Liaoning coastal economic belt” aimed at promoting a resource integration of the coastal ports of Liaoning Province and the creation of a port cluster centred around the port of Dalian. Dalian port group and Jinzhou port, both located in Liaoning Province in the northeastern part of China already began to cooperate with each other in 2006. Dalian port group initially held a 15% share in Jinzhou Xinshidai container terminal co. Ltd. The Dalian port group gradually became the second major investor in Jinzhou port. In 2010, Dalian port group set up the Liaoxi port investment developing co. Ltd. as a management platform for its port assets in the western part of Liaoning Province. In the framework of the OBOR initiative, Jinzhou port transferred additional shares to Dalian port group. Since 2014, Dalian Port Group holds 19.08% of the shareholding of Jinzhou port making it the main shareholder. Up to now, Dalian port group has invested more than 5 billion RMB in Jinzhou port.

Jin-Ji port region (Hebei and Tianjin) - Hebei Port Group Co. Ltd, the largest bulk cargo handling company in the world, owns Qinghuangdao port, Caofeidian port and Huanghua port. The company is controlled by Hebei province. Tianjin Port Group co Ltd. controls the port facilities in the Tianjin municipality, one of the four national-level municipalities in China (next to Beijing, Chongqing and Shanghai). In December 2015, the Tianjin Port Group co. Ltd and Hebei Port Group co. Ltd signed an agreement to form a 50/50 joint venture company Jinhaiyi port investment with a registered capital of 2 billion RMB. The company is planned to purchase some berths in Tianjin port and Huanghua port. In May 2016, Hebei Port group subsidiary Qinghuangdao co. Ltd and Tianjin Port Group established Bohai Jinyi port investment development co. Ltd. Qinghuangdao co. Ltd also signed agreements with Cangzhou Bohai port administrative affairs Co, Ltd and Tianjin port industry investment co. Ltd. Moreover, Qinghuangdao co. Ltd bought two multifunctional berths belonging to Huanghua port and set up Tangshan port investment development co. Ltd in view of constructing new berths at Caofeidian port.

Shandong Province - In April 2009, the ports of Qingdao, Rizhao and Yantai signed a strategic alliance agreement in which was agreed that Qingdao port act as the leading port and Yantai port and Rizhao port act as assistant ports in view of establishing a regional shipping centre. Qingdao port has set up a container company in cooperation with Rizhao port and Weihai port.

Jiangsu Province – In 2009, the State Council of China released its policy document on “The coastal development planning of Jiangsu Province”. The government promotes an acceleration of the integration of Lianyungang port and Rizhao port to form a port cluster around the Haizhou Bay. Furthermore, the Lianyungang government has set up a team to encourage Lianyungang port to integrate its resources with Xuwei port and Ganyu port.

Zhejiang Province – The ports of Ningbo and Zhoushan share a long history of some forms of coordination and cooperation (Fu and Chen, 2012). At the end of September 2015, the port complexes of Zhoushan and Ningbo finally merged to form the largest port group in the world handling some 880 million tons. The Ningbo port group was renamed to Ningbo-Zhoushan port group co Ltd. with Ningbo SASAC holding 94.47% of the shares and Zhoushan SASAC holding 5.53% of the shares. The registered capital of Ningbo-Zhoushan port group is 6 billion RMB. Next to the creation of Ningbo-Zhoushan Port Group, Zhejiang Province has set up a company named Zhejiang sea-port group, which is devoted to integrate the five ports of Zhejiang province. Zhejiang sea-port group is controlled by two companies named Zhejiang energy group (65% share) and Zhejiang financing Ltd (35%). The company bought the Zhejiang Mentou port for 1 billion RMB and then took part in the building of Jintang container port. In February 2016, Zhejiang province set up a seaport developing committee, which is a new provincial level organization. The work of the committee is focused on the approval of major construction projects, port planning and investments and the management of the port coastline. The committee is also in charge of the Zhejiang sea-port group and Ningbo-Zhoushan port group. In the future, the committee will control all the ports in Zhejiang Province. According to the decision of the committee, the provincial level capital will reach up to 20 billion RMB and the capital originally belonging to Ningbo-Zhoushan port will be transferred to Zhejiang sea-port group.

Fujian Province - The Fujian provincial government encourages the provincial transportation group and the Xiamen port administration group to integrate local ports in view of developing two leading companies to manage the berths of the local ports. The government of Fujian province also gave advice on accelerating port integration and the joint actions that could be undertaken by ports, industries and cities. The provincial government and local government would develop the ports together, but with a leading role for the local government. This arrangement would give more room to the provincial government to supply subsidies for port infrastructure and access channels. The provincial government is also encouraging the further transformation and upgrading of ports in the region. For example, the actors involved in the Feidi port project will receive an 80% corporate income tax cut from the Province in the first two years of operations and 40% in the following three years. Moreover, port charges are reduced by 10% for five years.

Guangdong Province - The Guangdong province government approved the “East of Guangdong port group planning (2016-2030)”. Key principles outlined in the plan include market-oriented planning and coordination, maximizing complementary advantages of ports, a comprehensive integration of port resources and enhance the level of centralization.

