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# European ports: potential gateways to international trade

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## **Introduction**

For many decades the EU has focused on building the Single Market by connecting all Member States.

Transport has always been considered fundamental in order to promote the fundamental freedoms of citizens, goods, capitals, and services.

However, many trends in recent years favored the growth of extra-EU markets and commercial traffic between them and Europe.

Freight transport, which refers to the activity of moving goods from one place to another, represents a derivative demand and must be suitable for these “new” global relationships.

Transport scenario has always been characterized by many geographical transitions caused by the development of new geographical areas and the consequent change in the geography of production, income and consumption.

Consequently, in order to understand which transport infrastructures are necessary to favor commercial flows, it becomes important to understand their evolution over time and which are the global phenomena influencing transport demand.

In this way investments can be targeted to build relevant infrastructures considering the scarcity of funds and avoiding their misallocation.

Thus, the aim of this thesis is to provide a global outlook and to examine whether European infrastructure policy is proper or not to this scenario and the emerging commercial flows.

The thesis is divided into four chapters. The first chapter provides an overview of recent global phenomena including demographic trends, GDP and global trade in goods that have an impact on freight demand.

Predicting the evolution of trade is very difficult but it is fundamental in order to understand the most important geographical areas from a commercial perspective and which are the major transport modes used worldwide for freight transport.

Considering that maritime transport carries most of worldwide freight, the focus will shift to this mode of transport which will then remain the perspective of the whole thesis.

Once the global context has been considered, we move on to examine the European situation in more detail. In fact, the second chapter analyzes the evolution of trade

within and outside Europe and the consequent implications in transport maritime pattern.

Then, the attention shifts to European port infrastructures and the evolution of the role of ports in recent years aiming to provide a starting point to evaluate what are the necessary interventions at the European policy level.

The data used in this chapter are mainly updated to 2019 referring EU-27, however in some figures, they refer to the period prior to Brexit including also the UK in the analysis, giving EU-28 statistics.

Once the “new” commercial flows and the situation of maritime infrastructures at European level are clear, it is fundamental to understand how European Union transport infrastructure policy reacts.

This is the purpose of the third chapter, which focuses on European transport policy, namely TEN-T.

After analyzing in detail the long implementation process over the years, the second part considers this policy in relation to maritime trade infrastructures and ports.

Subsequently, the financial pillar of this policy, i.e. the Connecting Europe Facility will be taken into consideration explaining how the funds are divided among the different modes of transport in order to understand if they are suitable or not for the emerging global trends.

All the material and considerations used in the first three chapters are prior to the spread of the COVID-19 pandemic which led to a structural breakdown, distorting and questioning all the forecasts made and the strategies decided by the governments.

COVID-19 has caused a global health crisis, determining victims and a high number of infections but also affecting the economy because of the lockdown measures implemented to contain the outbreak.

The fourth chapter of the thesis therefore tries to provide an outline of the impact of this crisis on the economic, commercial and port infrastructures levels, also trying to explain how the EU is trying to react.

However, the situation is constantly evolving, data and estimates are also subject to a high degree of uncertainty. The timing and methods of spreading the virus have been different between geographical areas and countries have faced this emergency with different measures.

For these reasons, in some in some of them the infections have decreased while in others these are still increasing making it very difficult to verify the current situation and make recovery predictions.

## **I. Global transport scenario: current and future perspectives**

This chapter aims to provide an overview of the recent trends in transport, in order to define possible future global scenario in which Europe should be able to fit.

Despite the underlying uncertainty that makes it impossible to define robust projections, transport demand is expected to grow significantly in the coming years.

In view of the fact that the majority of global traffic is carried by sea, the focus will be on the maritime trade always taking into account the growing importance of Asian countries and the consequently relevance of Europe-Far East connections.

This relationship, together with the economic development of MENA countries, is determining positive effects on Mediterranean trade flows.

However, uncertainty about transport demand and long planning times required makes it important to analyze future scenarios and be able to respond to a broad range of disruptive developments in order to minimize negative impacts. Indeed, considering the scarcity of funds it becomes important to invest in the infrastructures that will better facilitate future trade traffic and avoid, therefore, the misallocation of investment in infrastructure projects that do not create sufficient value for users or society, even if this value is hard to be evaluated.

### **1.1 The determinants of freight transport: demographic trends, GDP and global merchandise trade**

Transport demand is historically correlated with population, gross domestic product (GDP) and international trade activity (ITF 2019<sup>1</sup>).

Indeed, larger population also implies increased production and consumption of goods, causing consequences on the demand for freight transport.

