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One-Belt-One-Road policy implication on logistics route competition: Case study of China-Germany trade

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Executive Summary

China's "One Belt, One Road" (OBOR) initiative has caused great media attention and heated discussions globally since announced. It involves massive infrastructure investments and ambitious plans to reduce non-tariff barriers to trade in Eurasia and Africa and boost connectivity and commerce across the region, involving new roads, rail lines, ports, and pipeline, with China as the hub. The initiative consists of two parts: the land-based Silk Road Economic Belt and the sea-based Maritime Silk Road, covering areas with more than 60 countries generating 55% of the world's GNP, 70% of the global population, and 75% of known energy reserves.

The Economic Belt is designed to build a new Trans-Eurasian land bridge from China through Central Asia towards Europe. It includes further modernization of existing railroads through Russian territory, and a series of new railways and other road networks in other regions. The Maritime Road emphasizes improving connectivity with Southeast Asia, South Asia, West Asia, Europe and Africa, by building a network of port cities along the Maritime Road, linking the economic hinterlands in China. It includes not only port projects, but also cross-land connections such as railway and pipeline construction.

As enormous as the projects in OBOR are, the obstacles, costs, potential rewards and influences are all massive. Therefore, the policy brings an excellent opportunity for international trading companies and logistics service providers to expand their business and for targeted countries to develop their economy. To achieve these goals, it is important to first understand the current trading situation and transportation network and foresee the changes that the projects will bring.

This report focuses on the projects that are involved or closely related to the China-Germany trade routes. We will first describe the related projects in detail including their impacts on specific routes using various data sources, and then make comparison of the alternative routes in terms of shipping cost and transit time. For some of them, case studies are provided so that it can be shown how the new land corridor, and the new southern European ports are offering new options to the traditional choices for container shipments between China and Germany.

Contents

1. Introduction to One Belt, One Road

Proposed and led by China, the "One Belt, One Road" (OBOR) initiative involves massive infrastructure investments and ambitious plans to reduce non-tariff barriers to trade in Eurasia and Africa (Figure 1). The initiative consists of two parts: the land-based Silk Road Economic Belt (hereafter in this paper we will call it as the Economic Belt) and the sea-based 21st-Century Maritime Silk Road (hereafter in this paper we will call it as the Maritime Road), covering areas with more than 60 countries generating 55% of the world's GNP, 70% of the global population, and 75% of known energy reserves. Involving new roads, rail lines, ports, and pipelines, it aims at boosting connectivity and commerce across the region, with China as the hub. China's total financial commitment to the project is expected to reach 1.4 trillion dollars. Beijing has already committed around 300 billion dollars for infrastructural and trade financing in the coming years, including 40 billion dollars to the "Silk Road Fund" and initial capital of 50 billion dollars to the China-initiated Asian Infrastructure Investment Bank (AIIB) (Casarini, 2015). An overview of the completed, undergoing, and planned projects will be provided in the following sections.

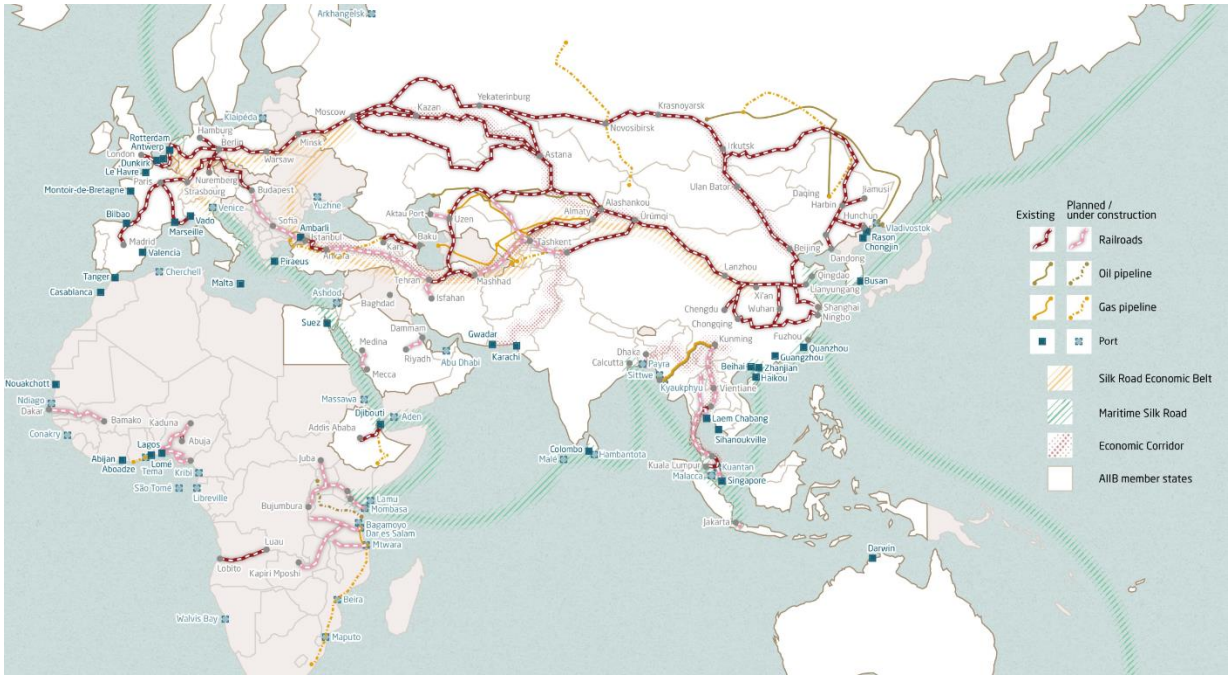


Figure 1: "One Belt, One Road" infrastructure projects, planned and completed (Source: MERICS, 2018)

2. The Silk Road Economic Belt

The Economic Belt essentially includes countries situated closely on the historical Silk Road through Central Asia, West Asia, Middle East and Europe. It then extends to South Asia and Southeast Asia, which ends in the six overland interconnecting infrastructure corridors. These have been identified as the New Eurasia Land Bridge, China-Mongolia-Russia Corridor, China-Central Asia-West Asia Corridor, China-Indochina Peninsula Corridor, China-Pakistan Economic Corridor, and Bangladesh-China-India-Myanmar Economic Corridor. Figure 2 provides a geographic overview of the corridors.

The development of the corridors includes further modernization of existing railroads, construction of new railway and highway networks, as well as introducing new air routes. Telecommunications, oil and natural gas pipelines will also be promoted (HKTDC, 2018).