Guangxi Province/ Beibu Gulf - Before China implemented the opening-up policy, the Guangxi seaport system only consisted of Fangchenggang port and Beihai port. Fangchenggang port initially became the hub port of Guangxi in the 1980s. Next to Fangchenggang as a hub port, the 1990s brought the development of Qinzhou port and Beihai port. In February 2007, Qinzhou port, Beihai port and

Fangchenggang port carried out an asset restructuring. One year later, the State Council of China issued a development plan for the Guangxi Beibu Gulf Economic Zone. As a result, Beibu Gulf International Port Group Co Ltd. was established in December 2009 as a state-owned enterprise directly under the autonomous region. The largest and the second major shareholder of Beihai port transferred their 40.79% equity of the listed company without compensation to the Beibu Gulf port group, and the group became the controlling shareholder of Beihai Harbour Co Ltd. The three ports are still operating independently, but the Beibu Gulf port group is in charge of mapping out the construction in the three ports and giving pricing guidance. Major infrastructure projects, industrial projects and other projects utilizing coastal resources will be planned and organized by the Beibu Gulf office and implemented respectively by Fangchenggang, Qinzhou and Beihai. In January 2016, the Guangxi transportation department and the Qinzhou municipal government signed an agreement that made Beibu Gulf port authority in full control of Qinzhou port. A similar agreement was signed in March 2016 by the Guangxi's department of transportation and Beihai Municipal government.

5.2. A strong orientation on hinterland development through corridors and dry ports

The international distribution systems in China initially were very much focused on the large export flows centred around major gateways along the coastline, mainly in the Pearl River Delta and the Yangtze River Delta. Conventional cargo flows of consumer products and industrial fabricates were consolidated in or near seaport areas, stuffed in containers and sent overseas to major markets in Europe and North America. Containers hardly ever travelled inland. In more recent years, the growing consumption in China has also given a strong impetus to the development of distribution structures for import flows. This shift has made many export-oriented enterprises to start engaging in both domestic and foreign logistics. In geographical terms, the distribution systems in China are no longer only located near the main gateways along the coastline, but have expanded to major inland locations in the West (e.g. in cities such as Chongqing, Chengdu or Wuhan) and fast growing seaport regions in the Northeast (e.g. near the Bohai rim ports). Major infrastructure investments in highways, railways and inland terminals have facilitated the increased participation of these regions in distribution networks and a rising penetration of containers inland. In 2012, around 78% of cargo was dispatched by road with barge and rail mainly concentrated on a number of important corridors, such as the Yangtze basin. The rapid development of China's rail system, the standardisation of cargo fares, and the reduction of a significant amount of paperwork has greatly increased the viability of using rail as a logistical alternative. The OBOR initiative, particularly the Belt part, and the 'Go West' policy give a prominent role to rail (and where available also barges) in securing future domestic and Eurasian freight mobility.

Chinese seaports are rapidly developing dry/ inland ports to compete for hinterland access and to gain a competitive advantage. They do so by establishing a coordination mechanism for the construction, operation and management of dry ports between the coastal ports and the inland areas and to guarantee a seamless connection of inland areas to international transport. Table 4 provides an overview of the recent dry port developments initiated by seaport interests. A good example is the port of Tianjin which has built and helped to build 21 dry ports in Northern and Western China. Another example is the cooperation between the port of Dalian (Liaoning Province) and Changchun (Jilin Province) in Northeast China. At the same time, many inland areas are promoting the construction of dry port logistics parks. Not all dry port and logistics park developments are oriented to the maritime gateways in the east to reach overseas markets. In the western provinces, many logistics areas have also developed a strong orientation towards the Eurasian rail connections.

< insert table 4 about here >

The growing interest in inland ports coincided with major changes in ownership structures of inland ports. For example, some 60% of the inland ports on the Yangtze River, representing 84% of total throughput, have outside ownership, among them the Shanghai port operator SIPG (Shanghai International Port Group) and COSCO (Veenstra and Notteboom, 2011). The inland strategy of terminal operator SIPG proved to be instrumental for the creation of a strong regional distribution system connected to its home-port Shanghai. It is a clear Chinese example of a process towards port regionalization (Notteboom and Rodrigue, 2005).

Zeng et al. (2013) discuss the recent development of dry ports in China and summarize the existing dry port network. They point to increasing seaport competition, a growing inland production and domestic consumption, and logistics costs and environmental considerations as the main drivers for the rapid growth of dry ports and associated logistics parks in inner China. Also other papers on Chinese inland ports (e.g. Hanaoka and Regmi, 2011; Beresford et al., 2012; Lu and Chang, 2013; Monios and Wang, 2013) have pointed to the fast growth of the inland networks and the complexity of the governance system for inland port development in China.

Increased competition and fragmentation in the Chinese inland seaport system can undermine economies of scale on intermodal routes and decrease the return on public investment (Monios and Wang, 2013). In some areas, government has stepped up to fight fragmentation by developing very large terminal facilities with associated logistics parks. Chongqing provides a very good example of this tendency. In its ambitions to become the logistics hub in western China and to face competition from nearby cities such as Chengdu in Sichuan Province, the Chongqing government has centred dry port development around two very large facilities along the Yangtze River: the Cuntan terminal with a total capacity of 2 million TEU and the Guoyuan terminal with a capacity of 1.2 million TEU in the first phase and the potential for 2 million TEU when fully developed. Both facilities feature large logistics parks right behind the terminals.

5.3.A two-way opening up of the port sector

The 13th five-year plan promotes the notion of a ‘two-way opening up’, i.e. attracting foreign investments and encouraging Chinese enterprises to go abroad. This policy direction is also having a clear impact on the functioning and role of seaports in the further opening-up of the Chinese economy.