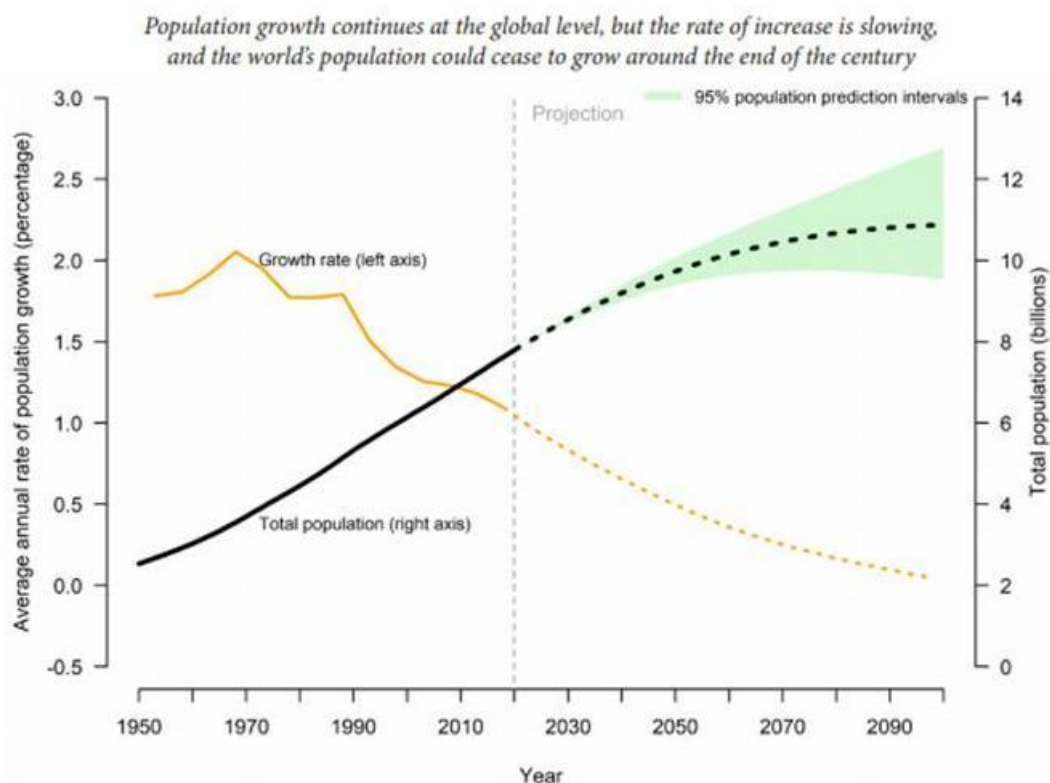
Projections, which could be affected by changes in fertility, mortality and international migration, affirm that the world's population, that was 7.7 billion in mid-2019, is expected to reach 8.5 billion in 2030, 9.7 billion in 2050 and 10.9 billion in 2100<sup>2</sup>.

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<sup>1</sup> ITF (2019), *ITF Transport Outlook 2019*, OECD Publishing, Paris, [https://doi.org/10.1787/transp\\_outlook-en-2019-en](https://doi.org/10.1787/transp_outlook-en-2019-en)

<sup>2</sup> United Nations, Department of Economic and Social Affairs, Population Division (2019). *World Population Prospects 2019: Highlights* (ST/ESA/SER.A/423), [https://population.un.org/wpp/Publications/Files/WPP2019\\_Highlights.pdf](https://population.un.org/wpp/Publications/Files/WPP2019_Highlights.pdf)

**Figure 1.1.1** Population size and annual growth rate for the world: estimates, 1950-2020 and medium-variant projection with 95% prediction intervals, 2020-2100



Data source: United Nations, Department of Economic and Social Affairs, Population Division (2019). *World Population Prospects 2019*.

Source: United Nations (2019)

Currently, from a geographical perspective 60% of the world's population lives in Asia (4.5 billion people) while the 17% in Africa (1.7 billion people).

Into detail, the world's two most populous regions in 2019 were Eastern and South-Eastern Asia, with 2.3 billion people (30% of the global population) and Central and Southern Asia, with 2.0 billion (26%)<sup>3</sup>.

The 2 billion increase planned for 2050 will be located mainly in sub-Saharan Africa as 1.05 billion (52%) could be added in this area while another 25% of global population growth is expected to be located in Central and Southern Asia, which is projected to add 505 million people between 2019 and 2050.

Hence, the 80% of the global population will live in these continents.

<sup>3</sup> United Nations, Department of Economic and Social Affairs, Population Division (2019). *World Population Prospects 2019: Highlights* (ST/ESA/SER.A/423), [https://population.un.org/wpp/Publications/Files/WPP2019\\_Highlights.pdf](https://population.un.org/wpp/Publications/Files/WPP2019_Highlights.pdf)



A lower population growth is predicted in Northern Africa and Western Asia which is expected to add 237 million people between 2019 and 2050.

By contrast, the other regions, including Europe, are estimated to reach peak population size and to begin to decline before the end of this century.

