Part Two

Maritime and logistic investment of China in the Mediterranean area and in the ports of Northern Range

Chapter V

Current Status and Trend of China's Port Infrastructure Construction

1. China's port infrastructure construction

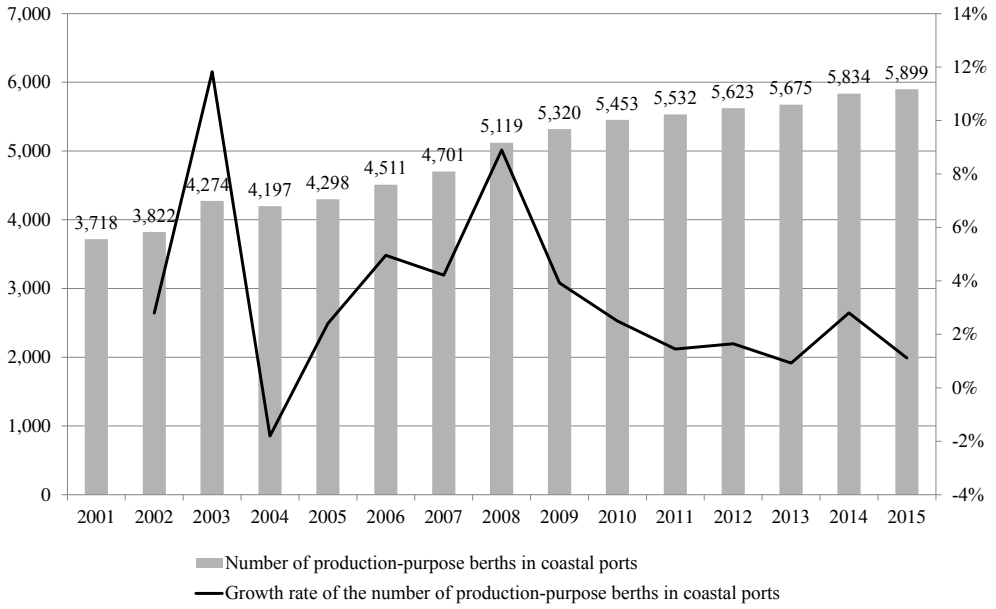
Since the founding of the People's Republic of China (PRC) in 1949, China's port development can be generally classified into four stages or periods, namely development and construction restoration, fast-pace development and construction, high-speed and high-grade development and construction, and stable development and construction[1].

During the development and construction restoration period from 1949 to 1979, the principal tasks involved expansion and renovation of existing aging terminals. With the implementation of the reform and opening-up policies and huge increases in import and export trade volumes in China during the fast-pace development and construction period from 1980 to 1999, China's ports could not meet new import and export requirements any more. The Ministry of Transport (MOT) of the PRC put forward the coastal main hub ports layout and planning and approved the construction of a batch of specialized terminals, allowing the terminal construction to pass into a fast development period. Following China's accession to the World Trade Organization (WTO), and with China's fast-pace economic development and the rise of port-neighboring industries from 2000 to 2010, China's port construction experienced high-speed development, with a rising number of high-level shipping routes. The number of production-purpose berths in coastal ports increased from 3,718 in 2001 to 5,453 in 2010, an average rise of 192 every year, after nearly one-decade persistent development. Since 2011, affected by the macro economy downturn, China's port construction entered the stable development period, which is characterized by saliently decreasing growth rates in berth numbers and cargo throughput as well as the growing number of production-purpose berths in coastal ports, which is 89 every year on average from 2011 to 2015.

Due to the constant sluggish shipping market, especially the domestic-trade shipping market, and enhanced supply-side reform of ports in recent years, the production-purpose terminal construction remains in stable development. By the end of 2015, the number of production-purpose terminals and berths owned by all the ports in China stood at 31,259, a decrease of 446 year on year. Among these ports, the number of production-purpose terminals and berths in coastal ports was 5,899, an increase of 65, and the number of production-purpose terminals and berths in inland-river ports was 25,360, a decrease of 511 (See Table 1). The number of berths for ships with a capacity of 10,000 tons and above at all ports in China was 2,221, an increase of 111 from the end of the previous year. Among these berths, the number of berths for ships with a capacity of 10,000 tons and above in coastal ports in China was 1,807, an increase of 103, and that in inland river ports in China was 414, an increase of 8.

[1] Ministry of Transport of the PRC (2011). "China Port and Waterway Construction in the Past 60 Years" in *Construction Achievement Volume*. China Communications Press.

Changes in numbers of China's production-purpose berths in coastal ports from 2001 to 2015



GRAPH 1 - SOURCE: Statistical Bulletin on the Road and Waterway Transport Industry Development issued by the MOT in various years

Statistics on the number of production-purpose terminals at ports in China in 2015

Category	Unit	2015	2014	Increase (decrease) in number	YoY increase in 2015
Port production-purpose berth	Number of berths	31,259	31,705	-446	98.59
Coastal	Number of berths	5,899	5,834	65	101.11
Inland river	Number of berths	25,360	25,871	-511	98.02
Terminals and berths for ships with a capacity of 10,000 tons and above	Number of berths	2,221	2,110	111	105.26

TABLE 1 - SOURCE: China Ports Yearbook 2016

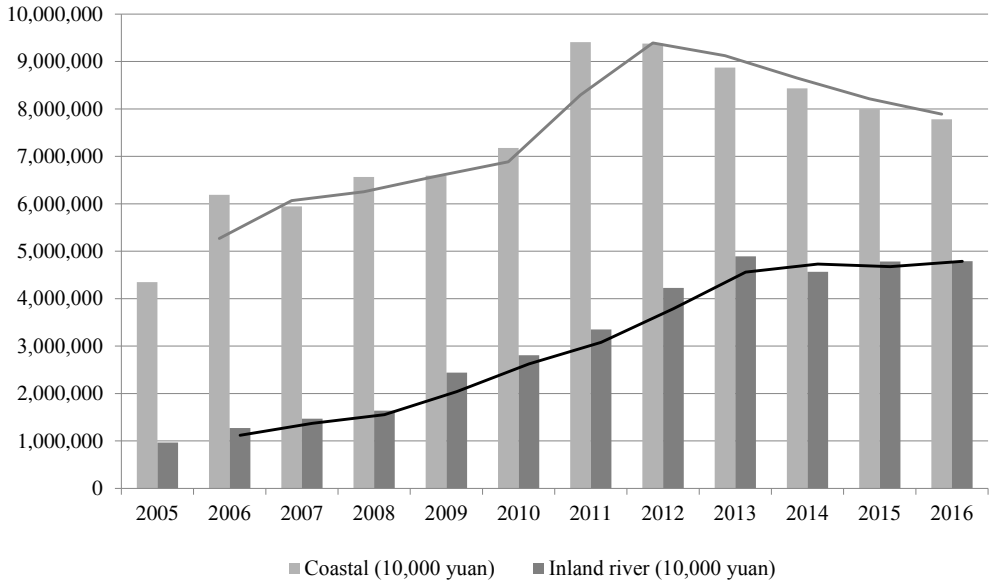
2. PORT PROJECT INVESTMENT IN CHINA

2.1 China's fixed asset investment in waterway transportation

Like the terminal investment trend, China's fixed asset investment scale in waterway transportation had been maintaining high growth during the shipping market's peak period. However, that growth was halted by the financial crisis in 2008. In view of the risks of China's economic downturn and structural adjustments of its transportation industry, the fixed asset investment in China's waterway transportation declined in 2011.

As for the changes of the fixed asset investment in waterway transportation since 2005, the fixed asset investment of China's coastal waterway transportation in 2011 reached 94.08 billion yuan (US$13.84 billion), reaching the investment peak within the recent decade. Nevertheless, because of the persisting sluggish shipping industry, the fixed asset investment showed a decreasing trend in the following years. By 2016, the investment volume was reduced to 77.84 billion yuan (US$11.45 billion). On the contrary, the fixed asset investment in China's inland river transportation basically showed a year-by-year increasing trend and totaled 48.92 billion yuan (US$7.19 billion) in 2013. After that, the investment volume growth also gradually slowed down.

Fixed asset investments in China's waterway transportation from 2005 to 2016



Note: The statistical data are those from January to November each year.
GRAPH 2 - SOURCE: MOT

Examining various regions, the fixed asset investment volumes in waterway transportation in China's eastern and central areas decreased, while those in China's western areas increased year by year. According to the forecast data in China's inland port construction in 2016, China's eastern area received an investment of 20.45 billion yuan (US$3.02 billion), a year-on-year decrease of 12.8 percent, China's central area realized an investment of 18.87 billion yuan (US$2.78 billion), a year-on-year decrease of 6.2 percent, and China's western area fulfilled an investment of 14.35 billion yuan (US$2.11 billion), a year-on-year increase of 29.4 percent. As for China's coastal construction, China's eastern area received an investment of 82.89 billion yuan (US$12.19 billion), a year-on-year drop of 4.6 percent, and China's western area realized an investment of 3 billion yuan (US$441 million), a year-on-year decline of 28.1 percent. It can be seen that in 2016, the fixed asset investments in waterway transportation in eastern and central areas of China decreased, while that in western China increased.

Statistics on the number of production-purpose terminals at ports in China in 2016[*]

	Inland river construction in 2016	Increase from the previous year	Coastal construction in 2016	Increase from the previous year	Total investment volume in 2016
Eastern area	2,045,211	87.20%	8,289,037	95.40%	10,334,248
Central area	1,886,941	93.80%	-	-	18,86,941
Western area	1,435,405	129.40%	300,000	71.90%	1,735,405
Total	5,367,557	98.20%	8,589,037	94.30%	13,956,594

[*] Unit: 10,000 yuan.

TABLE 2 - SOURCE: EXPRESS ON COMPLETED FIXED ASSET INVESTMENT IN ROAD AND WATERWAY TRANSPORTATION IN 2016, ISSUED BY THE MOT

2.2 China's key port investment projects in 2016

According to the Outline on the National Economy and Social Development in the 13th Five-Year Plan (Draft), China scheduled to implement 100 key engineering projects in next five years, involving such fields as science and technology, equipment manufacturing, agriculture, environmental protection, transportation, energy, talent, culture and education.

Among them, key projects regarding port and shipping construction include the vigorous promotion of the establishment of international shipping centers in places such as Shanghai, Tianjin, Dalian and Xiamen, and upgrading port intelligence level, which is expected to be the main direction of China's port construction investment between 2016 and 2020.

Under the guidance of China's 13th Five-Year Plan, various coastal provinces and cities are positively pushing forward their port investment and construction. In 2016, places with port projects include the bulk cargo terminal projects in Ningbo-Zhoushan Port, Meizhou Bay Port and Huanghua Port, the crude oil terminal projects in Huizhou Port and Rizhao Port, and the container terminal projects in Huizhou Port and Fuzhou Port (See Table 3).

Main coastal port projects in China in 2016

Port type	Port	Project name	Investment amount
Bulk cargo port	Meizhou Bay Port	Berths 8-15 in Luoyu operation site	First phase investment of 4.5 billion yuan (US$662 million)
	Huizhou Port	First phase of coal terminal in Tsuen Wan port area of Huizhou Port	An invested amount of about 1.69 billion yuan (US$249 million)
	Rizhao Port	Coke terminal project in south part of Shijiu port area	1.49 billion yuan (US$219 million)
	Beibu Gulf Port in Guangxi	Coal terminal at Qinzhou Port, to be in trial operation soon	1.49 billion yuan (US$219 million)
	Haikou Port	Third phase bulk terminal in Macun port area of Haikou Port	260 million yuan (US$38 million)
	Jiaxing Port	The water engineering part of grain terminal expansion project at Jiaxing Port was accepted after appraisal	220 million yuan (US$32 million)
	Zhanjiang Port	Start to build first public deepwater terminal in Donghaidao port area	900 million yuan (US$132 million)
	Huanghua Port	Third phase project at Huanghua Port was completed	4.45 billion yuan (US$654 million)
	Huizhou Port	Coal terminal in Tsuen Wan port area	2.49 billion yuan (US$366 million)
	Ningbo-Zhoushan Port	Shulanghu ore transit terminal in Qushan port area of Zhoushan Port	4.91 billion yuan (US$722 million)

Crude oil terminal	Ningbo-Zhoushan Port	Second-phase Shihua 450,000-ton crude oil terminal in Daxie port area of Ningbo-Zhoushan Port	165 million yuan (US$24 million)
	Huizhou Port	A 50,000-ton petrochemical terminal is scheduled to be built in Huizhou Port	About 290 million yuan (US$43 million)
	Huizhou Port	China National Offshore Oil Corporation (CNOOC) Oil Refinery Mabianzhou terminal at Huizhou Port	1.06 billion yuan (US$155 million)
	Huizhou Port	Huaying petrochemical fuel-oil blending and distributing center and terminal	3.2 billion yuan (US$470 million)
	Rizhao Port	Project of 300,000-DWT crude oil terminal of Lanshan port area	1.17 billion yuan (US$172 million)
	Huizhou Port	Petrochemical area in Tsuen Wan port area	290 million yuan (US$43 million)
	Huizhou Port	Terminal for fuel-oil blending and distributing center at Huizhou Port is scheduled to be completed in the second half of 2017	760 million yuan (US$112 million)
Container terminal	Huizhou Port	Huizhou international container terminal	1.96 billion yuan (US$288 million)
	Fuzhou Port	150,000-ton container terminal at Fuzhou Port was formally put to use	Total first phase investment of 1.05 billion yuan (US$154 million)
	Jiangsu Port	Second and third-phase projects of Taizhou international container terminal is now under construction	1.2 billion yuan (US$176 million)
	Dalian Port	Fourth phase project at Dayao Bay	Unknown
	Shantou Port	Phase II Project of Guangao port area of Shantou	Unknown

TABELLA 3 - SOURCE: Public information from the websites of ports in China and the websites of various provincial governments and departments in China

3. COASTAL PORT LAYOUT

In the recent 20 years, China's costal ports have generally formed a preliminary port layout with a rational distribution, clearly classified levels and specific functions as well as a specialized system centering on four major cargo categories, namely coal, crude oil, ore and container. They have been playing important roles in meeting China's shipping of staple materials including energy and raw materials, supporting the fast and stable development of China's foreign trade and guaranteeing China's participation in international economic cooperation and competition.

According to the MOT-issued China's Coastal Port Layout and Planning, China's coastal ports are classified into five port groups, namely Bohai Rim, Yangtze River Delta, Southeast Coast, Pearl River Delta and Southwest Coast, based on the economic development situations and features in different areas, the ports' present statuses within an area, the shipping relations among these ports and the economic rationality for the shipping of main cargo categories, so as to form a layout of eight transportation systems, namely coal, crude oil, iron ore, container, grain, commodity vehicle, continent-island roll-on/roll-off and passenger transport.

The layout is described as follows:

1. Bohai Rim port group

Bohai Rim port group, consisting of coastal port clusters in Liaoning, Tianjin, Hebei, and Shandong, serves the social and economic development of China's northern coastal and inland regions. The layout of Bohai Rim port group is shown in Table 4.

Layout of Bohai Rim port group

Port group	Regional port cluster	Core ports in the layout	Local ports or feeder ports	Port function	Scope of service
Bohai Rim port group	Coastal port cluster in Liaoning	Dalian Port and Yingkou Port	-	Large and specialized transit, storage and transport facilities for staple bulk cargos including petroleum (especially for crude oil and its storage), LNG, iron ore and grain	Three provinces in northeast China, namely Liaoning, Jilin and Heilongjiang, and eastern part of Inner Mongolia
		Dalian Port	Yingkou Port, Jinzhou Port and Dandong Port	Container	
		Dalian Port	-	Continent-island roll-on/roll-off, passenger transport and commodity vehicle's transit, storage and transport	
	Coastal port cluster in Tianjin and Hebei	Qinhuangdao Port, Tianjin Port, Huanghua Port and Tangshan Port	-	Specialized coal-loading port	Beijing, Tianjin and other places in North China as well as some areas on its west
		Qinhuangdao Port, Tianjin Port and Tangshan Port	-	Large and specialized transit, storage and transport facilities for staple bulk cargos including petroleum (especially for crude oil and its storage), LNG, iron ore and grain	
		Tianjin Port	Qinhuangdao Port, Huanghua Port and Tangshan Port	Container	
		Tianjin Port	-	Facilities for passenger transport and commodity vehicle's transit, storage and transport	
	Coastal port cluster in Shandong	Qingdao Port, Rizhao Port and Yantai Port		Large and specialized transit, storage and transport facilities for staple bulk cargos including petroleum (especially for crude oil and its storage), LNG, iron ore and grain	Shandong Peninsula and some areas on its west
		Qingdao Port	Yantai Port, Rizhao Port and Weihai Port	Container	
		Qingdao Port, Yantai Port and Weihai Port	-	Facilities for continent-island roll-on/roll-off and passenger transport	

TABLE 4 - SOURCE: Public information from the websites of ports in China and the websites of various provincial governments and departments in China

Dalian Port, Yingkou Port, Qinhuangdao Port, Tianjin Port, Yantai Port, Qingdao Port and Rizhao Port are core ports in the Bohai Rim port group (see Figure 1). The future development of the Bohai Rim port group will benefit from mutual influences of the "One Belt and One Road" initiatives, namely the "Silk Road Economic Belt and the 21st-Century Maritime Silk Road", the China-Mongolia-Russia Economic Corridor and the New Eurasian Continental Bridge Economic Belt, which will boost the ports' construction and development.

Bohai Rim port group

FIGURE 1 - SOURCE: map of China main ports

2. Yangtze River Delta port group

The Yangtze River Delta port group serves the economic and social development in the Yangtze River Delta and areas along the Yangtze River by relying on the Shanghai International Shipping Center, with Shanghai Port, Ningbo Port, Lianyungang Port playing the dominant role, and fully exerting the roles of coastal ports and those along the lower reaches of the Yangtze River, including Zhoushan Port, Wenzhou Port, Nanjing Port, Zhenjiang Port, Nantong Port and Suzhou Port. The layout of the Yangtze River Delta port group is described in Table 5.

Layout of Yangtze River Delta port group

Port group	Regional port cluster	Core ports in the layout	Local ports or feeder ports	Port function	Scope of service
Yangtze River Delta port group	Shanghai Port, Ningbo Port and Suzhou Port	Lianyungang Port, Jiaxing Port, Wenzhou Port and Taizhou Port	Container	Large and specialized transit, storage and transport facilities for staple bulk cargos including petroleum (especially for crude oil and its storage), LNG, iron ore and grain	Yangtze River Delta and areas along Yangtze River Mongolia
	Shanghai Port, Nantong Port and Ningbo-Zhoushan Port	Nanjing Port	Receiving, unloading, transit, storage and transport for imported petroleum and LNG	Container	
	Ningbo-Zhoushan Port and Lianyungang Port	Shanghai Port, Suzhou Port, Nantong Port, Zhenjiang Port and Nanjing Port	Transit and transport of iron ore	Continent-island roll-on/roll-off, passenger transport and commodity vehicle's transit, storage and transport	
	Lianyungang Port	Public terminals and energy enterprises' self-use terminals at Lianyungang Port	Receiving, unloading and transshipment of coal	Specialized coal-loading port	
	Shanghai Port, Nantong Port, Lianyungang Port, Ningbo-Zhoushan Port and Jiaxing Port	-	Transit, storage and transport of grain	Large and specialized transit, storage and transport facilities for staple bulk cargos including petroleum (especially for crude oil and its storage), LNG, iron ore and grain	
	Shanghai Port and Nanjing Port	-	Commodity vehicle transport	Container	
	Ningbo-Zhoushan Port and Wenzhou Port	-	Continent-island roll-on/roll-off transport	Facilities for passenger transport and commodity vehicle's transit, storage and transport	
	Shanghai Port	-	Transit and cruise transport for domestic and foreign passengers	Facilities for continent-island roll-on/ roll-off and passenger transport	

TABLE 5 - SOURCE: layout plan of China coastal ports

Yangtze River port group

FIGURE 2 - SOURCE: map of China main ports

3. Southeast Coast port group

Southeast Coast port group, consisting of major ports of Xiamen and Fuzhou and other ports including Quanzhou Port, Putian Port and Zhangzhou Port, serves the social and economic development of Fujian province and some places of inland provinces such as Jiangxi, and meets the requirement of three direct links of trade, mail, and air and shipping services across the Taiwan Strait. The port layout is shown in Table 6.

Layout of Southeast Coast port group

Port group	Core ports in the layout	Local ports or feeder ports	Port function	Scope of service
Southeast Coast port group	Quanzhou Port	-	Receiving, unloading, storage and transport of petroleum and natural gas	Fujian province and some places of inland provinces such as Jiangxi
	Xiamen Port	Fuzhou Port, Quanzhou Port, Putian Port and Zhangzhou Port	Container	
	Fuzhou Port, Xiamen Port and Putian Port	-	Transit, storage and transport of grain	
	Ningde Port, Fuzhou Port, Xiamen Port, Quanzhou Port, Putian Port and Zhangzhou Port	-	Continent-island roll-on/roll-off transport	
	Xiamen Port		Transit and transport of domestic and foreign passengers	

TABLE 6 - SOURCE: layout plan of China coastal ports

Layout of Southeast Coast port group

FIGURE 3 - SOURCE: map of China main ports

4. Pearl River Delta port group

Pearl River Delta port group consists of ports in eastern Guangdong and Pearl River Delta areas, mainly including Guangzhou Port, Shenzhen Port, Zhuhai Port and Shantou Port. Relying on Hong Kong's economic, trade, financial, information and international shipping center advantages, and consolidating Hong Kong's position as an international shipping center, Pearl River Delta port group serves South China areas and some places in Southwest China, and strengthens the exchanges between Guangdong province and inland areas with Hong Kong and Macao. The layout of Pearl River Delta port group is shown in Table 7.

Layout of Pearl River Delta port group

Port group	Core ports in the layout	Local ports or feeder ports	Port function	Scope of service
Pearl River Delta port group	Guangzhou Port and electric power-supply enterprises' self-use terminals	-	Receiving, unloading and transshipment of coal	South China and some areas in Southwest China
	Shenzhen Port and Guangzhou Port	Shantou Port, Huizhou Port, Humen Port, Zhuhai Port, Zhongshan Port, Yangjiang Port and Maoming Port	Container	
	Guangzhou Port, Shenzhen Port, Zhuhai Port, Huizhou Port, Maoming Port and Humen Port	-	Receiving, unloading, transit, storage and transport for petroleum and LNG	
	Guangzhou Port and Zhuhai Port	-	Transit and transport of iron ore	
	Guangzhou Port and Shenzhen Port	-	Transit, storage and transport of grain	
	Guangzhou Port	-	Commodity vehicle transport	
	Shenzhen Port, Guangzhou Port and Zhuhai Port	-	Transit and cruise transport of domestic and foreign passengers	

TABLE 7 - SOURCE: layout plan of China coastal ports

Layout of Pearl River Delta port group

FIGURE 4 - SOURCE: map of China main ports

5. Southwest Coast port group

Southwest Coast port group, consisting of coastal ports in western Guangdong, Guangxi and Hainan, mainly includes Beibu Gulf Port in Guangxi and Haikou Port in Hainan. It serves areas in western China and provides transport support for Hainan province in expanding material exchanges with places outside the island. The layout of Southwest Coast port group is shown in Table 8.

Layout of Southwest Coast port group

Port group	Core ports in the layout	Local ports or feeder ports	Port function	Scope of service
Southwest Coast port group	Zhanjiang Port, Fangcheng Port and Haikou Port	Including Beihai Port, Qinzhou Port, Yangpu Port and Sanya Port	Container	West China areas and Hainan province
	Zhanjiang Port, Haikou Port, Yangpu Port and coastal ports in Guangxi	-	Transit, storage and transport of petroleum and natural gas	
	Zhanjiang Port, Fangcheng Port and Basuo Port	-	Transit and transport of ore	
	Zhanjiang Port and Fangcheng Port	-	Transit, storage and transport of grain	
	Zhanjiang Port, Haikou Port and Sanya Port	-	Transit and cruise transport for domestic and foreign passengers	

TABLE 8 - SOURCE: layout plan of China coastal ports

Layout of Southwest Coast port group

FIGURE 5 - SOURCE: map of China main ports

4. Development of ports and terminals for different cargo categories

4.1 Development of coastal container ports

China's coastal ports have basically formed the port layout at various levels with eight ports of Dalian, Tianjin, Qingdao, Shanghai, Ningbo, Xiamen, Shenzhen and Guangzhou as container main ports, and other ports as local ports and feeder ports.

In 2015, another 12 container berths, including nine deep water berths, with a capacity of 6.15 million TEUs at coastal container terminals were built in China, and the number of multipurpose berths was reduced by three after contraction and renovation, resulting in an additional increase of container terminal capacity by 190,000 TEUs. By the end of 2015, China's coastal ports owned 394 specialized container berths, including 355 berths for ocean ships, with a throughput capacity of 183 million TEUs. In addition, China's coastal ports still had 150 multipurpose berths with a throughput capacity of about 10 million TEUs.[2]

4.2 Development of bulk cargo terminals

In terms of coal terminal construction, the construction layout of China's coal terminals always follows a pattern of shipping coal from North China to South China. By the end of 2015, seven coal-loading coastal ports in North China, namely Qinhuadao, Tangshan, Tianjin, Huanghua, Qingdao, Rizhao and Lianyungang ports, possessed 61 specialized coal-loading berths with a total coal-loading capacity of 820 million tons. There were 182 coal-unloading berths in China, including 147 deep water berths, with a total coal-receiving and unloading capacity of 700 million tons.

In terms of iron ore terminal construction, the layout of foreign-trade iron ore receiving and unloading ports in Bohai Rim had been formed with eight ports, namely Dalian, Yingkou, Tangshan, Tianjin, Yantai, Qingdao, Rizhao and Lianyungang ports, as principal ports, and three ports, namely Dandong, Qinhuangdao and Jinzhou ports, as supplement ports. The port layout for foreign-trade iron ore shipping system in Yangtze River Delta, which consisted of Ningbo-Zhoushan Port and those along the Yangtze River such as Shanghai, Nanjing, Zhenjiang, Nantong and Suzhou ports, had been established. The iron ore receiving and unloading coastal ports in South China mainly involve four ports, namely Zhanjiang, Fangcheng, Zhuhai and Fuzhou ports. By the end of 2015, China's coastal ports owned 60 iron ore receiving and unloading berths with a one-time iron ore receiving and unloading capacity of 100,000 tons and above per berth, and a total iron ore receiving and unloading capacity of 750 million tons.

4.3 Development of crude oil terminals

By the end of 2015, a two-tiered pattern of crude oil receiving and unloading ports had been formed in Bohai Rim. The six Tier-1 ports were Dalian, Yingkou, Tangshan, Tianjin, Qingdao and Rizhao ports, which mainly receive and unload crude oil directly from large oil tankers, and Tier-2 ports included Jinzhou, Qinhuangdao, Huanghua,

[2] Shanqing, Z. & Jianxin, C. (2006). *Summary of Coastal Port Construction in 2015* [J], China Ports. 2006(5).

Laizhou, Dongying and Longkou ports, which can transship crude oil from large ports and undertake offshore and ocean crude oil shipping tasks. The crude oil transit shipping system had been established in Yangtze River Delta with Ningbo and Zhoushan ports, located to the south of the Yangtze River estuary, being principal ports, and other ports including Shanghai, Taizhou and Nanjing ports being supplement ports. The rational layout of foreign-trade crude oil receiving and unloading ports has basically be set up along the coast of South China, including Quanzhou, Huizhou, Maoming, Zhanjiang, Qinzhou and Yangpu ports. By the end of 2015, China's coastal ports owned 27 berths with a crude oil receiving and unloading capacity of 200,000 tons and above each, and a total receiving and unloading capacity of 420 million tons.[3]

5. Development of China's port infrastructure construction

The planning, construction and operation of China's coastal port are currently in a good position, which is indicated by a healthy, stable and constant development trend. The port construction and operation have passed into the stage of adjustment and development according to the change of market demand. China's coastal port development has shown following trends.

I. Development of port infrastructure construction will be stable in the medium and long terms

On the one hand, amid constantly sluggish economy and trade, the port throughput growth rate constantly slows down. With the increasing number of terminals and port's scientific and technological levels, terminal capacity and efficiency also go up, leading to the relative oversupply of terminal capacity. According to relevant information, the overall throughput adaptability at China's coastal ports has increased to 1.3, reaching the bottom line of throughput oversupply. At the same time, with a constant adjustment of transportation structures, the investment volume in coastal port construction has declined year by year. On the other hand, the infrastructure construction in China's five coastal port groups has been generally completed, forming a basically stable pattern, which means that it is not possible for China's ports to start large-scale construction of terminals and berths. In general, China's coastal port development will be stable in the medium and long terms.