The gradual opening-up of Chinese ports to foreign investors was initiated in the mid-1980s, but up to the reforms of the early 2000s, the investor’s stake could not exceed 49%. Foreign players are in principle allowed to invest in and operate ports without a local Chinese partner. In practice, there are no cases in which a foreign operator or investor has a majority shareholding in a Chinese container terminal. Table 3 shows that the foreign investors typically end up either engaging into partnerships with local port business groups who have a majority shareholding, or, in case the local port business group does not have a majority share, are forming partnerships with Chinese or Hong Kong terminal operators such as CMHI, Cosco Pacific, China Shipping or HPH. In the medium term it is not likely that we will see a massive influx of foreign terminal operators in China’s terminal operating market despite a governance framework that allows such moves. First of all, the incumbent large Chinese/HK terminal operators have an edge given their already strong presence in China and related expertise in dealing

with the local markets and the local port governance arrangements. Secondly, the slowdown and capacity situation in Chinese container ports makes that many foreign global terminal operators such as DP World, APM Terminals and PSA are now giving priority to terminal investments in emerging economies of Southeast Asia, Latin America, Africa and Eastern Europe.

While the early 2000s brought a stronger opening-up of ports to foreign investors, the FTZ policy might accelerate the opening up of a select group of Chinese seaports. The Chinese government made a number of port areas proving grounds to test new sets of economic policies and governance reforms, not only focused on logistics but also on the development of more advanced manufacturing activities and trade-related services in these FTZs. While it is too early to evaluate which directions will be chosen in port-related FTZ and whether the implemented changes will be effective, the FTZ policy will help the formulation of nationwide social, economic and governance reforms in the longer term.

With regard to the internationalisation of Chinese enterprises, also Chinese terminal operators are increasingly exploring international expansion and investment opportunities, thereby contributing to the second dimension of the two-way opening up policy. However, compared to other global terminal operators, the international expansion strategy of Chinese terminal operating companies seems to be strongly embedded within geo-economic and geo-political policies of the Chinese government. Similarly to the merger between China Shipping and COSCO in container shipping in early 2016, the internationalisation of Chinese terminal operating companies is supported by Beijing in view of creating so-called 'national champions' able to play a role on the international scene and to support broader policies such as the OBOR initiative. The role of companies in OBOR has been made very explicit in the 13th Five-Year Plan through the ambition to enhance co-operations between China and Belt and Road countries, with private and corporatized enterprises taking a leading role.

China Merchants Holdings International (CMHI) and the terminal branch of the new China Cosco shipping group are the main actors in the internationalisation of the Chinese terminal operating business. The key investment of Cosco Pacific outside China can be found in the port of Piraeus in Greece, a key port on the Maritime Silk Road. Piraeus is one of the fastest growing container ports in Europe with a total throughput of 3.36 million TEU in 2015 compared to 880,000 TEU in 2010. In 2016, Cosco Pacific acquired a majority stake in Piraeus port paying EUR 280.5 mio for the initial acquisition of a 51% stake. Another EUR 88 mio will be paid within five years for the remaining 16%, provided the company has implemented the agreed investments in the port. Cosco has also shown interest in taking over a Greek intermodal rail operator in view of supporting the development of rail connections to the European hinterland. By 2017, a new rail link will be constructed between Budapest and Belgrade financed by Chinese companies, which will be connected to Macedonia and Piraeus. Cosco will also develop the Kumport terminal project in Turkey. CMHI has direct participations and is planning further investments in a large number of terminals around the world such as in Colombo, Sri Lanka. The group also has interests in a range of other terminals globally via shareholdings in Shanghai-based SIPG (24.5%), Hong Kong Modern Terminals Limited (27%) and Terminal Link (49% with the remaining stake in the hands of CMA CGM). Terminal Link is active in the US (Houston and Miami), France (Montoir, Le Havre, Dunkirk, Fos), Belgium (Zeebrugge, Antwerp), Morocco (Tangier, Casablanca), Malta (Marsaxlokk), Ivory Coast (Abidjan) and South Korea (Busan). Also other Chinese investor groups are investing abroad. For example, China Overseas Port Holdings is developing the port of Gwadar in Pakistan.

Also individual Chinese ports are taking actions to strengthen their role on the international scene. For example, Qingdao Port, China-Africa Development Fund and the National Development Bank Qingdao Branch recently signed a strategic cooperation memorandum to further implement the OBOR National Strategy and to share information and resources in view of developing African ports and related

infrastructure. There is also a noticeable increase in sister port agreements with ports which are strategically located from an OBOR perspective. For example, Shenzhen Yantian Port signed a sister port agreement with the Indonesian International Port Group in 2015, while Taicang Port, Lianyungang Port and other ports have established friendly relationships with Port Klang in Malaysia. While some port groups have extended their reach to other Chinese ports (e.g. the 19% shareholding of Dalian Port Group in Jinzhou port), the Chinese government is not promoting investments and shareholdings of Chinese port business groups in foreign ports. This role is reserved for the large terminal groups (such as CMHI and Cosco Pacific) and Chinese investment holdings.

6. CONCLUSIONS

The geo-economic and geo-political context for Chinese ports has changed in many ways in the past decade. While regional differences exist, the Chinese seaport system moved from a high volume growth status to a new normal of lower throughput growth. Growth rates in the container business are now comparable to the ones recorded by the more mature seaport systems of western Europe and North America. The global economic situation and the recent slowdown and reorientation of the Chinese economy are exerting a downward pressure on growth figures observed in Chinese ports. Despite the economic slowdown in China, the country's role in the global maritime (container) and logistics network continues to grow. Chinese ports are increasingly exposed to the requirements of global third-party logistics service providers, shippers and shipping lines (including alliances).

China's growing leadership role in the seaport industry, shipping and logistics makes that Chinese port actors are challenged to demonstrate a global benchmark and best practice status in terms of supply chain integration, connectivity, service availability and productivity. Chinese ports have made advances in developing a stronger supply chain approach. The policy of the central government to establish FTZs in a number of seaport areas created new opportunities and challenges in this respect. Furthermore, Chinese ports have developed a much stronger orientation on hinterland development through corridor and dry port development. The OBOR initiative and the 'Go West' policy are pushing ports to focus more on rail (and where available also barges) in view of strengthening inland connectivity to domestic and Eurasian freight markets. We demonstrated that in the past decade Chinese seaport capacity has kept up with demand growth and that berth productivity figures at Chinese container terminals are now among the highest in the world. However, the poorer economic situation of the past years has intensified concerns about terminal overcapacity and port overbuilding.

