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Possibilities for Dutch export to China via the Silk Road Economic Belt

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Abstract

The goals of this thesis are to determine the possibilities for Dutch export to China via the overland railway connection. The Chinese Belt and Road initiative will change global trade. As the overland railway connection connects China to Europe in a new way, unique possibilities arise. The Netherlands is an important trading partner for China, which is largely due to the position of the Port of Rotterdam. This thesis discusses the new railway connection, which is also referred to as the Silk Economic Road. Firstly an overview of trade between China and the Netherlands is given. After that, the railway network and its bottlenecks, like break of gauge, will be discussed. Rail is compared to the other modalities by costs and reliability. As a new modality is added to the transport mix, new opportunities for the Netherlands will arise. Hereafter the possibilities for Dutch export will be examined, with special respect to the export of agro-foods. The research is being done with a mixture of literature, data and interviews. A rail network extends the possible routes to China, one that is faster than ocean shipping and cheaper than air transportation. It has been found that there new opportunities for the Netherlands arise, especially for the export of agro-foods.

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Introduction

The Chinese Belt and Road initiative was announced by the Chinese leader Xi Jingping during his visit to the Nazarbayev University in Kazakhstan on the 7th of September 2013 (Swaine, 2013). Xi Jingping called for the construction of the Silk Road Economic Belt (SREB), to connect China to Europe via land. A month later during his visit to Indonesia he announced the construction of the 21st century Maritime Silk Road. This part of the Belt and Road initiative (BRI) consists of several (partly) Chinese owned ports along the traditional sea route. An overview of these ports can be found in table 1 in the appendix. In addition to the 21st century Maritime Silk Road, Xi Jingping called for the creation of the Asian Infrastructure Development Bank (AIIB). The role of the AIIB is to finance the infrastructure projects that are necessary for the initiative to succeed.

To organise this gigantic initiative a special leading group has been established, which has been placed under the National Development and Reform Commission (NDRC) (Swaine, 2015). This group published an article titled “Visions and Actions of Jointly Building Silk Road Economic Road and Economic Belt and 21st-Century Maritime Silk Road”, which can be seen as the framework of the initiative. In this framework, the goal of the Belt and Road initiative is stated as jointly creating economic growth (National Development and Reform Commission, 2015)

The countries participating in the BRI amount to more than 60 percent of the world population (Huang, 2016). Furthermore, total investments are estimated to have passed eight trillion dollars (Hurley, J. Morris, S. Portelance, G., 2019). When fully implemented, the BRI can reduce travel times up to twelve percent (Worldbank, 2020**)** and Europe can expect a six percent increase in trade (Herrero & Xu, 2017). Moreover, it is estimated by the Centre for Economics and Business Research (CEBR) (2019) that the BRI will boost global GDP with an more than seven trillion dollar per year by 2040.

As the initiative affects the way the world trades, new possibilities come to light. In this thesis the possibilities and threats for Dutch exports will be assessed. An answer will be given to the following research question:

What are the possibilities for the Dutch exports to benefit from the Silk Road Economic Belt?

To give an adequate answer to this question, several sub-questions have been constructed:

1) What is the current status of trade between the Netherlands and China?
2) What are the strengths and weaknesses of the railway connection?
3) Which goods are suited for the export via train to China?

In order to answer the research questions and sub questions a combination of literature and data will be used. Moreover, a total of six interviews have been conducted with professionals in the transport field, specifically railway exports. The interviews can be split up into three different categories. Two interviews have been conducted with individuals working for a logistics provider. By doing this, an overview of the railway network could be given. Another two have been conducted with companies that export to China, to find out why they choose a certain modality and the possibilities these companies see in the BRI. The last two interviews have been with an information platform, railcargo.nl and a researcher from Panteia. To answer the first question, literature and data is used to give a precise overview of trade between the Netherlands and China. The second sub-question will be answered with a combination of literature and interviews, with professionals in the transportation business. The third and last sub-question will be assessed with literature and interviews, with employees working for a company that exports to China.

This rest of this thesis is built up in the following way. In the first chapter the trade between China and the Netherlands is discussed. An overview of trade and the modal split is given. In this chapter the first sub-question will be answered. In the second chapter the railway network will be assessed. The strengths and weaknesses of the network will be discussed, to answer the second sub question. The third chapter will specifically focus on products that are suitable for transportation via the railway network. thereafter, in the fourth chapter the personal opinion of the author is given. In the last chapter a conclusion is drawn, wherein an answer to the research question is given.

Chapter one: The Netherlands & China trade

The Netherlands and China have had a long history of trade. During the eighteenth century the Dutch East India Company (VOC) set up a trading post in China (Van Campen & Mostert, 2015). The VOC imported Chinese made silk, tea and porcelain to the Netherlands. Trade has changed a lot since that time and now gigantic containerships depart from China to Europe (CBS, 2020a). Moreover, trade between China and the Netherlands has increased significantly since the eighteenth century. Trade happens due to comparative advantage. Comparative advantage means that a certain country can produce goods more efficiently than it can be produced domestically. This means that it is cheaper to import it from a foreign country than produce it yourself.

The Netherlands is one of the largest trading partners of China. Hence, the Netherlands plays an important role for Chinese exports. When taken a look at total Dutch imports, China ranks third, after Germany and Belgium. The share of imports from China have risen significantly, from 0.5 percent in 1988 to 8.9 percent of total imports in 2018 (CBS, 2020a). Moreover, the importance of the Netherlands can be seen by the fact that the Netherlands ranks eight as most important export destination for China.

Before a closer look is taken at trade between China and the Netherlands, it is important to clarify that exports can be split up into three different categories. Firstly, products that have been made for the importing countryies consumers and companies. So these are exported for the foreign market. Secondly, there are re-exports and transit goods. The difference between the two being that re-exports are under domestic ownership while transit goods are not. Transit goods only pass through a respective country, while it is not under the ownership of the country. The first two categories are the most important, as the importing country really imports these goods, so a focus will be laid on exports for the foreign market and re-exports.

As mentioned before, China is the third largest exporter to the Netherlands, China exported €79 billion to the Netherlands during 2019. These exports can be split up in the three aforementioned categories. Only 17.72 percent are goods that are meant for the Dutch market, which have a value of approximately €14 billion. Almost half of the total, €36 billion, are transit goods. These goods are imported by foreign countries and the Netherlands is only used as passage. The last €29 billion is exported after a short Dutch ownership. So, less than 20 percent of the imports from China are used for the Dutch market. The remaining two thirds is transported to the Dutch hinterland. Total imports, imports for the market and re-exports, done by the Netherlands are €43 billion. In 2001 this number was only €8.8 billion. So, in the last 18 years, import value has risen with 388.64 percent. The most important

import products can be seen in table 1. Here it can be seen that more than 50 percent of Dutch imports come from electronical appliances and machines. These are mostly consumer goods like smartphones and household appliances.