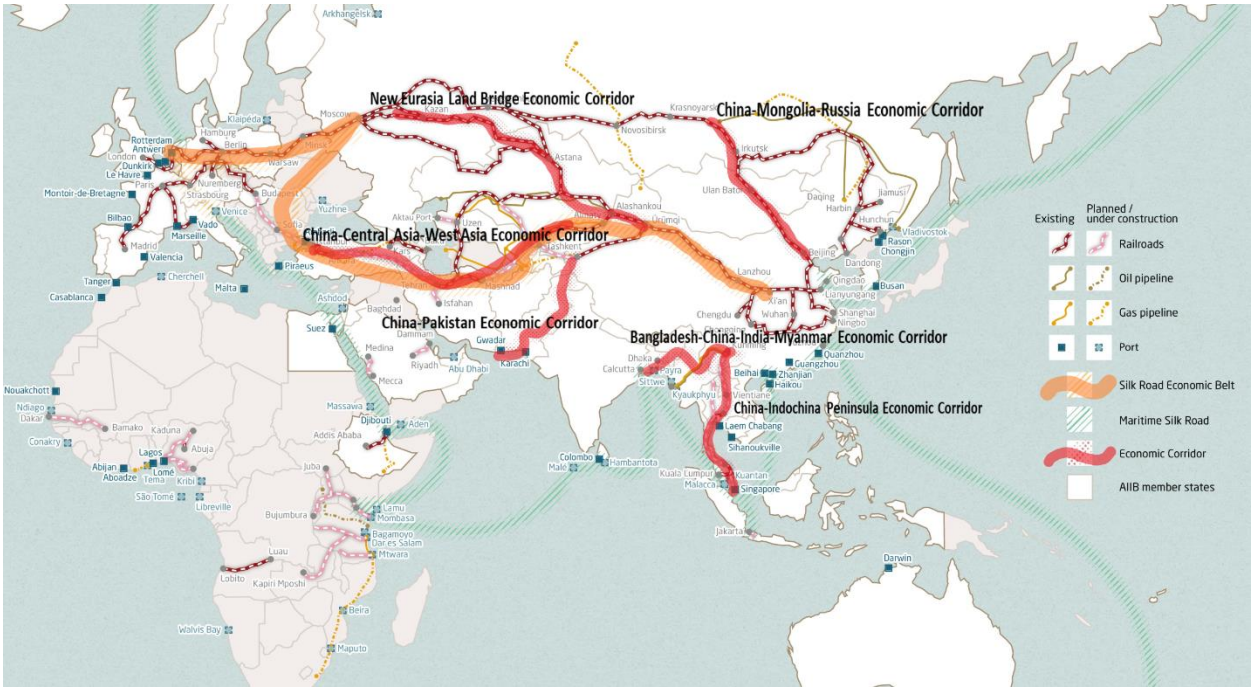


Figure 2: The Silk Road Economic Belt and economic corridors
(Source: Own illustration based on MERICS, 2018 and HKTDC, 2018)

2.1. Trans-Eurasian Railway

Focusing on the trans-Eurasian railway infrastructure, the Economic Belt is designed to improve the connections along the following four routes, as shown in Figure 3.

(1) The Northern Route: Eastern China (developed cities like Shenyang, Beijing, Zhengzhou, Yiwu, and Wuhan) → Manzhouli (border city in the Autonomous Region of Inner Mongolia of China) → Russia (Irkutsk, Novosibirsk, Omsk, Yekaterinburg, Kazan, and Moscow) → Belarusian border town of Brest →Poland→ Duisburg → Hamburg and Rotterdam but also as far as London or Madrid.

(2) The Mongolian Route: Eastern China→ Zamiin-Uud (a smaller border town of China) → capital city Ulaanbaatar of the Mongolian state → Irkutsk of Russia → merging with the Northern Route.

(3) The Southern Route: Central Chinese cities (Xi'an, Chengdu, Changsha, Kunming, and Chongqing) → Urumqi (the capital of Xinjiang province of China) → Dostyk and Alashankou (border cities of China with Kazakh) → Astana (the capital of Kazakh) → Petropavl (border city of Kazakh with Russia) → Yekaterinburg (a city of Russia) → merging with the Northern Route.

(4) The New Silk Road (NSR): a planned new Central Asian railway network, which plans to go through southern Kazakhsta to reach Europe via the middle east countries, instead of via Russia.

From western and central China to Duisburg, Germany, the Northern Route is about 12,920 km and takes 22 days, while the Southern Route is 10,320 km and takes 14 days (under the optimal condition). The Trans-Caspian route from eastern China to Istanbul (crossing southern Kazakhstan) is 10,648 km and takes 20-23 days (Nemitz, 2017).

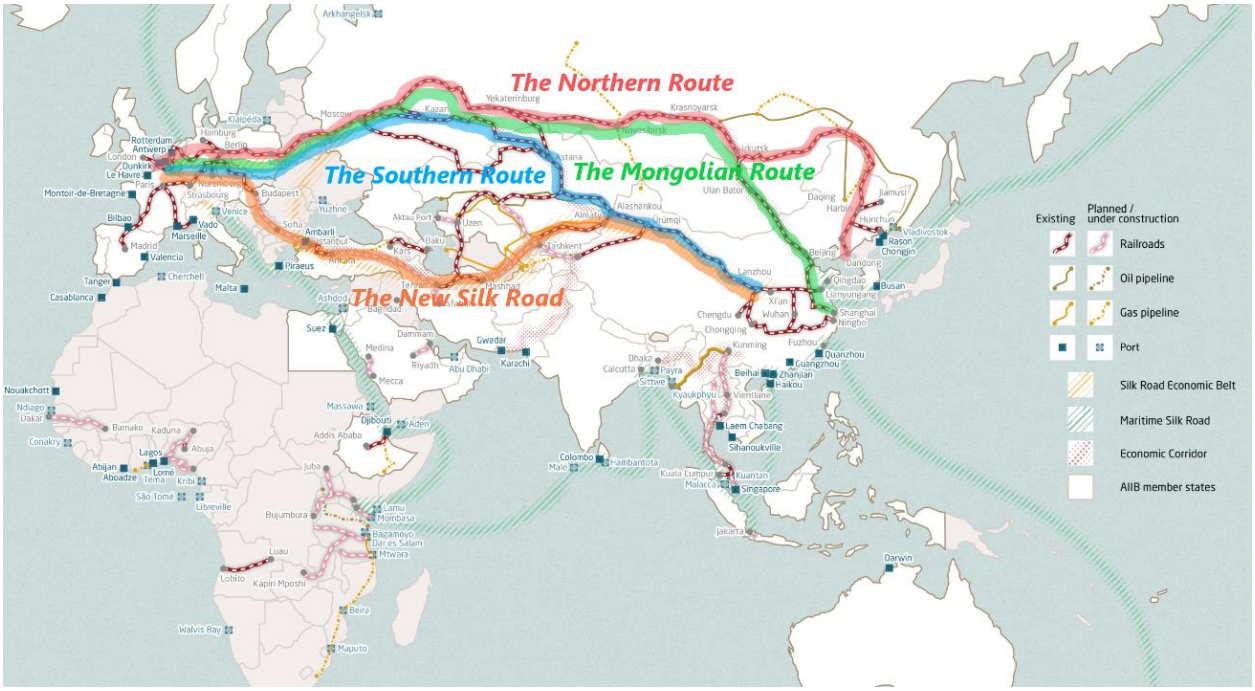


Figure 3: Trans-Eurasian railway routes
(Source: Own illustration based on MERICS, 2018 and HKTDC, 2018)

Along the trans-Eurasian railroads, there are some technical barriers to overcome, as well as operation and rates differences to handle.