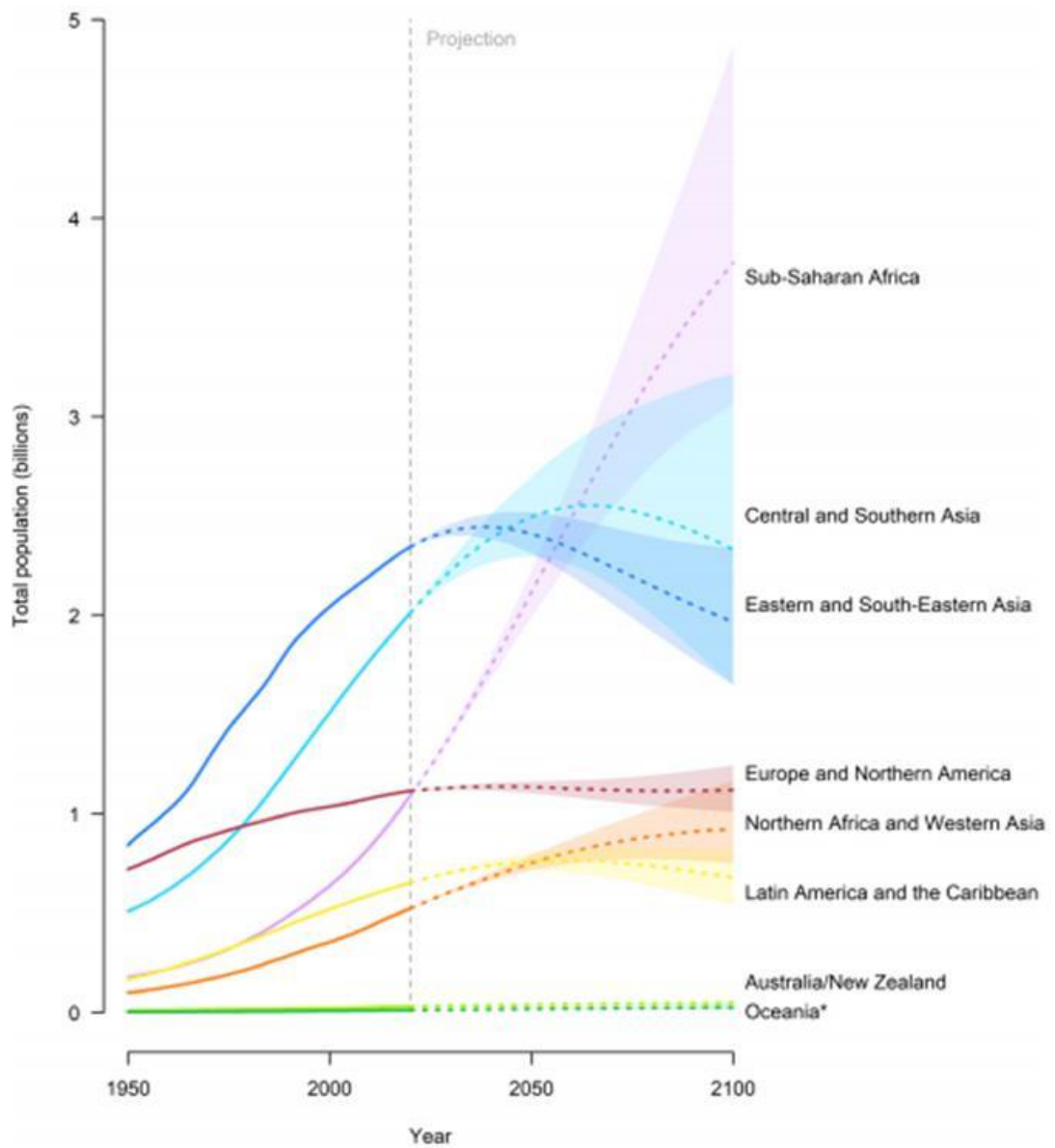
**Table 1.1.2** Population of the world, SDG regions and selected groups of countries, 2019, 2030, 2050 and 2100, according to the medium variant projections

Region	Population (millions)			
	2019	2030	2050	2100
<b>World</b>	<b>7 713</b>	<b>8 548</b>	<b>9 735</b>	<b>10 875</b>
Sub-Saharan Africa	1 066	1 400	2 118	3 775
Northern Africa and Western Asia	517	609	754	924
Central and Southern Asia	1 991	2 227	2 496	2 334
Eastern and South-Eastern Asia	2 335	2 427	2 411	1 967
Latin America and the Caribbean	648	706	762	680
Australia/New Zealand	30	33	38	49
Oceania*	12	15	19	26
Europe and Northern America	1 114	1 132	1 136	1 120
Least developed countries	1 033	1 314	1 877	3 047
Land-locked Developing Countries	521	659	926	1 406
Small Island Developing States	71	78	87	88

Data source: United Nations, Department of Economic and Social Affairs, Population Division (2019). *World Population Prospects 2019*.  
\* excluding Australia and New Zealand

Source: United Nations (2019)

**Figure 1.1.3** Population by SDG region: estimates, 1950-2020, and medium-variant projection with 95% prediction intervals, 2020-2100



Data source: United Nations, Department of Economic and Social Affairs, Population Division (2019). *World Population Prospects 2019*.  
\* excluding Australia and New Zealand.

Source: United Nations (2019)

Transport demand is correlated to GDP but recent political and economic developments have been affecting previous optimistic projections for GDP growth (ITF 2019<sup>4</sup>).

As a matter of fact, global GDP growth is projected at 3.5% in 2019 and 2020 but decline to 3.3% for 2015 to 2030 and 2.9 for 2015 to 2050.

<sup>4</sup> ITF (2019), *ITF Transport Outlook 2019*, OECD Publishing, Paris, [https://doi.org/10.1787/transp\\_outlook-en-2019-en](https://doi.org/10.1787/transp_outlook-en-2019-en)