II. Different types of terminals have different development focuses

1. Because of the imbalanced development in crude oil terminal capacity, China will strengthen crude oil terminal construction in the future. According to the statistics, China had a crude oil terminal capacity shortage of 74.4 million tons in 2014, the largest since 2011. Although the shortage of crude oil-receiving and unloading capacity was somewhat eased with the successive operation of newly-built crude oil terminals and the construction of land channels, the throughput capacity of crude oil terminals was generally not enough. The imbalanced

[3] *Idem.*

regional development led to the imbalanced crude oil terminal capacity. For example, in addition to Ningbo-Zhoushan Port, Dalian Port and Zhanjiang Port are the two ports with the surplus capacity of over 10 million tons each, while there is a crude oil terminal capacity shortage at Rizhao Port, Quanzhou Port and Huizhou Port. According to the crude oil terminal construction status in 2016 (see Table 3), Huizhou Port and Rizhao Port have strengthened their crude oil terminal construction, which will somewhat ease their terminal capacity shortage, but the shortage problem remains unsolved. It is estimated that crude oil terminal construction will be strengthened in the future.

2. There is an excess iron ore terminal capacity in North China and a capacity shortage in South China. Currently, 91 percent of China's ore berths with a capacity of over 100,000 tons each are distributed in Bohai Rim and Yangtze River Delta. There are 11 ore berths with a capacity of 300,000 tons and above per berth in Bohai Rim, accounting for 73 percent of those in China. To compete for cargo sources regardless of shipping-route water depth, the collection, distribution and transportation conditions, and the hinterland iron-ore demands, some ports in North China blindly elevated their ore terminal capacities with designed throughput being much higher than the actual one, causing waste of resources and vicious competition. The maximum berthing capacity among the ore terminals along the coast of South China is maintained at the level of 200,000 tons, surfacing apparently insufficient berths, which is not conducive to achieving the long-term goal of iron ore receiving, unloading and transport. At the same time, according to China's iron and steel industry development policy, the steel materials demand-supply imbalance along the coast of Southeast China should be changed through the constant promotion of the construction of iron and steel bases along the coast of Southeast China and accelerated construction of coastal high-quality iron and steel product bases in Ningde, Zhanjiang and Fangcheng ports. With the shift of iron and steel enterprises to coastal areas in South China, the iron ore demand in South China will greatly increase. As a result, the focus of ore terminal construction will also shift to coastal areas in Southeast China

III. Port transformation and upgrading will be the focus of port construction

1. Large-size ships have become the trend of shipping development, which has new requirements for port infrastructure. First, port's berthing, receiving and unloading capabilities should meet the requirements for large ships. Ports should offer better deep water conditions for large ships. For example, a fully-loaded 18,000-TEU ship requires the water depth to be at least 16 meters for waterways and ports. However, not many ports in China can meet this requirement. It is necessary to further dredge waterways and ports as well as renovate and upgrade ports' loading/unloading equipment in order to meet the requirement for ultra large ships. Second, the port's collection, distribution and transportation capabilities should be upgraded in order to meet the requirements of large ships. To avoid port congestion, it is necessary not only to upgrade ports' throughput capacity and storage yard capacity in the collection, distribution and transportation system, but also to achieve highly-efficient collaboration by coordinating various operation

systems. It is necessary for trunk ports to constantly upgrade their hardware facilities in the future development, because meeting the requirements of large ships' berthing operation will be the focus of port construction in the future.

2. Against the global energy crisis and constantly worsening environment, green port development has become a new trend for achieving sustainable development of ports. Compared with the advanced western countries, China's green port construction apparently lags behind, and its green-port theoretical research and practical exploration are still at the preliminary and developing stage. The main reasons include: first, China has more old ports which have been used for a long time, the port construction ideas and management methods lag behind in the port area development, the fund is insufficient and the environmentally friendly equipment are not complete; second, most ports have no comprehensive understanding of green ports. With the successive requirements from the central and local governments in China for the green port construction, the green construction will be the focus in the process of port upgrading and renovation.
3. Pilot work on building automated and intelligent terminals will be gradually carried out. According to the Action Plan on Promoting Intelligent Transportation Development (2017 - 2020), which was recently issued by the MOT, the intelligent port construction will become the focus in water transport's intelligent development. In an era when science and technology develop fast, the intelligent and unmanned terminal operation is the trend in the world's port development. It is estimated that an automated terminal can reduce manpower costs by about 70 percent and increase the operation efficiency by about 30 percent. China's port construction is currently in the stable development stage. Increased operation efficiency will greatly upgrade port's core competitiveness. Enhancement of intelligent and automated port construction will be the trend in China's port development. However, due to demanding investments and requirements for equipment and personnel, the automated terminal construction is currently in trial, and some ports with mature conditions have tried to build automated terminals. The automated terminal construction will be further promoted after relevant conditions mature.

6. Concluding remarks

The general pattern of China's port construction has been basically formed. With the descending global economy and the new normal of China's medium and high speed economic growth, China's coastal port will also enter stable development after experiencing the fast-growing port construction. Its port construction will grow steadily in the medium and long terms, the construction focus will be shifted to port's transformation and upgrading, and the moderate construction ahead of the times will be put under control. In terms of port transformation and upgrading, China's port and terminal construction should develop to get adapted to large ships, green, automation and intelligence. At the same time, problems including imbalanced regional development,

redundant construction and disordered competition in China's coastal port construction will be eased through the promotion of measures such as supply-side reform and port resource integration. In general, China's port infrastructure construction will develop towards the healthy and stable direction under the state's arrangement and guidance.

Chapter VI

Maritime and logistic presence of China in the Med & Gulf area: from a transit sea to a strategic sea

1. China and global layouts of maritime shipping

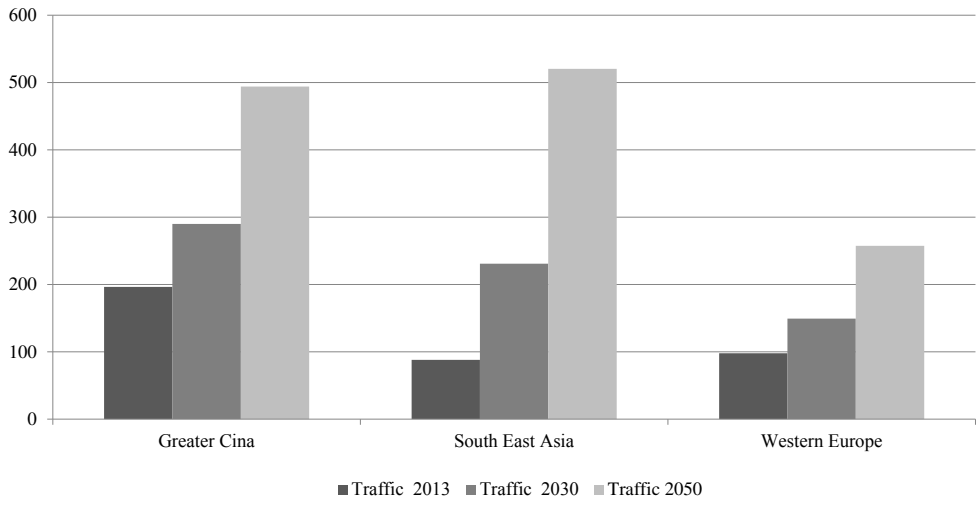
One of the latest studies by the OECD, "*Capacity to Grow*", carried out in 2016, has highlighted some very interesting data, which shows, among other things, the value that China holds in the global maritime shipping context. First, in order to better grasp the economic magnitude of the sector, in China the Maritime economy has a value of $970 billion and contributes to 9.4% of its GDP.

The data related to containerised traffic, broken down into maritime area, shows that the area known as *Greater China*[1] moves almost 200 million TEU, equivalent to approximately 31% of goods moved by sea on a global scale.

The Report also provides an expanded vision, with the inclusion of data deemed likely to change in the future: in fact, it informs that the same area will see an increase of its trade by 2030, reaching 290 million TEU, achieving, by 2050, 494 million; a +48% and 151% growth, respectively, compared to 2013.

Therefore, even in the foreseeable future, the Dragon is set to be a main player of containerised traffic. The same goes for its ports, which are nowadays world leaders in terms of productivity and handled volumes.

Container Traffic of the 3 main maritime global areas (Million TEUs)



Graph 1 – Source: SRM on OECD 2016

[1] Word that includes China, Hong Kong, Macau and Taiwan.

This situation applied to the past and is still applicable, in spite of the delicate balance the global layouts of the port system are experiencing at present; important changes, on an organizational and regulatory level, are currently underway, as well as some significant phenomena, which will cause an increase in competition between ports of call and sea carriers.

The unstoppable evolution of naval gigantism (which has been in progress now for several years), the big alliances in the container sector, fluctuations of the oil price, the crisis and the setbacks of some large carriers (for example Hanjin and HMM) and the well-known economic events of North Africa are just some of the factors that are leading the global maritime system towards some sharp changes of its strategies, routes and competitive conducts.

The launch of the Suez Canal in August 2015 and of the Panama Canal in June 2016 are also elements joining the fray; it should indeed not be forgotten that these two large strategic nodes are going to include, albeit with different measures and strategies, China. In relation to Suez, for example Alphaliner has repeatedly quoted the positive evolution that this Canal had on shaping the weekly services of the Far East - US East Coast, uone of the most travelled ones, with a movement of over 7.5 million TEU per year; the number of strings, in fact, grew from four in 2010 to eight in 2016, with a remarkable growth of volumes handled, while Panama remained stable, going from fifteen to thirteen.

China utilizes Suez as a large passageway for its traffic, and the following infographics show how the Egyptian canal is increasingly dependent on the ingoing and outgoing goods toward that area.

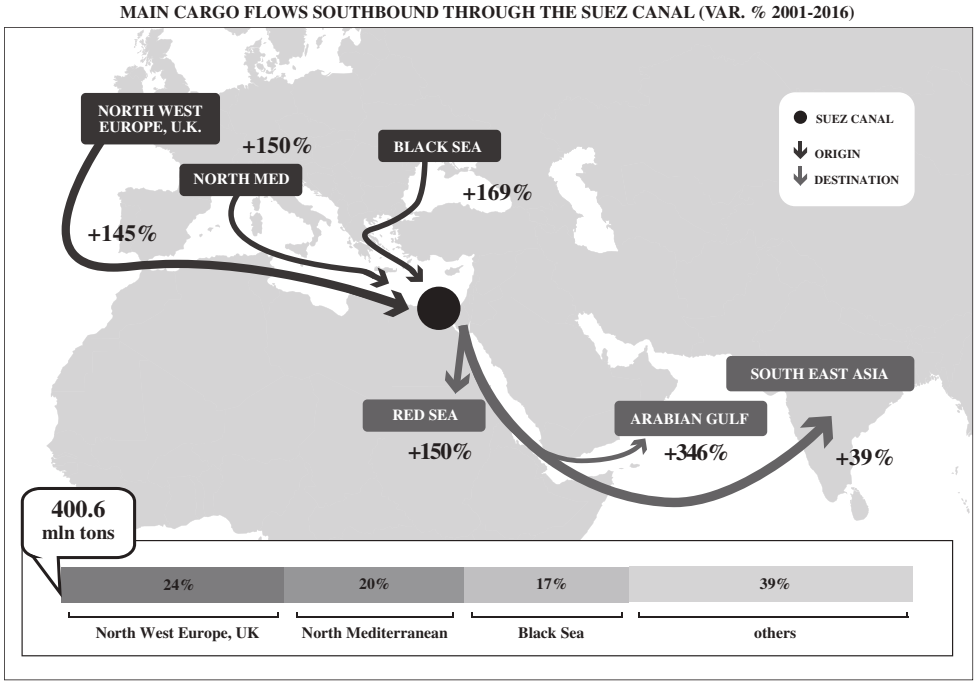
The data available from the Suez Canal Authority shows how, in the North-South direction, South East Asia is the main destination for the vessels, with 104 million tonnes of goods shipped each year (26% of the total) and how in the South-North direction the same area experienced goods movements of 157 million tonnes by the canal, equal to 40% of the total.

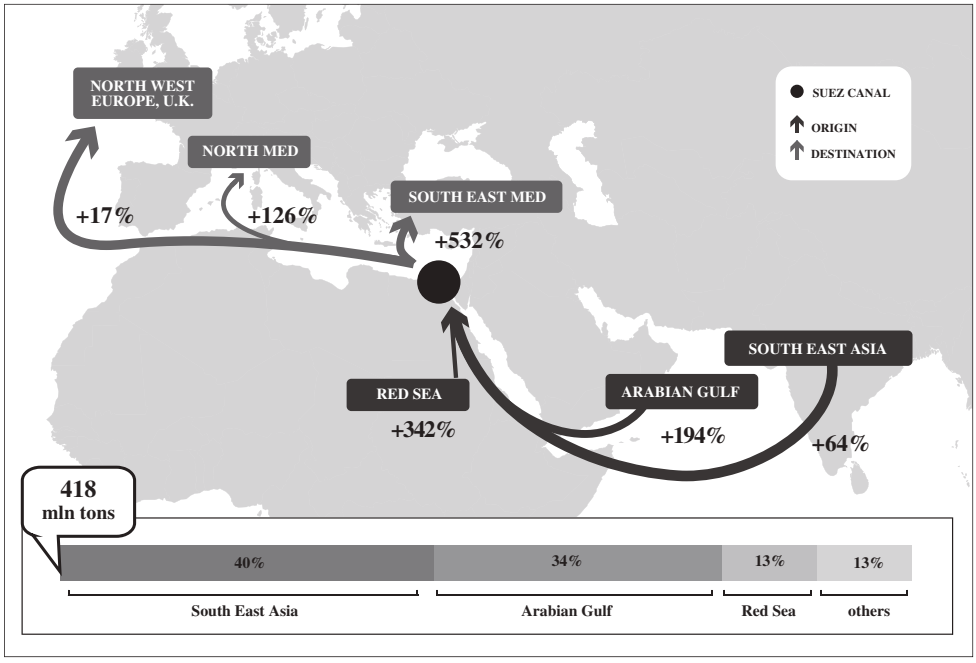
Since it is the dominant direction, it's easy to deduce that the lion's share of the tariff revenues of the canal are from ships coming from and going to the Far East. The strategies of the Egyptian government are a direct consequence of that, which lately have been directed at offering benefits and discounts (up to 65%) for the ships travelling on these routes, in order to compete with the Panama Canal, which due to its enlargement could absorb a number of traffic trajectories.

In the case of Panama, China is the second "customer" of the central-American junction (after the United States): in fact, there have been 48 million tonnes of Chinese goods shipped through the canal. It is symbolic (even though it was the consequence of a lottery draw) that the first ship ever to travel through the enlarged canal was the Cosco Andronikos, successively renamed Cosco Panama.

Throughout the years China, with its ports, its carriers and a strong *merger & acquisition* policy by its national shipbuilding companies has consolidated and strengthened its already diffused presence in the global maritime system. This Country, in fact, is already the owner of two large carriers, Cosco and China Shipping, as well as terminals spread all over the world through Cosco Pacific, which handles about 90 million TEU.

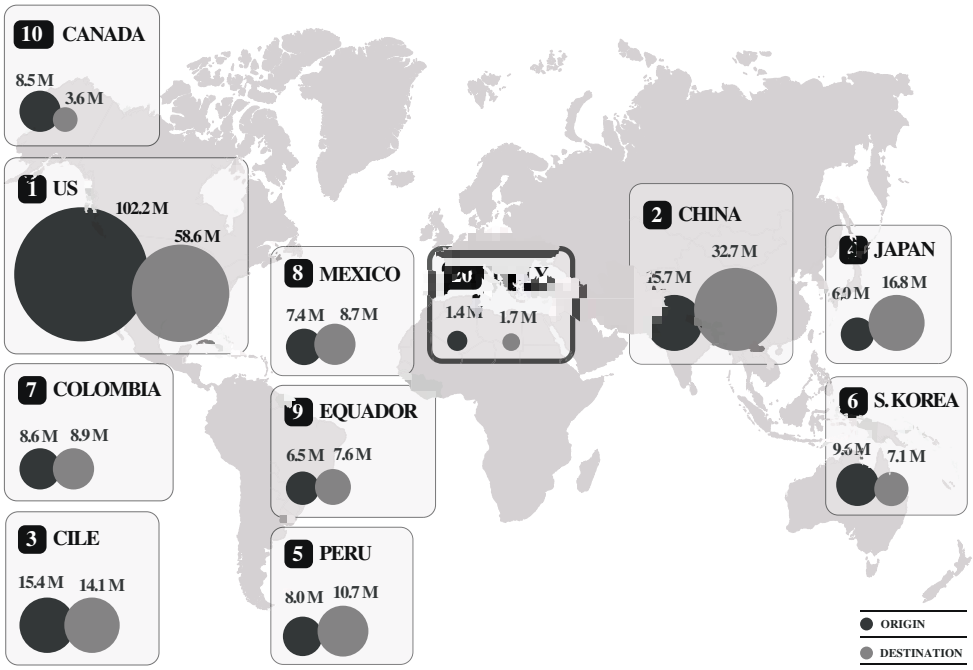
The main routes traveling by Suez: var. % 2001-2016





INFOGRAPHIC 1 – SOURCE: SRM on Suez Canal Authority 2017

The Panama Canal – Main Origin/Destination Countries of goods



INFOGRAPHIC 2 – SOURCE: SRM on Panama Canal Authority 2016

Given these premises, the purpose of this chapter is to illustrate and provide an analysis, albeit not completely thorough, of the maritime strategies followed by China in the Mediterranean; for this country the *Mare nostrum*, as time went by, has shifted from a transit sea for the ships into a real permanent logistic platform, with a course of action that culminated, as we will see, with the purchase of a relevant share of the Greek port of Piraeus.

It is only natural, in fact, to observe that the Mediterranean is assuming an increasingly central position as well as becoming a traffic hub ripe with opportunities for international trade, as attested by multiple studies by SRM[2].

A closer look at trade exchanges to and from the MENA area – which are carried out mainly by sea – reveals a steady growth from 2001 to 2015: from $40.6 billion to $66.5 billion in Italy, from $37.6 billion to $89.8 billion in Germany and from $75.2 billion to $147.6 billion in the USA.

It was China, though, who made significant progress. In the MENA area Chinese trade grew from $16.2 billion in 2001 to $185.6 billion in 2015, with a forecast growth estimated at $203 billion in 2018.

[2] See SRM (years 2011-2016). *Annual Report. Economic Relations between Italy and the Mediterranean*, Giannini Editore, Naples; SRM (years 2011-2016). *Italian Maritime Economy*, Giannini Editore, Naples.

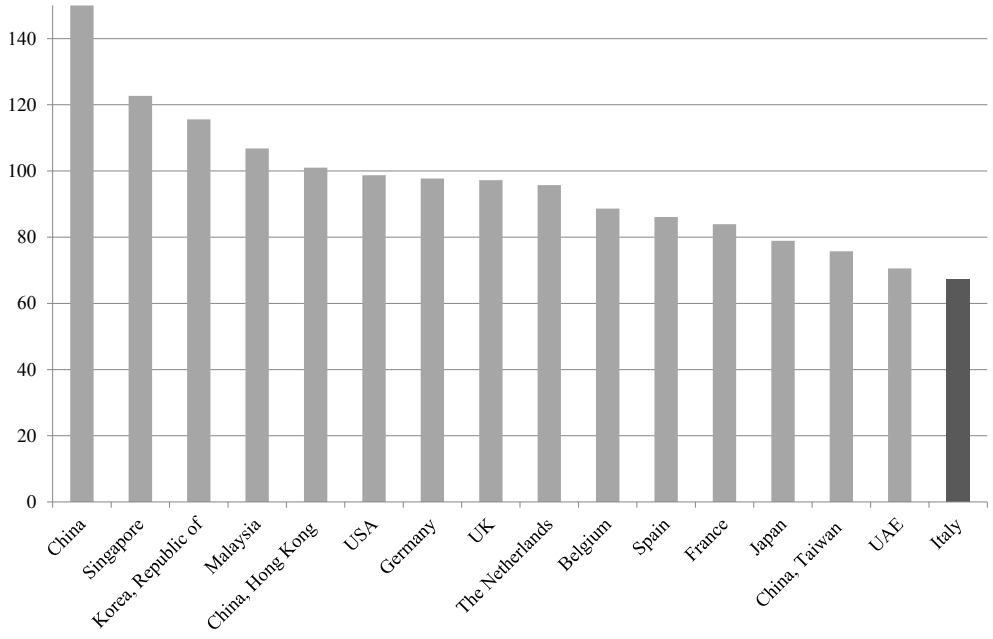
2. China in the international Competitiveness rankings

The first step we took in this chapter was to contextualize China in the international rankings of transport and logistics.

Firstly, we based the analysis on the UNCTAD *Liner Shipping Connectivity Index* (LSCI), which is generated from five components: (a) the number of ships; (b) the total container-carrying capacity of those ships; (c) the maximum vessel size; (d) the number of services; and (e) the number of companies that deploy container ships on services from and to a country's ports; in this case, since the index is calculated with *China 2004* equal to 100, it's obvious how this country is considered to have maritime *perfection* in terms of accommodating ships and ability of attracting vessels.

Nevertheless, China grew even further, achieving in 2016 the value of 167.48; the first European Country in the ranking is Germany with a value of 97.75, in 7th place; Italy is in 16th place of the 157 nations examined.

Liner Shipping Connectivity Index (LSCI) 2016 – Top 15 and Italy



Graph 2 – Source: SRM on UNCTAD 2016

It should be highlighted that the ranking includes all of our main European trade and maritime competitors in the Mediterranean – namely Germany, France, Spain – and that all of them rank higher than Italy, showing that we should (quickly) pick up the pace with those realities that have always put their maritime and logistic development at the core of their growth policies.

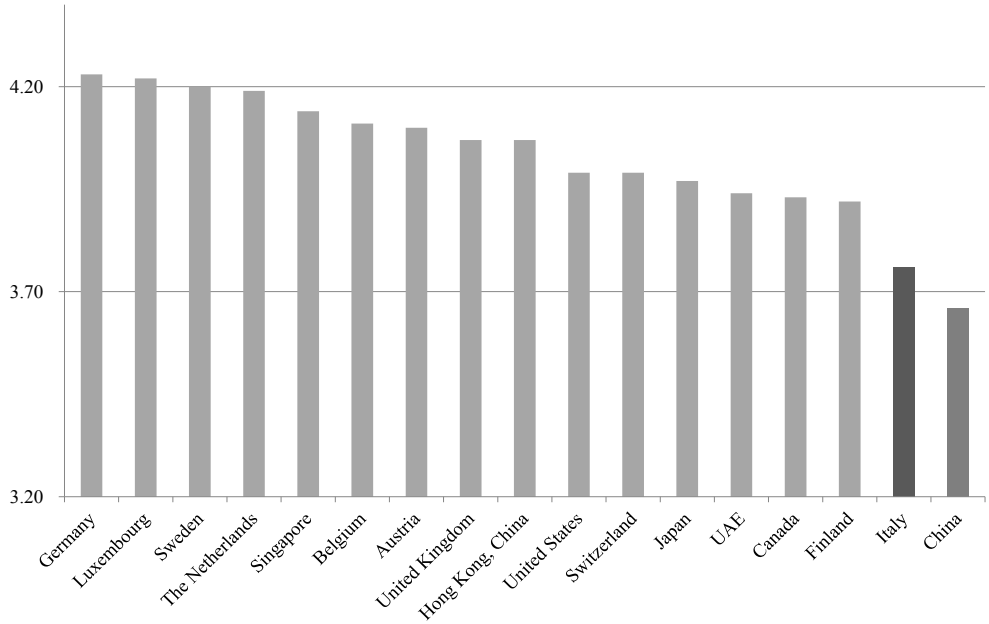
Going back to the presence of the Far East in the European ports, it is not a coincidence that the port of Antwerp in Belgium has PSA of Singapore as one of their terminal

operators; while it is not Chinese, it's still a manifestation of a know-how with which one has to deal with if there is the desire to attract traffics and develop ports of call. It is also not a coincidence (as we shall further expand on later) that Greece granted Cosco a significant area of its most important port. There are a lot of other examples, as we will see further on.

The LSCI, therefore, is an indicator one should examine thoroughly, since it shows the adaptability of a logistic and port system to the transformations and phenomena happening on a maritime global level. It's noteworthy to mention that, for example, the United Arab Emirates went from a value of 38.06 in 2004 to a value of 70.57 in 2016, showing it fully understood it had to strengthen its port capacity and efficiency; and this was done thanks to strong investments in the sector[3], especially in the Emirates of Dubai and Abu Dhabi, where there's a presence of large and state-of-the-art ports.

The LPI, *Logistics Performance Index* of the World Bank, is a different kind of indicator; unlike the previous one it's more oriented toward purely logistic parameters, in fact it takes into consideration: 1) the efficiency of customs and border management clearance; 2) the quality of trade and transport infrastructure; 3) the ease of arranging competitively priced shipments; 4) the competence and quality of logistics services; 5) the ability to track and trace consignments; 6) the frequency with which shipments reach consignees within scheduled or expected delivery times.

Logistics Performance Index (LPI) 2016 – TOP 15, Italy and China



GRAPH 3 – SOURCE: SRM on World Bank 2016

[3] See SRM (2015). *Outlook. Italian business in United Arab Emirates*, www.srm-med.com.

In this case, China does not achieve the top place, lying in 27th place among the 160 Countries examined. It is interesting to see how 7 European Countries are among the first 10 of the ranking. Italy lies in 21st place, a better placement than China. Looking at the rankings of the two indicators gives the impression that European Countries have a better synergy between their maritime system and their logistics, while Chinese investments are more focused on the ability of attracting and moving goods throughout the globe.

The faults of the Chinese system are more pronounced in the sub-indicators that form the LPI, where the country is in 31st place in the "Customs" and "Timeliness" factors, two key aspects of an efficient logistic system.

After determining the position of the Dragon in the two examined international indicators, we now move on to analysing maritime phenomena: ship gigantism related to port efficiency, the terminals and the big alliances in order to provide a framework of where and how the Country is positioning itself within the Med Area & Gulf.

3. Megaships, terminals and big alliances: how China is positioning itself in the Mediterranean

The policy of significantly increasing the ship size of the main container carriers saw a remarkable intensification during the last three-year period (2014-2016). This had an impact on the global routes, which became increasingly selective, since the ports are not always equipped to accommodate 19-21thousand TEU ships and because they do not always have a logistic efficiency and equipment suited to load/unload containers and sort them immediately toward the hinterland or other transhipment channels.

Therefore, a natural process of selection between the ports is currently underway, which is privileging those who can provide to the vectors lower costs, high productivity, cutting-edge logistic technologies capable of serving the ship and generating other transport modes. This started a race toward terminal expansion and investments in new infrastructural technologies (for example, the creation of *Maasvlakte 2* in Rotterdam, a fully automated terminal).

Additionally, there is also an intense policy of alliances underway, seeking routes rationalization, economies of scale and strategic opportunities, which is deemed likely to presumably be present also in the near future.

This led to the creation of some well-known names such as *2M*, *Ocean Alliance* e *THE Alliance*; they include the largest operators and are constantly evolving, progressively defining their "aggressive" tactics of container markets, which are of relevant interest for China, since the country has a port system strictly dependent on this segment. 9 out of the main 20 ports in the world are Chinese. Shanghai, the number one port in the world, in 2016 has moved 37.1 million TEU.

What's China position in the alliances and ship gigantism context?

In February 2016, there was the inauguration of the new shipping group that merged the two large operators: Cosco, a State-owned company founded in 1961, and China Shipping, established in 1997. The result of the merger created a group possessing assets valued around $80 billion and with a revenue of over $38 billion.

With its 1,114 ships and a cargo capacity equal to 85.32 million tonnes deadweight, Cosco Shipping (the shortened name derived from the fusion), located in Shanghai, is the biggest global shipping group. The new group holds the first place in terms of fleet capacity in the bulk carrier sector, with 365 ships for a total of 33.52 million tonnes deadweight, mainly operating with the China Cosco Bulk Shipping (Group) Inc. and China Shipping Bulk Carrier Inc. brands, of tankers, with 120 ships with 17,85 dwt (deadweight), mainly managed by China Shipping Development Inc., and by Dalian Ocean Shipping Inc., of the ships for general and specialized cargo, with three million dwt capacity, and ranking fourth in the world in the segment of containerships, with a fleet with a 1.58 million container TEU capacity with the Cosco Container Lines brand.