Table 1: Top ten Dutch import and exports products in million euros from China during 2019. *Source: CBS (2020a).*

Dutch export to China				**Dutch imports from China**		
Product	**Value**	**Percentage**		**Product**	**Value**	**Percentage**
Machinery	2603	26.0		Electronical appliances	21	31.7
Preparation of grains, flour, Milk, cake and starch	1536	15.3		Machinery	18	27.3
Optical instruments	963	9.6		Toys and games	3	4.5
Plastics	611	6.1		Furniture	2.4	3.7
Meat and meat preparations	547	5.5		Organic chemical products	2	3.0
Electronical appliances	483	4.8		Clothing, not knitted or crocheted	1.5	2.3
Pharmaceutical products	418	4.2		Plastics	1.5	2.2
Mineral fuels	335	3.3		Clothing, knitted or crocheted	1.4	2.1
Automobiles, tractors, bicycles and motorcycles	325	3.3		Products made from cast iron, iron and steel	1.2	1.7
Organic chemical products	264	2.6		Automobiles, tractors, bicycles and motorcycles	1.1	1.7

Dutch export is centred around Europe, where 71 percent of total exports went during 2018. However, this percentage has been decreasing and trade outside of Europe is increasing. This can be seen by the rise of exports to China. Dutch exports to China has risen from 1.5 percent in 2010 to 2.5 percent in 2018 of total exports (CBS, 2020a). This amounts to a total value of 12.8 billion, which places the Netherlands as the 35th exporter to China, and amounts to 0.5 percent of China's total imports. In table one it can be seen that machinery, agro-foods and optical instruments make up 50 percent of the Dutch exports. Especially high tech exports, which can be machinery as well as optical instruments, are higher when compared to the rest of the world. High tech consist of twelve percent of the exports as opposed to seven percent to the rest of the world (CBS, 2020a). These products are usually complete, or part of, large machines. An example would be the machines ASML produces, which are used in the production of microchips. However, due to the trade dispute between the United States and China, these goods are not allowed to be exported to China.

However, total export value to a country does not equal the amount of money that a country earns due to export. During 2016 the Netherlands earned 11,5 billion from the exports to China. 6 billion in direct exports and 5,5 billion in indirect exports. With direct exports the goods go directly from the Netherlands to China. These are mostly finished products meant for the importing country's market. Indirect exports are goods that are first exported as intermediate goods to another country, and then transported to China. It is striking that indirect exports and direct exports are close together, as there normally is a large difference between the two. The largest share of these earnings came from Dutch produced goods. The reason that the Netherlands earns so much from its exports is due to the fact that the products exported are all high value products, with a high profit margin.

In table 2 the modal split for Dutch imports and exports can be seen. The data has been split up in total transport, which are the three aforementioned categories combined. Total export/import, which is the sum of cargo for the domestic country and re-exports. Lastly, the export/import of domestic products is given. It should be noted that the only data available were from China, Mongolia and Taiwan combined. As the trade between the Netherlands and Taiwan or Mongolia is really low, this data could be used to display the trade between China and the Netherlands. To make the data somewhat more representative for only China, the three GDP's of the countries have been combined. China's GDP over 2019 was 14342 billion US dollars. For Mongolia the GDP was 13.85 billion and Taiwan's GDP was 605 billion (Tradingeconomics, 2020). So the combined GDP of the three countries is 14960.85 billion. China's share in total GDP of the three countries combined is 95.86 percent. The data was multiplied by 0.9586 to get an accurate estimation of trade with China only. In table 3 in the appendix, the complete table can be found.

In table 2 it can be seen that more than 50 percent of the Dutch outgoing transport is done via ocean shipping. Furthermore, almost one third of the total is shipped via air transportation. This only leaves a small portion for inland, truck and rail shipping, largely due to the distance to China. For exports of Dutch produced goods it can be noticed that the share of rail transportation is higher when compared to total export and total transportation. Meaning, that Dutch produced goods are shipped with rail more often. Moreover, the share of rail has been growing in the last years. Since the start of the BRI in 2013 the share of rail in total outgoing transportation has risen from 0,19 percent to 2,83 percent in 2018. For Dutch produced goods, this share has risen even more, from 0,38 percent in 2013 to 6,09 percent in 2018. Moreover it can be noticed that the share of air and sea transportation are diminishing. This is largely due to companies exploring alternative modalities. In addition to rail, the share of road transportation to China has also risen.

Table 2a: Incoming transport and domestic import in million euros. Percentage of total is given between brackets () Source: CBS Statline.

Incoming transport									
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Deepsea	53238,9	75222,0	67448,9	51720,2	62239,9	96947,9	92792,2	103564,9	76670,4
	(69,94)	(76,57)	(76,62)	(68,02)	(69,75)	(79,20)	(79,83)	(78,63)	(70,79)
Rail	978,1	1130,1	6177,8	413,8	1152,3	388,6	603,1	1102,0	565,8
	(1,28)	(1,21)	(7,02)	(0,54)	(1,29)	(0,32)	(0,52)	(0,84)	(0,52)
Air	8406,9	7896.4	6177,8	11130,1	18302,5	7988,9	5851,4	7903,7	11974,3
	(11,04)	(8,04)	(7,02)	(14,64)	(20,51)	(6,53)	(5,03)	(6,0)	(11,06)
Import for Dutch market									
Deepsea	7454,8	7708,3	7765,6	8290,3	9924,0	11453,5	10793,9	12160,2	13864,6
	(61,08)	(63,21)	(60,80)	(58,30)	(58,40)	(67,77)	(41,79)	(63,61)	(62,96)
Rail	668,4	518,7	1142,4	276,2	1207,5	34,3	97,0	381,4	178,8
	(5,48)	(4,25)	(15,04)	(1,94)	(7,11)	(0,20)	(0,38)	(2,00)	(0,81)
Air	1994,6	2019,6	2060,0	2777,5	3539,7	3503,6	12914,7	3962,7	3840,0
	(16,34)	(16,56)	(16,13)	(19,53)	(20,83)	(20,73)	(50,00)	(20,73)	(17,44)

Table 2b: Outgoing transport and domestic export in million euros. Percentage of total is given between brackets (). Source: CBS Statline.

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Outgoing transport									
Deepsea	13862 (52,46)	22303,6 (61,75)	21574,8 (65,81)	18405 (56,3)	19822,7 (58,67)	27088,3 (59,35)	26694,5 (63,87)	31471,5 (58,92)	22311 (56,50)
Rail	30,5 (0,12)	97,5 (0,27)	12,6 (0,04)	60,7 (0,19)	50,5 (0,15)	52,5 (0,11)	632,1 (1,51)	1520,6 (2,85)	1117 (2,83)
Air	9210,2 (34,85)	11321,6 (31,35)	10279,7 (31,36)	13464,3 (41,19)	13147,2 (38,91)	14784,6 (32,39)	13069,5 (31,27)	12906,3 (24,19)	14375,6 (36,4)
Export Dutch produced goods									
Deepsea	3279,5 (52,69)	4500,7 (58,37)	6022,6 (65,52)	5857,5 (58,04)	6462,9 (66,98)	7126,4 (65,19)	6136,4 (54,03)	7347,6 (56,61)	9579,2 (73,21)
Rail	18,2 (0,29)	60,7 (0,79)	4,2 (0,05)	38,4 (0,38)	25,3 (0,26)	30,7 (0,28)	397,0 (3,50)	1129,2 (8,70)	797,0 (6,09)
Air	2535,5 (40,73)	2799,2 (36,30)	2804,3 (30,51)	3847,2 (38,12)	2673,4 (27,71)	1466,6 (13,41)	4068,4 (35,82	705,4 (5,44)	2134,4 (16,31)

Furthermore in table 2 it can be seen that ocean is used more intensively for incoming transport than for outgoing transport. This means that a larger share of the imported products come via deepsea transportation compared to outgoing transport. A possible reason for this is that part of the outgoing transport are indirect exports, that are first transported to another country before they are transported to China. Another reason is that a lot of these goods are transported further to the hinterland. When a look is taken at the same numbers for Dutch goods, it is noticed that these shares are closer together. This is largely due to a lower share of ocean transportation used for import of products for the Dutch market. This gives prove to the above mentioned reason of goods transported to the hinterland.