(1) Gauge break

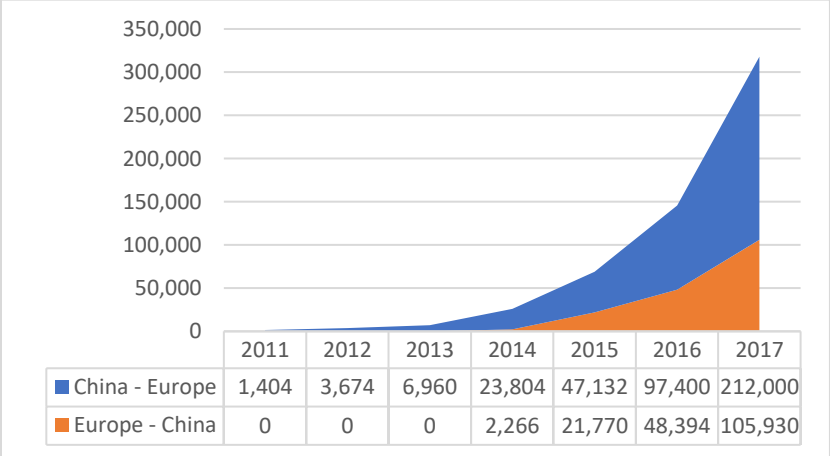
A big technical challenge in trans-Eurasia railway transportation is the difference in rail gauge. The rail system across Eurasia operates mainly on two gauges: standard gauge with a width of 1,435 mm used in China, Poland, Germany and most of the rest European countries and broad gauge with a width of 1,520 mm used in Kazakhstan, Mongolia, Russia and Belarus. Thus, carrying goods from China to Germany involves two gauge changes. At each gauge change, trains must stop, and containers are transloaded from one train to another. Although containerization enables an efficient transfer of cargo, this still generates additional costs, delays and inconvenience. A key priority has been the setting on efficient gauge transloading facilities, such as Khorgos in Kazakhstan (Rodrigue, 2017).

(2) Speed, capacity and rates

There is huge disparity among the countries in terms of operation and rates. Trains travel 1100 km per day in average in Asia compared with just 250 km per day in Europe. They carry from 41 containers in China and Europe to 120 containers in Russia. Besides, the freight rates per kilometer per 40ft container ranges from €0.23-0.32 in Kazakhstan, to €0.66-0.72 in Russia, €0.58-0.70 in Belarus, and €1.12-1.30 in Europe (Briginshaw, 2018).

2.2. Development of Eurasian Rail Freight Transport

Since the OBOR initiative was unveiled in 2013, the freight network across the Eurasian supercontinent has changed rapidly. Maritime transportation has always been the major mode for trade between Asia and Europe over the last centuries. Just eight years ago, regular direct freight railway service from China to Europe did not exist. Now the Eurasian rail network has connected 48 cities in China with 42 cities in 14 European countries until June 2018 (Xinhua, 2018).



	2011	2012	2013	2014	2015	2016	2017
China - Europe	1,404	3,674	6,960	23,804	47,132	97,400	212,000
Europe - China	0	0	0	2,266	21,770	48,394	105,930

Figure 4: Rail container trade between China and Europe in TEU
(Source: China Railway Container Transport, 2018)

Figure 4 presents the rail container trade volume development between Europe and China in the last seven years. It shows a nearly fivefold increase of the total volume from 2015 to 2017. However, a huge difference in the westbound and eastbound volume can be seen in the figure. What intensifies the situation is that 80% of the eastbound containers are unloaded, while 89% of westbound containers are loaded (Briginshaw, 2018). The train schedule for July 2018 onward published by the rail freight operator China Railway Container Transport shows that there are 46 direct services for westbound rail freight transport and 19 services for eastbound shipment. The strong trade imbalance may indicate a big problem existing in empty container repositioning and capacity utilization.

Along with the rapid freight volume growth, lots of individual projects in the Eurasian railway network have been implemented. For example, the Khorgos-East Gate is built as a dry port at the border between China and Kazakhsta, where break of gauge occurs as mentioned above. The special location of Khorgos, just at the heart of Eurasia, makes it one of Kazakhstan's primary dry ports for handling trans-Eurasian trains. Khorgos-East Gate currently has six berths with total capacity to process 540,000 TEU annually.

More than just a dry port, the Khorgos-East Gate project includes large scale logistics and industrial zones. With a colossal 5,740 hectares, an entire city is being built here. Khorgos-East Gate is a wholly owned subsidy of Kazakhstan's national railway (KTZ), but is also receiving investment from various sources, including China OBOR funds. For example, China's Jiangsu province has signed an MOU with the Kazakhstan government to invest $600 million into this region. Approximately 65 trains, amounting to 6,200 TEU, per month are currently being transshipped through Khorgos Gateway. Most cargo volume that passes from China to Kazakhstan still goes through the 50% Russian-owned Dostyk port along the China-Kazakhstan border, i.e. the Southern Route in the preexisting Asia-Europe connection (Shepard, 2017).

2.3. Status and Expectations in Eurasian Rail Freight Industry

The rapid development of rail freight traffic between China and Europe is based on large investments, infrastructure constructions and other political measures under OBOR initiative. The current situation and expected development will be described and analyzed from several aspects in the following section.

Chinese subsidies

One strong reason for the fast growth of rail freight is Chinese subsidies, which come from all levels of governments. The transportation and trading subsidies from local government are allocated to Chinese railway platform companies, and the railway companies offer shippers the standard subsidized rates and extra discount in case of large shipping volume. Subsidies can be anywhere between 20% and 80% of the total market transportation cost depending on the origin city (Mooney, 2018). They normally range from $1,000 to $5,000 per FEU (Barrow, 2018). Besharati, et al. (2017) however examined subsidies in 2014 and found an even higher range, up to $7,000 per FEU. In order to make the price competitive, some rail rates offered by the forwarding market are lowered to the level of sea freight around €3,000 ($3,394) per FEU (Knowler, 2018).

However, the future of Chinese subsidies is uncertain. The Chinese government indicated in 2017, that the rail subsidies would be drawn down to allow the rail freight services between China and Europe operate on a purely commercial basis. However, some interviewed stakeholders believe a sudden withdrawal of subsidies is not yet foreseen and they expect subsidies to remain until 2022 or even longer (Hillman, 2018). China will likely attempt to reduce subsidies gradually, rather than abruptly.