The new shipping group, and this is another key strategic point, has its own network of 46 port terminals for container traffic, managed by Cosco Shipping Ports, which is the second in the world in terms of volume of traffic, handling 90 million TEU per year. Cosco Shipping is also world leader in the segment of bunker sales, with annual supplies of over 25 million tonnes, as well as being third in the world ranking of the main container leasing companies, with a fleet counting on a capacity of over 2.7 million TEU, and its own leading global network of maritime agencies and services for the offshore industry. The group is also present in the sector of transport for passengers through Xiamen Ocean Shipping Inc. (Cosco Xiamen) and China Shipping Passenger Liner Inc. (CS Passenger Line).

Since several years, well before the merger, China started a strong strategy of penetration of ports and port terminals of the Mediterranean, of the Gulf and of North Europe, pursuing a number of activities, such as:

- material takeovers of the infrastructures, like terminals and ports, where it now owns important participations (majority stakes or relevant ones);
- a firm alliance policy, aiming at the most productive – in terms of business to pursue – global routes.

Let us analyse now the aforementioned points.

Surely, the most important step dates back to January 2016, with the disclosure of the news that the Greek Government had accepted Cosco's proposal for the acquisition of 67% of the Piraeus Port Authority.

This was the pillar that marked the strategic position of China within the Mediterranean: the offer of the Chinese shipping group was a turning point in the sector of European ports. The HRADF (Hellenic Republic Asset Development Fund) established that the deal had an overall value of 1.5 billion euro, since, in addition to the value of the offer of 368.5 million euro, there is also the scheduling – and this is the actual relevant point

of the matter – of mandatory investments amounting to €350 million throughout the next decade, with an expected revenue for the Greek nation deriving from the concession agreement amounting to €410 million.

Furthermore, there are the possible dividends and interests in favour of HRADF, as well as other investments in addition to the mandatory ones by the end of the concession period, which will expire in 2052.

The agreement establishes that the transaction has to happen in two stages. During the first stage, Cosco will pay HRADF €280.5 million to acquire 51% of the capital of the Piraeus Port Authority (PPA). After five years, as some determined conditions

established by the deal – such as the completion of mandatory investments – are fulfilled, Cosco will pay to HRADF another 88 million euro to increase its share in PPA to 67%. Basically, the port has been bought by the company. These investments will lead to the creation of 31,000 jobs in Greece and they will increase the value produced by the logistics of the Country from the present 400 million euro to 2.5 billion euro.

Another relevant point concerns Cosco's commitment to invest also in the cruise sector, in order to allow the Greek port, which in 2015 moved almost 1 million of cruise passengers, to increase its traffic to 3 million passengers. Such investments are also going to be realized in the building and ship repair sectors, as well as the handling of car units, in order to turn the port into the main Mediterranean hub for vehicle traffic; container handling is also concerned, with the goal to increase the volume of container traffic, which in 2016 amounted to 3.7 million TEU, bringing it to seven million TEU, reaching ten million TEU per year at a later stage.

The group concluded another important strategic positioning operation in May 2016, with the acquisition of 35% of Euromax Terminal Rotterdam (ETR) in the port of Rotterdam for over €125 million.

ETR manages one of the five container terminals in the *Maasvlakte I* area in the port of Rotterdam. The terminal has an annual container traffic capacity of 2.5 million TEU (likely to increase to 3.2 million with the completion of the second stage of the building project) and, in 2015, moved a traffic of 2.3 million TEU.

The operation is particularly relevant since it consolidates the presence of the Chinese Group in the North-European maritime markets, which had already been present in Antwerp, when in November 2004 Cosco Shipping Ports acquired a 20% share of the Antwerp Gateway terminal of the Antwerp Port (Cosco is also present in Zeebrugge Port, ed.).

It should be noted that Cosco, before concluding the two operations of Piraeus and Rotterdam, was already showing signals of its intention of consolidating its presence in North Europe when it declared, in December 2014, its intention of settling a control centre on all its intra-European services in Hamburg, whose responsibility shifted from Shanghai headquarters to the German subsidiary Cosco Container Lines Europe GmbH (Cosco Europe), that have their headquarters in the German port.

The persistent presence in the Mediterranean of China does not stop with these operations. In August 2016, in fact, Cosco showed interest in winning the concession of the third container terminal of Algeciras, in Spain. Algeciras, as it is known, is one of the most important ports of the Mediterranean for transhipment container traffic and oil products. In 2015 it moved 4.5 million TEU. In the first semester of 2016 it moved 2.3 million TEU, with a 13% increase compared to the same timeframe in 2015. The tender to send offers to manage the terminal was published on August 1. To specify, it concerns a terminal in an area of over 30 hectares with a 50-year long concession, which will have to be highly automatized, with a segment destined to the winning carrier and another to the public.

The area covers over 30 hectares in the southern zone and it's linked to the railway freight terminal of the port, with a quay able to accommodate two 20,000 TEU ships simultaneously. It should be highlighted that China's strategic placement is also happening in the East Med area.

In fact, another important asset they acquired is the Haifa port in Israel; in May 2015 the two Countries signed the deal that entrusted the management of the North Israeli port to Shanghai International Port Group Co. (SIPG).

After the deal between the two governments, the passage to the Chinese administration of the port (a 25-year long concession) will start in 2021, one year after the scheduled completion of the works for the new port of Haifa, built to handle 1.8 million containers. SIPG will invest about 1 billion Dollars (and a further 1 billion will be invested by the builder of the terminal) to build facilities and to buy equipment for the port.

The Haifa investment will contribute to strengthen the links between the port of Shanghai and the other ports on the maritime Silk Road (see the following paragraph) and to form a busier network between Shanghai and the other European ports.

Following the Eastern Mediterranean, it should be noted that in September 2015 the Chinese companies of China Cosco Holdings Inc., China Merchants Holdings (International) Inc. (CMHI) and CIC Capital Corporation, formed a joint venture to buy a share of the Turkish companies Fina Liman Hizmetleri Lojistik and Kumport Liman Hizmetleri ve Lojistik. The first Turkish company is a holding whose only asset is the investment in Kumport, which in turn owns and manages the container terminal Kumport Terminal in the port of Ambarli, on the north-western coast of the Marmara Sea, one of the most important seas in the Mediterranean.

The joint venture by the three Chinese companies, called *Euro-Asia Oceangate*, is 40% owned by Cosco Shipping Ports, 40% by Keen Charm Development Ltd, a company fully controlled by the port group CMHI, and 20% by CIC Capital, a branch of China Investment Corporation (CIC), a public Chinese company specialized in foreign investment. The joint venture agreed upon the acquisition of 64.5% of the share capital of Fina Liman for $920 million. The remaining part will remain with the Luxembourg company Turkac, which is managed by the State General Reserve Fund, a fund of the Ministry of Finance of the Sultanate of Oman.

The Kumport Terminal has six docks totaling 2,180 linear metres and a seabed depth of -16.5 m, which are able to accommodate containerships with a 18,000 TEU capacity, and has an annual container traffic capacity of 1.8 million TEU.

There is the possibility that the terminal will be subject to an enlargement, which could bring its annual traffic capacity to 3.5 million TEU. In 2014 the terminal moved traffic of 1,414,000 TEU, equal to 17% of the overall container traffic of Turkish ports, and in the 2009-2014 period registered an annual growth of traffic higher than 30%.

The last Chinese investment, but only in chronological order, was the one carried out in Italy in October 2016 with the deal between APM Terminals and China CoscoShipping Ports, the terminal branch of the Cosco group, for the establishment of a new joint venture that is going to take on the management of the incoming container terminal of Vado Ligure, as well as the Reefer Terminal, a specialized structure for the handling of temperature controlled goods, located in the same port of call. In the new entity, APM Terminals is going to hold the absolute majority, i.e. 50.1%, while Cosco is going to control 40%.

The remaining 9.9% is going to be held by Qingdao Port International Development, an entity with headquarters in Hong Kong and controlled by Qingdao Port International, a company which manages the Chinese port of Qingdao.

Cosco Shipping Ports

Cosco Pacific became Cosco Shipping Ports Ltd after the merger between Cosco and China Shipping, creating a group that holds 8% of the world containership fleet in terms of capacity.
In 2016 its terminals moved 95.1 million TEUs showing an increase of 5.1% on 2015. Furthermore, bulk traffic amounted to 80.8 million tonnes (+3%). In the first trimester of 2017 the aforementioned terminals moved 23.9 million TEUs of containers, with a 7.5% growth on the first three months of 2016, when they moved more than 22.2 million TEUs.
The Chinese terminals alone moved container traffic amounting to 19.6 million TEUs showing a 2.4% increase on the first trimester of 2016 while foreign terminals handled 4.3 million TEUs. This figure represented a 38.6% growth to which Euromax Terminal Rotterdam had contributed significantly with 666,000 TEUs moved in the first three months of this year.
In the Mediterranean, the branch Piraeus Container Terminal (PCT) manages containerised traffic in the port of Piraeus and handled 834,000 TEUs, with an increase of 3.4% on the first trimester of 2016 while the affiliated company Suez Canal Container Terminal (SCCT) moved 738,000 TEUs (+14.9%).

Container handled by Cosco in ports (2015)

Ports	M. TEU	Ports	M. TEU
Qingdao	17	Ningbo	3.1
Shentzhen	12.2	Piraeus	3
Guangzhou	10.3	Port Said	3
Shanghai	8.2	Hong Kong	2.8
Dalian	5.3	Nanjing	2.6
Tianjin	4.6	Antwerp	2
Lianyungang	3.5	Singapore	1.5
Yingkou	3.4	Others	8
		Total	**90.5**

SOURCE: SRM on Cosco

The oldest and most famous investment is the one China carried out in Egypt, which happened in 2007, when in November Cosco Pacific bought 15% of SCCT-Suez Canal Container Terminal from the Danish IFU and the remaining 5% from APM Terminals.

The new shareholder structure of SCCT thus became as follows: APM Terminals (Maersk Group) 55%, Cosco 20%, Suez Canal Authority 10%, National Bank of Egypt 5% and Egyptian private sector 10%.

With this investment, China put itself in the position to tackle the Mediterranean port market through the presence in one of the global strategic hubs of maritime transport such as the Suez Canal, with the aim of creating new business areas.

The second point we're going to cover concerns the policies of ship gigantism and big alliances.

The former is related to the need to adapt to a market that lately has been strongly oriented towards building large-sized ships, even though this strategy generated a debate on whether or not to build large ships, since they modify the strategies of the ports by forcing them to invest in logistic equipment and infrastructures or, alternatively, on changing traffic typology (although we are not going to expand on this particular aspect). Cosco followed the trend as well, and while it had a fleet that already had large-sized vessels among its ranks, in September 2015 it commissioned the construction of eleven 19,000 TEU containerships, for an investment of $1.5 billion, commissioned to four Chinese shipyards.

Six new ships entail an investment of $135.3 million each, and five additional ships are going to cost $139.5 million each. The delivery date of the eleven containerships is set for 2018.

As time goes by the large ships will entail, as we previously mentioned, a selective effect of the ports capable of providing a better logistic efficiency and more advanced infrastructure. This suggests that the Chinese investments we mentioned earlier are going to follow this logic, also signifying a steadily increasing presence of large-sized ships in the Mediterranean with the Far East as their origin/destination.

Another policy followed by the Chinese maritime carriers Cosco-China Shipping has been the ship alliances one; this phenomenon had a very marked evolution during the last 3 years as well, with companies signing and leaving a number of deals and agreements.

The 3 most famous ones, which now seem to have consolidated, are:

- *2M*: Maersk Line, MSC, Hamburg Sud and HMM (Hyundai Merchant Marine);
- *Ocean Alliance*: Cma-Cgm, Cosco Container Lines, Evergreen Line and OOCL;
- *THE Alliance*: Hapag-Lloyd, K-Line, MOL, NYK, Yang Ming, UASC.

Ocean Alliance is the one that mainly interests the purposes of this analysis, and involves the following international operators:

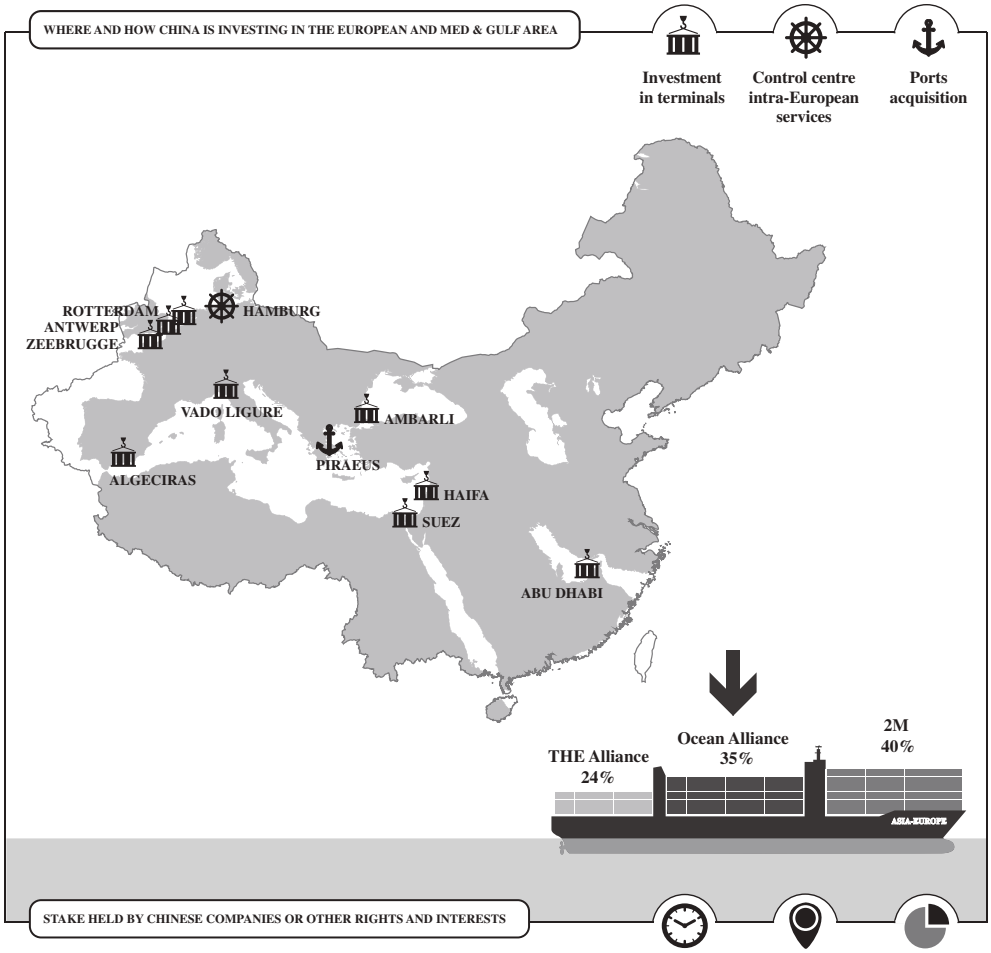
- Cma-Cgm (France);
- Cosco (China);
- Evergreen (Taiwan);
- OOCL (Hong Kong).

A European carrier under the French flag and three from the Far East point to a dealstrongly oriented toward Asia-Europe and Asia-Med routes, and vice versa.

The Alphaliner analysis, in fact, shows the future outline of the share-market of the first trajectory we mentioned, with 35% of the share held by the French-Eastern alliance (see Infographics 3).

The symbiotic nature of the 'large-ship/large-alliance' strategy is then clear; it started a competitive process that will ultimately benefit those carriers capable of better identifying the development trajectories, showing foresight in understanding which ones are going to be the most relevant markets in the future, especially in the container sector;

China's presence in the Mediterranean, in Europe and in the Gulf



2016	Cosco, Qingdao Port Int.	Italy	**Vado Ligure Terminal**	**40%** (Cosco) **10%** (Qingdao Port Int.)
2016	Cosco	EAU	**Khalifa Port Container Terminal 2**	**24%**
2016	Cosco	Spain	**Port of Algeciras**	**24%**
2016	Cosco	The Netherlands	**Euromax Terminal Rotterdam**	**35%**
2016	Cosco	Greece	**Port of Piraeus**	**67%**
2015	Euro-Asia Oceangate	Turkey	**Kumport Terminal**	**65%**
2015	Sigp	Israel	**Port of Haifa**	**25-year concession**
2013	Cosco	Belgium	**Zeebrugge Terminal**	**24%**
2010	Sigp	Belgium	**Zeebrugge Terminal**	**25%**
2007	Cosco	Egypt	**Suez Canal Container Terminal**	**20%**
2004	Cosco	Belgium	**Antwerp Container Terminal**	**25%**

INFOGRAPHIC 3 – SOURCE: SRM on Alphaliner, Abu Dhabi Ports, Bloomberg and Shanghai Daily

the Mediterranean appears to be qualify, and it is not by chance that this has always been a very coveted area for ports; it should be enough to mention that the Chinese were not the only ones interested in the Mediterranean, but there were also many other terminal operators and shipping companies from other countries, such as PSA of Singapore, DP World of the Arab Emirates, Hutchinson Ports of Hong Kong.

There are many examples to be found even in Italy, like the Danish Maersk opening new offices in Naples with the Southern Italian Region as their area of interest; and like the German Eurokai which, through Contship manages the ports of Gioia Tauro, Cagliari and La Spezia, and the same goes for Genoa, with an investment by APM, or PSA's investment in Venice.

Following some other examples, in the Mediterranean we find Tanger Med with APM and Eurokai, Valencia and Barcelona with MSC. The Mare nostrum, with its 2 billion tonnes of goods transited each year, turned into an arena where the operators can play the important match of international trade relations currently affecting the globe: one of these challenges is the new Silk Road, which we will cover in the next paragraph. Another topic, which will be discussed at the bottom of the paragraph, concerns another important investment which is being carried out by the Chinese state carrier (we reiterate that Cosco is totally state-owned); the shipping group, as it declared at the end of September, is going to build and manage a container terminal in the port of Abu Dhabi in the United Arab Emirates, establishing an operative basis for its ships in the Gulf. The agreement will be achieved through the payment of $738 million for a 35-year long concession, increasing the role of Abu Dhabi in the region's logistics, contributing to its economic and productive diversification process (the economy of the Emirate is mainly dependent on the Oil sector).

Cosco will establish a container terminal with 18-metres deep quays, the concession area will cover an area of around 70 hectares and the capacity of the port will have a 2.4 million TEU increase, adding to the present 2.5. The deal includes the option for a further 600 metres expansion of the quay in the future, in order to allow the additional expected growth of volumes and the annual nominal handling capacity will increase to

3.5 million TEU (the project is set to become fully operational in 2018); when all the working stages will be completed, the port will have an overall annual capacity of 6 million TEU.

4. *One Belt One Road* and the new routes for the Mediterranean

On the 7th of December 2013 the Chinese president Xi Jinping, guest of Nazarbayev University in the capital of Kazakhstan, revealed his Vision on the future of Eurasia to the students and the authorities; in an extract of this speech, he said *"in order to build more durable economic relations, improve cooperation and expand the development of the Eurasian region, we must take an innovative approach and build together a new economic belt on the silk road. This is going to be a major feat, which will benefit every Country in the road… The economic belt we're proposing is inhabited by 3 billion people and represents the largest market in the world, by a large margin… The people of this*

ancient silk road, together, have the chance to create a new, amazing chapter of this ever-unfolding story. As of now, this is a golden opportunity for development".[4]

The new Silk Road is a strategic initiative of China to improve links and cooperation among the Eurasian Countries. It includes the guidelines of the "economic zone of the silk road" and the "maritime silk road" and it is also known with the acronym *One Belt, One Road* (OBOR). A better image of the development trajectories that the programme will pursue can be found, with some approximations, on the Infographic 4.

Starting from the development of transport infrastructures (not just the maritime ones), OBOR's strategy aims to promote China's role in global relations, favouring international investment flows and commercial opportunities for Chinese productions.

The *Maritime Way*, in particular, circles the whole of Eastern and Southern Asia, reaching the Mediterranean through the Suez Canal. OBOR should ease connectivity and efficiency of the trade lane, decreasing shipping costs while improving the safety of the massive import and export flows of the country. The expected investment is going to be carried out gradually and it should be realized also thanks to the support of:

- the Asiatic Infrastructure Investment Bank (AIIB)[5], founded by China to fund large infrastructures, established at the end of 2015, with a capital of 100 billion dollar with headquarters in Beijing; many European Countries are among its stockholders, including Italy;
- SRF (*Silk Road Fund*)[6] established in December 2014, with 40 billion USA dollar as initial capital; the fund mainly provides support to investment and financing aimed at commerce, economic cooperation and connectivity in the context of the OBOR initiative, in cooperation with national and international companies and financial institutions;
- Other financial bodies, like for example the New Development Bank and the European Bank for Reconstruction and Development (EBRD).

As regards the relations between Asia and Europe, the roadmap of the OBOR initiative pinpointed six maritime and land economic corridors[7]; they are the routes where the main transport and energy infrastructure plans are allocated, in concert with the national plans of several Countries, specifically:

1. *The new Eurasian Land Bridge;*
2. *The China – Mongolia – Russia Economic Corridor;*
3. *The China – Central Asia – West Asia Economic Corridor;*
4. *The China – Indochina Peninsula Economic Corridor;*
5. *The China – Pakistan Economic Corridor;*
6. *The Bangladesh – China – India – Myanmar Economic Corridor.*

[4] Quotation from: GRAPPI, G. (2016). *Logistica*, Ediesse, p. 153.

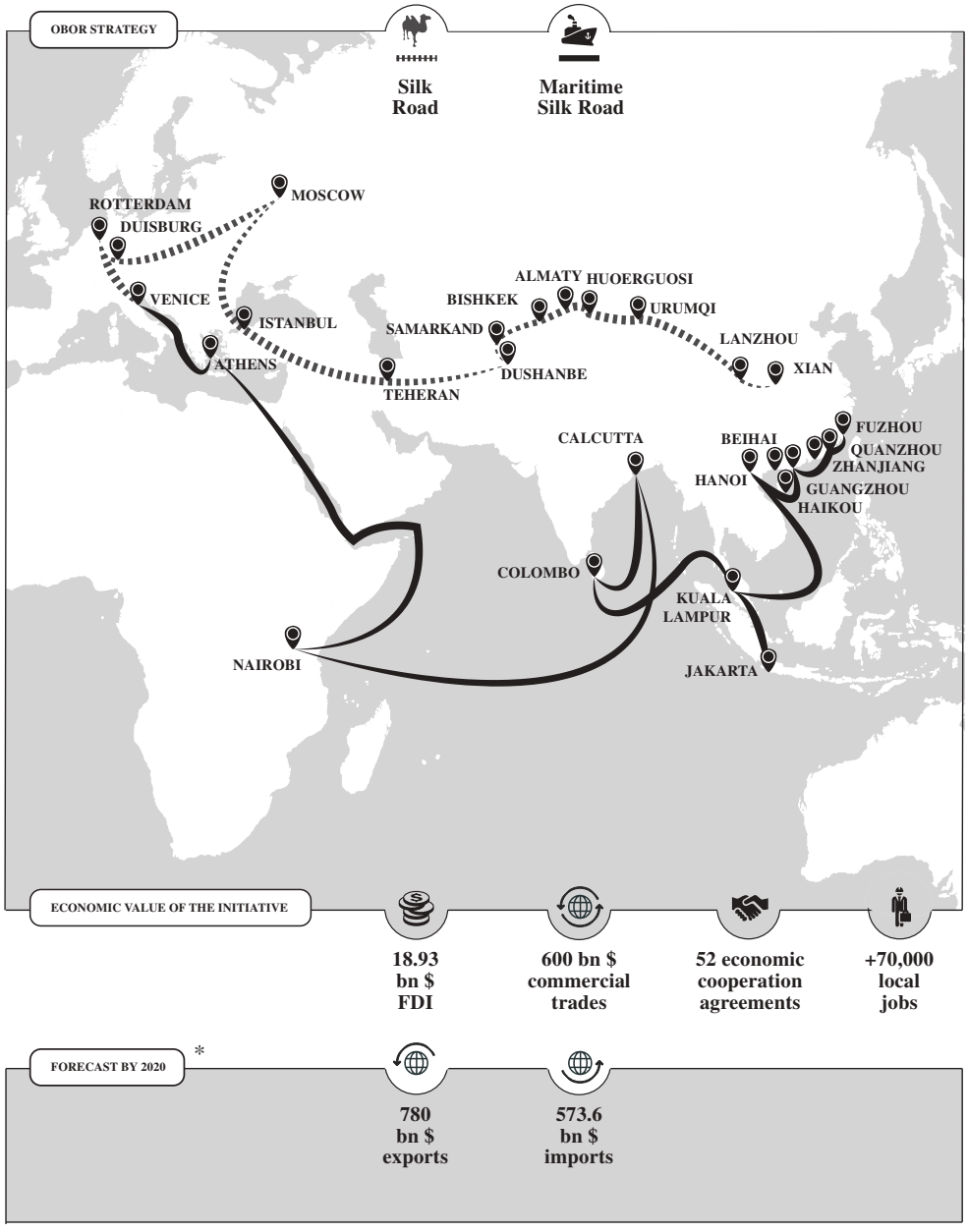
[5] For an expansion on the role and the functions of AIIB. http://www.aiib.org/.

[6] For an expansion on the role and the functions of the *Silk Road Fund* see http://www.silkroadfund.com/.

[7] For an in-depth analysis on the OBOR Corridors see: INTESA SANPAOLO (2016). *The One Belt One Road Initiative: An Opportunity for Western Balkans*.

As far as the Mediterranean is concerned it would seem, according to the routes highlighted by the Infographic 4, that the ports involved with the Chinese trajectories of the Silk Road are going to be Piraeus, Venice and Istanbul; when adding road and railway plans, many other Countries are included in the initiative. In North Europe, the most involved port seems to be Rotterdam, in Holland.

One Belt One Road



INFOGRAPHIC 4 – SOURCE: SRM

* First eight months of 2016.

In this regard, a service was recently launched, which will allow to channel Chinese goods directly in the port of Rotterdam through the rail service, in 15 days compared to the 30 necessary for maritime services. This initiative is worth mentioning, since in addition to its innovativeness it is also a railway link of remarkable proportions, one of the longest in the world, which will allow Chinese goods to be channeled to the port of Rotterdam.

Rotterdam is the main European port of call for volume of handled goods, managing the biggest part of maritime traffic going to Europe coming from the Far East, and has widened its surface toward the open sea in order to accommodate the latest generation of large containerships (*Maasvlakte 2* project), now it can count on the additional option of communicating with the Asian markets. The service was launched by the Chinese operator Cdirs, in partnership with the Dutch RailPort Brabant, which is part of the Gvt Group (one of the main Dutch logistic business groups).

The line, called *Chengdu-Tilburg-Rotterdam-Express*, is going to work on a weekly basis during the first stage of activity, but the companies are aiming to increase the offer to five departures per week by the end of 2017.

The train covers the distance between Chengdu (a location in central China) and Rotterdam, i.e. 8,000 km, the route lasts for 15 days, traveling through Kazakhstan and stopping in Moscow. The line is at the heart of an additional series of links. Starting from Chengdu, a logistic centre in the middle of the Chinese hinterland, there are a number of railway links towards other Chinese cities. Important ports such as Shanghai, Ningbo and Shenzhen are linked, as well as cities such as Wuhan, Xiamen, Nanning and Kunming. Moreover, starting from Chengdu, the goods can directly access Vietnam and South Korea. The port Authority of Rotterdam, for its part, keeps a watchful eye on these kinds of initiatives, which seem able to attract new traffic flows on the port of call.

This is one example of how the *Maritime Way* of silk gave and will keep on giving animpulse to the infrastructural, port and maritime equipment of the interested countries, as well as the ensuing business which will arise in terms of goods transport and investments of companies, which are sure to increase more and more, since they will be able to rely on rapid and efficient links. Giving credit to this statement, the Chinese Ministry of Commerce released in September 2016 the data[8] according to which the direct investments of China in the Countries involved in the Silk Road saw a 38.6% increase in 2015 compared to 2014, a record-breaking level. The amount of the investment is $18.93 billion, 13% of the foreign direct investment of the Country, equal to $145.67 billion. Chinese companies have already signed 52 economic cooperation agreements with the involved countries, with a payment, in taxation terms, of 900 million dollar and the creation of around 70,000 local jobs. The commercial trades between China and the Silk Road Countries have surpassed, during the first eight months of 2016, $600 billion, 26% of the overall volume of foreign trade of China.

The *Shanghai International Shipping Institute* expects that, by 2020, China will export to the countries and the regions along the Silk Road goods and services for about

[8] The source of this data and information is Xinhua (New China Agency), the largest and oldest of the two official Chinese press agencies, under the control of the Council of State of the People's Republic of China (www.xinhuanet.com).

$780 billion, with imports of $573.6 billion. In this paragraph, given the nature of the analysis, we chose to show some of the most important infrastructural projects due to be completed in the MENA area after the implementation of OBOR.