**Table 1.1.4** GDP growth in world regions

	Percentage change over previous year					Compound Annual Growth Rate	
	2016	2017	2018*	2019*	2020*	2015-2030*	2015-2050*
<b>OECD</b>							
World	3.1	3.6	3.7	3.5	3.5	3.3	2.9
OECD countries	1.8	2.5	2.4	2.1	1.9	2.0	1.9
Euro Area	1.9	2.5	1.9	1.8	1.6	1.5	1.6
United States	1.6	2.2	2.9	2.7	2.1	1.8	1.9
Japan	1.0	1.7	0.9	1.0	0.7	1.0	1.1
Non-OECD countries	4.2	4.6	4.7	4.7	4.7	4.2	3.5
Brazil	-3.4	1.0	1.2	2.1	2.4	2.2	1.9
China	6.7	6.9	6.6	6.3	6.0	4.8	3.2
India	7.1	6.7	7.5	7.3	7.4	6.5	5.2
<b>World Bank</b>							
World	2.4	3.1	3.1	3.0	2.9	—	—
Advanced economies	1.7	2.3	2.2	2.0	1.7	—	—
Emerging market and developing economies	3.7	4.3	4.5	4.7	4.7	—	—
<b>IMF</b>							
World	3.7	3.7	3.7	3.7	—	—	—
Advanced economies	1.7	2.3	2.4	2.1	—	—	—
Emerging market and developing economies	4.4	4.7	4.7	4.7	—	—	—

Note: \* Figures for 2018 onwards are predictions. World Bank figures for 2017 are estimates.

Source: OECD (2018<sub>[16]</sub>); World Bank (2019<sub>[17]</sub>); and IMF (2018<sub>[18]</sub>). Estimates for 2015-2030 and 2015-2050 are based on OECD ENV-Linkages model.

Source: ITF (2019)

GDP growth over the years varies according to the different sources, but all of them underline the higher level of growth in emerging markets and developing economies compared to the advanced ones.

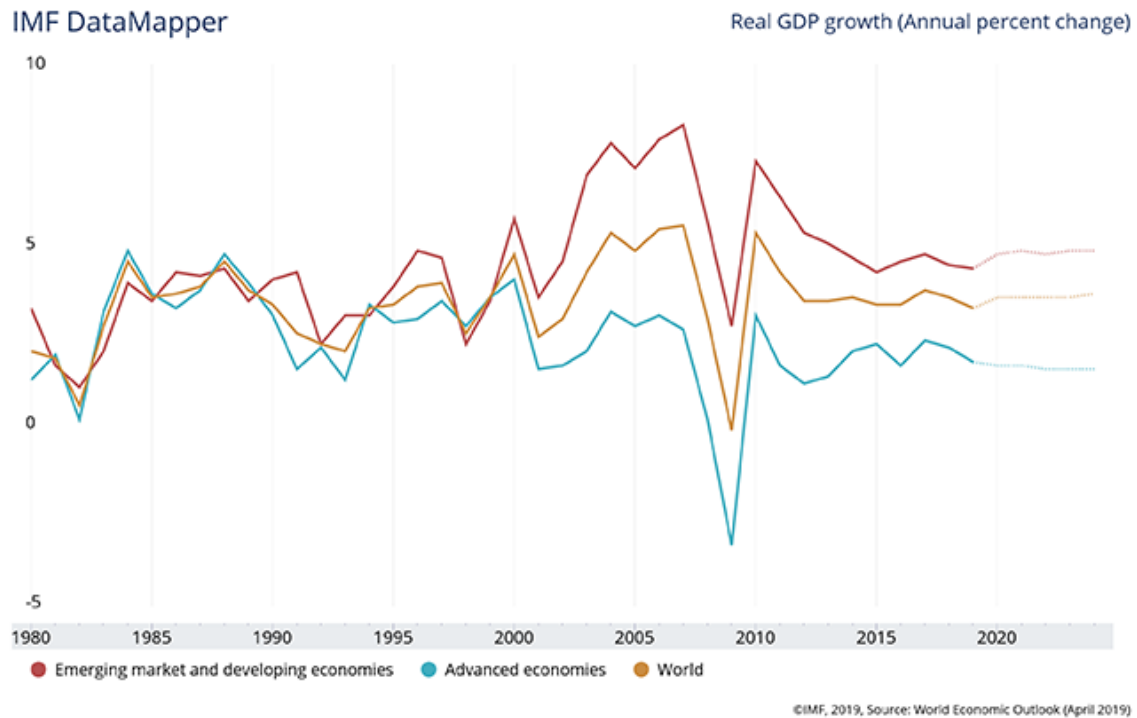
Taking into consideration growth forecasts related to 2030 and 2050, it is important to notice that non-OECD countries will have the highest world-wide growth rate.

Thus, they can be considered the main drivers of growth for future transport demand (ITF 2019<sup>5</sup>).

The higher level of growth of emerging markets and developing economies is pointed out more clearly in the figure 1.1.5 that makes a comparison among them, advanced economies and world in real GDP growth.

<sup>5</sup> ITF (2019), *ITF Transport Outlook 2019*, OECD Publishing, Paris, [https://doi.org/10.1787/transp\\_outlook-en-2019-en](https://doi.org/10.1787/transp_outlook-en-2019-en)

**Figure 1.1.5 Real GDP growth**  
(Annual percent change)



Source: IMF (2019)

Lastly, it is important to take into consideration trade as it is a main determinant of freight demand.

The value of world merchandise trade in 2018 was US\$ 19.67 trillion and China was the leading trader<sup>6</sup>.

In 2017, international merchandise trade volume grew by 4.7% following the same trend of global economy but then its growth rates have started to decline reaching 3.7% in 2019.