Overall, the rounds of reform of the port governance system in China have been instrumental in preparing Chinese ports for the fast changing geo-economic and geo-political environment. The Chinese government introduced a new port governance model more than a decade ago aimed at a further decentralisation by support autonomous and commercially driven local port entities. We demonstrated that market changes and the development of broader geo-economic policies such as the OBOR initiative have triggered processes of institutional layering in port governance without breaking out of the development path initiated by the Port Law of 2004 and related policy initiatives. The Chinese government has not introduced any major trend breaks, but followed a more incremental port governance evolution path. Therefore, China has not entered a fourth phase in its port governance evolution.

We have identified four forces that together form the motivation behind an approach of institutional layering without breaking out of the existing governance path that was initiated in the early 2000s: (1)

calls for more practicality of the Port Law of 2004 to cope with a fast changing market and geo-economic policy context; (2) room for regional variations to port governance practices, without disconnecting from the national policy nor breaking out of the existing path; (3) the development of new or more extensive roles and managerial competences for local port groups in view of explicitly incorporating broader policies (such as OBOR and FTZs) in strategy formulation and operational practice; (4) calls for more port integration and cooperation without undermining the corporatisation path as introduced in the Port Law of 2004.

The rise of port integration initiatives in China is one of the most visible developments of the past decade. We argue that port integration is partly driven by concerns of the central or provincial governments about the lack of capacity coordination in a lower growth environment (see e.g. Zhejiang Province). Next to these top-down driven integration processes, there are also bottom-up integration efforts initiated by a number of local port business groups (see e.g. the shareholding of Dalian Port Group in Jinzhou port). Irrespective of the drivers behind integration, the observed port integration processes are resulting in a wider spatial reach of corporatized and commercially-driven local port groups. They thus represent an incremental transformation of the existing port governance path that started in 2004. They do not lead to a return to a more centralised governance model that was in place in the first two phases of port governance evolution.

A last item that deserves attention relates to the two-way opening up of the Chinese port sector by combining initiatives to attract foreign investments and trade to Chinese ports with an internationalisation of Chinese port-related companies. While foreign players are in principle allowed to invest in and operate ports without a local Chinese partner, there have been no such cases in practice yet and there are no reasons to believe we will witness a massive influx of foreign terminal operators in China in the short and medium term. National champions such as CMHI and Cosco Pacific are increasingly investing in foreign ports, guided by the OBOR initiative and other geo-economic and geo-political policies of the Chinese government. Despite the role Chinese port business groups play in domestic port integration and the setting up of sister port agreements with foreign ports, Chinese policy-makers reserve the right to actually invest and take shareholdings in foreign ports for the large terminal groups (such as CMHI and Cosco Pacific) and Chinese investment holdings.

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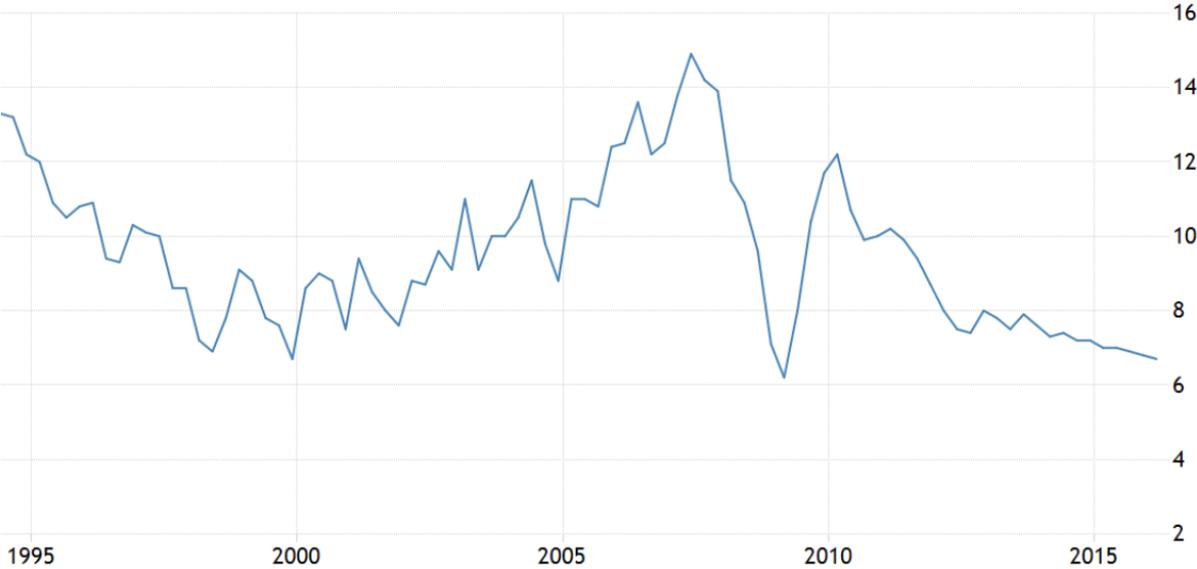
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Figure 1. GDP annual growth rate in China – quarterly data for the period 1994- Q1 2016