We considered benchmark countries such as: United Arab Emirates, Iran, Israel, Egypt, Qatar. Additionally, due to the presence of China in the port of Istanbul, we also considered Turkey. The census concerned only maritime and air transport infrastructures, since they are considered the platforms from which goods and passenger movement can be developed on an international scale. The elaboration, involving a limited number of countries, allowed us to pinpoint the infrastructural works related to maritime and air transport (whose investment has been disclosed) for a total of $27 billion.

Some of the main Port and Airport projects involving the Silk Road

Country	Project	Investment (US $ m)	TEU
Turkey	Mersin International Port	755	Operational
	Derince Port	543	Awarded
	Istanbul third airport	6,810	Financial Close
	Milas-Bodrum Airport terminals	807	Operational
	Dalaman Airport	800	Financial Close
	Istanbul Sabiha Gokcen Airport	530	Operational
	Cukurova Airport	470	Tendering
	Golden Horn Port	500	Awarded
	Izmir Airport	347	Financial Close
	Western Antalya Airport	-	Planning
	Asya Port trans-shipment container terminal	413	Financial Close
	Istanbul Salipazari Cruise Port	350	Awarded
	Petlim container terminal	300	Financial Close
Egypt	Nile River Bus Ferry	68	Planning
	Alexandria and Dekheila ports on the Nile Delta	-	Operational
	Abu Tartour mining port	-	Planning
	Nile River freight transport project	-	Planning
	Sharm el-Sheikh yacht marina	-	Tendering
	Damietta Port, new terminal	-	Tendering
	Dekheila Port, dirty bulk terminal	-	Tendering
	Dekheila Port, bulk grain terminal	-	Tendering
	Alexandria third container terminal	-	Tendering
	Safaga Port	-	Tendering
	Eltoor Port	-	Tendering
Iran	Chabahar Port	255	Planning
	Faw Peninsula port project	7,950	Tendering
	Um-Qasr Port, berth expansion	500	Planning
	Mashhad and Isfahan airports	-	Planning
	Teheran Airport Upgrade	2,200	Planning
	Khor Al-Zubair, berth expansion	500	Planning
	Um-Qasr Port, container project	130	Signed

Israel	Haifa's Bayport terminals (HaMifratz) concession	-	Awarded
	Ashdod's Southport terminal (HaDarom) concession	-	Awarded
UAE	Abu Dhabi Airport midfield terminal	2,900	Financial Close
	Sharjah International Airport expansion	-	Planning

TABLE 1 - SOURCE: SRM su *The Economist Intelligence Unit* 2016

5. CONCLUDING REMARKS. CHINA IN THE MEDITERRANEAN AND OPPORTUNITIES FOR ITALY

China's intervention in the Mediterranean is getting progressively greater, and will keep on carrying out heavy investments in infrastructures, especially in maritime and logistic works.

The creation of full-fledged logistic platforms gave the idea of a country willing to settle in a permanent and long-lasting way in the *Mare nostrum*, and not just by using it as a route or passageway; having a big carrier (such as Cosco) and the acquisition of terminals in many strategic ports of Europe and North Africa show how serious China is about enhancing international relations with the MED Area. This is an area where Chinese interests are already high, as proven by the data on trade relations and direct investment highlighted in the SRM MED Report[9].

China's entrance can be interpreted in two ways: the first one is mainly positive, while the second arouses some agitation for our port systems.

More possible trade flows (in terms of container and bulk cargo) and more active ships are a positive aspect, since these events can only bring more investment, employment and synergies among logistic, port and manufacturing companies; and consequently, a growth of international relations and trade development.

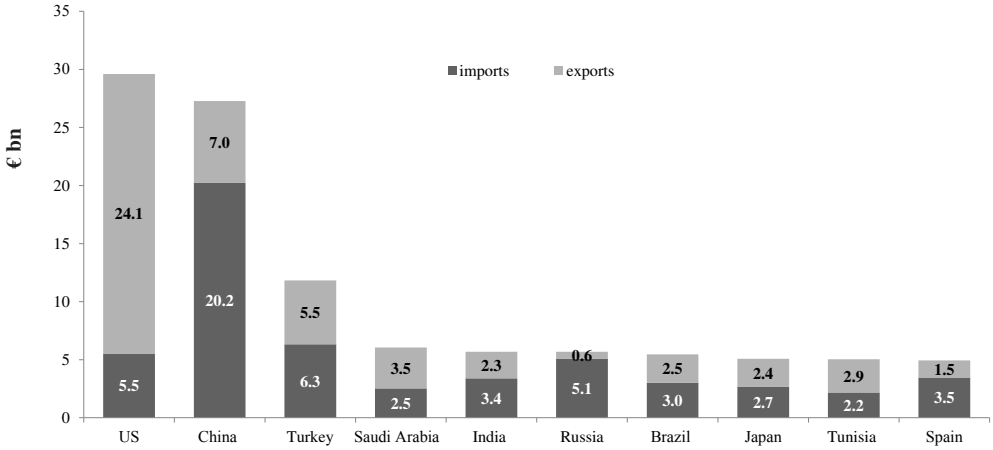
After all, the estimates referred to $1,300 billion of investment between China and the countries involved in the Silk Road.

Dealing with the development of maritime trade means that the Countries have to activate competitive mechanisms between ports and pursue increasingly efficient logistics; while it's obvious that China is going to use its previously acquired assets in the Mediterranean, enormous projects such as the Silk Road build up as time goes by, improving themselves during their later stages, and they start selecting ideas, infrastructures and routes, and one cannot be caught unprepared by said processes; just as one cannot dismiss the needs of manufacturing companies, which are going to sign deals and synergies with Chinese groups and companies.

These are the reasons why Italy must be ready. China is one of our main partners in terms of maritime interchange: **in 2016 our trade to/from this country amounted to over €27 billion**; therefore, we already have an important and well-established relation, on which we should invest even more.

[9] www.srm-med.com

Italy: first 10 Countries in terms of maritime import-export (2016)



GRAPH 4 – SOURCE: SRM on Istat Coeweb

This calls for awareness in the improvement of our port and logistic service; the reform passed recently (Legislative Decree 4 August 2016, No. 169) seems to head in this direction; there are still lots of concerns when it comes to having to adapt the infrastructures for the giant ships, since there is some discord in considering them an advantage for an infrastructure.The opinion can only be positive if the ship is merely considered as a source of assets in terms of tax payment, anchoring and load/unload tariffs.

On the other hand, should this start a process where the port becomes a fixed reference point for the vessel, with the guarantee of an efficient logistics with accessory intermodal mechanisms and logistics proceedings, the matter becomes totally different. A recent study by Professor Theo Notteboom of the University of Antwerp showed how a megaship docking in a port and unloading 8,000 TEU can activate 14 trains, over 1,100 trucks, 12 barges and additional naval transport in transhipment; and this is just the side considering transport, because there is also the value added for manufacturing companies which could process the containers.

Having an efficient port system can mean influencing in a strategic way a country like China, whose maritime culture emerges each year with the movement of almost 130 million TEU, and this is limited just to the first 6 ports of the country. If China wishes to improve its international relations with Eurasia and the Mediterranean with its companies and investments, it will inevitably end up favouring those Countries that can provide cutting-edge ports and logistics, and not those territories where bureaucracy and administrative procedures obstruct the flow of the transport and of the ship.

Italy, therefore, has to face a challenge, not limited just to the port of Venice, which is probably going to be involved in the Silk Road, but with the entirety of its system of manufacturing and logistic companies. Many Italian ports of call accommodate Chinese ships and/or are involved with incoming/outgoing routes of the Middle East; Gioia Tauro, Naples, Genoa, Trieste, Salerno, La Spezia and Livorno are among them just

to name a few. The circumstances can only benefit our realities, since on the one hand the new reform plan should ensure efficiency, and on the other there are considerable Community resources to strengthen the ports with, especially in the Southern Italian Region, where it is estimated that approximately 1 billion Euros is available for the ports system alone; when considering the whole of transport infrastructures, the amount rises to almost 5 billion.

Ports chosen by the alliances

INFOGRAPHIC 5 – SOURCE: SRM

The investment of the Dragon has a clearly defined strategy, to extend their influence in the Mediterranean, starting from Suez and spreading itself to Israeli and Turkish Ports in order to have its key points in the East-Med area; the Port of Piraeus is next, which is going to be the pathway towards Balkan markets and a transhipment hub for the smaller ports; then it will reach Algeciras (provided it wins the public international tender), to serve the West Med markets and to have its last point of reference before the transatlantic routes.

Another reference point for North-Europe is also going to be represented by the ports of Rotterdam-Antwerp and Zeebrugge, where Cosco is carrying out important investments and takeovers.

This is where our country can fit in, taking advantage of its geographical position and long-standing maritime know-how, showing its cultural background in terms of human and physical capital, and showing it has infrastructures and state-of-the-art ship owners, in order to seize the opportunities coming out of China, without settling for a secondary role.

Chapter VII

The New Silk Road: logistics disruption in the North-West European port system?

1. Foreword

The East-West route between the Far East and Europe is—together with the Pacific route between Asia and the Americas—a dominant route for containerised trade, traditional served by deep-sea transport and making use of large container hubs such as Shanghai, Hong Kong, Shenzhen or Singapore in Asia and Rotterdam, Antwerp or Hamburg in Europe. Since 1967, the first containers were transported by rail between the Far East and Europe in the so called Trans-Siberian Landbridge. Since 1971 this landbridge became an accepted container route (Hayuth, 1987). Recently, a number of alternative routes emerged: a new, revitalized landbridge, a northern route (Infographic 1) and the 'One Belt, One Road' initiative. Especially this One Belt, One Road (OBOR) initiative is seen as a game-changer for global logistics flows and as a potential force for disruption of current logistics practises and structures—some even expect a return of a 'global around the world transport system' because of the OBOR initiative (Haralambides, 2017). In this chapter we present our vision on the impact of One Belt, One Road, or the New Silk Road, for the ports of North-West Europe. First, we present the OBOR concept in more detail in section 2. In section 3 we identify driving forces for this initiative. In section 4 we take a closer look at OBOR-logistics investment in Europe, in section 5 we present a comparative analysis of different transport routes between Europe and the Far East and assess the competitive position of OBOR. In section 6, possible effects on the North-West European port system by OBOR are identified and in section 7 we present possible strategies by the ports and maritime stakeholders of North-West Europe to react on OBOR. Finally we present some conclusions.

2. 'New Silk Road' concepts

"Yi dai, yi lu", 'One Belt, One Road (OBOR)', the (Maritime) 'New Silk Road'. These concepts refer to Chinese President Xi Jinping's 2013 initiative to create a modern, USD 890 million version of the ancient silk road (Johnson, 2016)—in total, cumulative OBOR investment will be USD 4 trillion (The Economist, 2016). In this chapter we distinguish between the 'Maritime Silk Road' (One Road) and the land based 'Silk Road Economic Belt' (One Belt). In its simplest form OBOR is an infrastructure project that aims to establish a transport corridor that connects 4.4 billion people (Notteboom, 2016). Chinese investment is increasingly directed to the Silk Road. Investment in ports, like in the port of Piraeus by Chinese shipper Cosco Shipping Lines, is an important part of the project but also investment in a Chinese-designed nuclear reactor is included (The Economist, 2016). Other authors place more emphasis on the socio-economic motives of

the initiative (Johnson, 2016) or the future place in the world order China wants to gain by the initiative (Ferdinand, 2016).

New East-West intermodal routes: initiatives before the New Silk Route/OBOR

INFOGRAPHIC 1 - SOURCE: SRM on Tavasszy *et al.*, 2011

To speed up the actual development of the concept the Chinese government set up the 'Silk Road Fund', a 40 billion USD investment fund to invest in projects related to the initiative.[1]

[1] Among the investments backed by this fund are a hydroelectric dam in Pakistan, stakes in a Russian LNG project, part of the SIBUR Holding (Russia's largest gas processing and petrochemicals company), and a rumored acquisition of a Kazakhstan goldmine currently owned by commodity trader Glencore.

A second source of funding comes from the Asian Infrastructure Investment Bank (AIIB), which is planned to have a capitalisation of USD 100 billion. China is expected to fund around 50% of this investment bank (Lin, 2015). However, at the moment, only 50 billion USD of the total of nearly 1 trillion planned has been spent (Haralambides, 2017).

3. Drivers for OBOR

The OBOR project should be seen as more than just building infrastructure links or adding nodes to logistic networks. Also societal, geopolitical and economic challenges are to be addressed by the project. Both domestic affairs and international affairs play a role in the project. Analysts see China more and more playing an active role in safeguarding its economic interests around the world. The growing confidence of the China Communist Party (CCP) led to a more outward view to the world, making ambitions like OBOR possible (Ferdinand, 2016). We identify eight driving forces for OBOR.

1. Trade facilitation; the export of finished products by China and—even more important—access to energy commodities and raw materials (Lin, 2015) are mentioned as important drivers for the New Silk Road. Also the withdrawal by the USA government from the Trans-Pacific Partnership and the new role of China as the 'unquestionable global force of international trade' (Haralambides, 2017), replacing the USA, and focusing on regions like Africa, the Mediterranean, Russia and Iran, is an important driver for OBOR.
2. Geopolitical: bringing more countries under Beijing's influence by literally tying them to China (Casarini, 2016) and strengthening the global power of China, without causing conflict (The Economist, 2016). In addition, the important trade route via the Suez-canal and the Strait of Malacca are seen as very sensitive for geopolitical turmoil. The development of alternative routes therefore is important.
3. The desired diversification of the Chinese economy. The long lasting trade surpluses of China resulted in large amounts of foreign currencies. Finding investment opportunities abroad to diversify the Chinese investment portfolio is of utmost importance (Prasad, 2015).
4. Speeding up economic progress in underperforming Chinese regions. In recent years wages in China have risen sharply (Tate *et al.*, 2014). Especially in coastal regions wages are growing rapidly leading to companies moving either to inland locations—the 'Go West' strategy—where wages are lower or even to other countries like Myanmar.[2] The rising inequality between Chinese regions is seen as a problem. Several provinces in western China are structurally underperforming (Johnson, 2016). These provinces, like Gansu, Guizhou, Qinghai and Xinjiang, have average incomes that are only around 25% of those in some of the richest coastal provinces (Ferdinand, 2016). The national focus on the OBOR project had led to almost every

[2] Please see http://www.economist.com/news/briefing/21646180-rising-chinese-wages-will-only-strengthen-asias-hold-manufacturing-tightening-grip for more information on this topic.

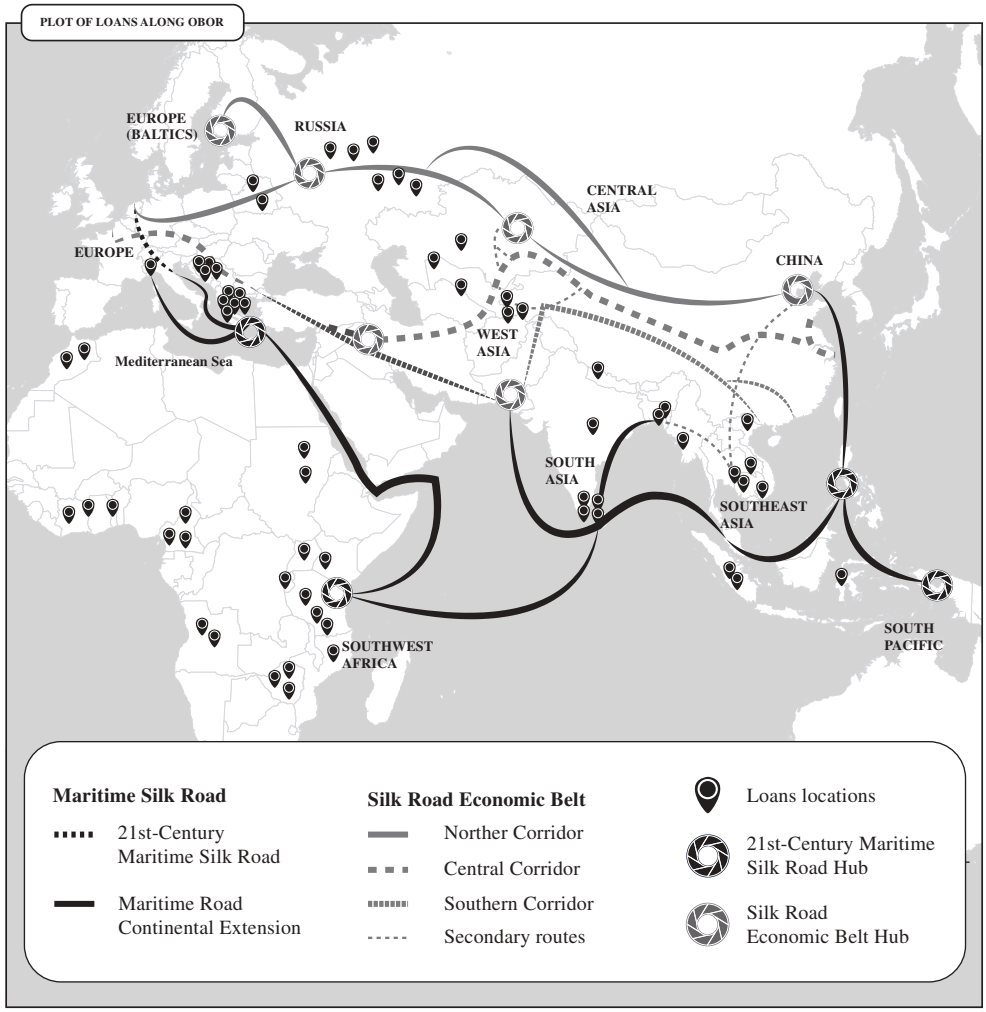
Chinese province investing heavy in logistics infrastructure (Johnson, 2016) and according to Notteboom (2016), territorial integrity of China is also an important driver for these developments.

5. Logistical connectivity; the move to inland China poses logistical challenges as some inland locations have inferior connections to the main exporting seaports in the eastern Chinese coastal regions. In contrast, Europe has become more accessible and is increasingly attractive for land based transport between China and Europe. From the European perspective, the geographical shift in China towards the west is mirrored by a shift towards the east in Europe. Eastern Europe showed the fastest economic growth in Europe in 2001-2014 (Hintjens *et al.*, 2015) and showed the biggest improvements amongst desired locations in Europe for logistics real estate (Prologis, 2016). The transport distance between the development regions in Western China and Eastern Europe is decreasing.
6. Another motive for the Chinese government for the development of OBOR is that it can foster demand for some Chinese industrial sectors facing *overcapacity* (Casarini, 2016). The steel industry is among the sectors that could benefit heavily from the construction of important transport infrastructure of other infrastructure (cities, industries etc.).
7. Especially the increasing sophistication of Chinese production is demanding for more time-sensitive transport. Deteriorating performance of deep-sea container transport therefore demands for alternatives, such as rail transport. The practise of (super) slow steaming of ultra large container vessels, low service reliability and port and hinterland congestion results in high costs for trade flows of expensive or time-sensitive products (Maloni *et al.*, 2013, Van Hassel *et al.*, 2016). Rail transport is increasingly seen as an alternative for slow steaming or expensive air-cargo. Because of the serious disruptions of Europe to Asia deep-sea services because of capacity shortages in the spring of 2017, DHL handles more rail shipments between Europe and Asia in both directions (Lloyds List, 2017).
8. The development of China as a maritime power and China's focus on sea lines of communication (SLOCs) as put forward by Lin (2015), are also important drivers for OBOR. Around 80% of oil imports into China are brought in via ocean transport. Under the presidency of Hu Jintao strategic steps were taken to develop China as a maritime power. The maritime silk road (MSR) initiative provides funding for investments in maritime infrastructure along the Indian and West Pacific Oceans (Lin, 2015). The geographic scope of the maritime silk road is much larger than the land based silk route. In 2016, Chinese state owned Landbridge Fund signed a 99 year lease for the Northern Australian port of Darwin. This move led to increased emphasis on the geopolitical background of this Chinese presence in Australia and is an illustration of an eastward direction of OBOR. To the west major investments are made in seaports that are en route between China to Southeast Asia, Sri Lanka and India, Kenya, and continuing to Europe (Piraeus).

4. A CLOSER LOOK AT OBOR-LOGISTICS INVESTMENT IN EUROPE

The maps of the New Silk Road, such as presented in Infographic 2, indicate that both the Silk Road Economic Belt as the Maritime Silk Road are made up of different connections: it can be seen as a network, developed around some important maritime and dry hubs and connecting four continents. But the logistics infrastructure development is accompanied by a large number of loans locations by the China Development Bank and the China Ex-Im Bank. Especially, the number of loan locations in the Balkan Peninsula is striking. China has a special interest in the political and economic co-operation between the countries of Central and Eastern Europe. However, at the moment investment in Central and Eastern Europe is in line with lagging investment in OBOR as a whole and is indicated by "Mixed results and modest prospects" (EIU, 2016).

One Belt, One Road overview, including locations for loans



INFOGRAPHIC 2 - SOURCE: SRM on China Investment Research

4.1 One Road: Maritime Silk Road investment

As stated before, this maritime infrastructure serves different cargo segments. When we look at investments made there is a distinction between ports infrastructure that focuses on the energy sector and those investments that focus on the container segment. One of the early investment projects of the Maritime Silk Road is the 2012 construction of an oil pipeline between Myanmar and China. Via this pipeline the geopolitical sensitive Malacca strait can be bypassed (Zhao, 2012). Further to the west, in Tanzania, China is working on the master plan for the Bagamoyo megaport development[3]. Further north when sailing to Europe China's significant role in the Egyptian economy should be noted (Luft, 2016). Next to ambitious plans by the China Fortune Land Development (CFLD) to construct a new capital to the east of Cairo, the involvement in the Suez Canal Corridor Area Project is worth mentioning. With Chinese money and expertise the industrial zone around the new expanded Suez Canal is developed.

4.2 Maritime Silk Road projects in the Mediterranean

In Europe most attention has been paid to seaports in South-Eastern Europe coming under Chinese influence. Investments and acquisitions done by Chinese state owned enterprises range from Piraeus and Venice to small scale terminal investments in ports of lesser importance. In 2009 the Greek government granted a 35 year concession for the operation of the port of Piraeus to Chinese Cosco Pacific (Van der Putten, 2014). The overall value of the deal for the whole concession is estimated to be around 1.5 billion euros[4]. In the wake of the severe financial crisis the Greek government sold off several state owned infrastructure ventures. In another transaction the Hellenic Republic Asset Development Fund (HRADF) for instance sold fourteen airports to German airport operator Fraport. The deal between the Greek government and Cosco Pacific included significant investments in modernisation and expansion of the port of Piraeus. Expansion of capacity is said to be up to 6.5 million TEU/year, up from 3.1 million in 2013.[5] The Chinese involvement led to Piraeus being the third fastest growing major container port in the world in 2016, with a rise of 10.4% in 2015 from 3.3 to 3.7 million TEU (Nightingale, 2017). One of the drivers for this growth has been the relocation of distribution operations of (Chinese) electronics producers to the port of Piraeus (Van der Putten, 2014). Further development as a hub might be steered by Chinese plans to buy Greek railway operator OSE and to develop the currently very underdeveloped freight railway network across the Balkans. In early 2017 concerns were voiced by the European Commission over the construction of these Balkan railway links.[6]

A second European seaport that attracted significant Chinese investment is the Port of Venice. Also Venice is one the key ports in the Maritime Silk Road strategy (Notteboom,

[3] There are serious concerns however about the viability of this 20 million TEU/year port development, see: IHS Fairplay, February 2016 "Bagamoyo port project shelved".

[4] http://www.joc.com/port-news/european-ports/port-piraeus/greece-cosco-china-finally-seal-piraeus-port-sale_20160705.html

[5] https://www.porttechnology.org/news/piraeus_becomes_meds_third_largest_for_container_traffic

[6] https://www.forbes.com/sites/wadeshepard/2017/02/25/another-silk-road-fiasco-chinas-belgrade-to-budapest-high-speed-rail-line-is-probed-by-brussels/#7118da5c3c00

2016). Here the North Adriatic Port Association (NAPA), a consortium of the ports of Venice, Trieste and Ravenna, supported by the Italian government, is trying to lure Chinese investors to invest in dry-docks to service large Chinese vessels (Casarini, 2016). In July 2016 the port authority of Venice signed a deal with the port authority of Tianjin for closer cooperation on port development. One of the first infrastructure developments in Venice under these new developments is the start of dredging for the Venice Offshore Port. This project will be undertaken by the China Communication Constructions Company Group (CCCC).

In several other ports in Europe Chinese terminal operating companies or shipping lines own assets. Major players include China Cosco Shipping Group and China Merchants Holding (CMHI). The list of ports with terminals (co-)owned by these companies include large ports like Antwerp, Rotterdam and Le Havre (Notteboom, 2016). The impact of these maritime investments in Europe on the ports in North-Western Europe will be dealt with later on in this article.

4.3 One Belt: Investments in rail infrastructure

While many hold the belief that the whole New Silk Route is the successor of the old Silk Route of the middle ages we have seen similar logistics concepts in more recent times. In 1907 a Japanese steamship line used the Trans-Siberian railway line to carry cargo and passengers from Vladivostok to Europe (Hayuth, 1987). But we want to focus on the Asian landbridge concepts of the 1980s (Poeth & Van Dongen (1983), Hayuth (1987) or Ducruet *et al.* (2009). A landbridge is seen as the utilization of land transport for a part of what would normally be entirely an ocean voyage (Hayuth, 1987). At the core of this concept was the use of the Trans-Siberian and Baikal Amur railways to ship mainly Japan made goods from the factories in Japan to Europe. As the Iron Curtain was still in place, the ports of Tallinn (Estonia) and Odessa (Ukraine) served as the most western nodes from where goods were transshipped for further distribution in Europe. Japan even had its own global development strategy that contained elements we see in the OBOR vision today (Poeth & Van Dongen, 1983)[7]. It is estimated that the Asian landbridge had at its peak a market share of over 12% in total container traffic between Asia and Europe (Vellenga & Spens, 2006). It has to be noted that containerized traffic between Asia and Europe was much smaller back then.

The role of Japan being a supporter of this development continued also after the dissolution of the Soviet Union (Hickok, 2000). In the mid-1990s, Japan provided loans for reconstruction and expansion of the China-Kazakhstan rail connection (Otsuka, 2001). In 1995 volumes carried by rail between China and Kazakhstan were reported to be up to 12.000 TEU per year (Shu, 1997). Around the year 2000 the potential for using these landbridges for (intermodal) freight transport was said to be limited because of regional fragmentation and outdated/missing infrastructure. Even in the outlook for the early 2000s no role for China was seen as main proponent for further development of the Asian landbridge (Otsuka, 2001). Only in 2004 for the first time the China Communist Party launched to idea of the New Silk Road via its main media outlet (Lin, 2011). In recent

[7] For Japan the key emphasis was on unrestricted access to important sea links and land bridges (railways, etc.) and the development of infrastructure like a second Panama Canal.

times the role of Japan in the development of the new silk road seems to have decimated. In 2008, when China, Mongolia, Russia, Belarus, Poland and Germany agreed to create conditions to pave way for regular container train service between Europe and Asia (Lin, 2011), Japan was out of the game.

In the 1990s a railway link between China and the Trans-Siberian railway via Kazakhstan was completed. In the OBOR railway link, Kazakhstan plays a central role. From a logistics point of view the difference in rail gauge can be bothersome. Both China, and most of continental Europe, make use of the so called 'normal gauge'. The railways in Russia, and most former CIS countries make use of broader railway tracks. This difference means that containers either have to be transshipped or that special railway carriages should be employed.

4.4 Recent rail initiatives

The OBOR rail connection is a complex rail network with a number of railway lines, corridors and inland port cities (Table 1 and Infographic 3).