Concerning 2030 and 2050, the expected annual growth rate is 3.4% and 3.2% respectively (Table 1.1.6)

<sup>6</sup> World trade organization (2019), *World trade statistical review 2019*, [https://www.wto.org/english/res\\_e/statis\\_e/wts2019\\_e/wts2019\\_e.pdf](https://www.wto.org/english/res_e/statis_e/wts2019_e/wts2019_e.pdf)

**Table 1.1.6** World merchandise trade

	Percentage change over previous year				Compound Annual Growth Rate	
	2016	2017	2018*	2019*	2015-2030*	2015-2050*
World	1.8	4.7	3.9	3.7	3.4	3.2
Exports						
Developed economies	1.1	3.4	3.5	3.3	2.7	2.3
Developing and emerging economies	2.5	5.3	4.6	4.5	4.2	4.0
North America	0.6	4.2	5.0	3.6	3.5	2.8
South and Central America	2.0	3.3	2.8	2.6	3.1	3.4
Europe	1.2	3.5	2.9	3.2	2.2	2.0
Asia	2.3	6.7	5.5	4.9	4.2	3.8
Other regions	3.4	0.2	2.6	3.6	3.6	4.2
Imports						
Developed economies	2.1	3.0	3.2	3.0	2.7	2.5
Developing and emerging economies	1.6	8.1	4.8	4.5	4.3	4.0
North America	0.0	4.0	4.3	3.6	2.8	2.9
South and Central America	-6.7	4.0	3.6	4.0	4.3	3.9
Europe	3.3	2.5	3.1	3.0	2.4	2.1
Asia	3.5	9.8	5.7	4.9	4.2	3.9
Other regions	-1.7	3.5	0.5	1.4	3.6	3.7

Notes: \*Figures for 2018 onwards are projections. Figures for 2015-2030 and 2015-2050 are based on the OECD ENV linkages model

Source: WTO (2018<sup>[11]</sup>)

Source: WTO (2018)

The considerable and persistent difference between developing and emerging economies is underlined even more and according to future forecasts, Asia will be the continent with the highest growth in world merchandise trade.

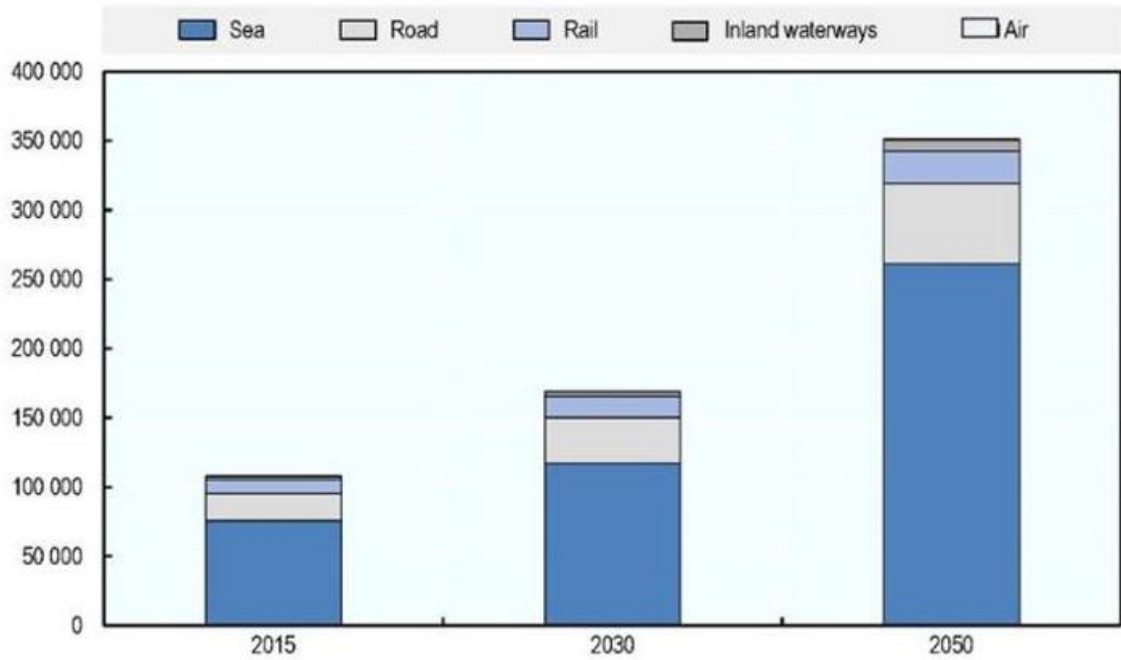
Analyzing freight transport by mode, we can notice the importance of maritime trade.

In 2015, 70% of the 108 trillion t-km transported worldwide was carried by sea and 2050 projections affirm that ships will carry out more than three quarters of all the goods movement by 2050 (ITF 2019<sup>7</sup>).

<sup>7</sup> ITF (2019), *ITF Transport Outlook 2019*, OECD Publishing, Paris, [https://doi.org/10.1787/transp\\_outlook-en-2019-en](https://doi.org/10.1787/transp_outlook-en-2019-en)

**Figure 1.1.7** Projected freight transport demand by mode

Current demand pathway, billion tonne-kilometres



StatLink  <http://dx.doi.org/10.1787/888933972183>

Source: ITF (2019)

The current demand pathway projects that maritime freight transport will grow at a compound annual growth rate of 3.6% through 2050 leading to a near tripling of maritime trade volumes.