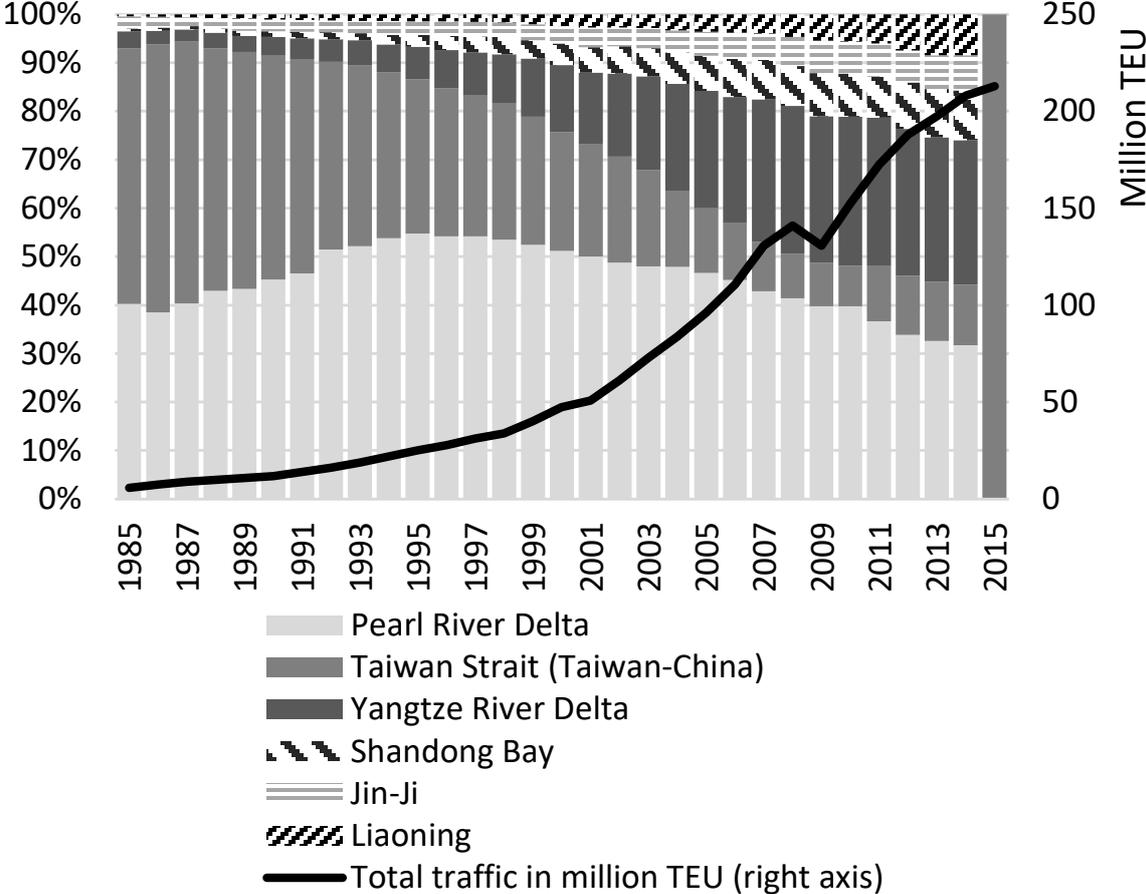
Source: based on data available at www.tradingeconomics.com