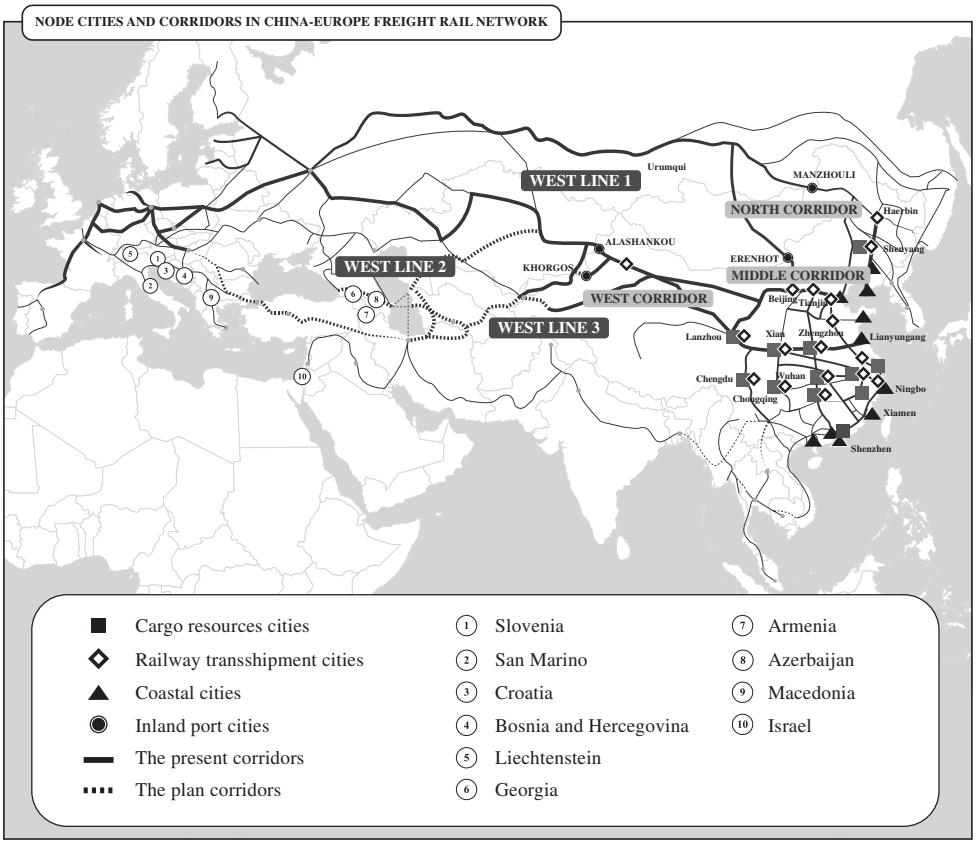
The current rail lines between China and Europe

No.	City in China	The border inland port city	The outside city	Direction
1	Chongqing	Alashankou (Khorgos)	Duisburg	Round Trip
2	Chongqing	Manzhouli	Cherkessk	One way
3	Zhengzhou	Alashankou (Khorgos)	Hamburg	Round Trip
4	Zhengzhou	Erenhot	Hamburg	Round Trip
5	Chengdu	Alashankou (Khorgos)	Łódź	Round Trip
6	Wuhan	Alashankou (Khorgos)	Pardubice	Round Trip
7	Wuhan	Alashankou (Khorgos)	Hamburg	Round Trip
8	Wuhan	Manzhouli	Tomsk	One way
9	Suzhou	Manzhouli	Warsaw	One way
10	Suzhou	Manzhouli	Brest	One way
11	Yiwu	Alashankou (Khorgos)	Madrid	Round way
12	Shenyang	Manzhouli	Hamburg	Round way
13	Changsha	Manzhouli	Hamburg	One way
14	Lanzhou	Alashankou (Khorgos)	Hamburg	Round way
15	Beijing Tianjin	Erenhot	Ulaanbaatar	Round way
16	Lianyungang	Alashankou (Khorgos)	Almaty	Round way
17	Yingkou	Manzhouli	Oblast Transbaikal	Round way
18	Qingdao	Alashankou (Khorgos)	Almaty	One way
19	Urumqi	Alashankou (Khorgos)	Almaty	One way
20	Xian	Alashankou (Khorgos)	Almaty	Round way
21	Hefei	Alashankou (Khorgos)	Almaty	One way
22	Jinan	Alashankou (Khorgos)	Almaty	One way
23	Dongwan	Alashankou (Khorgos)	Almaty	One way

TABLE 1 - SOURCE: Leading Group for Advancing the Development of One Belt One Road (2015)

One of the new additions to the rail infrastructure is the Khorgos Gateway (Infographic 3). A new 300 kilometer railway line offers a second railway link between China and Europe via Kazakhstan, next to the traditional landbridge railway port of entry Alashankou. The remote border town of Khorgos is transformed into a multimodal dryport and industrial zone[8]. Dubai based terminal operator DP World has acted as strategic advisor to the Chinese government in the Khorgos development and the ambition is to develop Khorgos into a new Dubai. In addition to Korgos and Alashankou, the city of Manzhouli acts as a eastern port of entry for the North corridor. Also Erenhot is a port of entry for the Middle corridor via Mongolia.

Blueprint of the China-Europe Freight Rail Development Plan



INFOGRAPHIC 3 - SOURCE: SRM on Leading Group for Advancing the Development of One Belt One Road (2015)

Table 1 and Infographic 3 present an overview of the current rail lines between China and Europe and Appendix 1 and 2 present the planned node cities, train lines and postal trains for 2016-2020.

[8] Please see https://reconnectingasia.csis.org/analysis/entries/obor-ground/ for more insights

Four types of node cities are selected in the China-Europe Freight Rail Construction Development Plan by the Leading Group for Advancing the Development of One Belt One Road (2015) for 2016-2020:

a. *cargo generating cities*: Chongqing, Chengdu, Zhengzhou, Wuhan, Yiwu, Changsha, Hefei, Shengyang, Dongwan, Xian, Lanzhou. These cities will operate shuttle train lines between China and Europe twice per week.

b. *transshipment rail cities*: Beijing, Tianjin, Shenyang, Haerbin, Jinan, Nanjing, Hanghzou, Zhenghzou, Hefei, Wuhan, Changsha, Chongqing, Chengdu, Xi'an, Lanzhou, Urumqi, Ulanqab. These are cities which function as important nodes in the rail transport network between China and Europe.

c. *coastal cities*: Dalian, Yingkou, Tianjin, Qingdao, Lianyungang, Ningbo, Xiamen, Guangzhou, Shengzhen, Qinzhou. These are import cities for the one road transport corridors.

d. the four important *inland port cities* are: Alashankou, Khorgos, Erenhot, Manzhouli.

Because the logistics related to e-commerce has increased sharply, the postal rail lines are attractive for those logistics, the postal rail lines are expected to operating regularly around 2020. In Appendix 2 an overview is presented of the planned postal rail lines between China and Europe. In the far future rail links between China and Europe via Iran and Turkey are expected to be completed (Notteboom, 2016).

Since the 'rail renaissance' between China and Europe started in 2011 and up to June 2016, 1881 train movements were realized and total trade volume was 17 billion USD (Leading Group, 2015). In 2016 market leader Deutsche Bahn (DB) shipped 40,000 TEU per rail from China to the various European countries. DB expects this number to rise to 100,000 TEU by 2020. Adding to the attractiveness are the decreased transit times of trains running from inland China to destinations in Europe. Transit time by rail from Chongqing in inland China to Duisburg (Germany) was in 2014 at the start of the service reported to be 18 days. In 2015 already one day cut from the schedule and in 2017 transit time is somewhere between 14 and 16 days. Chinese estimates expect that there will be 5,000 trains running annually between China and Europe in 2020.[9] These faster transit times allow both for new cargo segments to be carried by rail as for new cities to be added to the network. The Chongqing-Duisburg service has by 2017 expanded into a network where a growing number of Chinese and European cities are connected with regular services. Logistics Service Provider UPS, which has always focused on air freight is now also expanding its rail product. In March 2017 it announced the addition of six more cities to its rail service.[10] Key sales argument is the 65% cost saving that can be achieved when compared to air freight and the 40% transit time saving when compared to traditional ocean freight.

[9] http://news.xinhuanet.com/english/2016-10/25/c_135780112.htm

[10] UPS Press Release 28-03-2017: 'More cities added in China and Europe enable greater access to alternative shipping options for UPS customers'.

4.5 Pricing of the rail product

The rates for sea freight are divided into spot prices and prices fixed by long(er) term contracts. No spot market for transporting rail containers between China and Europe seems to have developed yet. An analysis of statements regarding the price charged to customers yields mixed results. At the 2015 IATA World Cargo Symposium[11] a manager of DB Schenker mentioned a price of USD 8,000 per FEU (Forty Feet Equivalent Unit) for China-Hamburg by train, compared to 3,000 USD/FEU for ocean and 37,000 USD for air freight. The list price for a 40ft high cube container from China to London was mentioned to be at 4,600 USD westbound and 2,500 USD eastbound due to the imbalance in demand. This 4,600 USD was estimated to be half of the price for air freight. On the other hand spot market rates for 40 feet containers between China and Rotterdam were far under 2,000 USD in the spring of 2017.

4.6 Products shipped via rail

The launching customer for the rail-service between Chongqing, an urban region in central China, and Duisburg back in 2011 was electronics producer Hewlett Packard (HP). HP started with the production of laptops in Shanghai but moved production further inland, where wages are lower, in 2008. By 2014 one in four laptops worldwide was said to be made in Chongqing.[12] A location further inland means a logistics challenge. Most laptops are not shipped via airfreight because of value/weight ratios. Inland transportation within China is at the moment still relatively inefficient. This created the opportunity for an alternative for traditional ocean freight via one of China's coastal seaports. Already in 2008 the first trails were undertaken and by 2015 more than 4 million laptops had been shipped by rail to European distribution facilities in Duisburg. By 2016 the service also attracted interest of competitors like Apple and Dell[13].

When it comes to the equipment employed on this service the usage of insulated and refrigerated containers should be noted. In order to protect the electronics products from the extreme climates (hot/cold) encountered during the 15 day trip, special equipment is recommended. The usage of reefer containers attracted several new cargo segments which could now be shipped by rail. Containers which would otherwise return empty to China are now increasingly filled with products that used to be flown or shipped to China. One example is (Dutch) milk-powder, for which a premium price is paid in China, and—thanks to the shorter transit times—non-frozen meat. Also automotive parts are transported via rail. Another segment that traditionally has been shipped via airfreight are pharmaceuticals. Due to shorter lead times and the aforementioned introduction of temperature controlled containers, up to 10% of refrigerated cargo currently flown

[11] http://www.joc.com/international-logistics/china-europe-rail-services-starting-turn-shippers%E2%80%99-heads_20150311.html

[12] http://www.china.org.cn/business/2014-06/16/content_32674371.htm

[13] As stated by a Dutch HP logistics manager in an interview with a Dutch logistics newspaper http://www.nieuwsbladtransport.nl/Nieuws/Article/ArticleID/51256/ArticleName/IntweewekenvanChinanaarDuisburg

between China and Europe could be shifted to rail, experts estimated already in 2015[14]. A recent new commodity to be shipped via the Asia-Europe rail links are parcels and mail. In late 2016 a very first trial run with 139 parcels originating in China destined for persons located around Frankfurt in Germany was shipped via rail.[15] In 2017 a more extensive pilot phase will be initiated. It is interesting to note that these postal services were only made possible after a 1956 ban on international mail transport by rail was lifted.

One of the supply chain risks faced by a rail solution is safety. Several container shuttles are equipped with a special guard carriage for part of the journey where most trouble is expected. A Chinese car dealer organization is using a Europe-to-China-rail shuttle for the parallel import of European luxury cars; the 'reduced risks' were mentioned as an advantage of using rail instead of ocean freight for these imports[16].

4.7 Supply chain optimization via rail

The operators of rail shuttles between China and Europe also emphasize on another benefit of the rail shuttles. When a shipment destined for Europe leaves the factory gates too late to be at a seaport in time rail can come in as an interesting solution, instead of expensive air cargo. In the past shippers would have to rely on expensive air freight solutions to get their products in store on time. Rail operators claim they can offer an attractive proposition when such a situation appears. Also in general one of the sales arguments put forward by the rail shuttle operators is the reliability of the service when compared to ocean freight. Market leader DB Schenker mentions 'Stable lead times compared to increased unreliability of Ocean Freight Carriers' in their sales pitch[17].

5. Comparative logistics analysis transport options between China and Europe

To be able to compare rail transport between China and Europe with competing modalities sea and air transport, a logistics analysis has been performed by Van Groningen (2017). The basis of the analysis are the logistics costs of transporting high-tech and high-value industrial products between a location in China and one in Europe. The analysis has been performed for two representative products: first laptops, an example of a high-tech electronics product with a market value of USD 600 and currently being transported by HP by rail, and secondly for high-quality automotive parts, an example is a turbo charger with a market value of USD 1,000. At the moment, BMW is an example of a company using the rail connection. Because of the product characteristics related to laptops and automotive parts, a potential for both rail, sea and air was assumed. For these two products five transport options were selected for the analysis:

[14] https://theloadstar.co.uk/coolstar/air-cargo-to-lose-out-as-new-asia-europe-rail-services-cut-transit-times-and-cost/

[15] http://news.xinhuanet.com/english/2016-10/25/c_135780112.htm

[16] Railway Gazette, jun 2016: Cars delivered from Europe to China by rail.

[17] DB Schenker (2015). *Get your business rolling with innovative rail logistics solutions between China and Europe* (sales presentation).

1. Rail transport with trucking between Stuttgart and Urumqi.
2. Ocean transport with trucking between Stuttgart and Shenzhen.
3. Air transport (Boeing 777-200F) and trucking between Stuttgart and Shenzhen.
4. Air transport (Boeing 727-200F) and trucking between Stuttgart and Shenzhen and Stuttgart and Urumqi.
5. Unmanned Cargo Aircraft (UCA) between Stuttgart and Shenzhen and Stuttgart and Urumqi.

Urumqi was selected because of its location in Western China and its rail connections to Europe. Shenzhen and Stuttgart are both important markets and global centers of high-tech manufacturing. Production processes located in Shenzhen only make use of ocean transport, production in Urumqi only makes use of the rail option in the analysis. For these three cities, a large industrial park currently in use has been selected. This requires additional trucking from airport, seaport and rail-terminal to the industrial site. The transport options are a wide-body full-freighter, the Boeing 777-200F, and a medium wide-body belly-freighter, the Boeing 727-200F. In addition to rail and ocean transport, an unmanned cargo aircraft (UCA) has been analyzed by Van Groningen (2017). This is an innovative new way of transporting cargo by an unmanned aircraft. An UCA is a sort of freight-drone. Originally drones were designed for (commercial) tasks like science observation and agricultural chemical spraying (Nonami, 2007). In more recent years the use of drones for cargo transport has been subject of several studies (Prent & Lugtig, 2012). Van Groningen (2017) made a logistics cost function for these different transport options, including cargo costs (warehouse, inventory and handling costs), cost functions for modes used (such as airport/seaport/rail usage, personnel costs, fuel costs, toll costs, depreciation and maintenance costs) based on distance and time travelled. The logistics costs data has been gathered by literature research, the costs of ocean transport is for example based on Van Hassel *et al.*, 2016. Table 2 presents an overview of modes of transport used and travel times and travel distances.

Modes of transport with corresponding travel times and distances on the routes Stuttgart-Shenzhen and Stuttgart-Urumqi

Mode(s) of transport	**Stuttgart-Shenzhen**		**Stuttgart-Urumqi**	
	time	distance	time	distance
Rail transport	n/a	n/a	320h03'	Truck: 422km Train: 7007km Truck: 2km
Ocean transport	633h46' or: 657h46'	Truck: 601km Ship: 18065km Truck: 42km	n/a	n/a
Boeing 777	20h24' or: 30h24'	Truck: 195km Aircraft: 9307km Truck: 56km	n/a	n/a
Boeing 727	16h08'	Truck: 27km Aircraft: 9307km Truck: 22km	11h13'	Truck: 17km Aircraft: 5932km Truck: 2km
Unmanned Cargo Aircraft	21h23'	9175km	14h53'	5795km

TABLE 2 - SOURCE: Van Groningen (2017)

Assuming sufficient available demand and a cargo volume of 5 tonnes (automotive parts and laptops), the logistics costs were calculated (Table 3 and 4). By comparing the results of the analysis it is striking that the rail alternative is not the low cost option in terms of logistics costs per turbo charger and laptop. It is surprising that the costs for rail transport and deep-sea transport are roughly the same: USD 25.29 and USD 25.08 for the transport of a turbo charger and USD 15.78 and 15.19 for the transport of a laptop (see Table 3 and 4). This is despite the fact that production in Shenzhen for the sea option is compared to production in Urumqi for the rail option. In addition it is surprising that transport by air (Boeing 777) also is cheaper than the rail and ship option, despite the high transport costs. The high level of inventory transit costs is the main reason for the high costs for the rail service. This is related to the long transit time of 320 hours for rail (13.3 days, see Table 2)—this is a relative short transit time compared to the market information presented before (14-16 days). The transport costs for 5 tonnes of cargo shipped by rail in the analysis of Van Groningen (2017) are relatively high compared to the USD 8,000 mentioned by Schenker. Another important cost category are the handling costs for LCL-handling of the containers. Although these costs are high for the rail option, they are the same for ocean transport. The costs for the unmanned cargo aircraft are by far the lowest, according to the analysis of Van Groningen, only USD 13.14 and USD 18.60 for a turbo charger and USD 6.06 and USD 9.09 for a laptop, depending on Urumqi or Shenzhen as the production location (Table 3 and 4). Total transport costs for this UCA are relatively high, having in mind that there is no personnel on board of the UCA. Table 3 and 4 present the base case. Van Groningen also produced some alternative scenarios with respect to higher fuel prices, transit time and scheduling effects and inventory time costs. In these alternative scenario's, the rail option was not becoming more attractive. In a scenario with a reduced depreciation rate, ocean transport even became more attractive.

Transport automotive parts China-Europe for different transport options, costs in USD

Stuttgart-Shenzhen
automotive, fuel USD 1,5/gallon, 5 ton freight, 735 turbo chargers (USD 1,000/unit)

Mode	Transport costs	Warehouse costs	Inventory transit costs	Handling costs	Total cargo costs	Total logistics costs	Per turbo charger
UCA	9,976	2,088	359	1,254	3,701	13,677	18.60
Boeing777	7,288	2,088	342	6,231	8,661	15,949	21.69
Boeing727	20,712	4,175	271	1,869	6,315	27,027	36.76
Ship	1,566	2,088	11,042	3,743	16,873	18,439	25.08

Stuttgart-Urumqi
automotive, fuel USD 1,5/gallon, 5 ton freight, 735 turbo chargers (USD 1,000/unit)

Mode	Transport costs	Warehouse costs	Inventory transit costs	Handling costs	Total cargo costs	Total logistics costs	Per turbo charger
UCA	6,068	2,088	250	1,254	3,592	9,660	13.14
Boeing727	13,507	4,175	190	1,869	6,234	19,740	26.85
Rail	7,390	2,088	5,373	3,743	11,203	18,593	25.29

TABLE 3 - SOURCE: Van Groningen (2017)

Transport laptops China-Europe for different transport options, costs in USD

Stuttgart-Shenzhen
Laptop, fuel USD 1,5/gallon, 5 ton freight, 1706 laptops (USD 600/unit)

Mode	Transport costs	Warehouse costs	Inventory transit costs	Handling costs	Total cargo costs	Total logistics costs	Per laptop
UCA	9,976	2,983	500	2,055	5,538	15,514	9.09
Boeing777	7,288	2,983	477	9,384	12,844	20,131	11.80
Boeing727	29,712	5,967	377	2,812	9,155	29,867	17.51
Ship	1,937	2,983	15,376	5,634	23,994	25,560	15.19

Stuttgart-Urumqi
Laptop, fuel USD 1,5/gallon, 5 ton freight, 1706 laptops (USD 600/unit)

Mode	Transport costs	Warehouse costs	Inventory transit costs	Handling costs	Total cargo costs	Total logistics costs	Per laptop
UCA	6,068	2,983	348	1,885	5,216	11,284	6.61
Boeing727	13,455	5,967	264	2,895	9,126	22,581	13.23
Rail	10,683	2,983	7,482	5,790	16,255	26,938	15.78

TABLE 4 - SOURCE: Van Groningen (2017)

Based on the research by Van Groningen (2017), the rail option is not very distinctive in terms of total logistics costs. The rail transit time already is low, indicating that the high transport costs of the rail option (USD 7,390 and USD 10,683, see Table 3 and 4) is the main cost category in need of improvement. If these costs could be significantly reduced the rail option certainly would be more competitive. In addition, we assess the transport costs for ocean transport as being low in the analysis of Van Groningen; they may be based on the exceptional market circumstances of highly fluctuating tariffs during 2016. Also, the transit time by sea is (very) low; the 26.4-27.4 days (634-657 hours) of the ocean transport chain do not include time spend at the quay and on the terminal. This might increase the transit time with 6 days of so, very much increasing inventory transit costs in favour of the rail connection. If these 6 days are included, the costs for turbo chargers transported per ship are going up from USD 25.08 to USD 29.17 for the Shenzhen-Stuttgart route. The costs for a laptop are rising from USD 15.19 to USD 18.18—higher than the rail costs of USD 25.29 for a turbo charger and USD 15.78 for a laptop (Table 3 and 4). In the professional press, a time difference of 20 days (480 hours) between the sea and rail option is indicated[18]. In addition, the costs of congestion and unreliable services related to traditional ocean transport are not included in the analysis. Finally, the relation analysed was between China and Germany. If the analysis had been focussed on emerging locations in Central and Eastern Europe and China, the rail option certainly would be much more attractive. But the shipping option also might use the port of Venice as part of the Maritime Silk Road. This would improve the maritime option significantly at the cost of the rail alternative and at the costs of the ports of North-West Europe.

[18] http://automotivelogistics.media/intelligence/china-europe-rail-the-road-less-travelled

The contribution of Van Groningen (2017) is important in presenting for the first time thoroughgoing research on different modal options between China and Europe. The impact of inventory handling costs also is of much importance in the analysis. The bottom line is that the rail option is a competing alternative. And when referring to the drivers of the OBOR initiative, the logistics advantage of the rail option is only one of the important drivers for the initiative.

International trade and transit of manufactured goods (NSTR9) by value and weight of transported goods (estimation) between Asia and the Netherlands, in billion Euros and kilos and relative shares of total trade volumes, 2015

	value	**share**	**weight**	**share**
	billion euro	%	billion kg	%
Import (total)	65.0	17	5.7	1
Import for domestic use	27.4	12	3.1	1
Import for re-export	37.6	24	2.6	2
Export (total)	22.6	5	1.3	0
Export Dutch products	16.0	6	1.0	0
Re-export	6.6	4	0.3	0
Outgoing transit (total)	19.6	7	1.1	1
Total	97.2		8.1	

TABLE 5 - SOURCE: Statistics Netherlands, statline

6. IMPACT OF OBOR ON THE PORTS OF NORTH-WEST EUROPE

The logistics analysis has been performed on high-tech manufactured products; products having a high value-density. This however is only a small part of the total amount of goods transported between the Far East and Europe. In Table 5 the trade between Asia and the Netherlands for 'automotive, machinery, electrical apparatus and consumer products' (NSTR 9) is presented for three different types of flows: import/export, re-export and transit. Especially re-export and transit flows are important, because the main origin and destinations of these goods in Europe is the German market. These flows therefore give an indication of broader European demand and may be a potential market for rail transport. An important characteristic of these goods is that they are high in value and low in volume. For example, re-export volumes of these type of goods have a share of 24% of the total value of re-export flows between Asia and the Netherlands, but the share in the volume of re-export goods between Asia and the Netherlands measured by weight is only 2% (Table 5). The total weight of import, export and transit goods between Asia and the Netherlands of manufactured products is 8.1 million tonnes (Table 5); this is 6.4% of the total of containerised cargo handled in the port of Rotterdam in 2015 (126.2 million tonnes). The share of China in total containerised trade between the port of Rotterdam and Asia is 50% and if we assume that 50% of containerised cargo of manufactured products to and from China might shift to rail, this will result in about 2

million tonnes of cargo or about 200.000 containers (TEU) that will not be handled in the port of Rotterdam in the future because of a potential shift to rail; some 1.6% of total containerised cargo handled in the port. For the important ports in North-West Europe in total, this 1.6% means 640 thousand TEU of the total of 40.2 million TEU handled by the top 5 container ports in 2015 (Nightingale, 2017). This is a maximum amount of cargo that will not be handled in the seaport of North-West Europa because of the potential shift to rail, according to our assumptions.

A maximum potential for the shift from ocean cargo to rail of 1.6% of total containerised trade seems not very spectacular. But it has to be seen in the broader perspective of lower growth of global trade and containerised volumes in general since 2011, and of other structural trends that will have an effect of decreasing containerised trade such as more local production patterns because of re-shoring and near-sourcing practises, the impact of the circular economy which is increasing the re-use of existing products, the rise of the sharing economy where the use and the ownership of products are decoupled, demographic factors: on older population in Europe and China is consuming more services instead of products and so on. Also, increased investment in manufacturing facilities in Central and Eastern Europe (Figure 1) will result in new trade patterns towards these growth areas. OBOR is also responsible for an important part of these investment flows (EIU, 2016).

Cross-border manufacturing (jobs created) Europe, 2012-2014

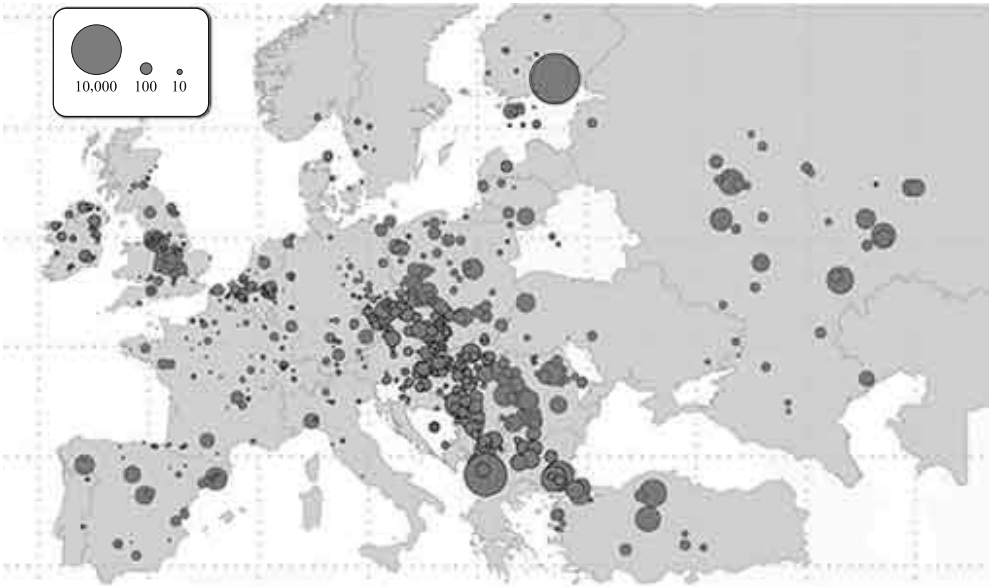


FIGURE 1 - SOURCE: fDi markets, Financial Times Group 2014

The effect of the modal shift from sea to rail will add up to all those effects. New centres of manufacturing will make use of new entrance ports, such as Piraeus and Venice or Gdansk instead of the ports of North-West Europe. This also is an important effect of OBOR. Haralambides (2017) states that the Mediterranean basin is 'central' in

the OBOR network, based on these investment patterns. This will also be a challenge for the ports of North-West Europe and could further reduce volumes. However, in 2016 the largest ports in North-West Europe increased their combined container handling by 1.0%, the Mediterranean ports grew only with 0.4%—despite the strong growth of Piraeus (Nightingale, 2017). In the long run however, this Mediterranean centred strategy around hub ports like Piraeus and Venice might be able to become a strong competitor for North-West European ports, resulting in additional loss of cargo. Especially because new investment patterns, such as illustrated in Figure 1, are not in the traditional hinterland of the North-West European ports, in which Germany is still the centre of gravity. These developments will not become reality in the short run. Like already indicated, OBOR investment is still at a low level. The needed infrastructure to connect the maritime hubs to the hinterland is also slow to materialize. The planned 'China-Europe land-Sea Express' route linking Hungary to the port of Piraeus is, according to the EIU (2016), still in the early stages. Also, new opportunities arise in the ports of North-West Europe, such as serious interest by Cosco Shipping in the planned mega-container facility in the Saeftinghedock in the port of Antwerp[19].

There is a relation between container flows and locational choice for re-export facilities. The warehouses and European Distribution Centres related to the re-export of cargo might also shift to Central and Eastern Europe, because these facilities are relatively footloose (Warffemius, 2007). If seaports will be replaced by inland ports along the New Silk Route, this will also have an effect on employment and value added related to employment in warehouses, logistics chain management and other supporting services. Notteboom and De Langen (2015) estimate a relation between logistics real estate and containerised transport: 50,000 square meters of warehousing space is related to cargo flows of about 3,000-5,000 TEU. The premium container segment that is shifted from deep-sea to rail transport is very much tied to these warehouses and European Distribution Centres (Duprez & Dresse, 2013). If the relation between warehouse space and containers used is reciprocal, and 200,000 containers will be shifted toward rail, this might result in 2 million square meters of warehousing decoupled from the strategic link to the seaports and relocation towards Central and Eastern Europe might be considered. Based on an average employment of 27 employees per 10.000 square meters of warehousing (TNO, 2006), this will mean a loss of some 5,000 warehouse workers. In addition, other logistics services are related to these functions, such as transport, IT, legal, finance et cetera. So the total effect might be larger in terms of employment.