**Table 1.1.8** Projected growth rates of freight transport demand

Current demand pathway, global compound annual growth rate in percentages

	2015-2030	2015-2050
Freight transport demand	3.1	3.4
Rail	2.7	2.5
Road	3.5	3.2
Inland waterways	3.4	3.8
Aviation	5.5	4.5
Sea	3.0	3.6

Source: ITF (2019)

Many factors can affect the current international trade scenario which is positive but could be threatened by many causes of disruptions (ITF 2019<sup>8</sup>).

First of all, e-commerce has been increasing significantly in recent years and it is expected to grow further in the future determining also an increment of air and road modes of transport.

In addition, manufacturing re-shoring and 3D printing could change dramatically international trade and consequently reducing sea and air transport while vehicle automation could determine disruption as it allows reducing transport costs and increasing road transport.

Road transport could be also favored by high capacity vehicles (HCVs) that can carry larger loads than regular trucks reducing emissions and congestions and by energy transition for long-distance road freight allowing the reduction of CO2 emissions.

Lastly, new shifts in international trade routes, driven by investment in infrastructures, could alter current transport flows pattern as freight networks in Eurasia and Africa and the effects of global warming in Arctic waters could create new maritime shipping routes and fuel Far East-Europe relationship.

## **1.2 Global maritime trade**

Maritime transport plays a key role in international trade as it allows to carry goods over long distances and at lower costs compared to other means of transport.

In fact, most of the movement of goods over long distances is covered by maritime transport, considering that in 2017, 10.7 billion tons of goods were loaded worldwide with an increase of 4%<sup>9</sup> compared to 2016 and future projections underline even more its importance.

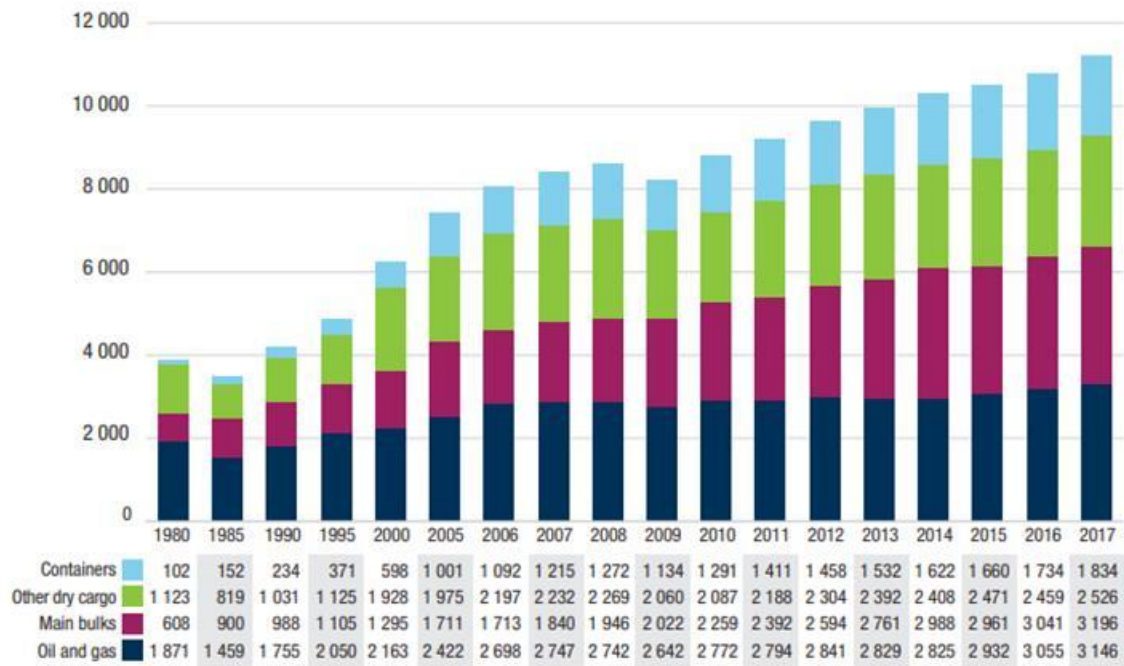
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<sup>8</sup> ITF (2019), *ITF Transport Outlook 2019*, OECD Publishing, Paris, [https://doi.org/10.1787/transp\\_outlook-en-2019-en](https://doi.org/10.1787/transp_outlook-en-2019-en)

<sup>9</sup> UNCTAD (2018), *Review of Maritime Transport 2018*, New York and Geneva: United Nations, [https:// unctad.org/en/PublicationsLibrary/rmt2018\\_en.pdf](https://unctad.org/en/PublicationsLibrary/rmt2018_en.pdf)



**Figure 1.2.1** International seaborne trade, selected years  
(Millions of tons loaded)



Source: *Review of Maritime Transport*, various issues. For 2006–2017, the breakdown by cargo type is based on Clarkson Research, 2018a.

Notes: 1980–2005 figures for main bulks include iron ore, grain, coal, bauxite/alumina and phosphate. Starting in 2006, main bulks include iron ore, grain and coal only. Data relating to bauxite/alumina and phosphate are included under "other dry cargo".

Sources: UNCTAD (2018)

Figure 1.2.1 represents the evolution of international maritime trade taking also into consideration the different types of cargo.

In 2017, major dry bulk commodities, accounted for 42.3% of the volume, increased while containers and minor bulks represented 24.3% and 25.4% respectively and remaining volumes are made of other dry cargo. Between 1980 and 2018 containers recorded the major increase of more than 8%.