When we take a look at the earnings from Chinese export to the Netherlands something striking can be noticed. China earned 11.9 billion from their exports, which can be split up into 9 billion direct exports and indirect exports were 3 billion. Direct exports are finished products that are exported to a certain country, where it will be consumed. Indirect exports are intermediate products, which are exported. In the country where these intermediate goods are exported to, the product is finished and exported again. This ratio has been roughly the same for the last years. So to conclude, the Netherlands and China earn roughly the same amount from their exports, while China exports almost four times the Dutch value.

During 2019 the following products were the largest growing export products from the Netherlands to China (CBS, 2020c). These products show us in which direction trade with China is developing. An overview of these products with its respective growth value during 2019 can be found in table 3.

Table 3: Growth, in million euros, from the five largest growing exports from the Netherlands to China during 2019. Source: CBS (2020a) & CBS (2020c)

Product	**Growth**	**Exportvalue 2019**
Meat, especially pork meat	439	547
Scientific instruments	389	963
Pharmaceutical products	199	418
Baby milk powder	99	**XXXX**
Electronical appliances	92	483

These aforementioned products can be placed in a more broader category. Firstly, agro-foods, which include meat and baby milk powder. Agro-foods is a collective name for everything regarding food. As the Netherlands is the second largest exporter of agro-foods, this opens up a new possibility for the export of these goods. During 2019 Dutch export of agro-foods to China rose with 538 million euros (Dutch Government, 2020). This was all due to the aforementioned pork and baby milk, of which the growth can be seen in table 3. It should be mentioned that the rise in demand for pork is due to an external shock, namely the outbreak of the African swine fever, which killed a third a China's pig population (He, L. 2020). These goods have to be transported under certain conditions, in particular being cooled. Which is a possibility via rail as the train supports reefer containers (Panteia, 2018). Secondly, scientific instruments and electronical appliances can be categorized as high value goods. These high value goods are usually transported via air, which is rather expensive. Lastly we have the pharmaceutical problems which are not completely part of one of the abovementioned groups. They are relatively high value and benefit from a short transit time. In table 2 the high value goods can also be noticed. The share of air transportation is higher for export of Dutch product. This means that a significant larger part of total export is transported via air. As air transportation is the most expensive modality, only cargo above a certain value will be transported via air.

So in conclusion, trade between China and the Netherlands is not in balance. The Netherlands only exported €12 billion during 2019 while Chinese exports were €79 billion. The largest growing export products from the Netherlands are all suited for transportation via the railway network.

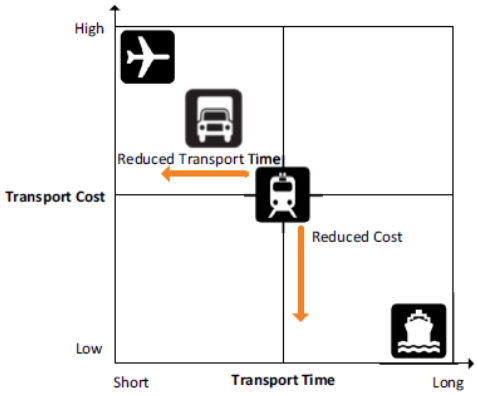
Chapter two: Rail network explanation

China wants to ensure a reliable trade route westwards. Before the initiative the only way to transport goods from China to Europe was by ship, which takes a long time, and via air transportation, which is extremely expensive. Around 99 percent of the cargo transported from China to Europe is done via ocean shipping (Rodemann & Templar, 2014). China is the largest exporter of goods worldwide (CBS, 2020a). Moreover, these enormous volumes have caused to overload the Chinese Ports. As a result it takes a longer time to handle the cargo from ship to further transhipment. As said by Wensink (INT3) cargo has to wait one or two weeks before it is transported further. This further increases the transport time via ocean shipping. To offer reliable shipping, the ships have to rely on other factors. Firstly, the passage through the Suez canal. The Suez canal offers a passage from the Indian Ocean to the Mediterranean Sea. This saves around 20% of shipping time compared to travelling around the Cape of Good Hope. The usage of the Suez Canal is dependent on fuel prices, as fuel is being saved by sailing through the canal. As the passage through the Suez Canal costs money, it makes sense to sail around the Cape of Good Hope if fuel prices are low enough, as was the case during the Covid-19 pandemic. However, to make use of the Suez Canal, China has to rely on external factors. Moreover, due to the improving economy of China, production plants are forced to locate more inland (Sonobe, T., Hu, D. & Otsuka, K. 2006). These larger distances to the port meant higher trucking costs, hence a new alternative was sought. In addition to the larger distance, the infrastructure in western China is less developed, which further increases the travel time. Transportation via air, to and from China, has also reached its maximum capacity (INT3& INT4). Hence, to maintain and increase their global trade, China was keen on opening up new trade routes. So, they constructed an overland connection via rail.

Railway transport has two significant advantages over ocean shipping. Firstly, the shipping time is way shorter compared to ocean shipping. Goods transported from China to Europe via ocean usually take up 40 to 45 days (Panteia, 2018 & INT1). When these goods are transported via the railway network, transport times decrease to sixteen to eighteen days. So, railway shipping saves almost three weeks of shipping time. Moreover, as the train terminals are of a smaller scale then the ports, cargo is serviced faster at the terminals, which decreases the chance of unexpected delays (INT4 & DB Schenker, 2019). According to Groot Wesselink (INT1) these transport times can decrease to a mere twelve days in the near future. Semeijn (1995) said that reliability and transit time rank above costs when a transport decision is being made. Furthermore, more trains than ships leave to China weekly, which offers a more reliable and flexible option. However, as the train passes through several countries, several external factors, like a blockage or a conflict between

countries can limit the reliability. When rail is compared to the other modalities, it can be placed in the middle, with a fast transport time and relatively low cost, which can be seen in figure 1. Furthermore, railway transport has a significant lower carbon footprint. Research from Arviem (2017) concluded that the Economic Silk Road will save 75% of the carbon dioxide emissions of the ocean route. In conclusion, rail offers relatively fast transport time, for a reasonably price, while also being better for the environment.