OBOR also offers business opportunities in terms of new possibilities for producers in Western Europe for exporting products to the Far East. In the earlier sections we discussed products like car parts and milk powder transported from west to east by rail. In general, new transport infrastructure has usually benefits for regions at both ends of the line.

[19] http://www.tijd.be/ondernemen/logistiek/Chinezen-geinteresseerd-in-Saeftinghedok/9846593?ckc=1&ts=1492788301

7. Strategies by the port authorities of North-West European ports

In the preceding sections we presented four main effects for the large seaports of North-West Europe:

- the loss of China based premium deep-sea cargo shifting to rail and approaching the traditional port hinterland by rail, bypassing the maritime hubs of North-West Europe,
- the loss of distribution facilities and accompanying employment in additional logistics services,
- the shifting hinterland because of investment in Central and Eastern Europe, including OBOR based investment
- the shift of cargo to new hubs in the Mediterranean, like Venice and Piraeus.

Also, the interest of Cosco Shipping to participate in a possible mega-container facility in Antwerp (Saeftinghe) was announced. Offering Chinese logistics firms premium facilities is an important strategy to link carriers and logistics service providers to the ports of North-West Europe. The investment by Cosco in the Euromax ECT terminal in the port of Rotterdam is another example of such an approach. Chinese carriers are not the dominant logistics parties at the moment. Market leaders such as Maersk Line are investing heavily in new technology and IT-infrastructures. Cosco is part of the Ocean Alliance and is at the moment also dependent on the broader strategies of its alliance members.

Port authorities should concentrate on offering customers the best available port and hinterland infrastructure and services and should develop other important locational characteristics of their ports according to world scale standards. The size of the OBOR initiative is unique and is surpassing other historical projects by far—OBOR is a much bigger effort than the Marshall plan of the late 1940s to fund post-war reconstruction, which had the size of roughly USD 100 billion (in 2016 dollars)[20]. Therefore, individual port authorities lack the power to influence OBOR, even if they join forces.

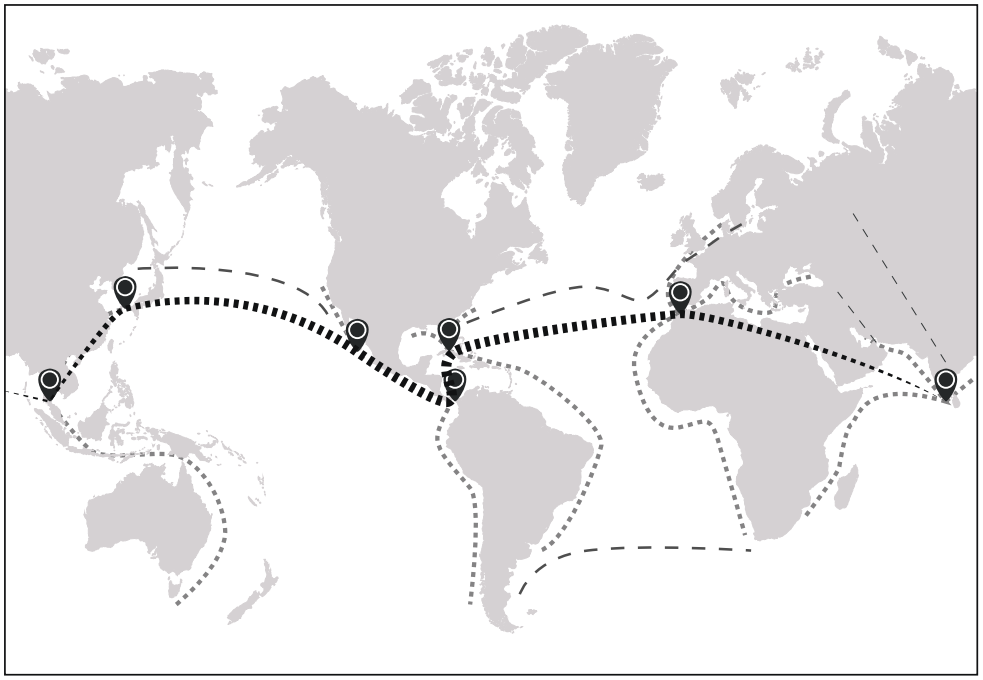
The TIR Consulting Group (2016) sees additional opportunities for seaports to participate in the building of a digital infrastructure across Eurasia over the next half century, to create a seamless smart Internet of Things platform for carrying out commerce and trade between Chinese ports, such as Shanghai, and the port of Rotterdam. This digital infrastructure is seen as complementing the OBOR initiative. Especially the port of Rotterdam is seen by the TIR Consulting Group as the critical global node that connects the Americas to Europe on the Atlantic Ocean side, while Shanghai connects Asia to the Americas on the Pacific side. This digital global perspective resembles the vision of Haralambides (2017) of OBOR as an Around-the-world Transport Network (Infographic 4). "The Port of Rotterdam can position itself as an aggregator of a digitalized intermodal transportation and logistics platform stretching across Europe and into Asia, fundamentally changing the port's conception, role, and business model." This vision by the TIR Consulting Group for the port of Rotterdam, is also seen by the port

[20] https://www.hongkongfp.com/2016/10/15/hidden-strategic-goals-one-belt-one-road-marshall-plan/

authority of Hamburg, at the moment co-operating with US tech-firm Cisco in a Smart Port strategy, based on Internet of Things technology.

By investing heavily in these new technological tools, including blockchain technologies, the ports of North-West Europa may stay ahead of the competition of the Mediterranean ports. But the foundation of the port strategies must be based on operational excellence and strategic flexibility and adaptation to new technologies and innovations.

Does China intend to develop OBOR into an Around-the-World Transport Network?



INFOGRAPHIC 4 - SOURCE: SRM on Haralambides (2017)

8. CONCLUSION: LOGISTICAL DISRUPTION OF THE PORTS OF NORTH-WEST EUROPE?

In this chapter we presented the OBOR initiative. The most important part of our contribution is the presentation of a logistical analysis of different transport options between China and Europe, including rail. Based on the results of the logistics analysis performed by Van Groningen (2017), we conclude that the rail option is a competitive alternative next to deep-sea and air cargo. In addition, we presented our vision on possible shifts out of the ports of North-West Europe of premium cargo and warehouse space, initiated by the emergence of the rail infrastructure and the emergence of new hubs in the Mediterranean, like Venice and Piraeus, and strong patterns of manufacturing investment in Central and Eastern Europe.

However, we do not think that OBOR will be a strong disruption for the ports of North-West Europe. Firstly, the effects presented are relatively small. However, combined with other effects currently happening, serious negative effects on the growth perspectives of the ports of North-West Europe might occur. Second, the quality of the ports of North-West Europe still is very high when compared to the ports of the Mediterranean. In the ranking of the World Economic Forum (2016), the Netherlands, Belgium and Germany are ranked globally as having the 1st, 6th and 11th best port infrastructure, while Greece and Italy rank number 47 and 56 respectively. So there's a long way to go. Third, the economic co-operation between China and the Central and Eastern European Countries is disappointing with mixed results and modest prospects (EIU, 2016). Also the infrastructural projects are complex and will only show results on the (very) long term. This resembles the experience of Chinese foreign direct investment in Africa (The Economist, 2015). Fourth, the route between China and Europe is complex and the countries that have to be passed are not very stable, both in a political and economic sense. One serious negative event could damage the track record of the rail route. Fifth, the OBOR initiative is too ambitious; the ambition is way too large, goals like the absorption of China's excess industrial capacity are seen as unrealistic (Holland, 2016) and the plan has all the dangers of becoming an additional 'ghost project'. Holland (2016) sees striking similarities with a plan rolled out by Japanese prime minister Keizo Obuchi in the 1990s. Like OBOR, that plan too promised to provide work for Japan's recession-hit construction sector by building Japanese-funded infrastructure projects around Asia. Some infrastructure projects were realized but Holland concludes: "…the reality fell woefully short of Tokyo's grandiose dreams. Far from cementing Japan's economic ascendancy across Asia, the project left a legacy of bad blood, and marked the beginning of a financial retreat from around the region that Japan has only recently begun to reverse."

China has a history of infamous ghost projects and potential bubbles. The real disruption might be the failure of OBOR.

APPENDIX

Planned trains line for 2016-2020 between China and Europe

No.	City in China	The border inland port city	The outside city	Direction
1	Shijiazhang-Baoding	Alashankou (Khorgos)	Duisburg	Round Trip
2	Erenhot	Minsk	Round Trip	One way
3	Kunming	Alashankou (Khorgos)	Hamburg	Round Trip
4	Erenhot	Rotterdam	Round Trip	Round Trip
5	Guiyang	Alashankou (Khorgos)	Łódź	Round Trip
6	Erenhot	Duisburg	Round Trip	Round Trip
7	Xiamen	Alashankou (Khorgos)	Hamburg	Round Trip
8	Manzhouli	Łódź	Round Trip	One way
9	Korla	Alashankou (Khorgos)	Duisburg	Round Trip
10	Taiyuan	Alashankou (Khorgos)	Brest	One way
11	Erenhot	Almaty	Madrid	Round way
12	Moscow	Round Trip	Hamburg	Round way
13	Nanchang	Alashankou (Khorgos)	Hamburg	One way
14	Erenhot	Almaty	Hamburg	Round way
15	Moscow	Round Trip	Ulaanbaatar	Round way
16	Nanjing	Alashankou (Khorgos)	Almaty	Round way
17	Manzhouli	Almaty	Oblast Transbaikal	Round way
18	Moscow	Round Trip	Almaty	One way
19	Nanning	Erenhot	Almaty	One way
20	Manzhouli	Ulaanbaatar	Almaty	One way

APPENDIX 1 - SOURCE: Leading Group for Advancing the Development of One Belt One Road (2015)

Planned postal rail lines between China and Europe

The departure city	The inland port city	The outside city
Zhengzhou	Alashankou /Erenhot	Moscow Duisburg Hamburg
Chongqing	Alashankou	Moscow Duisburg Hamburg
Urumqi	Alashankou	Almaty Moscow
Suzhou	Manzhouli	Moscow Duisburg Hamburg
Haerbin	Manzhouli	Moscow

APPENDIX 2 - SOURCE: Leading Group for Advancing the Development of One Belt One Road (2015)

Chapter VIII

Israel's port sector and logistic potentiality

1. Foreword

Maritime transport is a sector of great importance to the Israeli economy given that 99% by volume and 80% by value of imports/exports of the country passes through its ports. Trade is important for Israel because the country has the need to export its high-tech and innovative production and to import energy since it is not self-sufficient: this importance is reflected by the fact that 63% of its GDP depends on trade. Israel also has an advantageous geographic position on the Mediterranean which provides the country with the potential to be a gateway between East and West. This explains why the country's economic growth is closely dependent on a modern and competitive port system and why, therefore, the strategy and policy development in this sector are a top priority for the government. Also, a leading company in the shipping world, ZIM, is based in Israel and operates in the business of container transport.

The economy and international trade of the country have experienced significant growth over the past two decades, and its ports have recorded strong performances by taking advantage of considerable improvements to infrastructure.

This chapter aims to analyse the Israeli port system with emphasis on governance and its performance, integrating it with information on the latest infrastructure projects that the country intends to implement in order to take advantage of new market dynamics.

After analysing the role of Israel in the Mediterranean context, both for east-west routes and for short sea shipping, this work will focus on the opportunities that the country could take as part of the 'One Belt One Road' initiative, the ambitious infrastructure project undertaken by the Chinese government that involves a number of countries both in Asia and in Europe.

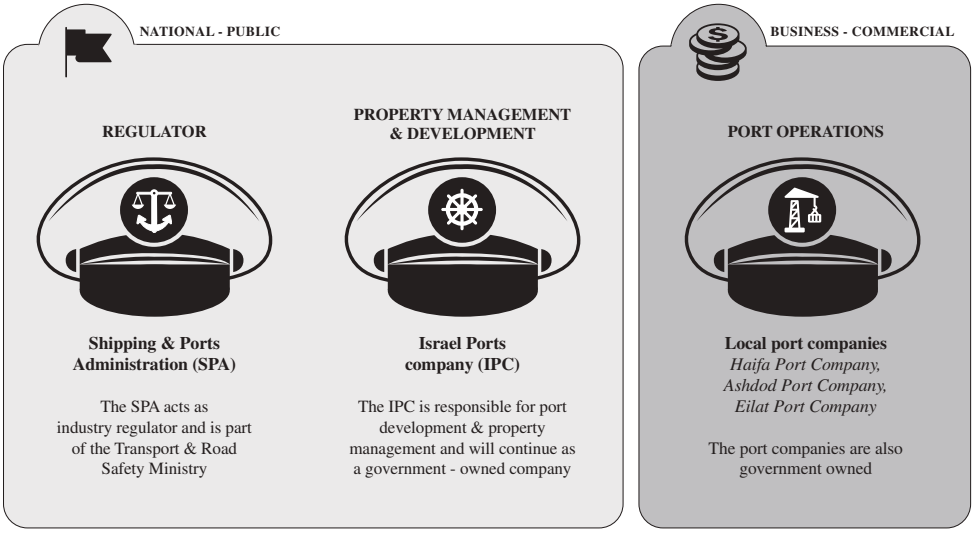
2. The Israeli port system: governance and performance

Seaborne transport in Israel is managed by the Ministry of Transport that is also in charge of the policy-making process.

In 2005, the country started a port reform programme aimed at encouraging the free market, promoting the participation of private capital and supporting competition to improve the country's competitiveness in the global market. The reform introduced a new organizational structure which led to the replacement of the Israel Port Authority (which had operated from 1961 to 2005) with 5 new government companies.

The Government has chosen to adapt the port system of the country to the landlord model, under which public entities own the infrastructure and take responsibility for their maintenance and development while private companies are responsible for delivering transportation services through their superstructures and equipment.

Governance of Israeli ports



INFOGRAPHIC 1 - SOURCE: SRM on Israel Ministry of Finance and IPC, 2017

The Administration of Shipping and Ports (ASP) is a ministerial body that regulates maritime traffic, infrastructure and operators.

The IPC - Israel Ports Development & Assets Company Ltd. - was then introduced. This is a government body holding ownership of the infrastructure and which is responsible for the development of the three commercial seaports of Haifa, Ashdod and Eilat. The IPC is also responsible for ensuring the efficiency and competitiveness of the ports in the management of the Israeli maritime trade. Parallel to the management and development of physical and technological infrastructure of a port, IPC is also active in the promotion of other solutions aimed at improving the business competitiveness of the nation, especially with regards to the supply and logistic chain. Also, under the regulatory umbrella of IPC three government companies operate and manage ports: Haifa Port Company, Ashdod Port Company, Eilat Port Company.

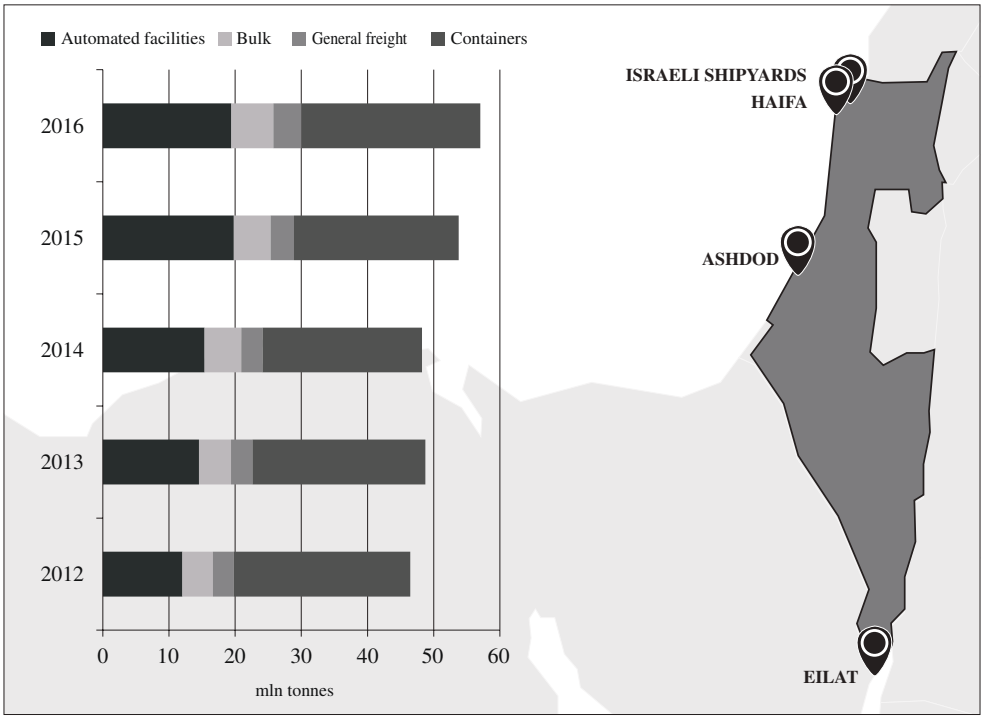
In 2008 Israel Shipyards, a company that had been building, repairing and refurbishing military and commercial vessels for fifty years, founded Israel Shipyards Port, the first private port in Israel located in the Haifa Bay.

As mentioned above, the government pays great attention to the development of its ports, which was formalised in the Strategic Master Plan 2055 approved in 2007 where two main objectives were set out: the development of private investment and the improvement of competitiveness. This plan was developed by IPC and contains an ambitious development programme which aims to improve the competitiveness of Israel in the Mediterranean context.

Over the past 25 years, freight traffic in Israeli ports has risen by an average of 4% per year and in 2016 it reached 57 million tonnes (+6%). The activity of commercial ports is divided into three main areas

1. The container sector, accounting for approximately 67% of the revenue of the two main ports;
2. General cargo, including vehicles;
3. The bulk.

Type of cargo handled by four Israeli commercial ports



Infographic 2 - Source: SRM on Israeli CBS, 2017

These are the characteristics of the main Israeli ports:

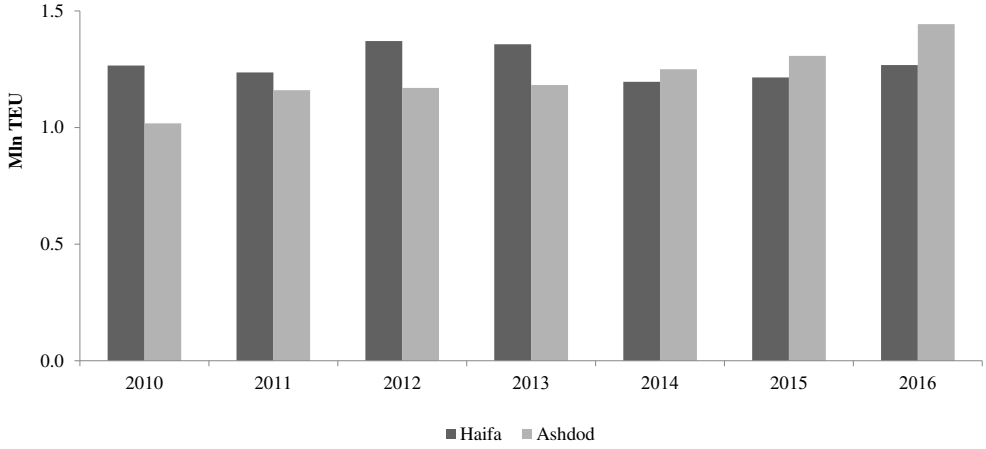
- **Ashdod.** Run by Ashdod Port Company and located on the Mediterranean coast, south of Tel Aviv. It handles about 24 million tonnes of cargo (42% of Israel's total), including dry bulk, vehicles, metal and wood products, wheat, sulphur, general cargo, containers; in 2014 it surpassed Haifa and became the main hub of the nation in this segment.
  In addition to managing goods, Ashdod is also a passenger and cruise ships port. It has docks of a total length of 5 km with depths of up to 15.5 meters.
- **Eilat.** Located on the Red Sea, it is Israel's gateway to the Far East and is fully privatized since 2012. The Eilat Port Company manages approximately 2.1 million tonnes on its 530 m of quay (about 3% of the country's total), in particular minerals and vehicles.
- **Haifa.** Run by the Haifa Port Company and located on the Mediterranean coast, north of Tel Aviv. It is the main port of the country. It handles about 28 million tonnes of cargo (51% of the total), mainly container, wheat, chemical products; like Ashdod, it

also has a cruise terminal. It has docks of a total length of 6.7 km with depths of up to 15.5 m.

- **Israeli Shipyards**: It was the first private port of the country, founded and run by Israeli Shipyards Co. and located on the Mediterranean coast, south of Haifa. It handles about 2.8 million tonnes (5% of the total) over an area of 330,000 sqm and it has one-kilometer-long docks.

In summary, Eilat and Israeli Shipyards are private, while Ashdod and Haifa are still managed by state-controlled companies. In addition to the four commercial ports, in Israel there are two other energy ports at Hadera and Ashkelon.

Container traffic ports of Ashdod and Haifa. 2010-2016



GRAPH 1 - SOURCE: SRM on ISP and Ashdod Port Company

In 2016 Ashdod recorded a 10.3% increase with 1.4 million TEUs and Haifa showed a 4.2% growth with 1.3 million TEUs. The graph shows the steady positive performance of Ashdod over the time span analysed; Haifa, on the other hand, slowed mainly due to the displacement of ZIM's transhipment activities to the port of Piraeus. The return of the Israeli carrier as of September 2014 was an important factor supporting growth in subsequent years, along with the reduction in operating costs for shippers who used feeder services from the Greek port of Piraeus.

Haifa port also recorded excellent performance in efficiency, which represents an important parameter because a more productive port involves lower transportation costs and therefore facilitates the imports and exports of a country. According to an OECD study, in 2012 Haifa was the 4th port in the world for productivity[1]. This is also partly due to the availability of the latest generation of management instruments at the container terminal. With this regard, it is particularly relevant to mention the TOS, a computer system that provides tools for the planning, management and control of port operations,

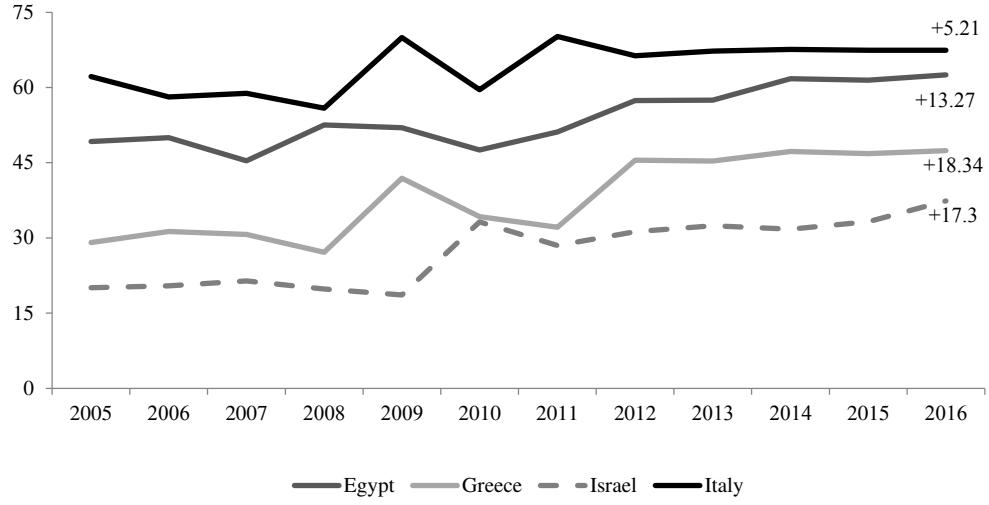
[1] MERK, O. & DANG, T. (2012). "Efficiency of world ports in container and bulk cargo (oil, coal, ores and grain)" in *OECD Regional Development Working Papers*, 2012/09.

allowing the rationalization of docks, storage areas, equipment and labour. The use of highly innovative equipment is indeed understandable given that Israel is a world leader in the fields of science, technology and innovation, ranked tenth in the Bloomberg Global Innovation Index 2017 and second in the IMD index for expenditure on R&S.

In the last 25 years the container segment has recorded an average annual growth of 6.6%. In 2016 the two Israeli ports handled a total of 2.7 million TEUs, but the goal is to reach 3.5 million by 2021 helped by the completion of the expansion work currently underway. These will allow it to manage ships with a capacity of up to 18,000 to 19,000 TEU and improve logistic productivity and efficiency, thus enhancing competitiveness in comparison to other Mediterranean ports.

It should be noted that since the reform was passed in 2005, Israel has significantly improved its position in the global context of containerized liner services, as registered by the UNCTAD Liner Shipping Connectivity Index. The chart below shows the performance of Israel in the period indicated, together with that of Italy and some neighbouring competitor countries in the Mediterranean. Although Israel shows a lower index than that of its competitors, it should be noted that the container business is relatively new for the country which has shown considerable progress since 2005, so much that it has the most significant growth rate of the index (+86% over the span analysed).

LSCI trend 2005-2016. Israel and some competitor countries in the Med



* The figures in the graph show the difference in absolute value of the index between 2005 and 2016. China 2004 = 100

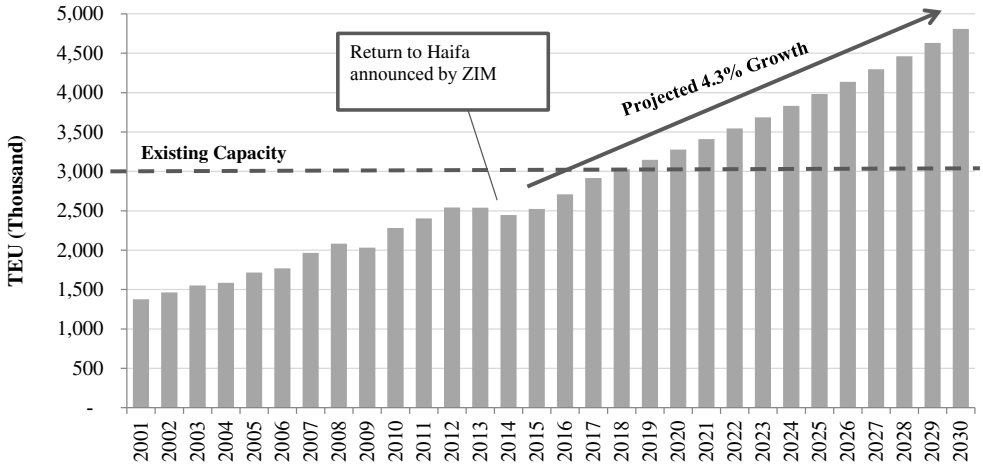
Graph 2 - Source: SRM on UNCTAD, 2016

Due to the growing importance of the container sector, the government has decided to build two new container terminals: the Haifa Bayport and the South Terminal in Ashdod. These two ports, in fact, had already reached 75% of their capacity in 2013 (1.9 and 1.5 million TEU respectively).

The aim of strengthening Israeli port infrastructure is to accommodate a growth in demand estimated at 4.3% by 2030 and amounting to a total of 4.8 million TEU.

With the two new terminals Israel's capacity should reach 7 million TEUs, thus there will be an imbalance that could contribute to changing the nature of Israel's container traffic with an increase in the transhipment share, currently ranging between 10 and 15%..

Container traffic Forecast (Thousand TEU)



GRAPH 3 - SOURCE: SRM on IPC, 2017

Shanghai International Port Group (SIPG) and Dutch Terminal Investment (TIL) have acquired a 25-year right to manage Haifa Bayport and Ashdod Port – scheduled to be completed by January and October 2021 respectively.

Bayport will be built by the Israeli companies Shapir Engineering and Ashtrom for $1 billion to which SIPG will add an additional investment of $1 billion that will go towards improving the infrastructure, equipment, facilities and systems. It is an ambitious project that comprises the use of 197 acres of land to be subtracted from the sea, using the dredged material to build a new waterway, and the construction of three new docks with depths of 15m which would allow access to containerships of up to 19,000 TEUs. All this will determine a handling capacity of 1.86 million TEU.

Even now, before the implementation of the Bayport project, Haifa port is already called by the major carriers in the east-west line services. In February 2017 it welcomed for the first time a ship exceeding 14,000 TEUs, Maersk Elba, operating on a weekly service by 2M.

Haifa Bayport plan

* The white circle indicates the area given to SIPG to build the new terminal.
Figure 1 - Source: IPC, 2017

The Southport container terminal in Ashdod will be completed by Pan Mediterranean Engineering Company (CHEC) and it will cost $1 billion needed for excavation work for a new navigable channel and for the construction of 2 docks with depths of 12.5 m, which will allow access to the mega-vessels. Again, it is estimated that an additional investment of $1 billion from TIL will be necessary for equipment such as cranes, dedicated vehicles, information management systems and other requirements.

