OCEAN
SHIPPING
CONSULTANTS

a company of

Royal
HaskoningDHV
Enhancing Society Together

Business briefing II

The future of European container trade

MAY 2022

Executive summary

The potential future development of major European seaborne container trade lanes is complex to predict. There are many uncertain factors including the development of nearshoring, trade wars[1] and the rise of e-commerce. That said, the diverging macroeconomic and demographic outlook of global regions can provide an indicative but valuable outline of the growth and direction of future European container trade.

During the last two decades, there has been a gradual shift regarding European container trade partners from the West (North America) to the East (Asia). The results of this study show that this trend is likely to continue over the next two decades. Overall European container trade is expected to grow by 2.8% per year (CAGR) between 2020 and 2040. However, the different European trade lanes are expected to show significantly different growth trends. European container trade with North America and the intra-European container trade are expected to grow much slower than container trade with Africa, the Middle East/India and the Far East (figure 1).

In addition to the base case scenario, two alternative scenarios are conducted. In a 'nearshoring' scenario, it is assumed that intra-regional trade will grow faster compared to the base case scenario. In a 'trade war' scenario, it is assumed that trade between Europe/US and Far East will grow at slower pace compared to the base case scenario. There can be several reasons for a trade war between these economic powers, including an escalation of the current war in Ukraine. The alternative scenarios show that the growth of European container trade -in terms of TEU-miles- is subject to downside risks. As a result, the average number of sea miles per TEU on European trade lanes is expected to decrease in both alternative scenarios (figure 2).

The growth and direction of European container trade can determine investment decisions of the main stakeholders in this sector: port authorities, shipping lines and shipbuilders. The expected growth of European container trade until 2040 shows the need to expand container handling capacity going forward. In addition, the expectation of a relatively strong demand for services with Southeast Asia, the Indian subcontinent and Africa can have implications on liner network optimization and the average vessel size deployed on individual European trade lanes. As the world's largest container vessels are deployed on the Europe-Far East trade lane, demand for these vessels is expected to see relatively robust growth as a result of the anticipated trade pattern. This effect will be mitigated in case of significant nearshoring or the arise of a trade war.

Figure 1. European seaborne container trade
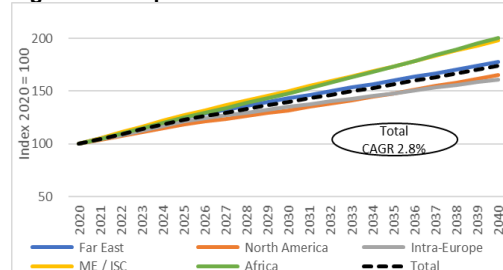
Source: Royal HaskoningDHV

**Figure 2. European container trade – average miles per TEU**
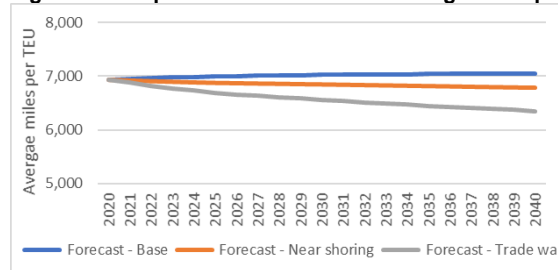
Source: Royal HaskoningDHV

---

1 The discussion of a trade war scenario does not in any way imply that Royal HaskoningDHV expects or foresees a trade war.

Introduction

During the last two decades the development of European seaborne container trade has experienced two important trends. Firstly, the growth of European seaborne container trade has reduced considerably since the fallback during the financial crisis in 2009 (figure 3). This trend cannot be fully attributed to lower economic growth since the financial crisis as the European container trade-to-GDP ratio has dropped as well since 2009 (figure 4). Secondly, there has been a gradual shift regarding European trade partners from the West (North America) to the East (Asia) (figure 5). In 2020, the combined trade between Europe and the Far East was three times as large as the combined trade between Europe and North America, while two decades ago this difference was significantly smaller. This study explores the potential future development of major European seaborne container trade lanes.