Figure 1**.** Modalities ranked by cost and time. Source: Rodemann & Templar, 2014)



A disadvantage of rail are the transport costs. To get a container from China to Europe, the cost will be 2 to 3 times as expensive when compared to deepsea shipping *(*INT 6). This difference will become smaller, when you take into account that railway terminals are usually closer to their final destination. Due to the terminal being closer to the destination, trucking costs decrease. Normally, when the goods arrive in the port they have to be trucked to their final destination. As China is a gigantic country, up to two thousand kilometres could be saved (INT6). Furthermore, as mentioned before cargo has to wait a longer time in the Chinese ports before being transported to the final destination, which further increases the cost. As most companies use cost and reliability as their main transport choice factors, the choice for ocean shipping is made. To solve this problem, the Chinese government offers subsidies for the transport to China. These subsidies amount up to 60% of the total costs. Hence, the cost of railway shipping is almost the same cost of ocean shipping (INT3). However, the Chinese government is lowering these subsidies, which will result in a change of customers (INT1). However, it is not expected that these subsidies will disappear altogether, which is largely due to the fact that the New Economic Silk road is not as mature as the other modalities. Moreover, the costs of the railway have diminished due to efficiency effects. Groot Wesselink from Nunner Logistics (INT1) stated that when they started with rail transport to China in 2013 the costs were twelve thousand dollar per container and have decreased to four thousand dollar nowadays. This roughly equals the costs of shipping a

container via ocean shipping. The cost reduction is partly due to efficiency gains and partly to the subsidies.

However, capital costs should also be taken into account. These costs increase with time, due to the money lost that could have been earned had it arrived sooner. For high value goods these costs are high, thus a faster transportation time is preferred. To demonstrate that certain modalities carry high value goods, the data from 2016-2018 from table 2 have been divided by the weight of the goods. This gives an indication of the value per ton cargo. These values can be seen in table 4.

Table 4a: Price in thousand euros for a ton of cargo split by the modalities for cargo. Source: CBS Statline

	2016	2017	2018
		Incoming transport	
Deepsea	5.61	5.66	4.51
Inland	5.88	4.07	2.37
Truck	10.27	10.11	15.60
Rail	17.21	9.24	6.01
Air	25.22	31.49	52.71
		Import for Dutch market	
Deepsea	2.44	2.41	2.68
Inland	3.91	4.07	4.01
Truck	4.12	4.03	4.42
Rail	13.40	14.14	21.39
Air	105.71	39.61	61.88

Table 4b: Price in thousand euros for a ton of cargo split by the modalities. Source: CBS Statline

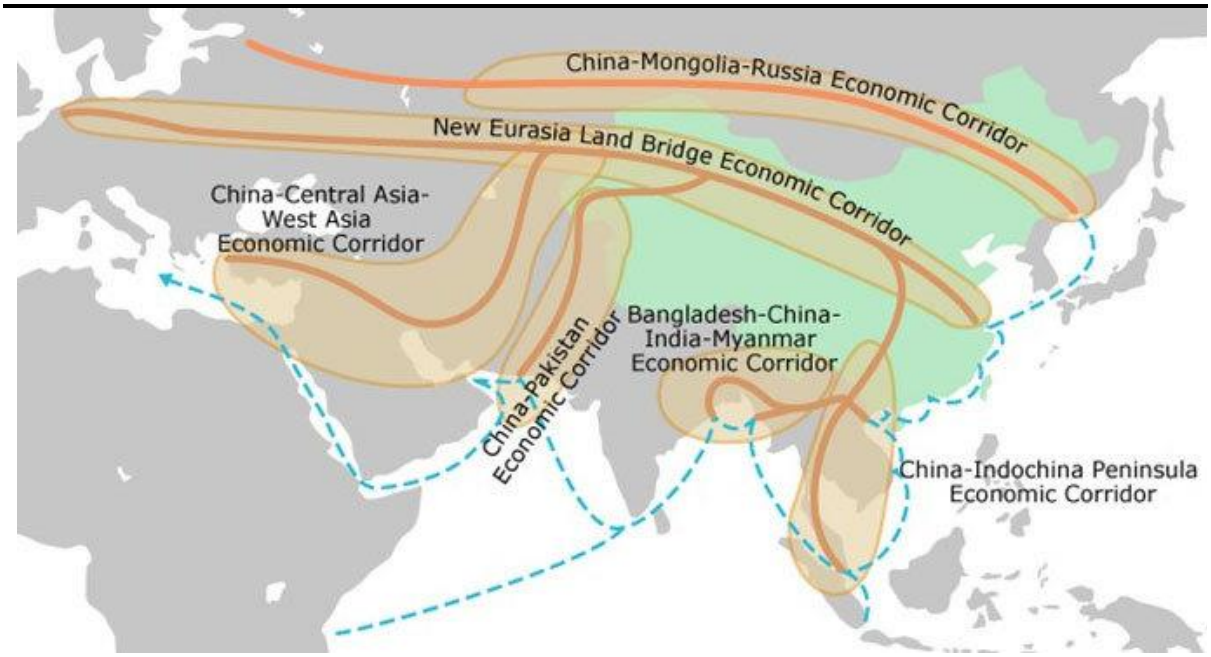
	2016	2017	2018
		Outgoing transport	
Deepsea	1.87	2.18	1.93
Inland	0.73	9.01	0.70
Truck	5.56	29.86	10.11
Rail	5.84	9.08	3.43
Air	68.88	66.64	74.89
		Export Dutch produced goods	
Deepsea	0.88	0.92	2.15
Inland	0.67	8.08	0.67
Truck	4.33	22.98	9.59
Rail	4.74	11.93	3.73
Air	94.49	27.42	69.06

In table 4 it can be seen that for each three years the value of the goods transported via air transportation is the highest. This is in line with the aforementioned fact that most high value goods are transported via air. Furthermore, goods transported via road are also of high value, but vary a lot through the years. A possible reason for this is that companies want to

ensure reliable shipping to China, but does not want to pay the high transportation costs for air transportation. Moreover, value per ton for rail transportation has been diminishing. This indicates that rail also becomes a viable option for medium value goods, thus attracting more customers. When rail is compared to ocean shipping, it can be noticed that the value of the goods is roughly three to four times higher for cargo transported via rail.

The railway network should connect China to Europe via a land connection. The reason for this is that China wants to expand its possible trade routes. The train route follows a certain economic corridor, these can be seen in figure 2.