Ashdod Southport plan

* The white circle indicates the area given to TIL for the new terminal.
FIGURE 2 - SOURCE: IPC, 2017

The three Israeli commercial ports were declared free zones through the Free Trade Zone Law, signed in 1969. In these areas, companies benefit from certain tax benefits such as exemption from payment of indirect taxes. Companies headquartered in the city of Eilat are guaranteed exemption from value added tax (except for cars and electronic products). In 1996, following the signing of the peace treaty between Israel and Jordan, the US declared its commitment to open the Qualifying Industrial Zones (QIZ) in order to attract investment and strengthen economic cooperation in the region[2].

The new rail links of Haifa will play an important role in facilitating the export of the hub as Israel is a strong exporter not only of pharmaceutical and chemical products but also of food. These infrastructures are believed to raise Israeli exports worldwide.

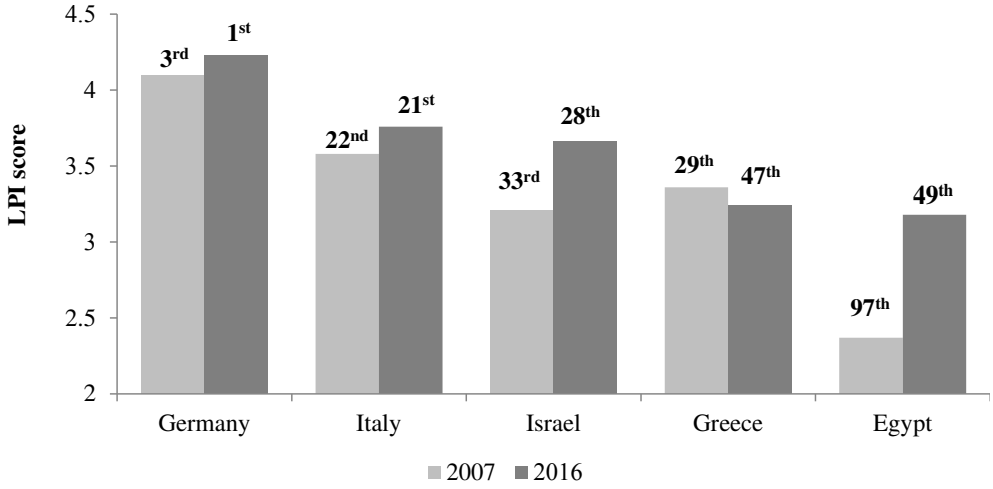
[2] A similar agreement was signed by the USA in 2004 with Egypt. Materials and processing costs incurred in a QIZ must constitute at least 35% of the estimated value of the product at the time of export to the United States. Of this 35%, 15% must come from material from the United States or Israel, and the West Bank, Gaza Strip, Jordan or Egypt depending on the program. The remaining 20% must come from Israel, Jordan or Egypt. The remaining 65% may come from anywhere in the world. All importers must also certify that the product meets the conditions for exemption from duties (ASSOCAMERESTERO, *Business ATLAS 2016. Israele*).

ZIM Integrated Shipping Ltd

The role of Israel in the context of world shipping is not limited to the relevance of its ports, but is also reflected in the presence of ZIM Integrated Shipping Ltd, one of the largest shipping companies in the world, 16th in the global ranking with a fleet of 63 vessels for a capacity of 289,000 TEU.
The company offers a global and regional network of services that spans over 120 countries. In response to the market situation of the container segment, characterized by continuing weak demand and a situation of oversupply that led to a lowering of freight rates, ZIM has always pursued a strategy of independence with the aim to choose autonomously the services to be performed and the ports to call. According to Alphaliner data, in April 2017 Zim has a market share of 3% on the Asia-Mediterranean route.
However, the market difficulties that characterized 2016 have resulted in a change of direction that led to a cooperation with THE Alliance from April 2017 on the services Mediterranean - US East Coast. Moreover, a new weekly service in the Black Sea has been introduced in cooperation with MSC to meet the specific demand for agricultural products.
In the last quarter of 2016 the company's financial results showed an improvement and the period closed with a net profit of $4.6 million, which is the first positive net result after four consecutive quarters ended in loss (the fourth quarter of 2015 concluded with a net loss of 28.3 million US dollars). In 2016, ZIM's ships transported a total volume of containerized cargo equal to more than 2.4 million TEU, with an increase of 5.2%. The average revenue per teu amounted to $902, with a significant decrease of -19.9% compared to $1,126 in 2015.

All work undertaken so far by the Israeli government to improve the logistics performance of the country have yielded important effects, so much so that Israel is in 28th place in the world ranking of the World Bank based on the Logistics Performance Index (in 2007 it was 33rd).

Logistics Performance Index (LPI) of Israel and some benchmark countries. Comparision 2007-2016



GRAPH 4 - SOURCE: SRM on World Bank 2016

4. SHORT SEA SHIPPING IN ISRAEL

The European Commission has always paid much attention to the development of Motorways of the Sea with the aim to foster road-sea intermodality, which is more environmentally friendly. In the 2007-2013 European programming cycle 45 projects for Motorways of the Sea have been approved for a total cost of €1.5 billion and the new 2014-2020 cycle has already allocated €250 million. Israel is one of the countries affected by the Motorways of the Sea linking the West with the East Med and the projects that directly involve the country are:

- Motorway of the Sea of Europe in the South East, which connects the Adriatic Sea with the Ionian Sea and the Eastern Mediterranean.
- Motorway of the sea of south-west, connecting Spain, France, Italy and Malta with South Eastern Europe and the Black Sea.

The goal is to create a network of effective intermodal freight transport between the two sides in a perspective of integration and cohesion of transport networks between the countries of the Mediterranean. In particular, the main European Ro-Ro company (Grimaldi) is also active in the country. Services concerning Israel include the following lines:

- **The Adriatic line service**: a weekly service between the ports of Koper (Slovenia) - Ravenna -Monfalcone - Ashdod - Haifa - Piraeus - Izmir. The service is carried out with multipurpose and ro-ro vessels. In tandem, the services are also provided on container ships, on the basis of agreements with other shipping companies.

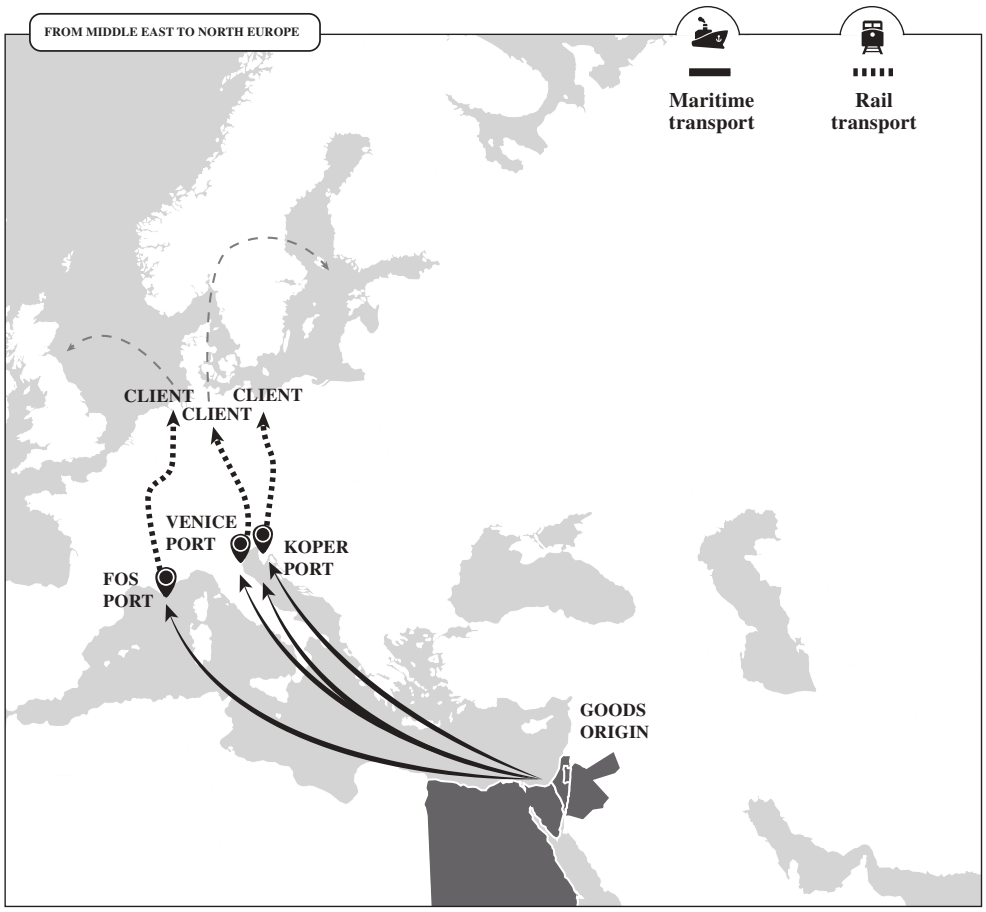
- **Euromed services**: Weekly connection that affects more than 65 destinations in nearly every country of the continent, from South-East (Turkey)to the North East (Russia), stretching as far as the areas of the northern coast of Africa and the Near East, such as Egypt, Israel, Syria, Lebanon, Libya and Tunisia. Currently there are 35 ships used on the Euro-Med network with approximately 40 ports served: the main ports are called every two days while the others only once a week. The reasons for the success of this service are its high frequency of stops and the unparalleled size of the Ro / Ro Multipurpose Car Carriers used on those routes, which can carry more than 4,600 cars or a mix of cars, 3,000 linear meters of rolling freight, 800 TEU of containers and special cargo weighing 200 tonnes each.

Israel is also involved in the project called "**Fresh Food Corridors (Ffc)**" approved by the announcement "Connecting Europe Facility" of 2014 which provides for the creation in the Mediterranean of new supply chains for reefer containers (refrigerated) and perishable goods destined to European markets. For the first time, fresh products will go to the ports of Koper, Venice and Marseille through new fast shipping services for agri-food products (fresh food) coming from Israel-Jordan-Palestine with the use of the same means of transport "maritime refrigerated container" without any manipulation of the goods. This will ensure the effective transport in controlled and seamless temperature conditions. The action will be complemented by a feasibility study on the establishment of a Rail Reefer corridor in another gateway port (La Spezia). All of these innovative elements have led the European Union to provide a co-financing of 10 million euro of the TEN-T Programme - about 50% of the cost of the entire operation. Four EU countries (Slovenia, Italy, France and Cyprus) will be involved and, for the first time, non-EU Countries of the southern Mediterranean (**Jordan**, **Palestine**, **Israel** and **Egypt**), as well as all the stakeholders in the supply chain (exporters, freight forwarders, shipping lines, ports and terminals, rail operators). In this network there will be some special transport corridors for refrigerated containers coming from the three Mediterranean ports which will then be forwarded by rail to central and northern Europe[3].

The project is in line with the EU policy supporting the development of "motorways of the sea". This makes it possible to improve the efficiency of the control processes for this particular type of goods coming into Europe. Furthermore, it will be possible to improve real-time control of the door-to-door transport chain (ensuring transparency, visibility and security) as well as the technologies for the development of trains with innovative power generation systems capable of transporting refrigerated means for forwarding goods towards European markets.

[3] In the early morning of March 1st, 2017, the vessel MSC MIA SUMMER started from the port of Ashdod, Israel, embarking 35 reefer containers of agrifood operators Mehadrin and Mentfield. On March 5th the ship reached the Port of Koper, Slovenia, and the day after the load was sent to Rotterdam by train, arriving at their destination in the evening of March 8th. This was the first cargo of reefer goods via railway which crossed the whole of Europe with perishable products.

Fresh food Corridors



INFOGRAPHIC 3 - SOURCE: SRM on PICCO, A., *Connecting Shipping and TEN-T Core Network Corridors Conference*

5. ISRAEL'S LOGISTIC POTENTIALITY AND ITS ROLE IN THE OBOR

The analysis of the Israeli port performance cannot be separated from an assessment of the logistics potential of the country which, due to its geographic location and business relations in place, is becoming increasingly more concrete. Israel has the obvious advantage of looking both on the Mediterranean and on the Red Sea, a crucial location for major shipping routes. From the point of view of "land" it also has a very favorable position because it is located on one of the ideal routes of direct trade to Europe from China.

In 2015, China's exports amounted to 2,273 billion dollars (14% of the world total), confirming the country as a global leader in exports. Europe is one of the main target markets attracting 20% of Chinese exports, 80% of which travels via sea[4]. These data help to explain the interest of China to gain control of maritime routes linking its ports with the main European ports thus ensuring that its products are transported to the target markets in a safe, efficient and cheap way. Given China's growing dependence on maritime trade, a further objective that the government aims to achieve is to minimize the risk of disruptions in the shipping chain. This will be done by avoiding the use of single routes and developing a number of alternative corridors for the transport of exports to target markets.

This is the scope of the ambitious infrastructure programme undertaken by the Chinese government along major routes Asia-Europe, called "21st Century Maritime Silk Road". It provides for the development of ports in Southeast Asia, the Indian Ocean and the Mediterranean. The Chinese government is also involved in the initiative "Silk Road Economic Belt", which aims to build infrastructure – i.e. transportation, utilities and telecommunications - in an area that stretches from Xinjiang (North-West of China) to the Baltic Sea. The Chinese government uses the acronym OBOR (One Belt One Road) to indicate the combination of the two initiatives.

This strategy has important implications for Europe because China is gradually gaining, both economically and geo-strategically, increased strength in regions close to it. This plan also has an impact on shipping because China is boosting its ability to influence the East-West trade routes, strengthening its role in terms of logistics and transport.

The best example of this strategy is the acquisition, completed in 2016, of the port of Piraeus in Greece[5] which played a decisive role in designing new business relations between Europe and Asia. The port has in fact assumed the role of distribution centre for Chinese goods en route to Europe and it is the Mediterranean hub of reference for the vessels of Chinese company Cosco Shipping. This proved to be a successful operation even in financial terms because in the first half of 2016 COSCO realized from its operations in Piraeus a profit of $17.9 million, an increase of 18.3% on the same period of 2015.[6]

Investments in Port Said and Alexandria (Egypt), Kumport (Turkey), Antwerp and Zeebrugge (Belgium) fall within the same scope.

In such context it becomes glaringly obvious that Israel is crucial to China's interests because this middle-eastern country could represent the gateway to European, Middle-eastern and North African countries. The first diplomatic relations between the two countries date back to 1992 and annual bilateral trade has reached $8 billion. The

[4] Eran, O. (2016). *China has laid anchor in Israel's ports.*

[5] On 20th January 2016 the Hellenic Republic Asset Development Fund announced that it had accepted the offer from COSCO Group Ltd to acquire 67% of Piraeus Port Authority for a value of €1.13 billion (the price includes the value of shares, investments and future revenues). The agreement COSCO-Piraeus Port Authority lasts until 2052. The goal is to increase container handling to over 5 million TEU by 2018, which will make Piraeus the 5th port in Europe.

[6] Van der Putten, F.P. (December 2016). "The geopolitical relevance of Piraeus and China's New Silk Road for Southeast Europe and Turkey" in *Clingendel Report*.

companies involved in the main infrastructure projects are Chinese and 3,500 Chinese workers are already in Israel while an extra 20,000 are scheduled to move to the country in the future.[7]

China's interest in Israel in terms of investments has significantly grown over the last few years. The two main examples are: a) in 2011 China National Chemical Corporation acquired 60% of Israeli Makhteshim Agan, sixth global pesticide producer, for a value of $1.44 billion, and b) in 2015 Chinese state-controlled Bright Food Group acquired 77% of Tnuva Food Industries Ltd., the main lacto-dairy company of the country, for $2.5 billion. Another important investment regards the acquisition of Israeli Alma Laser Ltd., manufacturer of cosmetic and medical lasers, by Fosun Pharma Group for $221,6 million.

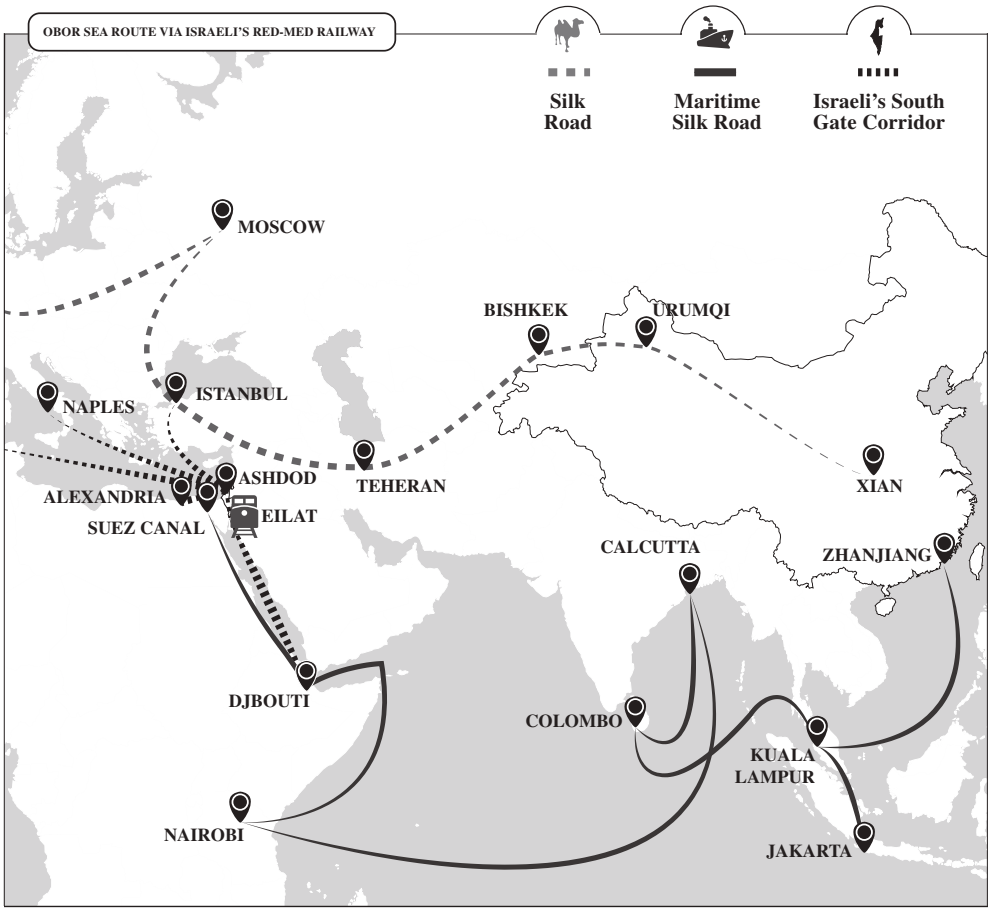
The growing cooperation between the two countries is mainly due to the status of Israel as a "Start-Up Nation" that can meet the technological demands of many Chinese enterprises. Israel has an important role for China also because it is a window on the Mediterranean and the Red Sea which represent two important nodes on the major trade routes of shipping. China's involvement in Israel in the maritime sector began in 2014 when China Harbor Engineering Company (CHEC) signed a contract for the construction of the new container terminal in Ashdod. In May 2015 Shanghai International Port Group (SIPG) obtained a 25-year management concession of the new terminal in Haifa starting from 2021[8].

Israel can play an important role in OBOR also for terrestrial links. In 2014, China and Israel signed a memorandum of understanding for the construction of a 300-km long high-speed railway from the port of Eilat on the Red Sea and the port of Ashdod on the Mediterranean. Chinese companies will be involved in the financing and construction of the railway, which will be dedicated to both goods and passengers and cross the Negev desert. Trains will travel at a speed between 250 and 300 km/hour allowing one to travel between Eilat and Ashdod in about 2 hours. Investments related to infrastructure are estimated to be between 8 and 13 billion dollars: it will be necessary to build sixty-three bridges and five tunnels.

Also this infrastructure will have a significant impact on the future of shipping, because the "Red-Med" railway could improve access of Chinese goods to Africa (China's largest trading partner with 120 billion dollars of import/export), and represent an alternative for the transport of containers from the Red Sea to the Mediterranean.

[7] Chudi, O. (2017). "Israel signs to take 20,000 Chinese building workers" in *Globes*, 04-01-2017.
[8] Friedfeld, L. & Metoudi, P. (2015). *Israel and China: From Silk Road to Innovation Highway.*

The role of Israel in the OBOR



Infographic 4 - Source: SRM on Courtesy APCO worldwide http://www.apcoworldwide.com

The Chinese government has invested heavily in infrastructure along the Suez Canal over the last years just to extend its control over an area that was considered a primary point of access to Europe[9]. Some difficulties and risks connected to tensions in the area have emerged and this has prompted the government to consider other routes as alternatives.

In this way Israel could assume the role of "Asia pivot" allowing it to play an important role in the global shipping scene. The sea-rail-sea combined route could allow

[9] In 2008, COSCO Pacific invested $185.6 million in a joint venture to manage the Suez Canal Container Terminal (SCCT) in Port Said East Port. In 2012, for the second phase of development of this port China Harbor Engineering Company (CHEC) invested $219 million to build a quay of 1,200 meters. The CHEC has also completed a €1 billion contract to build a dock in the port of al-Adabiya at the southern entrance of the Canal.

Scott., E. (October 2014). "China's Silk Road Strategy: A foothold in the Suez, but looking to Israel" in *China Brief*, Vol. XIV, No 19.

it to download the goods on the Red Sea by reducing the length of sea routes with obvious advantages in terms of cost and it will also make it possible to bypass the Suez Canal thus eliminating toll tariffs. However, there are also some constraints to consider: first, Israeli port facilities bordering the Red Sea are not adequate to accommodate large ships (Eilat can handle ships of up to 8,000 TEU capacity). This is a significant limitation because 56% of the total capacity used on the Asia-Mediterranean services corresponds to ships above 10,000 TEUs[10]. If the Israeli government were to invest billions of dollars to adapt both the Eilat port infrastructure to accommodate large ships and the dry port infrastructure to handle their cargo, the project of the Red-Med railway may not be economically viable.

Secondly, the transportation of containers would prove to be more expensive as these should be unloaded in Eilat, transferred on train and then loaded again on a ship on the Mediterranean. Additionally, it is not realistic to plan the transport by train of a mega-ship's entire load. It is therefore estimated that the railway could attract approximately 3-4% of the Asia-Europe trade flows.

So considering this potential, the Red-Med railway project will result in the largest infrastructure built in cooperation between China and Israel to strengthen trade relations between the two countries and will probably play the role of an additional route, although limited, from China for goods destined to Europe. In this context, the Red-Med line can be compared to another work recently completed by China, the Eurasian Land Bridge, a railroad for goods that connects Central China to Germany, or other infrastructure projects that China is developing in East Africa and elsewhere.

6. Conclusions

The country's economy is tied hand in glove with the efficiency of its ports, given that 63% of Israel's GDP depends on trade and that this is almost entirely seaborne. This is why shipping is considered a key sector for the development of Israel. In 2007 the government reserved a planning document with a fifty-year vision. The stated aim of making ports more competitive in the Mediterranean context is subject to infrastructure improvements both in the container sector and in Short Sea. Therefore, a phase of privatization of ports started, making it possible to attract large foreign investments mainly from China.

Israel's logistics system has indeed significant growth potential associated with the initiative "One Belt One Road" (OBOR) through which China is strengthening its economic presence in the Eastern Mediterranean. Its involvement in major infrastructure projects is growing at a significant rate and may have considerable implications on trade routes. Within the scope of this strategy, Israel is gaining importance due to its strategic geographical location for both sea and terrestrial routes through which goods from China can enter into the European markets. The significant potential for growth of the country is also supported by the investment plan of the Israeli government for a total amount in infrastructure projects exceeding $140 billion by 2020.

[10] *Containerisation International*, January - February 2015.

Main figures of Israeli Maritime Economy:

- Foreign trade is worth 63% of Israel's GDP.
- **99% by volume** and **80% by value** of imports/exports of the country is **seaborne**.
- Maritime transport is worth **$157 billion**.
- Goods traffic of Israeli ports amounts to **57 million tonnes**.
  Average annual growth over the last 25 years: **+4%**.
- Container traffic amounts to **2.7 million TEU**.
  Average annual growth over the last 25 years: **+6.6%**.
- Total investments planned for Haifa Bayport and Ashdod Southport: **$4 billion**.
- Vehicles imported each year: about **300,000**.
- ZIM: **16th carrier** in the world by fleet capacity.

Chapter IX

Asian Infrastructure Investment Bank: financing big projects from Asia to Europe

1. Foreword

The Asian Infrastructure Investment Bank (AIIB)'s mission is to improve social and economic development in Asia by investing in infrastructure and other productive sectors. In that perspective, one of its main initial purpose, was to help financing and realizing the centerpiece of Chinese foreign economic policy: "One Belt, One Road" (OBOR) initiative. As AIIB membership grew to include European and other advanced economies, Chinese officials distanced the AIIB from China's OBOR initiative. However, though not the exclusive AIIB's objective, the OBOR initiative remains one of the main recipient of AIIB's financing. In fact, the AIIB's approved projects largely overlap with the geographic area of the OBOR initiative. Many initial projects are part of the China-Pakistan Economic Corridor, a central component of OBOR.

Though China, with a share of almost 30% of AIIB's capital, is the leading country of the institution, AIIB also has "non-regional members," such as the United kingdom, Germany, France and Italy which can play a part in AIIB's projects. Therefore, AIIB's membership is an opportunity of growth for these countries.

This chapter analysis AIIB's structure (objectives, membership, governance), its financial tools, and the role of Italy in AIIB's membership. The chapter ends with an interview with Laurel Ostfield, Head of Communications and Development at AIIB.

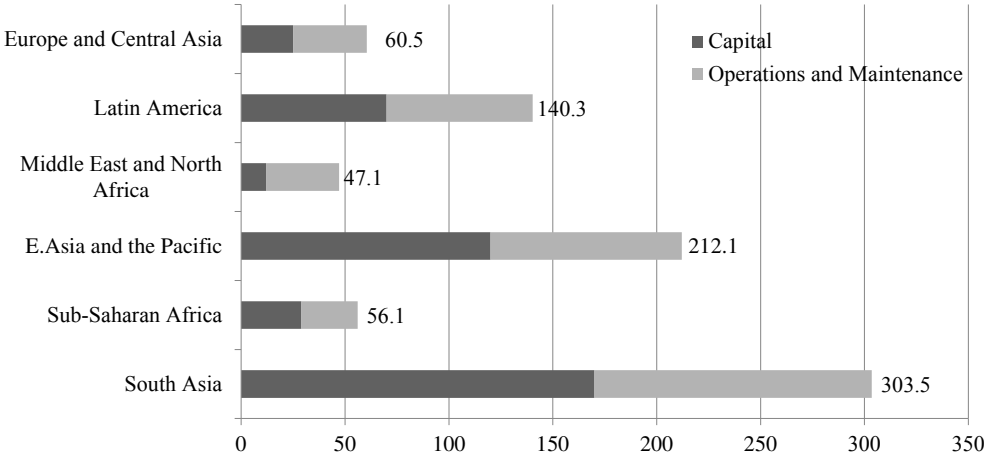
2. Asian Infrastructure Investment Bank: the structure

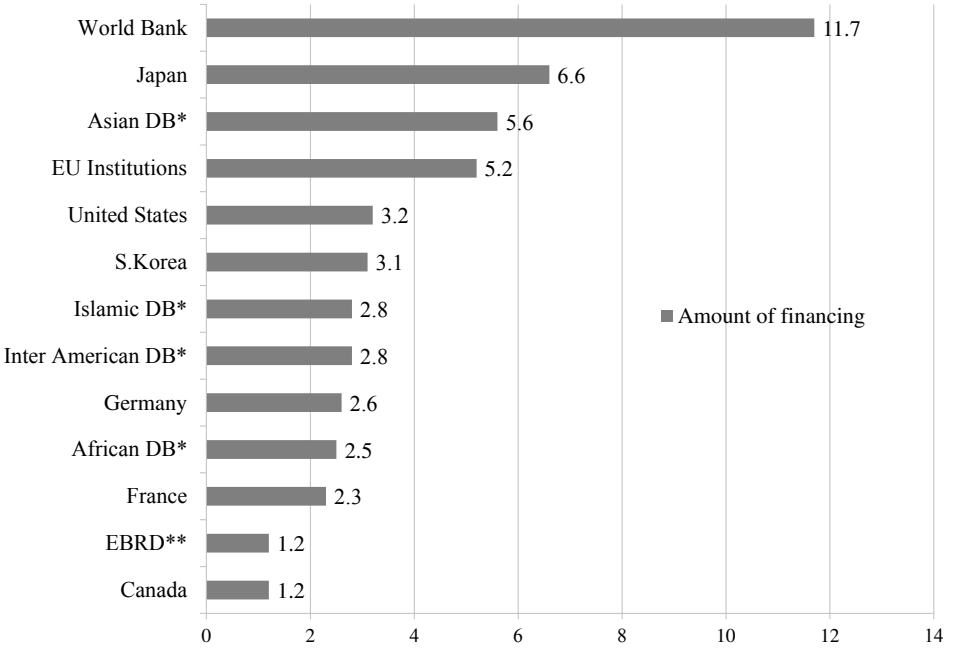
2.1 Objectives

The Asian Infrastructure Investment Bank (AIIB) is a China-led multilateral financial institution founded to "promote interconnectivity and economic integration in the region" and "cooperate with existing multilateral development banks (MDBs)," such as the World Bank and the Asian Development Bank (ADB).