Infrastructure bottlenecks

Another main challenge for the rail service is terminal bottlenecks, particularly those at the borders where containers must be transloaded for gauge changes. New rail infrastructure within China and transfer facilities on its border (e.g. Khorgos-East Gate as mentioned above) have released some pressure in Asia. The major one now exists at the entry point into EU, i.e. the border between Poland and Belarus. In 2015, the transit time from Chongqing, China to Duisburg, Germany was 15 days. With the increasing number of trains passing by Brest, a Belarusian city at the Polish and Belarusian border, congestion appears and transit time of the same route increases to 17 days in 2017. To solve the problem, an effective measure was taken by creating an alternative crossing at Grodno (see Figure 5), so that the transit time reduces to 15 days now (Miller, 2018).

Figure 5: Alternative rail route crossing Polish/Belarusian border (Source: Miller, 2018)

Congestions are expected to be further alleviated by the improvements in European intermodal network. Besides, the New Silk Road (i.e. China–Central Asia–West Asia Corridor, see Figure 2 and Figure 3) will create more capacity and thus reduce congestion.

3. The Maritime Silk Road

The Maritime Road (shown in Figure 6) emphasizes improving connectivity in Southeast Asia, South Asia, West Asia, Europe and Africa, by building a network of port cities along the Maritime Route, linking the economic hinterlands in China. Although the Maritime Road is a maritime strategy, it includes more than just port projects, but also cross-land connections like railway and pipeline construction. Projects are implemented or planned in the Indian Ocean and the Western Pacific. Several focuses are the Bay of Bengal, the Northern coast of the Mediterranean Sea, and East Africa.

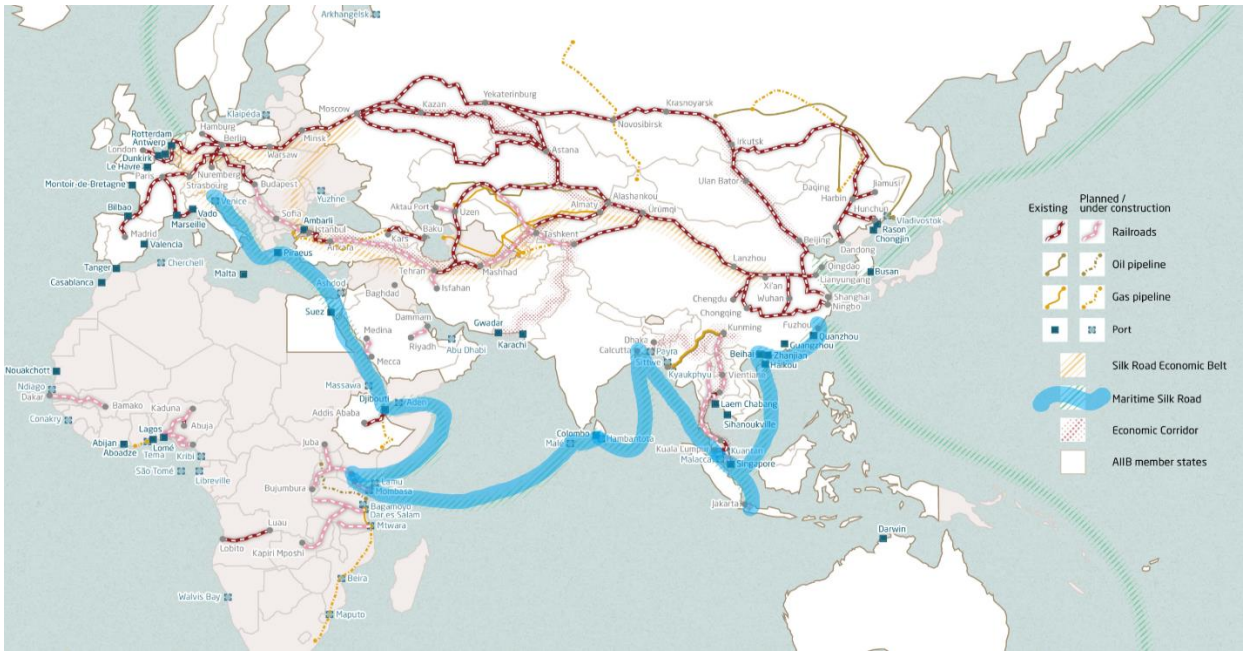


Figure 6: The 21st Century Maritime Silk Road (Source: Own illustration based on MERICS, 2018)

3.1. Ports in Mediterranean Sea

Port of Piraeus

The Port of Piraeus stands out as a prominent OBOR-labeled project. The Greek port is, in fact, the gateway between the Middle East and the Balkans and European markets. Its central location in the Mediterranean Sea has an advantage over other ports, as it is shown in Figure 7.

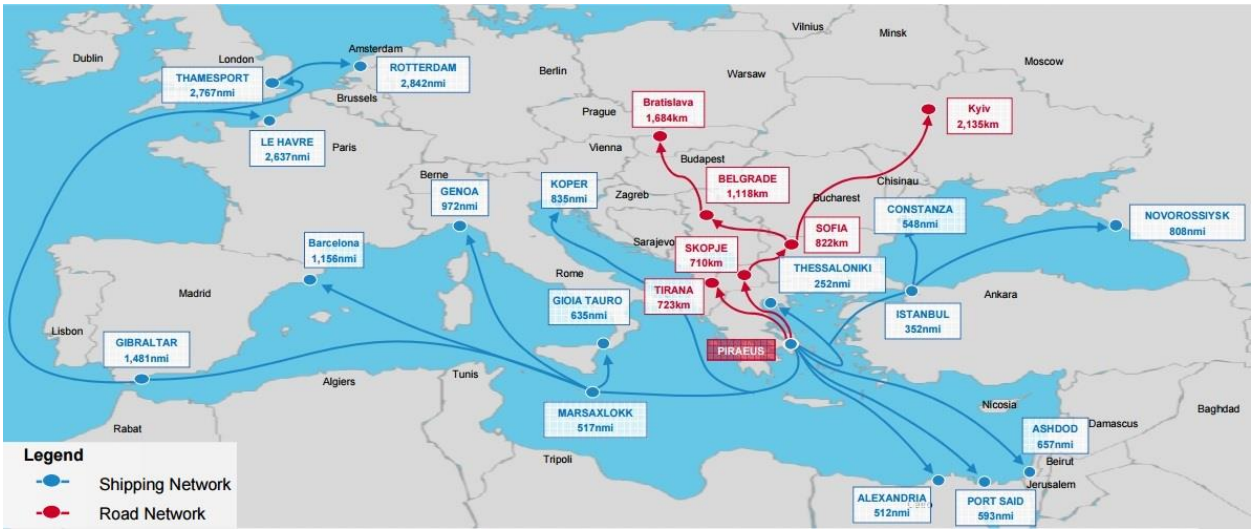


Figure 7: Location of Piraeus (Source: Piraeus Port Authority, 2015)

The fourth largest shipping company, the Chinese state-owned enterprise COSCO, has been investing in the Port of Piraeus since 2008. In 2016, COSCO acquired a controlling share in the Piraeus Port Authority and made a total commitment of 500 million euros to modernize and expand the port facilities and staff. This makes the Port of Piraeus the only major seaport in the European Union that's entirely managed by a Chinese company (van der Putten, et al., 2016). The investment includes a new crane system with higher efficiency and new deep-water docks, and expected higher efficiency of the customs clearance, the port administration, and hinterland connections, etc. (Casarini, 2015). As a result, Piraeus has become one of the fastest growing ports in the world with throughput growth from 433,000 TEU in 2008 to 3.7 million TEU in 2016, ranked 8th in Europe (Casarini, 2015).