Figure 2: Overview of the six economic corridors. Source: HKDTC (2017)

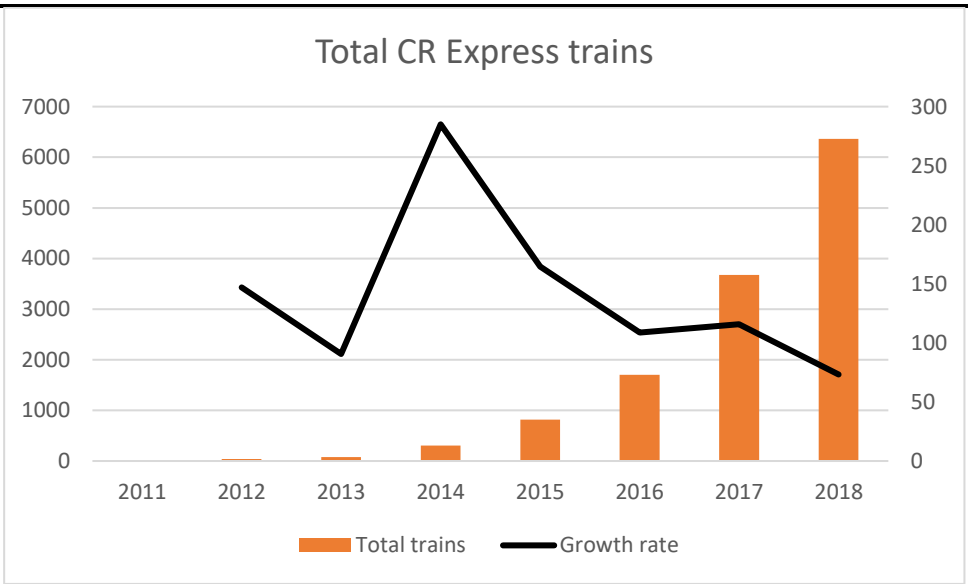


The corridors that are of importance for Dutch Export are the China-Mongolia-Russia Economic Corridor, the New Eurasia Land Bridge Economic Corridor and the China-Central Asia-West Asia Economic Corridor. As confirmed by all six interviewees, The New Eurasia Land Bridge Economic Corridor is by far the most important one as around 90% of total Dutch export volume is transported via this route. This railway connection runs from China through Kazakhstan, Russia, Belarus, Poland and Germany. Moreover, the importance of the corridor can be seen in table 2 in the appendix, as all lines that have been found use the New Eurasian Land Bridge.

The trains along Silk Road Economic Belt are dispatched by local city operators, which together form the China Railway Express, a state owned enterprise. An overview of the operators and lines can be found in table 2 in the appendix. Since the first train in 2013 more

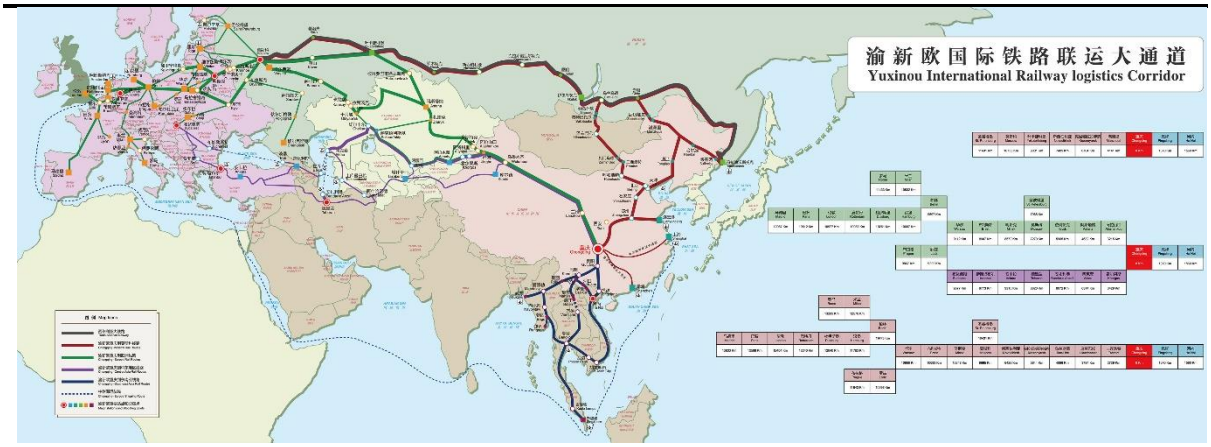
than 17000 trains have used the network. Total trains dispatched and growth rate can be seen in figure 3**.** However, the train in 2013 was the first one under Chinese authority. The idea of a the railway connection that is now used in the BRI started after the financial crisis in 2008. DBschenker, together with their customer Hewlett Packard started with experimenting a connection between the factory of HP in Chongqing to Duisburg. After some tests, the first trains were operated in 2011, with the final destination being Venray (INT6). Nowadays, total volume transported via rail roughly equals to eighteen fully loaded container vessels, which roughly equals 306,000 TEU (INT6). This number is not expected to rise in 2019 as China Railway focusses on quality instead of quantity (DB Schenker, 2019). These local operators make all decisions regarding railway transport, to maintain control over the railway network. They work together with the national railways in the respective countries that the train travels through (INT3). Furthermore, they also determine the route, so what will be the endpoint of a certain line. Due to the different cities operating the trains, there is a lack of regional coordination (Wagener, N., Aritue, B. & Zhu, T. 2019). Moreover, the local city operators compete with each other over the lines. So, these local operators make sure that the trains are able to travel along the route. In addition to the collaboration with the national railways they also work together with commercial parties. These parties will ensure that the goods are transported from the railway terminals to the final destination of the customer. Due to the fact that China maintains control over the route, they can ensure their trade routes to Europe.

Figure 3. Total trains dispatched and the growth rate. Source: Belt and Road Portal, 2019



China Railway Express has built connections between 62 Chinese cities with 53 European cities spread over 16 different countries (Belt and Road Portal, 2019) A closer look at the routes and connections can be seen in figure 4. One of the lines that has been constructed is the YiXinOu line. This line is over 13000 kilometres long and runs from Yiwu through eight countries to the Spanish capital of Madrid. So, as can be seen in figure 3 the New Economic Silk Road connects China with almost the whole of Europe. Moreover, as the railway connections in Europe have been developed, goods can be transported from the endpoints of the railway towards other countries.

Figure 4: A closer look at the routes that run between China and Europe. Source: ichongqing.info, 2019



As said by three out of the six interviewees, the Netherlands has missed the opportunity to become the European hub for the BRI. This can be seen by the fact that only four trains to and from China are serviced in the Netherland every week. In Duisburg around 35 to 40 trains are serviced weekly (HSBC, 2019). Moreover, no investment larger than 100 million has been made in the Netherlands with regard to the Belt and Road initiative (CBS, 2020a). The European gateway has become Duisburg, where the largest inland port of Europe, Duisport is located (Duisport, 2020). Angela Merkel, the chancellor of Germany, did notice the opportunities the Economic Silk Road had and went to China in 2013 to lobby for Duisburg, this has worked as everyone wants to go to Duisburg (INT1). Moreover, almost 90 percent of the volume with respect to western Europe via the Economic Silk Road is handled in Duisburg, which confirms its position within the network.

However, this does not mean that the Netherlands cannot benefit from the BRI. The Netherlands has an outstanding railway connection to Duisburg and due to this it is possible to offer direct services to China via rail. Furthermore, Duisburg is only located 200 kilometres

from Rotterdam, hence trucking cargo to Duisburg is a viable option. The only Dutch city that offers regular and reliable services to China is Tilburg, which has a direct connection to Chengdu (INT3). In the near future, a new direct connection from Venlo to Chongqing will be operated (INT1). Furthermore, Nunner logistics, a logistics operator that specializes in railway transport offers direct railway connections, via Duisburg to multiple Chinese cities (INT1).