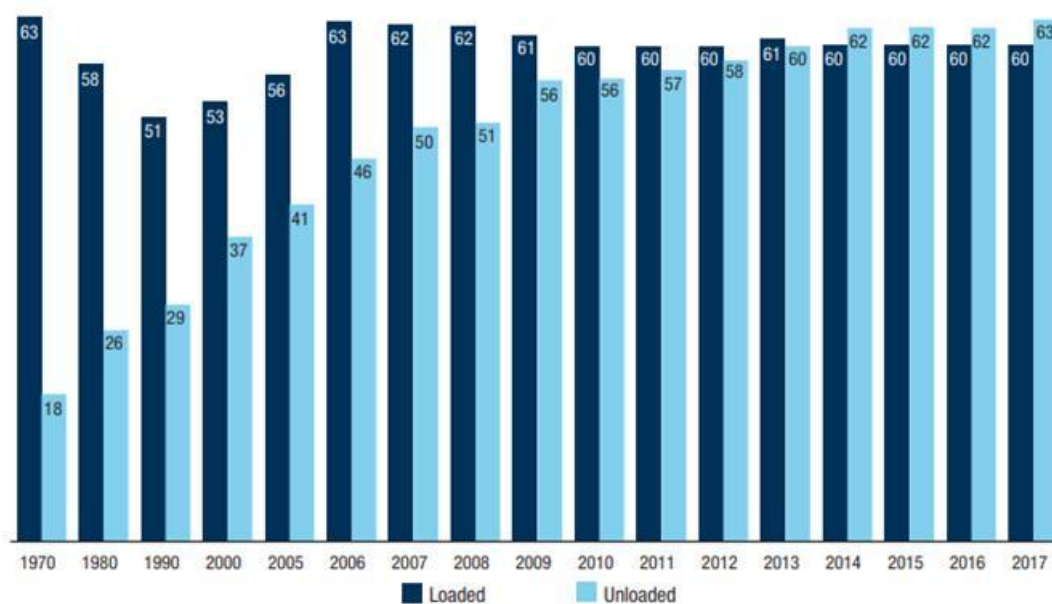
Developing economies play a fundamental role in maritime trade considering that in 2017 they shipped 60% of world merchandise trade and unloaded 63%.

On the other side, the share of developed countries declines over the years as they loaded 34% of goods and unloaded 36% while transition economies accounted for 6% of global seaborne exports and 1% of imports<sup>10</sup>.

<sup>10</sup> UNCTAD (2018), *Review of Maritime Transport 2018*, New York and Geneva: United Nations, [https:// unctad.org/en/PublicationsLibrary/rmt2018\\_en.pdf](https://unctad.org/en/PublicationsLibrary/rmt2018_en.pdf)



**Figure 1.2.2** Participation of developing countries in seaborne trade, selected years  
(Percentage share in world tonnage)



Source: UNCTAD secretariat calculations, based on the *Review of Maritime Transport*, various issues, and table 1.4 of this report.

Source: UNCTAD (2018)

However, the expected growth of 3.6% in seaborne trade between 2015 and 2050 could be limited by some factors which are reshaping the maritime transport.

First of all, geopolitical, economic and trade policy risks including protectionism affect maritime transport reducing trade flows, a recent example is the United States-China trade tension. It is estimated that the tariff escalation applied in September 2018 and May and June 2019 between these two countries affected 2% of world maritime trade volume<sup>11</sup>.

Secondly, the emergence of digitalization and artificial intelligence allows ports to improve performance and connectivity and they also need to revise their strategies and operations in order to reduce externalities and support the shift to greener and more sustainable ports considering that the environmental performance of international shipping remains a major concern affecting shipping market dynamics.

<sup>11</sup> UNCTAD (2018), *Review of Maritime Transport 2018*, New York and Geneva: United Nations, [https:// unctad.org/en/PublicationsLibrary/rmt2018\\_en.pdf](https://unctad.org/en/PublicationsLibrary/rmt2018_en.pdf)

Another important trend is the Belt and Road initiative whose fully implementation could increase the world trade between 1.7% and 6.2%<sup>12</sup>.

Furthermore, lower demand levels and the oversupply capacity dominated by mega containerships have led to a growing consolidation of liner shipping mainly through mergers and alliances. This remains a major problem for small operators considering the potential abuse of market power by large shipping lines, making supervision by the competent authorities necessary.

Lastly, the construction of ever larger and larger containerships and the replacement of existing ships with larger ones are producing much more profound consequences on port facilities (Costa, Haralambides and Roson 2019<sup>13</sup>).

The origin of this disruption refers to the belief that economies of scale bring numerous benefits in maritime shipping, however only a small number of ports can accommodate them.

All the effects of these factors on the transport scenario are difficult to be determined and therefore they require continuous monitoring and evaluation. Government policies should be able to promptly manage and react to changes of this evolving scenario in order to mitigate disruptions and to transform them into opportunities.

### **1.3 The strengthening of Asian centrality in the world economy**

Demographic trends, GDP and global merchandise trade show the emergence and strengthening of the Asian market in the global scenario.

The leading influence of Asia, in maritime transport is also pointed out by figure 1.3.1 which shows the regional distribution of global maritime trade in 2018.