Railway projects in this region (see Figure 8) are intended to provide a high-speed rail connection with a speed of up to 200 km per hour extending all the way from the port of Piraeus in Greece to Budapest, Hungary. This is a quick transport route for Chinese goods to reach East and Central Europe (Casarini, 2015). These current and planned projects, from north to south, mainly include: (1) A 370 km High-Speed Railway between Belgrade, Serbia and Budapest, Hungary is financed with around 2 billion dollars from China's Export-Import Bank and built by China Railway and Construction Corporation. This will cut travel time from eight hours to less than three (Casarini, 2015); (2) the Greece railway system from Thessaloniki to Macedonia. (3) the Macedonian railway line that connects with the upgraded Hungaro-Serbian High-Speed Railway.

Figure 8: Budapest–Belgrade–Skopje–Athens railway (Source: One Belt One Road Europe, 2018)

Overall, the planned transportation corridor, also named the 'Land Sea Express Route', from Greece through the Western Balkans to Hungary and the Czech Republic will connect with the China – Europe train corridor running east-west via Russia, Belarus, Poland, Germany and the Netherlands (van der Putten, et al., 2016). Thus, Piraeus is not only a bridge for the Maritime Silk Road, but also a hub that connects the MSR to the planned rail network of the EB (van der Putten & Meijnders, 2015).

North Adriatic ports

Other than Piraeus, the North Adriatic ports are also well-located for China's Belt and Road effort and to serve as China's strategic logistical hub to reach Europe, as shown in Figure 9. These ports are at the northern tip of Adriatic Sea, a natural waterway that penetrates deep into the middle of the European continent, thus providing the cheapest naval route from the Far East via Suez to Europe with a distance that is about 2,000 Nm shorter than other North-European ports. (North Adriatic Ports Association, 2018) The near-by fifth Pan-European transport corridor provides a quick-link to central Europe such as Austria, Switzerland and Southern Germany (European Commission, 2017). Large commercial and industrial hubs like Vienna, Munich and Milan are just a few hours' drive away (North Adriatic Ports Association, 2018). The shipping time to the Central and Eastern Europe Markets from Shanghai is cut down by eight days and 2,400 miles compared to shipping goods to the Port of Hamburg.

Five Ports Alliance, mainly financed by China and Italy, is a major container terminal partnership in the northern Adriatic. The project, managed by the Northern Adriatic Port Association, involves the three Italian ports of Venice, Trieste, and Ravenna, as well as port of Koper in Slovenia, and port of Rijeka in Croatia (Figure 9). The project includes a huge multimodal offshore platform eight-miles from the coast near Venice to serve modern ocean giants with water depth of at least 20 meters. The handling capacity of this platform will be somewhere between 1.8 and 3 million TEU per year which is to be compared to 6

million TEU, the current total of all Italian ports combined. (van der Putten et al. 2016). The project, 'Venice Offshore Onshore Port System' (VOOPS), is expected to start construction in January 2018 (European Commission, 2017). When completed, it would provide an almost parallel alternative to the port of Piraeus and the Balkan route, as well as the North-European ports (van der Putten et al. 2016).

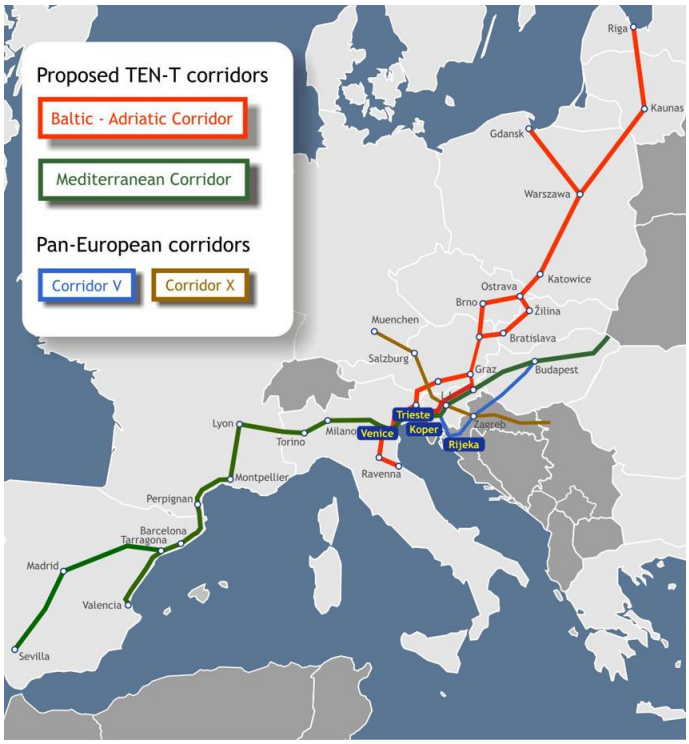


Figure 9: Location and connections of North Adriatic ports
(Source: North Adriatic Ports Association, 2018)

If the Mediterranean ports, North Adriatic ports and Piraeus port, could reach the efficiency and capacity and establish adequate hinterland connections, they would create a serious threat to the North West Continent ports, e.g. Rotterdam, Antwerp, and Hamburg, and could lead to an unprecedented shift in European transport and economy schemes, especially the small countries like Belgium and the Netherlands, whose economies heavily rely on their major ports.

3.2. Competition between Ports in Mediterranean and North West Coast

Among the total containerized seaborne trade from China to Europe, about 30 percent of the volume is to Mediterranean ports and 70 percent to northwestern Europe (Rastogi & Arvis, 2014). As for the China-Europe trade, especially the northern Europe trade, the current shipping route is through the Suez Canal, then in a wide loop through the Mediterranean, the Bay of Biscay and the English Channel to ports in Northwestern Europe, from where they are dispatched by road and rail to inland cities.

Table 1 lists the average transit time on selected routes departing from the Port of Shanghai. Transit time from Shanghai to Mediterranean ports can be up to 10 days shorter than to North West Continent. However, the priority setting of the ports by liner operators have a big impact on the transit time. For example, the

fastest services from Shanghai to Hamburg and to Piraeus provided by MSC both take 29 days (MSC, 2018), while fastest shipment from Shanghai to Piraeus by COSCO only takes 21 days, however 31 days for the fastest carriage from Shanghai to Hamburg (COSCO Shipping, 2018).