From the above it can be concluded that the importance of inland terminals is growing. Inland terminals are terminals that are not located next to the ocean, so they do not serve the gigantic ocean vessels. Inland terminals are used as a distribution centre were the goods are sorted instead of in the main port. An example of an inland terminal is the railway terminal in Tilburg, where the cargo can be loaded unto the train and transported to China. This cargo can come from producers, who ship their cargo to Tilburg, or from incoming cargo from the port of Rotterdam. This cargo is unloaded from a vessel and immediately transported to Tilburg. In Tilburg the cargo is sorted and placed on the correct train.

Along the route there are several bottlenecks that limit the speed and reliability of the connection, which are the most important factors of the transport choice. All six interviewees confirmed that most bottlenecks are located on the European side of the network. Break of gauge is a bottleneck that severely limits the reliability. Break of gauge means that the trackwidth differs between countries. In China and Europe the track width is the same, however the Russian track width differs. Due to this, the cargo has to be transhipped several times. According to Otsuka (2001) one transhipment can cause a delay up to five hours. Break of gauge takes place at the Polish-Belarusian border, usually in Malaszewicze or Brest and at the Kazakh-Chinese border, in Alashankou or Khorgos. Largely due to the break of gauge, the terminal in Malaszewicze is overloaded (INT1, INT2, INT4, INT5 & INT6). These overloaded terminals cause unexpected delays to the trains. Hence, the transportation is seen as not reliable which limits the users. Furthermore, as reliability is the most important choice for a certain modality, unexpected delays weaken the position of rail in the modality choice. Secondly, the legal train lengths differ along the route. In China the trains can carry a maximum of 68 wagons while in Europe this length is limited to only 41 wagons (Panteia, 2018, INT2, INT3, INT4 & INT6) Therefore, trains coming from China have to be split up, 41 from the 68 wagons can continue their journey, while the other 27 have to wait for the next train. As a result, a container can face some unexpected delays, which is undesirable.

Research by Bas Reijnders (2017) has shown that the most important selection factor is the timing of the transport. Timing can be classified as the combination of transit-time, reliability

and frequency (Reijnders, 2017). With respect to transit-time and frequency rail performs better than ocean shipping. More than 30 trains are serviced weekly within Europe, compared to ten to fifteen ships leaving from Europe. This means that the frequency of rail transport is higher when compared to ocean shipping. Moreover, the transit-time of rail is around half of the ocean shipping time. Lastly, the reliability of the rail transport is lower than that of ocean shipping. The reason for this is that the railway connection is relatively new and does not have the maturity of ocean shipping. However, the unexpected delays in Chinese ports decrease the reliability of ocean shipping. The reliability of the railway can only rise when it will be used more intensively. However, it should be noted that there is a certain threshold above which extra trains will cause congestion and dimmish the reliability.

In conclusion, the railway connection connects China to Europe via various lines. These lines are overseen by the local authorities which limits efficiency. The transit time of rail is much lower when compared to ocean shipping. It is better for the environment as well. The New Eurasian Land Bridge is the most intensively used corridor for transportation of cargo to and from western Europe. Several bottlenecks, like break of gauge and the costs, limit the efficient use of the network. For the Netherlands, Duisburg has become important as a loading point for cargo destinated for China.

Chapter three: Opportunities for the Netherlands

The goods shipped by the growing export sectors mentioned before are all of relatively high value. Hence, it makes railway transport a viable option. Rail transport will be a viable option for companies if the time being saved weighs larger than costs being saved due to a cheaper transportation network. This is due to the capital costs of products.

As said before, due to the increasing welfare in especially eastern China, production plants are pushed further land inwards. This is also supported by the Chinese Go-West strategy, to increase welfare in inland China. Therefore transport costs will increase since cargo has to be transported further, if transported by the eastern ports. Moreover, this will further increase the transport time. As railway terminals are closer to these new production areas, rail will offer an alternative. The containers don't have to be transported over a large distance to the final destination. Furthermore, the Chinese ports have reached maximum capacity and as a result containers are not serviced efficiently in these ports. Containers have to wait for up to two weeks until they are transported to their final destination. This seems like a long time, however it was confirmed in two interviews (INT 3 & INT 6). Whereas train terminals are of a smaller scale, so the cargo is processed much faster.

A large opportunity comes with the loosening of the Russian import embargo. As a reaction to western sanctions, Russia prohibited the import of certain European goods. The sector that was hit the hardest was the agro-food sector. However, these restrictions are being loosened. Russia has decided that goods that are prohibited to import are now able to pass through Russia territory, under strict conditions. These goods have to travel with a track and trace system that works on the Russian satellite navigation system GLONASS (INT3 & INT6). These sanctions have been loosened recently and tests are being run, to ensure the reliable transport of these goods (INT1). As there is Chinese demand for these products, the loosing of the embargo brings a large opportunity for the Netherlands.

Furthermore, as mentioned before, the growing Dutch export products are all relatively high value goods. For high value goods a faster shipment time is preferred. This is due to the future value of money. Every day that the goods are transported, the company that ships these goods loses money. Most of these goods are transported via air which is rather expensive. When these goods are transported via rail, transport costs drop. However, the longer transport time also costs more money due to the time value. But, the savings in capital costs outweigh the increased transportation cost. So, as the Dutch export to China is primarily focused around these products, the New Economic Silk Road offers great possibilities.

Moreover, there are large companies that transport large volumes of cargo around the world. Which can be broken up into emergency, priority and routine cargo. This cargo al has different lead times. For the emergency and priority cargo air transportation is preferred, as these goods have to be transported rather swiftly. For routine cargo, air is used as well. Routine cargo is perfectly suited for transport via rail, hence saving costs for the company.

As said before, there is a large trade imbalance between the Netherlands and China. Meaning that a lot of containers have to return to China empty. This costs a lot of money. The New Economic Silk Road offers an alternative way of getting these containers back in a faster way. However, it would be beneficial if these containers were filled. China is eager to get these containers back and offers subsidies for eastbound trains. These subsidies, as said before, cover around 60 percent of the total cost.

The five largest growing export products of the Netherlands that can be seen in table 3 are all types of products that are suited for railway transportation. As the demand for these goods remains, the producers of these goods should transport via rail to add an extra modality to their transport mix. As pork meat demand was due to an external factor, it will be seen if the demand remains. Moreover, as these goods are now predominantly transported via air, transportation via rail will save costs for these companies. Lastly, as said before, the Chinese welfare is growing. As a result, demand for foreign luxury goods have risen. Products like chocolate, cheese and wine have seen enormous increases during the last few years.

Given these points, a large opportunity arises for the Netherlands in the export of agro-foods. As the Netherlands is the second largest exporter of these goods worldwide, the New Economic Silk Road offers a new modality for the export to China. As these goods are now predominantly transported via air transportation, rail will offer a reasonable alternative, cost wisely.

Chapter four: Analysis

After doing research on the New Economic Silk Route, in the following part I will give my analysis of the new trade route. Since its first train in 2013 the network has grown, and rail has become a growing modality. In table X it can be seen that for imports and exports the share of rail in total trade has risen. Especially the Dutch exports make more use of the rail modality. In the coming years the development of the New Economic Silk Route will continue, hence the route will become more efficient. Around half of the goods that are now transported via air, are suited for the transportation via rail. In table 2 it can be seen that that percentage equals roughly 2 to 3 billion euro's worth of cargo. When taken a look at the values per ton in table 4, cargo up to 40 thousand euro's per ton could be shipped via the railway network. However, the capacity of the network is not large enough to handle this volume. Capacity related problems are caused by the terminals at the entry points. Along the route there is enough space for more trains.