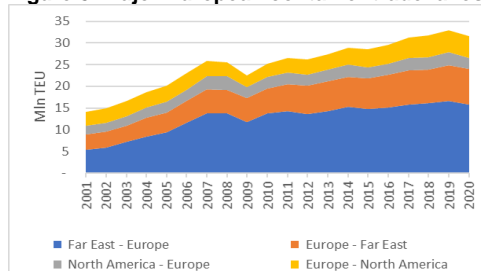**Figure 3. European seaborne container trade**
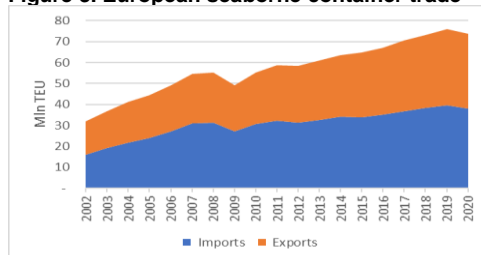
Source: Clarksons
Economics data

Figure 4. European container trade-to-GDP ratio
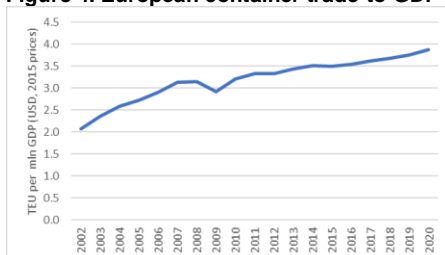
Source: Royal HaskoningDHV, derived from Clarksons and Oxford

Figure 5. Major European container trade lanes

Source: Clarksons

Methodology

The methodology to forecast major European container trade lanes can be split into several steps. Firstly, an origin-destination (OD) matrix is constructed for the base year 2020 containing seaborne container trade across seven large global regions (table 1). As this data is not readily available - except for a select number of key trade routes – it is constructed by Royal HaskoningDHV based on data from Clarksons and UN Comtrade.

Table 1. OD-matrix seaborne container trade (2020, mln TEU, full)

		Imports							
		North America	Europe	Far East	ME / ISC	Latin America	Africa	Oceania	Total
Exports	North America	5.2	2.7	7.3	1.5	2.6	0.4	0.3	**20.0**
	Europe	5.0	13.3	8.2	4.0	2.1	2.3	0.6	**35.5**
	Far East	20.2	15.8	59.4	6.8	3.9	3.3	2.8	**112.2**
	ME / ISC*	1.4	2.9	2.7	1.8	0.1	0.6	0.1	**9.5**
	Latin America	2.1	2.1	2.4	1.1	1.6	0.6	0.1	**9.9**
	Africa	0.1	1.1	1.7	0.6	0.0	1.6	0.0	**5.2**
	Oceania	0.2	0.2	1.5	0.2	0.0	0.1	0.2	**2.4**
	Total	**34.2**	**38.1**	**83.2**	**15.9**	**10.3**	**8.9**	**4.1**	**194.6**

Source: Royal HaskoningDHV, derived from Clarksons and UN Comtrade data. * Middle East & Indian subcontinent.

Secondly, future imports and exports for all seven regions are based on OLS regressions and used in the forecast horizon of 2020 to 2040. The independent variables of these regressions are regional GDP (imports) and world GDP (exports). For many regions a structural break was included in the regression model to take account of lower growth since the financial crisis. This second step provides the row totals and column totals of the future OD-matrices.

Thirdly, the RAS method is used to estimate future bilateral trade relations in the OD-matrices of the years 2025, 2030, 2035 and 2040. The RAS method is a well-known method for data reconciliation in supply-use or input-output tables of an economy, but it has other applications as well. Its aim is to achieve consistency between the entries of a matrix and pre-specified row and column totals. Mathematically, the method is an iterative scaling method[2].