Table 1: Transit time on selected routes departing from Shanghai (Source: Big Schedule, 2018)

Port of Origin	Port of Destination	Transit Time (days)
Shanghai	Rotterdam	29
	Hamburg	32
	Genoa	28
	Piraeus	22
	Trieste	28

3.3. Other Projects

Bay of Bengal

The ports in the Bay of Bengal provide an alternative for the current shipping route from the Middle East through the Strait of Malacca to China. Around 80% of Chinese oil imports are from Africa and the Middle East and must pass the Strait of Malacca in the past (Gilmartin, 2008). The Bangladesh–China–India–Myanmar Economic Corridor (BCIM) project (see Figure 2) includes modernizing the ports in the Bay of Bengal and constructing up-to-date railway and pipeline connections to China. If successfully implemented, not only the Strait of Malacca, but also the new Carat Canal in Thailand and other nearby states will be directly impacted especially for trade from and towards South China, and transport patterns in Southeast Asia could be greatly changed.

East Africa

East African nations such as Kenya, Tanzania, and Ethiopia are seemingly the focus for China. But related projects have popped up everywhere from Cameroon to Namibia and Nigeria. A rail line between the Kenyan port of Mombasa and Kenya's landlocked capital Nairobi was completed in late May 2017, and now carries 7,000 passengers per week (Xinhua, 2017). Another newly opened line links land-locked Ethopia's capital Addis Ababa with the port of Djibouti (Xinhua, 2016). Overall, the network connecting Kenya with Ethiopia, South Sudan, Uganda, Democratic Republic of Congo, Rwanda, and Burundi, as well as proving a link between Nairobi and the secondary port of Lamu have been planned.

4. Implications on China-Germany Trade

4.1. Trade Development between China and Germany

Total trade volume

China is Germany's most important trading partner in 2017, with trade value of 188 billion Euro between them (largest among all trading partners of Germany) (Statistisches Bundesamt, 2018). Figure 10 presents the trade volume between China and Germany from 2013 to 2017. It achieved a fivefold increase in the last

15 years. And it can be seen, for most of the past 10 years (except 2015), German export growth rate was higher than import rate, a positive indicator that the trade is getting more balanced.

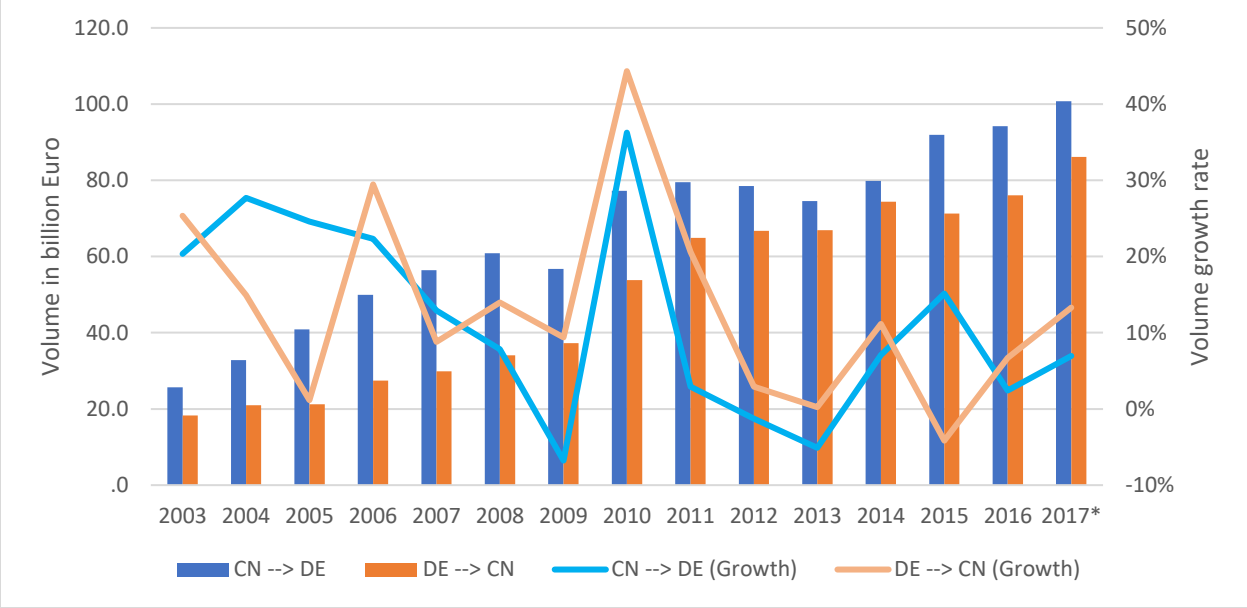


Figure 10: Trade volume between China and Germany (2003-2017)
(Source: Statistisches Bundesamt, 2018)

Trade by sea

Figure 11 shows the container volume carried by sea between China and Germany from 2012 to 2017. The volume has a slight decrease since 2014.

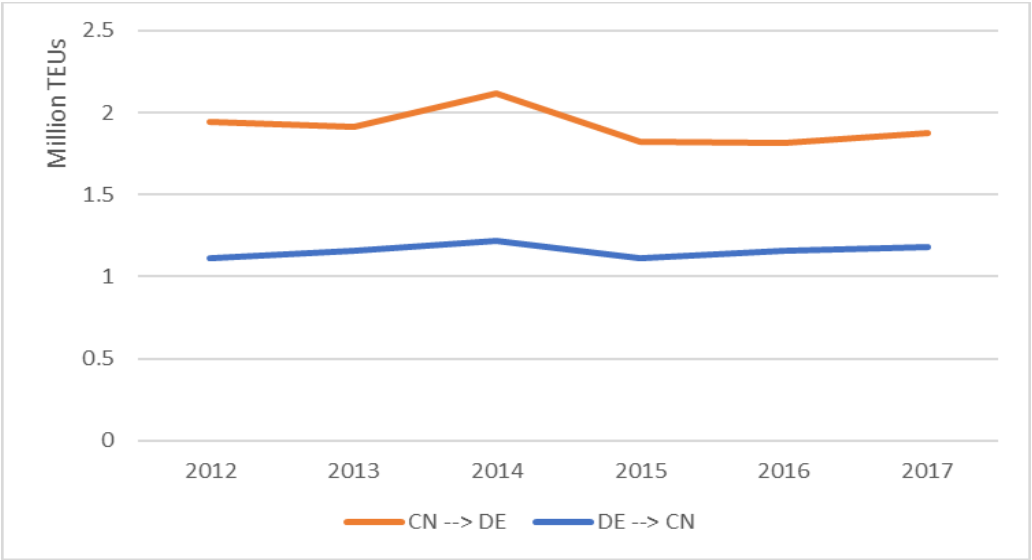


Figure 11: Container flow between China and Germany by sea (2012-2017)
(Source: Statistisches Bundesamt, 2018)

Trade by rail

Based on the data provided by Statistisches Bundesamt from main rail operators' reports, 7,156 TEUs were transported from China to Germany by rail in 2017 (see Figure 12). This number, however, does not include containers transshipped in a third country (other than Germany and China, e.g. Poland), because rail shipments often pass across several borders and are operated by different rail carriers in different countries and therefore might be counted differently depending on the shipping bills.