When the route becomes more efficient, more volume will be transported via the railway network. This increased volume will further push the capacity at the terminals at the entry points. As these terminals are already overloaded, total delay will increase. So, it is necessary that investments will be made at these terminals to ensure an efficient transport. Moreover, break of gauge is a significant bottleneck that causes unexpected delays. As the terminals are already overloaded due to the volume, break of gauge is a problem that should be handled more efficiently. I think there are two possible solutions. Firstly, to construct an extra terminal, so the density of trains in a terminal will decrease. Also, the terminals that are already in place should be equipped with the newest and best equipment. This will ensure more capacity, which is necessary for the grow of the network. As these terminals are located in Europe, investments should be made by the European Union. If they fail to do so, the Chinese will try to make these investment, as they have already pumped so much money in the project and will continue to do so. The second solution is far more expensive. That is to construct new railway lines through Russia with the same track width as China and Europe. It is very unlikely that this will happen due to the fact that Russia has a different track width for military reasons. Moreover, when these investments in the terminals are not made, new routes will be sought bypassing the overloaded terminals. An example can be given by a new route that DBschenker is using. They use the network to get to the Russian City of Kaliningrad. In Kaliningrad the cargo is loaded onto a ship that sails to Rostock, in Germany. When the cargo has arrived in Germany it is transported via rail to Duisburg. This route bypasses the overloaded terminals and as Kaliningrad has the Russian trackwidth, the cargo has to be transhipped only once (INT6).

The Chinese economy and export will continue to grow. This will cause more delays in the Chinese ports, which are already overloaded. As the railway network is relatively new, the maximum capacity has not been reached yet. However, the terminals at the entry points are overloaded. Investments to increase capacity at these terminals should be made. If this is done, volume transported via the railway network can increase. Logically, more trains means a low transportation cost, which makes transportation via the network more attractive. These costs can increase when the subsidy is stopped, however this is not expected to happen in the near future. These subsidies will diminish at a similar rate as the cost decrease due to efficiency. Furthermore, a growing Chinese economy will have rising Chinese income as a consequence. As these incomes increase, demand for European produced goods will rise. As most of these goods are centred around agro-foods and other luxurious goods, they can perfectly by transported via rail.

As mentioned before the Netherlands have missed their opportunity to become the European hub for the network, however, personally I do not think that this will become an issue in the future. As the Netherlands has multiple outstanding connections to Duisburg, so the railway connection to China still is easily accessible. Moreover, it can be doubted that the Netherlands has the capacity to act as the European hub. As said by Roeleveld (INT2) , the Dutch railway network is already nearing its maximum capacity. If the Netherlands wanted to become the hub, huge investments had to be made. It can be doubted if these investments would have been worth it. As analysed above, most of the goods coming from China to the Netherlands are transported further to for instance Germany. Therefore, it would not make sense to first have the goods travelling through Germany to the Dutch hub and then transporting it back to Germany.

The railway network has a lot of potential, and I think that every company that exports to China should investigate in railway transportation. At this moment, transportation costs for a container are roughly the same via rail and ocean. As the transport time via rail is far lower, total costs would be lower due to the capital costs. For the companies it can be cheaper to transport partly via rail and partly via sea. The reason that the costs are so low at the moment is largely due to the subsidies the Chinese government is supplying. Hence, the volume has risen in the last years. As the volume is rising, the cost will further decrease due to efficiency. Consequently, the Chinese government will decrease their subsidies, and possibly decrease them to zero in a couple of years. I expect that this is possible, as the volume has risen significantly that the cost has decreased to the same price as ocean transportation.

As said by multiple interviewees, the train has proven to be reliable during a major crisis, namely the corona virus. As the other modalities, ocean, air and truck were heavily influenced by the virus and proved to be unreliable, rail transportation still operated during these times.

Chapter five: Conclusion

The New Economic Silk route opens up new possibilities. The railway network that connects China and Europe has been developed and will only become more efficient. This network ensures that goods can be transported between Europe and China in a faster way. There are some bottlenecks along the route, especially the overloaded terminals at the entry points. A lot of work has been and will be done to ensure a more efficient route. For the Netherlands, a large opportunity comes in the form of agro-foods, these goods usually have a short life time, thus a fast transport time is needed. As these goods are mostly transported via air, the railway connection offers a cheaper and environmental friendly alternative.

The Netherlands and China are important trading partners, but the trade is imbalanced. Meaning that more cargo comes from China than leaves the Netherlands. This causes empty containers in the Netherlands. The railway connection offers a new modality for the Netherlands to increase trade with China. A lot of cargo is now shipped via sea or air, as can be seen in table 2. A large part of this cargo is suited for the transportation via rail, thus making rail a competitor to ocean shipping and air transportation

As the railway connection is becoming more mature, it will attract more costumers. However, the railway network can not reach its full potential without the subsidies. These subsidies give an incentive to use the railway network instead of the ocean route. This is needed to mature the railway network. The subsidies are needed as an incentive to use the network. When the network is used more intensively, the costs will decrease. This means that the subsidies are needed for the network to get started and when it will be part of the transport mix of companies, the subsidies can be lowered.

The Netherlands are able to benefit from the Economic Silk Road due to its close location to Duisburg. Hence, Dutch cargo can be transported via the rail without having to travel a large distance. The Netherlands has not become the European hub however that could have been intentional, as the railway capacity in the Netherlands is limited. However, the choice to use the network is made by individual companies. They should be stimulated by the Dutch government to use this new environmental friendly network.

To answer the research question: What are the possibilities for the Dutch export to benefit from the New Economic Silk Route, there are plenty. Mainly that most of the largest Dutch export products are suited for transportation via rail. Moreover, a large share of cargo transported via air can be transported by rail, for a significant lower cost. At this moment, the capacity is too limited to transport these amounts of cargo. So several investments around the bottlenecks have to be made to increase capacity.

Discussion

For the Belt and Road initiative to succeed closer policy coordination is needed. Only when this is achieved countries can benefit from the spillovers and larger economic growth.

To further expand the possibilities for the growing Dutch exports, more interviews with representatives from these respective companies could have been conducted. This would have given a more comprehensive overview of the possibilities these companies see. Furthermore, the research could be supported more with data, due to the time limit I was unable to do so.

As the Coronavirus is influencing the world massively, results from this thesis could be influenced by it. Especially during times when China was in lockdown, the volumes decreased significantly. As a result, costs for ocean shipping went up.