Figure 2. Geography of the Chinese seaport system



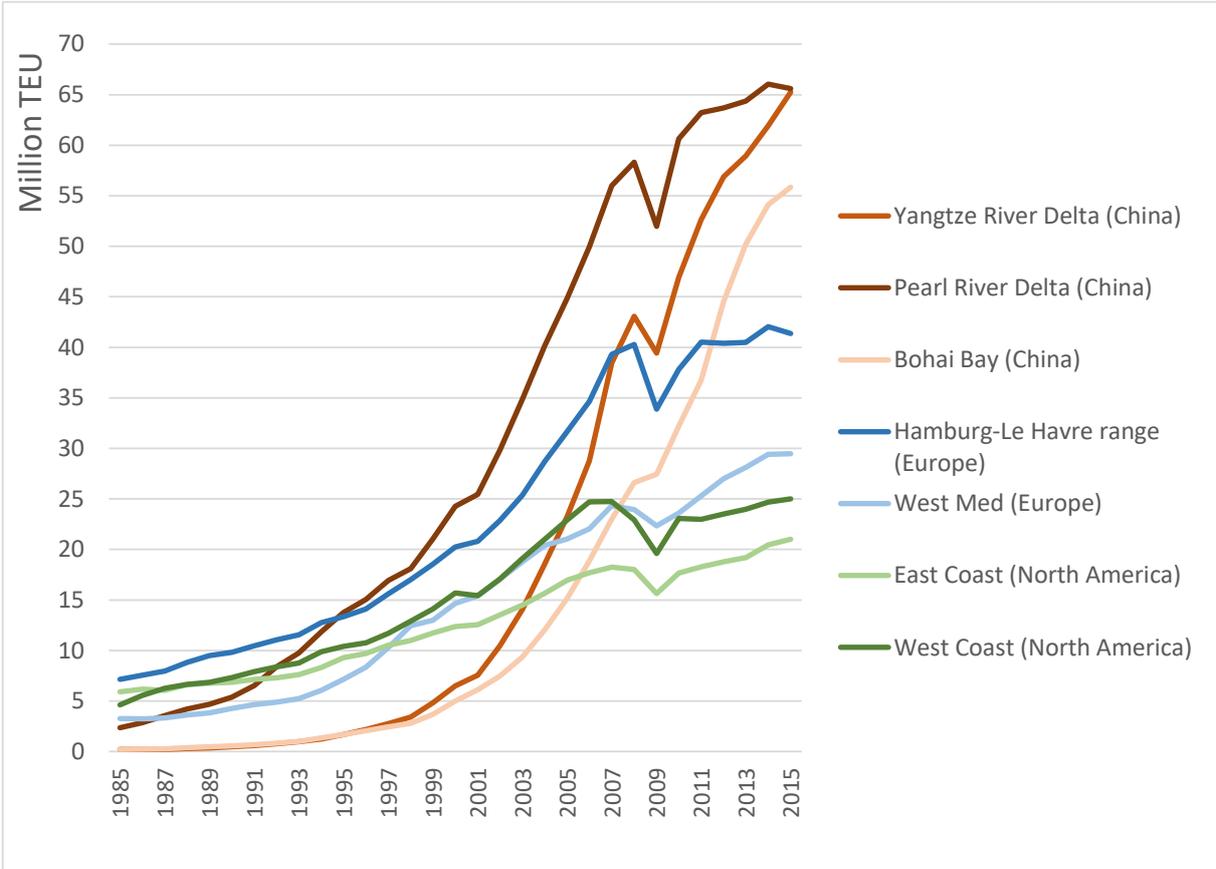
Source: authors' elaboration

Figure 3. Share of multi-port gateway regions in total TEU traffic of mainland China, Taiwan and Hong Kong SAR



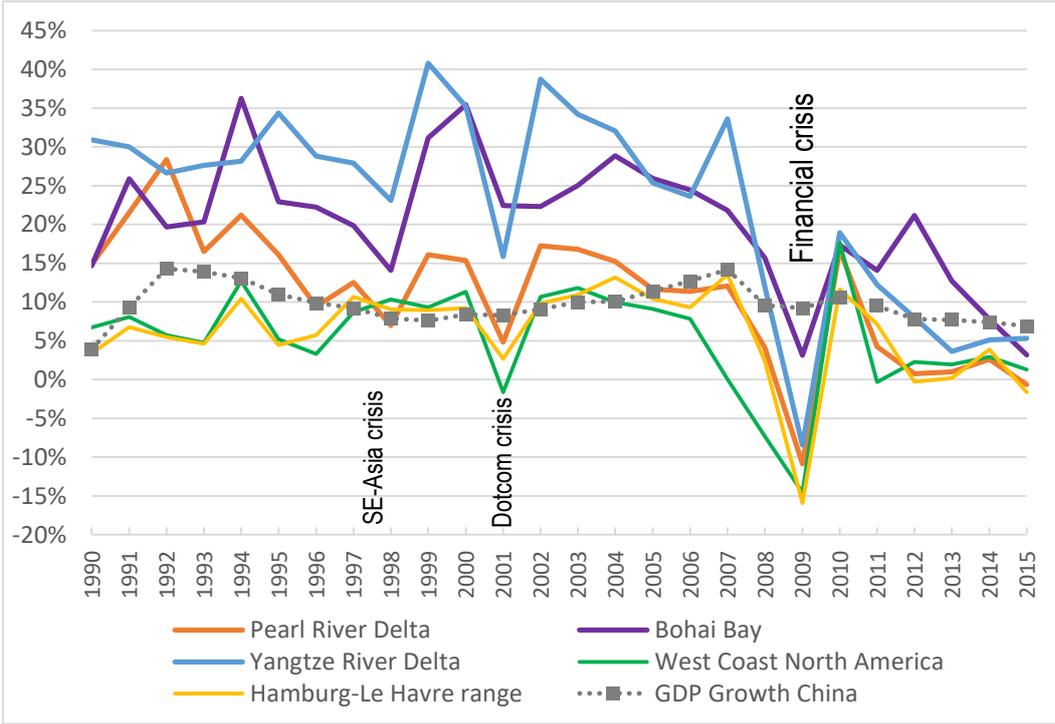
Source: authors' compilation based on data individual port authorities

Figure 4. Container throughput in Chinese port regions and key port regions in Europa and North America, 1985-2015, in million TEU



Source: authors' compilation based on data individual port authorities

Figure 5. Y-o-y growth rate in Chinese port regions and key port regions in Europa and North America



Source: authors' compilation based on data individual port authorities

Figure 6. The Silk Road Economic Belt (one Belt) and 21st century Maritime Silk Road (one Road) as announced by the Chinese state news agency Xinhua



Source: based on Chinese map of Xinhua News Agency (base map from Google Maps)

Table 1. Evolution of total cargo throughput in main Chinese ports (in million tons)

	2008	2009	2010	2011	2012	2013	2014	2015	Growth 2014/2008	Growth 2015/2014	Rank in China	Rank in world
Ningbo/Zhoushan	520	570	627	691	744	810	873	889	68%	1.8%	1	1
Shanghai	582	590	653	728	736	776	755	717	30%	-5.0%	2	2
Tianjin	356	380	408	451	476	501	540	541	52%	0.2%	3	4
Guangzhou	344	375	400	429	434	455	500	520	45%	3.9%	5	6
Qingdao	300	316	350	375	402	450	480	500	60%	4.2%	6	7
Tangshan	199	176	251	308	365	446	501	490	151%	-2.2%	4	8
Dalian	185	204	301	338	373	408	420	415	127%	-1.2%	7	11
Rizhao	151	181	221	253	281	309	353	361	134%	2.3%	8	12
Yingkou	211	200	225	261	301	330	331	339	57%	2.4%	9	13
Hong Kong	259	243	268	277	269	276	298	257	15%	-13.8%	10	16
Qinhuangdao	252	244	257	287	272	273	274	253	9%	-7.6%	11	17
Shenzhen	211	184	221	223	228	234	223	217	6%	-2.7%	12	19
Xiamen	122	110	139	157	172	191	205	210	67%	2.4%	13	20
TOTAL TOP 13	3694	3772	4321	4777	5053	5459	5753	5709	56%	-0.8%		
Y-O-Y growth rate		2.1%	14.6%	10.6%	5.8%	8.0%	5.4%	-0.8%				