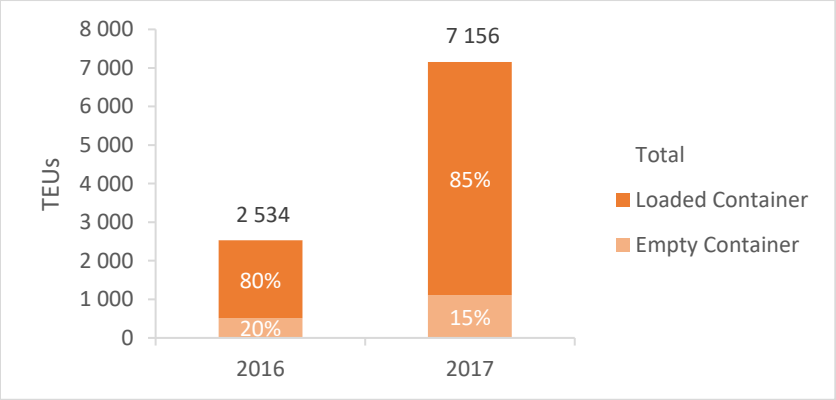


Figure 12: Container flow from China to Germany by rail (2016-2017)
(Source: Statistisches Bundesamt, 2018)

Using the data above, rail freight accounts for less than 1% of the whole trade, as shown in Table 2. Due to the incomplete data as explained above, the real percentage share of rail freight should be higher. Rastogi and Arvis (2014) indicates that container services along Tans-Siberian Railways and Trans-Kazakhstan Railways represent a 3–4 percent share of total container traffic between Europe and Asia.

Table 2: Percentage share of rail and sea shipment (Source: Statistisches Bundesamt, 2018)

Year	2016		2017	
	Volume (TEUs)	Percentage	Volume (TEUs)	Percentage
Rail	2,026	0.11%	6,048	0.32%
Sea	1,815,235	99.89%	1,875,604	99.68%
Total	1,817,261		1,881,652	

4.2. Route Competition

Transportation model comparison

A general comparison between ocean, rail, and air transportation modes for Eurasian link is illustrated in Figure 13. However, depending on many factors, the real cost and time differences between the three modes can be very different.

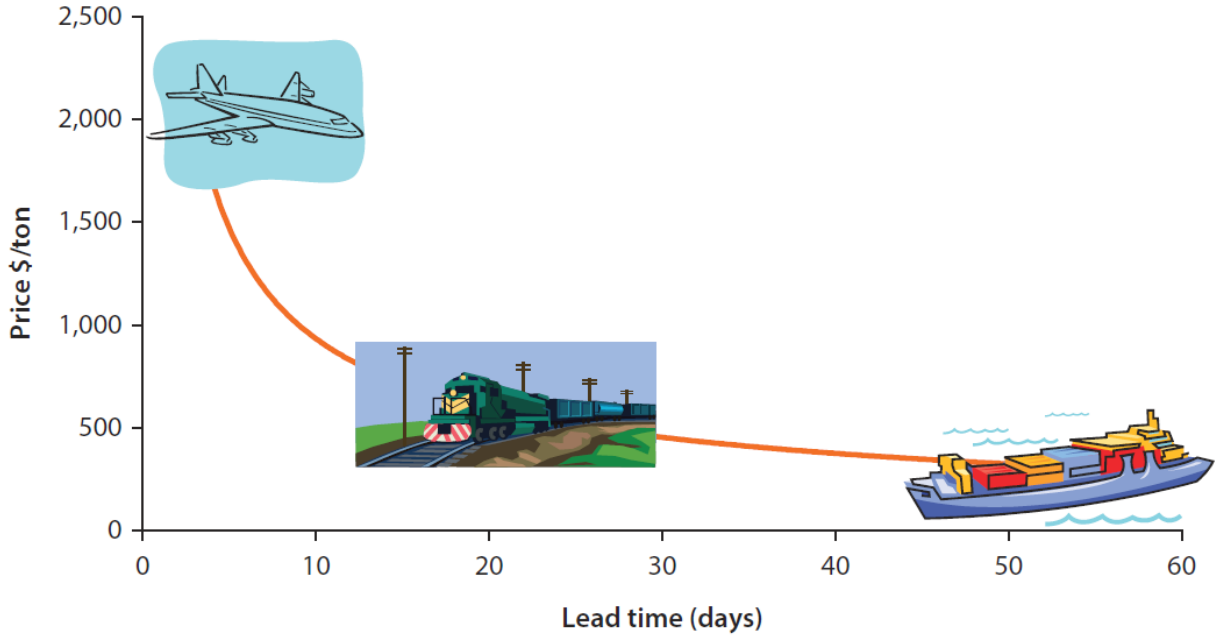


Figure 13: Lead Time and Price of Transportation Services on the Eurasian Link
(Source: Rastogi & Arvis, 2014)

These factors that influence shippers' decision on shipping routes include at least:

(1) Origin locations: e.g. Middle China, or East China?

(2) Destination locations: e.g. North Germany, or South Germany?

(3) Cargo value and interest rate: e.g. how sensitive is the shipper to transit time and inventory cost?

(4) Sensitivity to reliability: e.g. how sensitive is the shipper to the delay or disturbance risk?

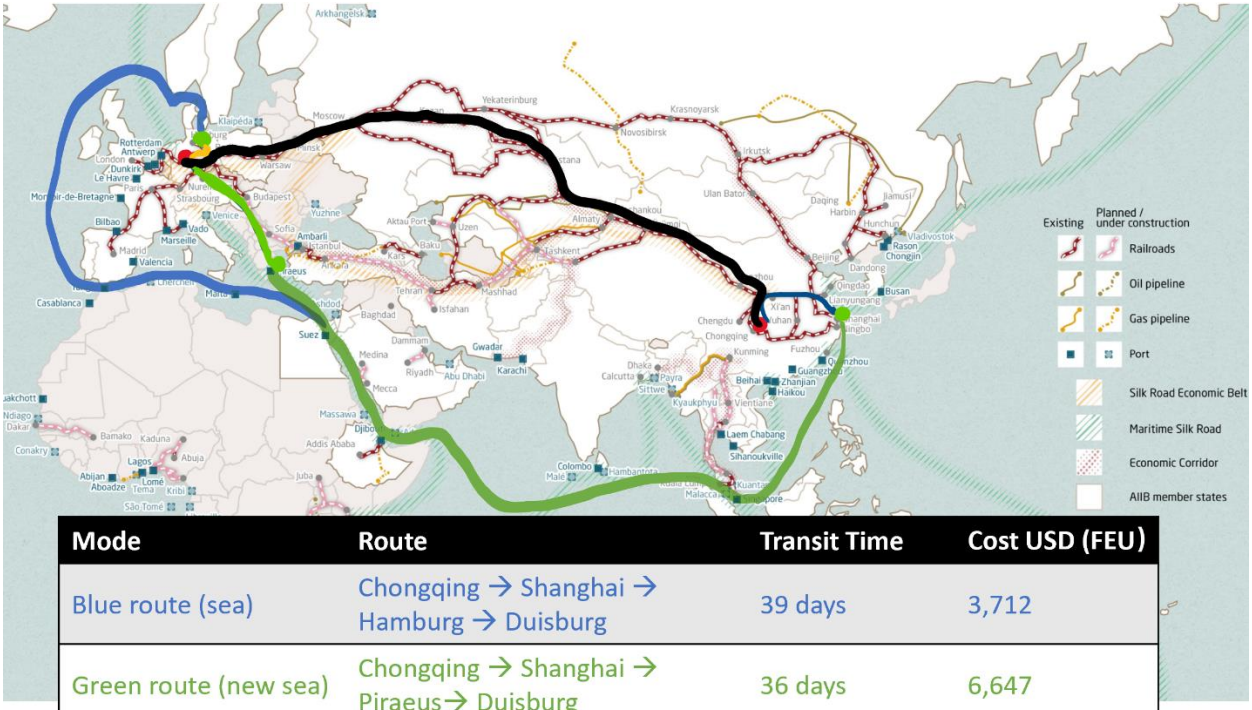
(5) Preference of flexibility: e.g. how much does the shipper prefer more logistics options?