Proposed in October 2013 by Chinese President, Xi Jinping, the Asian Infrastructure Investment Bank (AIIB), after two years of negotiations, was formally established on 25th December 2015.

*Annual Developing Country Infrastructure Needs (2015-2020) and Official Sector Financing ($bn)**





* DB (Development Bank). ** EBRD (European Bank for Reconstruction and Development).
GRAPH 1 - SOURCE: SRM on IMF and OECD data

As its name suggests, the Bank's stated purpose is to provide financing for infrastructure needs throughout Asia, as well as in neighboring regions. In fact, it was initially thought as a tool to realize what is considered the centerpiece of Chinese foreign economic policy: 'One Belt, One Road' (OBOR) initiative.[1]

Investment in infrastructure in Asia is strategic. In 2015, World Bank economists estimated that developing countries would require annual investments of $819 billion in infrastructure in order to prevent a decrease in economic growth over the previous five-year period (2010-2015). South Asia and East Asia and the Pacific combined account for 63% ($516 billion) of the needed investment.

In aggregate figures, the MDBs are among the largest providers of development support for infrastructure financing, although MDB financing for infrastructure has declined in recent decades. As the following figure shows, the need for infrastructure financing far outweighs the amounts that are currently being provided by the MDBs and other official sources.

China set the deadline for expressing interest in becoming a founding member of the AIIB for the end of March 2015.

Initially, the United States government was opposed to the AIIB's creation and ostensibly because of concerns about the Bank's proposed policy guidelines and standards. The Obama Administration later softened its criticism of the AIIB and would urge the other MDBs to work with the AIIB on the development of robust standards and practices.

As AIIB membership grew to include European and other advanced economies, Chinese officials distanced the AIIB from China's OBOR initiative. In November 2014, shortly after China signed the Memorandum of Understanding (MOU)[2]to begin negotiations, Chinese President Xi said that *"China's inception and joint establishment of the AIIB with some countries is aimed at providing financial support for infrastructure development in countries along the 'One Belt, One Road' and promoting economic cooperation"*.[3]

In June 2016, during a meeting with global executives, the AIIB President Jin Liqun clarified China's position, saying that while the Bank would support OBOR projects, the AIIB was not created exclusively for this initiative. Speaking in Washington, DC alongside the World Bank's spring 2016 meetings, President Xi said *"We would finance infrastructure projects in all emerging market economies even though they don't belong to the Belt and Road initiative"*.[4]

[1] To realize this vision, China is investing in a range of institutions and initiatives, including the AIIB, and other funding mechanisms such as the Silk Road Fund and the New Development Bank (also known as the BRICS Bank), a collective arrangement with Brazil, Russia, India, and South Africa. See Gallagher, K.P., Rohini, K., Yongzhong, W. & Yanning, C. (2016). "Fueling Growth and Financing Risk" in *Global Economic Governance Initiative Working Paper 002 - 5/2016*, Boston University.

[2] This set out the general principles for the new bank

[3] Quoted in Sun, Y. (2015). "China and the Evolving Asian Infrastructure Investment Bank" in Bob, D. (Ed.) (2015). *Asian Infrastructure Investment Bank: China as Responsible Stakeholder*, Sasakawa Pace Foundation, USA.

[4] Nan, Z. & Xiao, C. (2016). "AIIB Leas support for Belt and Road Infrastructure Projects" in *China Daily*, 8th June 2016.

Nonetheless, the AIIB's approved projects largely overlap with the geographic area of the OBOR initiative. Many initial projects are part of the China-Pakistan Economic Corridor, a central component of OBOR. It is uncertain how China will balance its stated goal of establishing an independent and high-standard MDB with pursuing its own economic and national security priorities for the region.

Multilateral Development Banks

Multilateral development banks, or MDBs, are supranational institutions set up by sovereign states, which are their shareholders. Their remits reflect the development aid and cooperation policies established by these states. They have the common task of fostering economic and social progress in developing countries by financing projects, supporting investment and generating capital.
The best-known multilateral development bank is the World Bank, which extends loans and credits to a plethora of countries. Other popular MDBs include the *African Development Bank* and the *Asian Development Bank*.

2.2 Membership

Membership in the AIIB is open to all members of the World Bank or the ADB and is divided into "regional" and "non-regional members." Regional members are those located within areas classified as Asia and Oceania by the United Nations. Unlike other MDBs, the AIIB allows for non-sovereign entities to apply for AIIB membership, assuming their home country is a member.

In October 2014, 21 regional countries met in China's capital, Beijing, and signed a Memorandum of Understanding (MOU) that set out the general principles for the new bank. China set the deadline for expressing interest in becoming a founding member of the AIIB for the end of March 2015. By the time the AIIB's Articles of Agreement were signed in December 2015, the Bank had 57 founding members, from every region except North America.[5]

The AIIB has 57 founding members. Over half of the members of the Asian Development Bank (ADB) have joined the AIIB and only two of the European ADB members have so far not joined (Belgium and Ireland). According to AIIB officials, approximately 25 additional countries are expected to join in 2017.

In January 2016, after all 57 prospective founding members had signed the AIIB's Articles of Association, the Beijing-based bank started operations.

[5] Canada, however, applied for AIIB member in August 2016.

The 57 AIIB's founding members, geographical breakdown

Region	Country
Southeast Asia (10)	Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam
Northeast Asia (3)	China, Mongolia, South Korea
South Asia (6)	Bangladesh, India, Maldives, Nepal, Pakistan, Sri Lanka
Australasia (2)	Australia, New Zealand
Central Asia (5)	Azerbaijan, Kazakhstan, Kyrgyz Republic, Tajikistan, Uzbekistan
Middle East (9)	Israel, Iran, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, Turkey, United Arab Emirates
Africa (1)	Egypt,
Europe (19)	Austria, Denmark, Finland, France, Georgia, Germany, Iceland, Italy, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Russia, Sweden, Switzerland, the United Kingdom
South America (2)	Brazil, South Africa

TABLE 1 - SOURCE: SRM on AIIB; April 2017

2.3 Governance

The AIIB has a governance structure similar to the other MDBs, with two key differences: 1) the AIIB does not have a resident board of executive directors and 2) the AIIB's articles give a larger degree of decision making authority to regional countries and the largest shareholder country, China.

The AIIB's Articles of Agreement (AOA) includes the number of shares allocated to each AIIB member based on a complex formula that takes into account the size of the economy and whether they are a regional or non-regional member. The Articles also include provisions to determine how voting power is determined (based on a country's shareholding) and is strongly based on weighted voting. Voting shares of non-regional member countries is capped at 25%.

China is the largest shareholder of the AIIB and maintains a 28% voting share, over 350% that of the second largest AIIB member nation, India (8%). This is the largest gap between the first and second largest shareholders at any of the MDBs, although the United States has the largest voting share in any single other MDB (30% at the Inter-American Development Bank). The largest shareholders after India are Russia (6%), Australia (4%), and Turkey (3%).

It is important to notice that for special votes, such as approving membership, selecting the president, increasing the capital stock of the AIIB, and changing the size or composition of the executive board, the Articles of Agreement require a 75% special majority. As China will have more than a quarter of the votes, it will have an effective veto over these types of decisions. The United States has veto power over major governance decisions at the World Bank, the Inter-American Development Bank and the IMF.

At the AIIB's inaugural board of governors meeting in January 2016, Mr. Jin Liqun of China was elected AIIB President for a five-year term. Prior to his selection as President-designate in September 2015, Jin served as Secretary-General of the AIIB's Multilateral Interim Secretariat (MIS).

AIIB Top Management structure as at April 2017

Name	Role in the AIIB
Liqun Jin	President
Gerard Sanders	Office of the General Counsel (OGC)
Huan Chen	Office of the Chief Officer (OCO)
Martin L. Kimmig	Risk Management Department (RMD)
Laurel Ostfield	Communications & Development Department (CDV)

TABLE 2 - SOURCE: SRM on AIIB

2.4 Capital Structure

As a regional bank, the AIIB's regional members will hold the majority of the Bank's capital stock; a minimum of 75%, except as otherwise agreed by the board of governors.

The initial subscribed capital of the AIIB is $100 billion. As of the end of 2016, $89 billion was subscribed. Like other MDBs, the capital that shareholders contribute to the AIIB comes in two forms: "paid-in capital," which generally requires the payment of cash to the MDB; and "callable capital," that funds that shareholders agree to provide, but only when necessary to avoid a default on a borrowing or payment under a guarantee. At 20% of total capital, the AIIB will have a much higher share of paid-in capital than the World Bank and other MDBs. Out of $20 billion in initial authorized AIIB paid-in capital, $19.6 billion is already committed.

The World Bank and the regional development banks began their operations with 20%-50% paid-in capital. This figure has fallen to around 5% for most of the MDBs, with the exception of the European Bank for Reconstruction and Development (EBRD). As a result of its large percentage of paid-in capital, the AIIB would be able to ramp up lending quickly. According to analysis prepared by the Overseas Development Institute, the AIIB could conservatively achieve a portfolio of around $120 billion by 2025.[6]

2.5 The Articles of Agreement (AOA)

The Articles of Agreement form the legal basis for the Bank. The Articles were negotiated by the 57 Prospective Founding Members, with Hong Kong joining the negotiations via China. The Prospective Founding Members of the agreement which have signed and ratified the Articles, have become a member of the Bank (currently 52 Countries have signed the agreement and become members). Other states, which are parties to the International Bank for Reconstruction and Development or the Asian Development Bank may become members after approval of their accession by the bank.

The Articles of Agreement document is divided into 11 chapters which rule on purpose, membership, financing, governance, and all the matter concerning suspension and termination of operations and membership.

[6] WEISS, M.A. (2012). "Multilateral Development Banks: General Capital Increases" in *CRS Report*, R41672.

3. AIIB FINANCING OPERATIONS

According to the AIIB's Articles of Agreement, recipients of AIIB financing may include member countries (or agencies and entities or enterprises in member territories), as well as international or regional agencies concerned with the economic development of the Asia-Pacific region.

The AIIB has signed a co-financing framework agreement with the World Bank and three non-binding Memoranda of Understanding with the ADB, EBRD, and the European Investment Bank (EIB). To date, the AIIB has approved nine projects worth $1.7 billion, most of which are being co-financed with established MDBs. According to documents prepared for the Organization for Economic Cooperation and Development (OECD), AIIB officials foresee its lending program growing to $1.5-$2.5 billion in 2017 and $2.5-$3.5 billion in 2018.[7]

Despite recent distancing from China's OBOR initiative by Chinese and AIIB leadership, many of the approved projects are closely aligned with the OBOR initiative. The project pipeline for the next two years includes projects in Azerbaijan, Georgia, India, Indonesia, and Oman, among others.

The Board of Directors of the Asian Infrastructure Investment Bank (AIIB) recently (March 2017) approved three loans totaling US$285 million, bringing the bank's total lending to over US$2 billion. In particular, the project includes: 1) US$125 million loan for Indonesia Dam Operational Improvement and Safety Project Phase II, co-financed with the World Bank; 2) US$100 million loan for Indonesia Regional Infrastructure Development Fund Project, co-financed with the World Bank; 3) US$60 million loan for Bangladesh Natural Gas Infrastructure and Efficiency Improvement Project, co-financed with the Asian Development Bank.

AIIB's Approved Projects as of January 2017

Project Name	Country	**Sector**	**Partner**	**Project size ($m)**	**AIIB funding ($m)**
Myingyan power plant	Myanmar	Energy	IFC/ADB	N/A	20
Tarbela 5 hydropower extension	Pakistan	Energy	World Bank	824	300
National motorway M-4	Pakistan	Transport	ADB/DFID	273	100
Distribution system upgrade	Bangladesh	Energy	None	262	165
Dushanbe-Uzbekistan border road	Tajikistan	Transport	EBRD	106	28
National slum upgrading	Indonesia	Urban infrastructure	World Bank	1,700	217
Trans-Anatolian Natural Gas Pipeline	Azerbaijan	Energy	World Bank	8,600	600
Duqm Port Commercial Terminal	Oman	Transport	None	353	265
Railway System Preparation	Oman	Transport	None	36	60
Total				12,154	1,735

TABLE 3 - SOURCE: SRM on AIIB, January 2017

[7] OECD (2016). *DAC Working Party on Development Finance Statistics. Proposals for changes to Annex 2 of the Converged Statistical Reporting Directives for the Creditor Reporting System (CRS) and the Annual DAC Questionnaire*, 16th March 2016.

The Articles of Agreement allow the Bank to provide financing in a variety of ways, including, inter alia, making loans, investing in the equity capital of an enterprise, and guaranteeing, whether as primary or secondary obligor, in whole or in part, loans for economic development. In addition, the Bank may underwrite, or participate in the underwriting of, securities issued by any entity or enterprise for purposes consistent with its purpose.

- *Tools: Sovereign-Backed Financing*
  Sovereign-backed Financing means a loan to, or guaranteed by, a Member; a guarantee that:
  a. covers debt service defaults under a loan that are caused by a Government's failure to meet a specific obligation in relation to the Project or by a borrower's failure to make a payment under the loan;
  b. is accompanied by a Member Indemnity.

- *Tools: Non-Sovereign-Backed Financing*
  Non-sovereign-backed Financing means any financing extended by the Bank that is not a Sovereign-backed Financing; it includes any financing to or for the benefit of a private enterprise or a sub-sovereign entity (such as a political or administrative sub-division of a Member or a public-sector entity) that is not backed by a guarantee or counter-guarantee and indemnity provided by the Member to the Bank.

- *Tools: Equity Investment*
  The Bank may make direct equity investments in private or public sector companies. It may invest either in a new enterprise or an existing enterprise. The investment may take a variety of forms, including:
  a. Subscriptions to ordinary shares or preference shares (or a combination of both);
  a. a loan convertible into equity.

  The Bank's investment may not exceed thirty percent (30%) of the company's ownership holdings. However, in exceptional circumstances, the Board may decide to approve a higher, but not controlling share; if the Bank's investment is in jeopardy, the Bank may take control of the company in order to safeguard its investment.

- *Tools: Preparation Advances for Sovereign-Backed Financing*
  The Bank may decide to make an advance (*Preparation Advance*) to finance preparatory activities for a Project to be supported by Sovereign-backed Financing. A Preparation Advance is made only when there is a strong probability that the Financing for which it is granted will be extended, but granting a Preparation Advance does not obligate the Bank to finance or otherwise support the Project for which it is granted. The maximum aggregate principal amount of all approved Preparation Advances for any given Project may not exceed the lesser of:
  a. Ten percent (10%) of the total estimated amount of Financing for the Project;
  b. USD ten million ($10,000,000) equivalent.

  The President of the AIIB decides whether to approve each Preparation Advance.

4. Italy's membership in AIIB

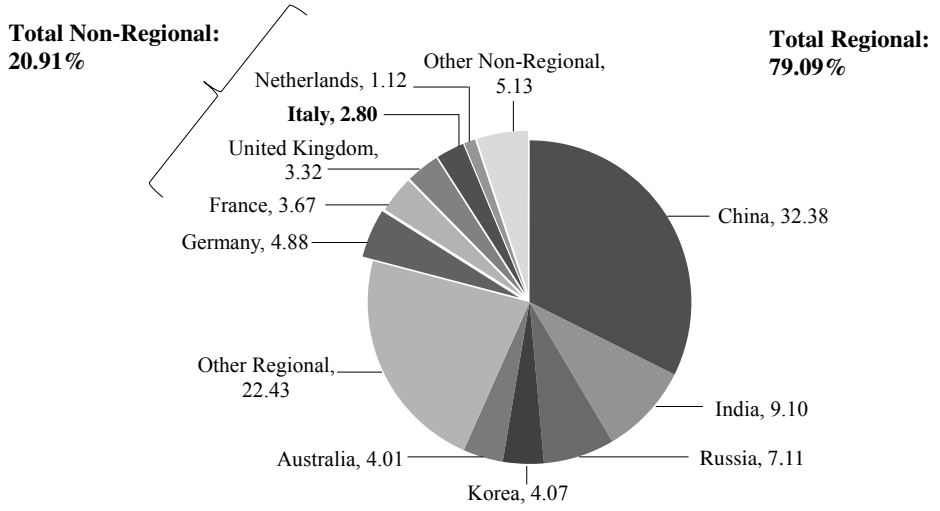
Italy, France and Germany announced they would become founding members of the AIIB in March 2015. Germany became a member in December 2015, while France in June 2016 and Italy in July 2016. The decision by the three EU states came a week after Britain announced it would join the bank.

The reason behind this choice, despite initial concerns by the USA about the bank's standards of governance, is to give their firms the best opportunities to invest and work in the world's fastest growing markets and access to Chinese foreign direct investments.

Italy holds a 2.8% stake in the China-led Asian Infrastructure Investment Bank (AIIB), making it the fourth-largest European Country within this new and important financial institution, following Germany with 4.88%, France with 3.67% and the United Kingdom with 3.32%. Overall, Italy ranks twelfth among the 57 AIIB member countries, although 75% of the shares of the new regional financial institution are held by Asian countries, with China and India holding 32.38% and 9.1% respectively. At the bottom of the list are Malta and the Maldives, with a shareholding of 0.01% each.

The expectations for Italy's membership in AIIB are positive. Italy can make a considerable contribution to the AIIB. Italian industries with specific skills can participate in the single projects whose profits are to be divided among the 57 members. The AIIB is a bank capable of generating profit and support the development of the continent's infrastructures.

AIIB's Capital Structure: Regional and Non-Regional members (% shares)



Graph 2 - Source: SRM on AIIB data; April 2017

"Regional" members of the AIIB

Members	Membership date	Total subscription		Voting Power	
		$m	%	Number of votes	%
China	Dec 25, 2015	29,780.4	32.38	300,898	27.85
India	Jan 11, 2016	8,367.3	9.10	86,767	8.03
Russia	Dec 28, 2015	6,536.2	7.11	68,456	6.33
Korea	Dec 25, 2015	3,738.7	4.07	40,481	3.75
Australia	Dec 25, 2015	3,691.2	4.01	40,006	3.70
Indonesia	Jan 14, 2016	3,360.7	3.65	36,701	3.40
Turkey	Jan 15, 2016	2,609.9	2.84	29,193	2.70
Saudi Arabia	Feb 19, 2016	2,544.6	2.77	28,540	2.64
Iran	Jan 16, 2017	1,580.8	1.72	18,902	1.75
Thailand	Jun 20, 2016	1,427.5	1.55	17,369	1.61
UAE	Jan 15, 2016	1,185.7	1.29	14,951	1.38
Pakistan	Dec 25, 2015	1,034.1	1.12	13,435	1.24
Philippines	Dec 28, 2016	979.1	1.06	12,885	1.19
Israel	Jan 15, 2016	749.9	0.82	10,593	0.98
Kazakhstan	Apr 18, 2016	729.3	0.79	10,387	0.96
Vietnam	Apr 11, 2016	663.3	0.72	9,727	0.90
Bangladesh	Mar 22, 2016	660.5	0.72	9,699	0.90
Qatar	Jun 24, 2016	604.4	0.66	9,138	0.85
New Zealand	Dec 25, 2015	461.5	0.50	7,709	0.71
Sri Lanka	Jun 22, 2016	269.0	0.29	5,784	0.54
Myanmar	Dec 25, 2015	264.5	0.29	5,739	0.53
Oman	Jun 21, 2016	259.2	0.28	5,686	0.53
Azerbaijan	Jun 24, 2016	254.1	0.28	5,635	0.52
Singapore	Dec 25, 2015	250.0	0.27	5,594	0.52
Uzbekistan	Nov 30, 2016	219.8	0.24	5,292	0.49
Jordan	Dec 25, 2015	119.2	0.13	4,286	0.40
Nepal	Jan 13, 2016	80.9	0.09	3,903	0.36
Cambodia	May 17, 2016	62.3	0.07	3,717	0.34
Georgia	Dec 25, 2015	53.9	0.06	3,633	0.34
Brunei Darussalam	Dec 25, 2015	52.4	0.06	3,618	0.33
Lao PDR	Jan 15, 2016	43.0	0.05	3,524	0.33
Mongolia	Dec 25, 2015	41.1	0.04	3,505	0.32
Tajikistan	Jan 16, 2016	30.9	0.03	3,403	0.31
Kyrgyz Republic	Apr 11, 2016	26.8	0.03	3,362	0.31
Maldives	Jan 04, 2016	7.2	0.01	3,166	0.29
Total Regional		72,739.4	79.09	835,684	77.33
Grand Total		91,972.8	100	1,080,616	100

TABLE 3 - SOURCE: SRM on AIIB data

"Non-Regional" members of the AIIB

Members	Membership date	Total subscription		Voting Power	
		$m	%	Number of votes	%
Germany	Dec 25, 2015	4,484.2	4.88	47,936	4.44
France	Jun 16, 2016	3,375.6	3.67	36,850	3.41
United Kingdom	Dec 25, 2015	3,054.7	3.32	33,641	3.11
Italy	**Jul 13, 2016**	**2,571.8**	**2.80**	**28,812**	**2.67**
The Netherlands	Dec 25, 2015	1,031.3	1.12	13,407	1.24
Poland	Jun 15, 2016	831.8	0.90	11,412	1.06
Switzerland	Apr 25, 2016	706.4	0.77	10,158	0.94
Egypt	Aug 04, 2016	650.5	0.71	9,599	0.89
Sweden	Jun 23, 2016	630.0	0.69	9,394	0.87
Norway	Dec 25, 2015	550.6	0.60	8,600	0.80
Austria	Dec 25, 2015	500.8	0.54	8,102	0.75
Denmark	Jan 15, 2016	369.5	0.40	6,789	0.63
Finland	Jan 07, 2016	310.3	0.34	6,197	0.57
Luxembourg	Dec 25, 2015	69.7	0.08	3,791	0.35
Portugal	Feb 08, 2017	65.0	0.07	3,744	0.35
Iceland	Mar 04, 2016	17.6	0.02	3,270	0.30
Malta	Jan 07, 2016	13.6	0.01	3,230	0.30
Total Non-Regional		19,233.4	20.91	244,932	22.67
Grand Total		91,972.80	100	1,080,616	100

TABLE 4 - SOURCE: SRM on AIIB data

"Prospective" members of the AIIB

Regional	Non-regional
Afghanistan	Belgium
Armenia	Brazil*
Fiji	Canada
Hong Kong, China	Ethiopia
Kuwait*	Hungary
Malaysia*	Ireland
Timor-Leste	Peru
	South Africa*
	Spain*
	Sudan
	Venezuela

* Prospective Founding Member.

TABLE 5 - SOURCE: SRM on AIIB data

Interview with Laurel Ostfield, AIIB Head of Communications and Development

The AIIB was founded in December 2015 with the main purpose to finance OBOR projects. How do you judge "the results achieved so far" (in terms of membership, global recognition and projects)? And, in particular, what are the main projects you have implemented for OBOR?

First, let me clarify that AIIB was NOT created to finance OBOR projects. OBOR is an initiative of the Chinese government; AIIB is an international development bank that currently has 57 founding signatories and another 13 applicants, totaling 70 members from around the world. Our mission is to improve social and economic development in Asia by investing in infrastructure and other productive sectors. The projects we fund will better connect people, services and markets to promote sustainable development, growth and prosperity.

To date, the AIIB has approved 12 projects worth almost $2 billion. "What kind of infrastructure" have you invested more so far (Rail, Road, Ports, Others)? Is there a specific strategy for maritime infrastructural projects?

AIIB defined three thematic priorities to guide its approach to lending: sustainable infrastructure, cross-border connectivity and private capital mobilization. In its initial years, we are focusing on developing strategies in energy, transport, and sustainable cities.

Your latest three projects are taking place in Indonesia. "Which other countries" are going to have AIIB financial support in the near future? Are you planning investments in countries located in the Mediterranean area?

If you look at our proposed projects, besides Indonesia, we also have a number of projects planned in India. The Republic of Georgia has two projects in the pipeline, Tajikistan, Kazakhstan and the Republic of Philippines each have one.

There are 17 non-regional members in the AIIB. How are they contributing to AIIB's projects? In particular, what kind of role "Italy and its firms" can play in the AIIB's projects?

We have "17 non-regional members" and "11 prospective non-regional members". They play a role in governance of the bank as members of the Board of Governors and Board of Directors. We also practice universal recruitment and procurement, which means we are universally open to worldwide suppliers, contractors and consultants, including from Italy.

What are the main "obstacles" the AIIB is facing in implementing its projects?

We are a new organization which means we are still ramping up our capacity to review and evaluate project proposals. We are actively recruiting top talent from around the world to help us with our mission.

What are "AIIB's future plan" (in terms of new branches, investments, membership, etc…)?

In 2017 we will continue to sharpen our strategic focus, strengthen our core competencies and develop our areas of specialization. We aim to grow as a dynamic institution, promoting broad-based economic and social development through sustainable infrastructure financing, with a goal to become the 'go-to' repository of know-how and best practices in infrastructure finance.

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This Report was designed, coordinated, and written by SRM.
The contributing authors are:

Massimo DEANDREIS, General Manager, SRM

Alessandro PANARO, Head of "Maritime & Mediterranean Economy" Dept., SRM

Michele ACCIARO, PhD, Associate Professor of Maritime Logistics and Head of Logistics Department, Kühne Logistics University, Hamburg

Anna Arianna BUONFANTI, Researcher, "Maritime Economy" Area, SRM

Onno DE JONG, MSc, Port economist, Erasmus Centre for Urban, Port and Transport Economics, Erasmus University Rotterdam

Olimpia FERRARA, Head of "Maritime Economy" Area, SRM

Bart KUIPERS, PhD, Port economist, Erasmus Centre for Urban, Port and Transport Economics, Erasmus University Rotterdam

Zhao NAN, Director of Port Development Department, Shanghai International Shipping Institute

Dario RUGGIERO, Researcher, "Mediterranean Economy" Area, SRM

Giuseppe RUSSO, Economist and Consultant, Director of the Centre of Research 'Luigi Einaudi', founding member and director of study centre 'Step Ricerche'

Liu WEIRONG, Shanghai International Shipping Institute

177, Via Toledo - 80134 Naples - Italy
Phone: +39 0817913758-61 - Fax +39 0817913817
comunicazione@sr-m.it - www.sr-m.it

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The 2017 Report on the Maritime Economy has now reached its fourth issue and is based on two mainstays. Firstly, there is an analysis of the principal economic data of the sector on a national and global scale, with updates on the features of ports and shipping in the global, European and Italian scene as well as in-depth analyses of routes and dynamics of traffic.
Secondly, this volume deals with the evolution of Chinese investment in ports and maritime terminals in the Mediterranean and in Northern Europe, a topic SRM has been following regularly over the last few years. This phenomenon has already had an influence on the *Mare nostrum* and will probably continue for a long time, as evidenced by the huge plan of infrastructural investment that the Dragon is implementing in order to complete the *One Belt One Road Initiative*. This project provides for the creation of seaborne and land routes which will allow China to expand its trade relationship with Europe and Asia through the implementation and improvement of transport infrastructure. Analyses are supported by fascinating and thought-provoking case studies.
This year's Report also avails itself of collaborations activated by SRM with researchers from major national and international centres of study which have enriched the content of this publication thanks to their specific know-how: the Shanghai International Shipping Institute, the Kühne Logistics University of Hamburg, the Centro Einaudi of Turin and the Erasmus University of Rotterdam.

SRM

Study Centre based in Naples, connected to the Intesa Sanpaolo Group, originally an intellectual and scientific safeguard, has the objective to improve the knowledge about the territory in terms of infrastructural, productive and social assets with the European and Mediterranean vision. Specialized in the analysis of regional dynamics, and with a particular eye on the South of Italy, it also deals with the permanent monitoring of the relationships between Italy and the Mediterranean and of the economic phenomena regarding the maritime and logistics industry.

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