Note: ranking based on figures 2015

Source: authors' compilation based on data of National Bureau of Statistics China

Table 2. World ranking of the average berth productivity of ports (based on data points for 354 ports globally), year 2012

R	Port	Country	All ships	R	Port	Country	Ships < 8000 TEU	R	Port	Country	Ships > 8000 TEU
1	Qingdao	China	96	1	Qingdao	China	80	1	Qingdao	China	136
2	Ningbo	China	88	2	Shanghai	China	79	2	Jebel Ali	UAE	125
3	Dalian	China	86	3	Nhava Sheva	India	79	3	Tianjin	China	124
4	Shanghai	China	86	4	Ningbo	China	77	4	Ningbo	China	117
5	Tianjin	China	86	5	Busan	S-Korea	77	5	Dalian	China	112
6	Yokohama	Japan	85	6	Jebel Ali	UAE	77	6	Kaohsiung	Taiwan	107
7	Jebel Ali	UAE	81	7	Taipei	Taiwan	73	7	Bremerhave	Germany	106
8	Busan	S-Korea	80	8	Tainjin	China	70	8	Busan	S-Korea	105
9	Nhava Sheva	India	79	9	Salalah	Oman	70	9	Shanghai	China	104
10	Yantian (Shenzhen)	China	78	10	Elizabeth	USA	69	10	Tanjung Peik	Malaysia	104
...											
12	Xiamen	China	76								
16	Nansha (Guangzhou)	China	73								
19	Mawan (Shenzhen)	China	71								

Source: authors' compilation based on JOC Group (2013)

Table 3. Terminal utilisation degree and shareholding structure for main container terminals in mainland China and Hong Kong (situation in 2013)

Port region	Port	Terminal	Utilisation degree (2013)	Shareholding structure summary			Shareholding structure - details																		
				Chinese local Port Groups (*)	Chinese/HK terminal operators	Foreign terminal operators	Local Port Group (*)	Other Port Groups	COSCO Pacific	China Shipping	CMHI	Sinotrans	HPH	MTL	OOCL	PSA	APL	APM T	DP World	TIL	NYK Lines	Other			
							China	China	China	China	China	China	China	Hong Kong	Hong Kong	Hong Kong	Singapore	Singapore	The Netherlands	Dubai	Switzerland	Japan			
Liaoning	Dalian	Dalian International CT (phase 3)	86%	40%	40%	20%	40%				40%												20%		
	Dalian	Dalian Port CT (phase 2)	65%	35%	20%	45%	35%			20%							25%		20%						
	Dalian	Dalian CT (DCT)	42%	51%	0%	49%	51%										49%								
	Yingkou	Yingkou CTS	102%	50%	50%	0%	50%			50%															
	Yingkou	Yingkou New Century CT	78%	60%	40%	0%	60%																		
	Jinzhou	Jinzhou New Age CT	50%	49%	51%	0%	34%	15%			51%														
Jin-Ji (Tianjin/Hebei)	Tianjin	Tianjin Port Alliance Intern. CT (TACT)	79%	40%	20%	40%	40%									20%	20%		20%						
	Tianjin	Tianjin Port Pacific Intern. CT	101%	51%	0%	49%	51%										49%								
	Tianjin	Tianjin Five Continents Intern. CT	113%	40%	42%	0%	40%			14%	14%	14%											18%		
	Tianjin	Tianjin Port Eurasia Intern. CT	100%	70%	30%	0%	70%			30%															
	Qinhuangdao	Qinhuangdao Port New Harbour CT	49%	70%	30%	0%	55%	15%			30%														
Shandong Bay	Qingdao	Qingdao Qianwan CT (QQCT)	96%	31%	20%	49%	31%			20%									20%				29%		
	Qingdao	Qingdao Qianwan United CT (QQCTU)	78%	16%	60%	25%	16%			10%		50%							10%				15%		
	Qingdao	Qingdao Qianwan Intern. Advance CT	87%	12%	46%	43%	12%			8%		38%				24%			8%				11%		
	Yantai	Yantai Port CT	63%	88%	10%	13%	88%					10%											13%		
	Lianyungang	Lianyungang New Oriental Intern. CT	103%	45%	55%	0%	45%					55%													
Yangtze River Delta	Shanghai-Waigaoqiao	Shanghai Pudong Intern. CT (SPICCT)	86%	30%	30%	0%	30%			30%															
	Shanghai-Waigaoqiao	Shanghai Mingdong CT (SMCT)	83%	50%	0%	0%	50%																		
	Shanghai-Waigaoqiao	Shanghai East CT	90%	51%	0%	49%	51%												49%						
	Ningbo	Ningbo Gangji Terminal	91%	50%	0%	50%	50%																		
	Ningbo	Ningbo Bellun International Terminal	83%	51%	49%	0%	51%																	50%	
	Ningbo	Ningbo Yuan Dong Terminals	94%	60%	40%	0%	60%			20%															
	Ningbo	Ningbo Daxie CMHI Terminals	69%	35%	45%	0%	35%					45%					20%							20% (CITIC)	
	Nanjing	Nanjing Port Longtan Terminal	120%	45%	30%	0%	45%			20%			10%												
	Taicang	Taicang International CT	93%	10%	90%	0%	10%			39%							51%								
	Taicang	Taicang International CT - phase 2	42%	30%	70%	0%	30%										70%								
Taiwan Strait	Xiamen	Xiamen Intern. CT (XICT)	33%	51%	49%	0%	51%								49%										
	Xiamen	Xiamen Songyu CT	70%	75%	0%	25%	75%																	25%	
	Xiamen	Xiamen Ocean Gate CT	22%	30%	70%	0%	30%			70%															
	Fuzhou	Fuzhou Qinzhou CT	83%	51%	0%	49%	51%																		
	Fuzhou	Fuzhou International CT	40%	54%	0%	46%	54%																		
	Fuzhou	Fuzhou Jiangyin International CT	40%	75%	0%	25%	75%																		
	Quanzhou	Quanzhou Pacific CT	91%	18%	82%	0%	18%					82%													
Pearl River Delta	Zhuhai	Zhuhai Intern. CT (Gaolan) - phase II	65%	50%	50%	0%	50%									50%									
	Shenzhen	Yantian Intern. CT (phase I and II)	49%	29%	71%	0%	29%			15%						56%									
	Shenzhen	Yantian Intern. CT (phase III/West Port)	105%	33%	67%	0%	33%			15%						52%									
	Shenzhen	Shekou CTS	86%	0%	100%	0%	0%																		
	Shenzhen	Chiwan CT	70%	64%	36%	0%	64%					80%				28%									
	Shenzhen	Shenzhen Haixing Harbour	45%	0%	100%	0%	0%					67%	33%			8%									
	Shenzhen	China Merchant Mawan Port	68%	0%	84%	0%	0%									84%								16%	
	Guangzhou	Guangzhou CT (Xinsha)	45%	51%	0%	49%	51%																		
	Guangzhou (Nansha)	South China Ocean Gate Terminal	107%	41%	39%	20%	41%			39%														20%	
	Guangzhou (Nansha)	Nansha CT phase 1	115%	51%	40%	0%	51%					40%													
	Hong Kong	HIT Terminal	96%	0%	100%	0%	0%																		9%
	Hong Kong	Asia CT	66%	0%	100%	0%	0%																		
	Hong Kong	COSCO-HIT Terminal	91%	0%	100%	0%	0%					50%													
Hong Kong	MTL - Kwai Chung	85%	0%	100%	0%	0%																			