Fourthly, average maritime distances for all bilateral trade relations in the OD-matrix are estimated in order to calculate TEU-miles for all trade routes (table 2). The two largest container ports for each region are used to provide an indication of the distance in nautical miles for all bilateral trade routes. These indicative results are calibrated towards the number of global TEU-miles as published by Clarksons (972 billion TEU-miles in 2020)[3]. Table 3 provides an overview of the resulting TEU-miles for all bilateral trade relations.

Fifthly, two alternative scenarios are conducted to assess the impact of nearshoring and the arise of trade war.

Table 2. OD-matrix maritime distances (nautical miles)

		Imports						
		North America	Europe	Far East	ME / ISC	Latin America	Africa	Oceania
Exports	North America	5,391	3,705	6,251	8,942	5,399	3,490	7,674
	Europe	3,705	1,914	11,526	6,921	5,947	1,470	12,168
	Far East	6,251	11,526	1,148	5,117	12,108	7,682	5,687
	ME / ISC*	8,942	6,921	5,117	1,229	8,713	4,171	6,087
	Latin America	5,399	5,947	12,108	8,713	4,855	4,773	8,746
	Africa	3,490	1,470	7,682	4,171	4,773	6,411	6,188
	Oceania	7,674	12,168	5,687	6,087	8,746	6,188	1,183

Source: Royal HaskoningDHV, derived from Seadistances.org data

Table 3. OD-matrix seaborne container trade (2020, million TEU-miles)

		Imports							
		North America	Europe	Far East	ME / ISC	Latin America	Africa	Oceania	Total
Exports	North America	27,800	10,003	45,633	13,413	14,038	1,396	2,302	**114,585**
	Europe	18,524	25,515	94,517	27,685	12,488	3,380	7,301	**189,410**
	Far East	126,272	182,117	68,174	34,792	47,221	25,352	15,924	**499,852**
	ME / ISC*	12,519	20,072	13,815	2,189	1,058	2,304	325	**52,282**
	Latin America	11,338	12,488	29,059	9,221	7,587	2,831	629	**73,153**
	Africa	349	1,617	13,060	2,395	144	10,556	147	**28,268**
	Oceania	1,535	2,434	8,531	1,112	95	484	260	**14,450**
	Total	**198,337**	**254,245**	**272,788**	**90,809**	**82,629**	**46,303**	**26,889**	**972,000**

Source: Royal HaskoningDHV, derived from Seadistances.org and Clarksons data

---

2 It is important to note that this methodology has important caveats. Both OLS regression and the RAS method are based on historical causal relations and historical trade patterns between regions. Both causal relations and trade patterns can change going forward because of structural changes in the supply side and/or trade relations of countries and regions.

3 An adjustment factor of 9.5% is used to calibrate the Royal HaskoningDHV indication of global TEU-miles towards the figure as published by Clarksons..

Results – World trade

First, the results for global seaborne container trade are described. Figure 6 shows a forecasted continuation of the upward trend as seen in the previous two decades. The compound annual growth rate (CAGR) of world seaborne container trade is expected to be 3.2% between 2020 and 2040. The expected growth of TEU-miles is slightly lower (3.0%). As a result of this, the average number of miles per TEU is expected to decrease marginally over the next two decades (figure 7). A key reason for this development is the relatively large growth of the Asian market including intra-Asian trade, which entails comparatively short sea distances.

Figure 6. World seaborne container trade forecast
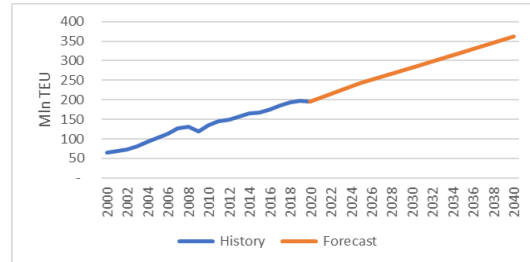
Source: Royal HaskoningDHV