Case study 1: Midwest China to Duisburg

Container transport from Chongqing, China to Duisburg, Germany is chosen as an illustrative example. Different route options are highlighted, transit time and cost of the routes are listed in Figure 14. Transit time by rail is less than half of ocean shipping time, but it's only 17.5% more expensive than ocean freight via shanghai and Hamburg, and even cheaper than transporting via Piraeus. So, rail freight is highly

competitive. However, the rail price is after high subsidy deducted from market price. With the fading subsidies, shippers are more likely to use sea freight to transport the products with lower time-sensitivity.

Comparing two sea routes, the advantage of Port of Piraeus in term of ocean transit time is not presented clearly. Firstly, the destination city (Duisburg) locates much closer to Hamburg than to Piraeus. Besides, the rail connection from Greece to Germany is not yet efficient. Once the high-speed rail connection construction from Piraeus to Budapest is finished, the land transit time will be shorter.

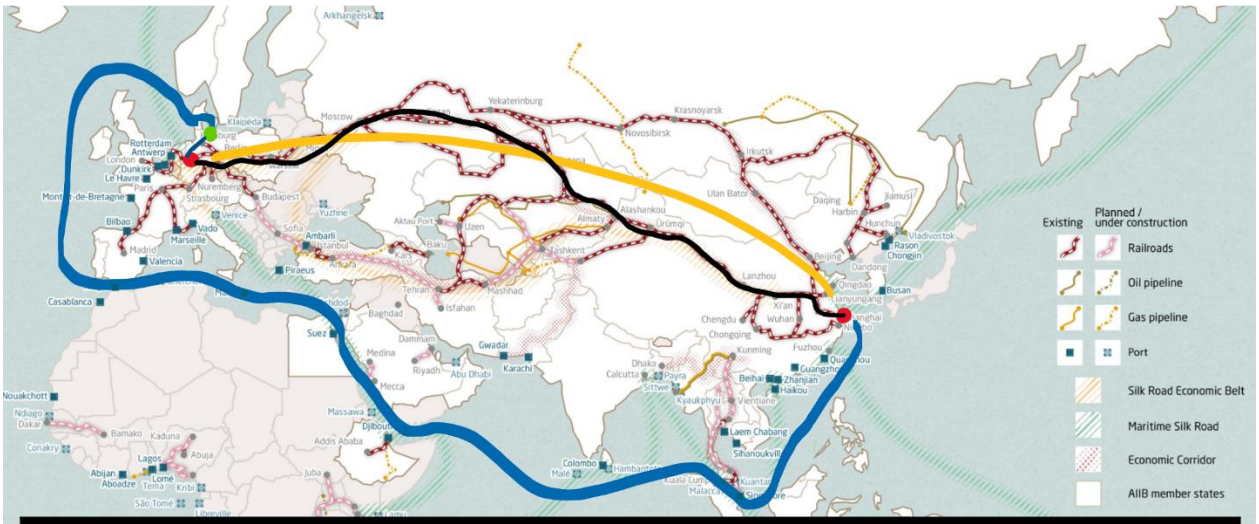


Mode	Route	Transit Time	Cost USD (FEU)
Blue route (sea)	Chongqing → Shanghai → Hamburg → Duisburg	39 days	3,712
Green route (new sea)	Chongqing → Shanghai → Piraeus→ Duisburg	36 days	6,647
Black route (rail)	Chongqing → Duisburg	15 days	4,500

Figure 14: Route competition for container shipment from Chongqing to Duisburg (Source: Own illustration based on multiple sources)

Case study 2: East China to Duisburg

Another example is the container shipment from Shanghai to Duisburg. The route information is illustrated in Figure 15. Sea freight takes about 10 days longer than rail freight, but the transport price is less than half of the rail freight price. Therefore, for the cargos, whose origin locates in East China near main sea ports, ocean transport remains the best option.



Mode	Route	Transit Time	Cost USD (15 tons 60 cbm)
Blue route (sea)	Shanghai → Hamburg → Duisburg	30-35 days	1,700 – 2,900
Black route (rail)	Shanghai → Duisburg	18-19 days	5,000 – 5,600*
Yellow route (air)	Shanghai → Duisburg	3-7 days	27,500 – 29,800

*3000$/FEU subsidiary is deducted from the rail rate (4000/72*60).

Figure 15: Route competition for container shipment from Shanghai to Duisburg
(Source: Own illustration based on Kuehne+Nagel, 2017)

5. Conclusion

OBOR has brought great opportunities for stakeholders involved in the trade between China and Europe, including local manufacturers, international trading companies and logistics service providers. The Eurasian rail freight has been developing rapidly with the large subsidies from Chinese government. However, the huge rail shipment imbalance, congestions and delays caused by infrastructure bottleneck, fading subsidies are the challenges that rail freight industry is facing. With the construction of railway networks (particularly the New Silk Road) and facility improvement, the efficiency and reliability of rail service will be further enhanced. But overall, the new rail connection is a more of an alternative logistic option to the shippers, rather than a direct competition to the ocean shipping industry.

Meanwhile, sea freight network between Europe and Asia is also changing under OBOR. Ports in the Mediterranean (e.g. Piraeus, Genoa, Koper, etc.) have the geographical advantage for Asia-Europe trade and they have received many investments for port facilities modernization, port extension and capacity enhancement. Moreover, the hinterland connection is also being improved. Their competitiveness to northwestern European ports (e.g. Hamburg, Antwerp, Rotterdam, etc.) is raising.

For Germany-China trade, the direct block train service is suitable for time-sensitive products with origins in Midwest China, while ocean freight service remains attractive for low-value cargos originally located on

the Chinese east coast. In terms of the choice between Mediterranean ports and northwestern European ports, it greatly depends on the location of destination: cargos with destination in northern Germany are more likely to be shipped to northern ports. Port of Piraeus will be a more attractive option for German shippers when the high-speed rail service is available.

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