Notes:

(*) This includes the respective local market-oriented public port groups such as Dalian Port Group, Tianjin Port Group, etc... For Shanghai, this is SIPG (Shanghai International Port Group).

CT = Container Terminal, MTL = Modern Terminals Limited (CMHI holds a 27% share in MTL), CMHI = China Merchants Holdings International, HPH = Hutchison Port Holdings (data includes HPH Trust), APM T = APM Terminals (part of AP Moller group), DP World = Dubai Ports World, TIL = Terminal Investment Limited (shipping line MSC has a 65% share).

Source: authors' compilation based on Drewry (2014) and port/company websites

Table 4. Dry port developments in China initiated by seaport interests

Dry Port	Description				Functions			
	Serving Port(s)	Started	Capacity (TEU/year)	Area(ha)	Customs Clearance	Storage	Forwarding	Other
An'yang	Rizhao	NA	200 000	800	√	√	√	
Baotou	Tianjin	2007	38 000	190	√	√		
Changchun	Dalian	2008	50 000	200	√	√		
Chengde	Qinghuangdao	2009	NA	180	√	√		Processing,packaging
Daqing	Dalian	2010	100 000	130	√	√		
Dezhou	Tianjin	2008	NA	NA	√	√		
Er'lanhaote	Tianjin	2008	50 000	550	√	√		
Handan	Tianjin	2010	NA	NA	√	√		
Houma	Qingdao,Tianjin	2009	60 000	149	√	√		
Huinong	Tianjin	2007	100 000	NA	√			
Ji'an	Xiamen	2009	NA	NA	√	√		
Jilin	Dalian	2008	60 000	41	√	√		
Lanzhou	Tianjin	NA	300 000	1200	√	√	√	Distribution,processing
Linyi	Rizhao	2008	120 000	180	√	√		
Longyan	Xiamen,Fuzhou	2010	90 000	86	√	√		Distribution
Manzhouli	Dalian,Qinghuangdao	2007	250 000	180	√	√		
Mudanjiang	Dalian	2011	200 000	270	√	√		
Pinggu,Beijing	Tianjin	2010	200 000	200	√	√		Distribution,processing,bonded storage
Quzhou	Ningbo	2009	50 000	54	√	√		
Sanming	Xiamen,Fuzhou	2007	50 000	30	√	√		
Shangrao	Ningbo	2008	50 000	300	√	√		
Shaoguan	Yantian	2008	100 000	100	√	√		Bonded logistics
Shenyang	Dalian,Yingkou	2003	150 000	200	√	√	√	Consolidation,transshipment
Shijiazhuang	Tianjin	2006	205 000	255	√	√	√	
Wu'lumu'qi	Tianjin	2009	NA	NA	√	√		
Xining	Rizhao,Tianjin	NA	100 000	145	√	√		
Yinchuan	Lianyungang,Tianjin	2009	NA	NA	√	√	√	
Yingtian	Ningbo	2011	100 000	200	√	√		
Yiwu	Ningbo	2002	1 000 000	1601	√	√	√	Consolidation,distribution
Yuyao	Ningbo	2003	70 000	89	√	√	√	Consolidation,distribution
Zhangjiakou	Tianjin	2011	100 000	300	√	√		
Zibo	Tianjin	2010	100 000	105	√	√		
Taiyuan	Tianjin	2012	NA	8	√	√	√	
Bayannur	Tianjin	2015	NA	1200	√	√		Distribution
Langfang	Tianjin	2014	NA	NA	√	√		
Tangshan	Tianjin	2014	NA	NA	√	√	√	
Baoding	Tianjin	2014	NA	53	√	√	√	

Source: authors' compilation based a wide range of sources