Figure 7. World container trade – average miles per TEU
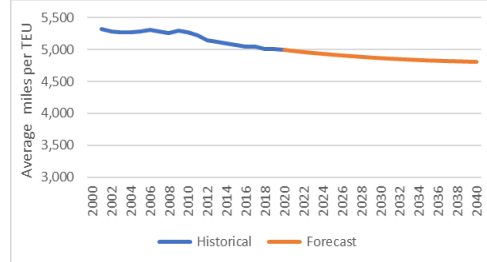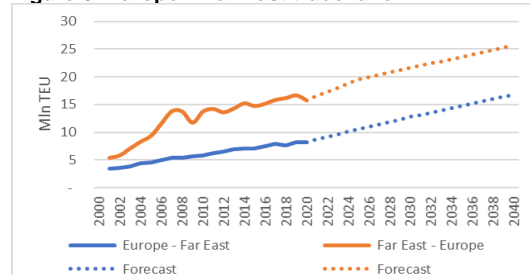

Source: Royal HaskoningDHV

Results – European trade

A focus on European container trade shows a more diverse picture. As a result of diverging economic and demographic prospects between global regions, the gradual shift of European trade partners from the West (North America) to the East (Asia) is expected to continue going forward. Container trade with North America and the intra-European container trade is expected to grow significantly slower than container trade with Africa, the Middle East/India and the Far East.

The expected development for the two largest European trade lanes is shown in figure 8 and 9. The Europe - Far East trade lane is expected to grow robustly in both ways. However, the Europe – North America trade lane shows a diverging pattern for the two directions. North America imports and European exports are expected to grow significantly stronger than the other way around, among others due to slower population growth, and hence consumption, on the European side of the Atlantic. As a result, the North America – Europe trade lane is expected to remain at the same volume going forward.

The compound annual growth rate (CAGR) of total European seaborne container trade is expected to be 2.8% between 2020 and 2040. The expected growth of TEU-miles on European trade is even slightly higher (2.9%). As a result of this, the average number of miles per TEU on European trade is expected to increase marginally over the next two decades (figure 10). Again, the key reason for this development is the strong growth of the Asian market and the fact that the average sea distance between Europe and Asia is relatively large.

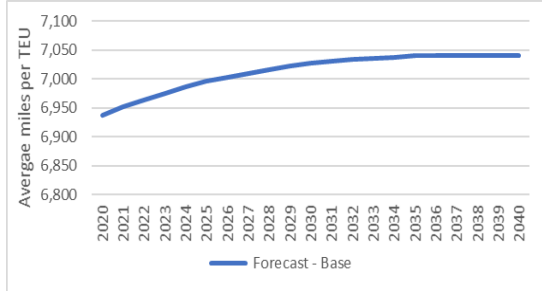**Figure 8. Europe – Far East trade lane**

Source: Royal HaskoningDHV

Figure 9. Europe – North America trade lane
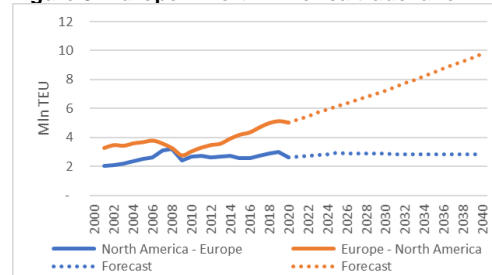
Source: Royal HaskoningDHV

Figure 10. European container trade – average miles per TEU

Source: Royal HaskoningDHV

Scenarios: near shoring and trade war

Two alternative scenarios have been conducted.

Firstly, in a 'nearshoring' scenario the share of intra-regional trade over total trade - which is used as a proxy for the extent of nearshoring- will grow faster compared to the baseline scenario. There are many different reasons why nearshoring could increase going forward. These include rising wages in emerging economies, which makes outsourcing into these countries less attractive, or the fear of logistic disruptions like the Suez blockage in 2021. In the 'nearshoring' scenario it is assumed that the share of intra-regional trade over total trade will continue the growth path as seen between 2008 and 2020. As shown by figure 11, the share of intra-regional trade over total trade has increased between 2008 and 2020 (CAGR 0.8%). In the baseline scenario, as presented in the previous sections, this share remains stable between 2020 and 2040. It is assumed that the total world container trade in the OD-matrix will remain the same as in the baseline scenario, which implies that inter-regional trade must grow slower than in the baseline scenario[4].