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INT1. Interview with Erik Groot Wasselink from Nunner Logistics

INT2. Interview with Pieter Dirk Roeleveld from Railcargo.nl

INT3. Interview with Chris Wensink, a researcher for Panteia

INT4. Interview with Cas Bertens from ASML

INT5. Interview with Wietze Klaver from Campina Friesland

INT6. Interview with Rien Gulden from DBschenker

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Appendix

Transcripts of the interviews have not been added to the appendix due to privacy reasons. These transcripts can be requested by sending an email to 453770lh@eur.nl

Table 1: Chinese ports along the maritime Silk Road Source. Soure: Sipri (2018)

Country	**Port**
Pakistan	Gwadar
Myanmar	Kyaukpyu
Malaysia	Kuantan
Malaysia	Meleka Gateway
Sri Lanka	Hambantota
Brunei	Muara
Maldives	Feydhoo Finolhu
Greece	Pireaus
Italy	Port of Naples
Belgium	Port of Antwerp

Table 2*:* The routes and its operators. Source https://www.erina.or.jp/wp-content/uploads/2017/12/A-DONG.pdf & Li, Bolton & Westpahl, 2016 and HKTDC, 2020 & DB Schenker (2019)

Operator	Route	Corridor	Time
YuXinOu	Chongqing – Duisburg	New Eurasian Land Bridge	13-14 days
HanXinOu	Wuhan – Czech Republic – Duisburg - Spain	New Eurasian Land Bridge	16 days
SumanOu	Suzhou-Warsaw	New Eurasian Land Bridge	12-18 days
RongXinOu	Chengdu-Lodz	New Eurasian Land Bridge	10 days
ZhengOu	Zhengzhou – Hamburg	New Eurasian Land Bridge	17-19 days
HexinOu	Hefei – Germany	New Eurasian Land Bridge	15 days
XiangOu	Changsha – Duisburg	New Eurasian Land Bridge	18 days
YixinOu	Yiwu-Madrid	New Eurasian Land Bridge	18 days
HaOu	Harbin – Hamburg	New Eurasian Land Bridge	15 days

Note: The lines are not limited to their destination mentioned above. Along the route several other destinations can be reached. For instance, goods transported via the ZhengOu line can also reach Madrid. However, the goods have to be transhipped at the final destination given in the table above

Table 3a: Incoming transport and domestic import in million euros. Percentage of total is given between brackets () Source: CBS Statline.

	2010	2011	2012	2013	2014	2015	2016	2017	2018
Incoming transport									
Deepsea	53238,9 (69,94)	75222,0 (76,57)	67448,9 (76,62)	51720,2 (68,02)	62239,9 (69,75)	96947,9 (79,20)	92792,2 (79,83)	103564,9 (78,63)	76670,4 (70,79)
Inland	782,9 (1,03)	1600,7 (1,63)	183.2 (0,21)	1655,8 (2,18)	743.8 (0,83)	3862,1 (3,16)	3603,9 (3,10)	2959,3 (2,25)	3834,7 (3,54)
Truck	12715,0 (16,70)	12336,2 (12,56)	12303,6 (13,98)	11121,3 (14,63)	6791,6 (7,61)	13218,1 (10,80)	13392,7 (11,52)	16179,0 (12,28)	15257,8 (14,09)
Rail	978,1 (1,28)	1130,1 (1,21)	6177,8 (7,02)	413,8 (0,54)	1152,3 (1,29)	388,6 (0,32)	603,1 (0,52)	1102,0 (0,84)	565,8 (0,52)
Air	8406,9 (11,04)	7896.4 (8,04)	6177,8 (7,02)	11130,1 (14,64)	18302,5 (20,51)	7988,9 (6,53)	5851,4 (5,03)	7903,7 (6,0)	11974,3 (11,06)
Import for Dutch market									
Deepsea	7454,8 (61,08)	7708,3 (63,21)	7765,6 (60,80)	8290,3 (58,30)	9924,0 (58,40)	11453,5 (67,77)	10793,9 (41,79)	12160,2 (63,61)	13864,6 (62,96)
Inland	134,4 (1,10)	114,8 (0,94)	32,8 (0,26)	597,2 (4,20)	330,8 (1,95)	334,1 (1,98)	503,2 (1,95)	761,4 (3,98)	2898,6 (13,16)
Truck	1952,7 (16,00)	1834,2 (15,04)	1771,2 (13,87)	2278,7 (16,02)	1990,3 (11,71)	1574,3 (9,32)	1520,6 (5,89)	1850,6 (9,68)	1237,9 (5,62)
Rail	668,4 (5,48)	518,7 (4,25)	1142,4 (15,04)	276,2 (1,94)	1207,5 (7,11)	34,3 (0,20)	97,0 (0,38)	381,4 (2,00)	178,8 (0,81)
Air	1994,6 (16,34)	2019,6 (16,56)	2060,0 (16,13)	2777,5 (19,53)	3539,7 (20,83)	3503,6 (20,73)	12914,7 (50,00)	3962,7 (20,73)	3840,0 (17,44)

Table 3b: Outgoing transport and domestic export in million euros. Percentage of total is given between brackets (). Source: CBS Statline.

Air	Rail	Truck	Inland	Deepsea
Outgoing transport				
9210,2	30,5	3112,6	209,7	13862
(34,85)	(0,12)	(11,78)	(0,79)	(52,46)
11321,6	97,5	2369,3	25,2	22303,6
(31,35)	(0,27)	(6,56)	(0,07)	(61,75)
10279,7	12,6	870,5	43,4	21574,8
(31,36)	(0,04)	(2,66)	(0,13)	(65,81)
13464,3	60,7	757,2	2,5	18405
(41,19)	(0,19)	(2,32)	(0,01)	(56,3)
13147,2	50,5	762,2	40,5	19822,7
(38,91)	(0,15)	(2,15)	(0,12)	(58,67)
14784,6	52,5	3417,1	300,8	27088,3
(32,39)	(0,11)	(7,49)	(0,66)	(59,35)
13069,5	632,1	1293,1	107,8	26694,5
(31,27)	(1,51)	(3,09)	(0,26)	(63,87)
12906,3	1520,6	5082,9	2436,9	31471,5
(24,19)	(2,85)	(9,52)	(4,56)	(58,92)
14375,6	1117	1608,8	76	22311
(36,4)	(2,83)	(4,07)	(0,19)	(56,50)
Export Dutch produced goods				
2535,5	18,2	327,5	63,9	3279,5
(40,73)	(0,29)	(5,26)	(1,03)	(52,69)
2799,2	60,7	336,3	13,8	4500,7
(36,30)	(0,79)	(4,36)	(0,18)	(58,37)
2804,3	4,2	344,8	15,8	6022,6
(30,51)	(0,05)	(3,75)	(0,17)	(65,52)
3847,2	38,4	348,6	0,1	5857,5
(38,12)	(0,38)	(3,45)	(0,00)	(58,04)
2673,4	25,3	464,8	22,7	6462,9
(27,71)	(0,26)	(4,82)	(0,23)	(66,98)
1466,6	30,7	2209,9	98,5	7126,4
(13,41)	(0,28)	(20,21)	(0,90)	(65,19)
4068,4	397,0	688,9	67,5	6136,4
(35,82	(3,50)	(6,07)	(0,59)	(54,03)
705,4	1129,2	2203,7	1593,3	7347,6
(5,44)	(8,70)	(16,98)	(12,28)	(56,61)
2134,4	797,0	523,3	51,4	9579,2
(16,31)	(6,09)	(4,00)	(0,39)	(73,21)