Secondly, in a 'trade war' scenario the growth of bilateral trade between Europe and the Far East (both ways) and the US and the Far East (both ways) is reduced by 50% compared to the base case scenario. Again, there are many different reasons why a trade war could arise, including an escalation of the current war in Ukraine. It is assumed that the total world container trade in the OD-matrix will remain the same as in the baseline scenario, which implies that other trade relations will grow stronger than in the baseline scenario as a substitution effect[5].

The implications for European container trade are shown in figure 12. Both in the nearshoring scenario and in the trade war scenario, the growth of TEU-miles on European trade lanes will be lower than the growth of TEU's. The key reason for this is the fact that intra-regional trade connections have shorter sea distances than inter-regional connections (nearshoring) and low growth of long-distance Europe-Far East trade (trade war). As a result, the average number of miles per TEU is expected to drop in both scenarios.

Figure 11. Global intra-regional trade
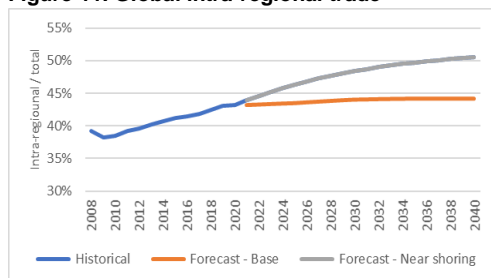
Source: Royal HaskoningDHV

Figure 12. European container trade – average miles per TEU
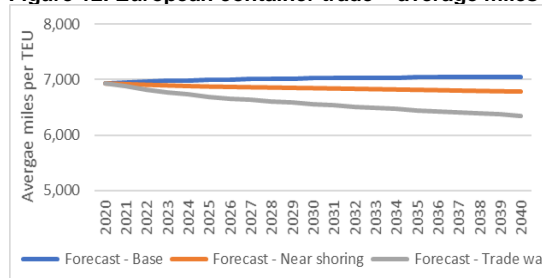
Source: Royal HaskoningDHV

---

4 Please note the row and column totals of the OD-matrix were not fixed in the nearshoring scenario. The additional intra-regional trade results in a reduction of inter-regional trade. This reduction is spread across all trade relations based on their relative share in the global container trade.

5 Please note that substation towards other trade regions (e.g. the Indian subcontinent) requires a technological catch up. This might be challenging in the first years of the forecast horizon.

Stakeholder implications

The growth and direction of European container trade can determine investment decisions of the main stakeholders in this sector: port authorities, shipping lines and shipbuilders. The expected growth of European container trade of 2.8% per year until 2040 shows the need to expand container capacity going forward.

Especially for shipping lines and shipbuilders, the expected continuation of the gradual shift of European trade partners from the West (North America) to the East (Asia) will have additional consequences. In the base case scenario, one can expect strong demand for additional services on European trade lanes with Southeast Asia, the Indian subcontinent and Africa. This will not only have implications on the network optimization of these shipping lines but potentially also on the average vessel size deployed on European trade lanes.

Currently, the largest vessels (17k TEU – 24k TEU) are mainly deployed on the Europe-Far East trade lane[6] due to stronger economies of scale at higher sailing distances. The relatively robust growth forecast of European trade with regions that are geographically far away will increase the demand for deployment of these very large vessels. This effect will be mitigated in case of significant nearshoring or the arise of a trade war between Europe/US and Far East.

---

6 Clarksons Research shows that from a global perspective over 90% of the largest vessels (>17k TEU) are being deployed on the East-West mainlane (Container Intelligence Quarterly, 2022Q1).