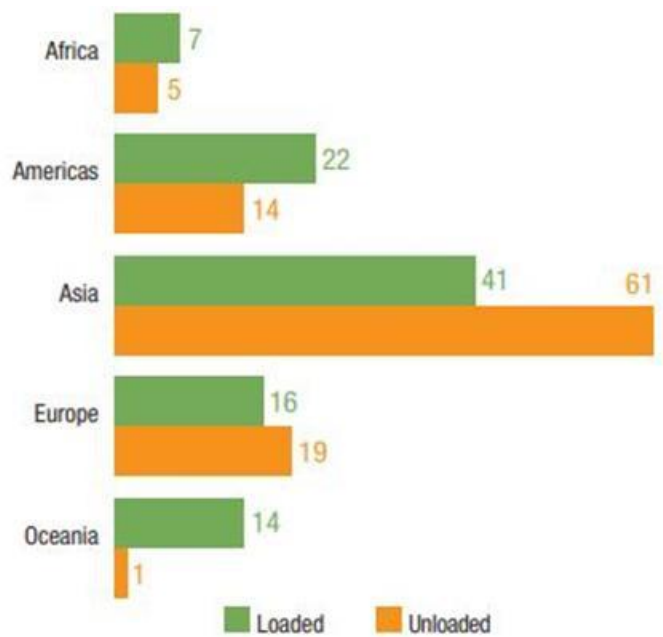
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<sup>12</sup> World Bank. 2019. *Belt and Road Economics: Opportunities and Risks of Transport Corridors*. Washington, DC: World Bank. License: Creative Commons Attribution CC BY 3.0 IGO, <https://www.worldbank.org/en/topic/regional-integration/publication/belt-and-road-economics-opportunities-and-risks-of-transport-corridors>

<sup>13</sup> Costa, P., Haralambides, H., and Roson, R.(2019) *A European Public Investment Outlook* , 8. *From Trans-European (Ten-T) to Trans-Global (Twn-T) Transport Infrastructure Networks. A Conceptual Framework*, UK: Open Book Publishers, 2020, <https://doi.org/10.11647/OBP.0222>

**Figure 1.3.1** International maritime trade by region, 2018

(Percentage share in world tonnage)



Sources: Compiled by the UNCTAD secretariat based on data supplied by reporting countries, as posted on government and port industry websites, and data provided by specialist sources.

Note: Estimated figures are based on preliminary data or on the last year for which data were available.

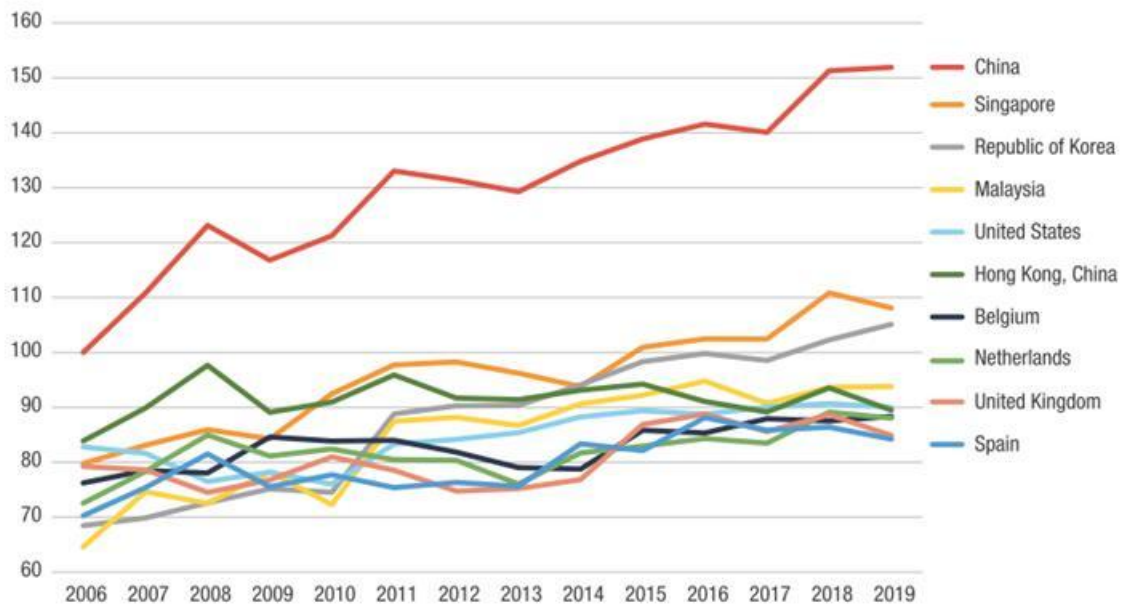
Source: UNCTAD (2019)

Asia can be considered the largest trading region as 41% (4.5 billion tons) of the world maritime trade in 2018 was originated in that area and 61% (6.7 billion tons) of total goods unloaded were received in Asian seaports.

Actually, countries of that area have evolved from the role of place of origin of European, American and Japanese imports to export destinations from OECD countries. Moreover, the Liner Shipping Connectivity index (LSCI), calculated every year by UNCTAD, further underlines the importance of Asia, as the connectivity of a country or a port in the global container shipping network is an important determinant of accessibility to global trade, trade costs and competitiveness (UNCTAD 2019).

The figure 1.3.2, that represents the 10 most connected economies and their evolving trend since 2006, shows that 5 of them are in Asia, 4 in Europe and 1 in North America. In particular, China is the leading country and its LSCI recorded 51% increase since 2006.

**Figure 1.3.2** Liner shipping connectivity index, top 10 economies, 2006-2019

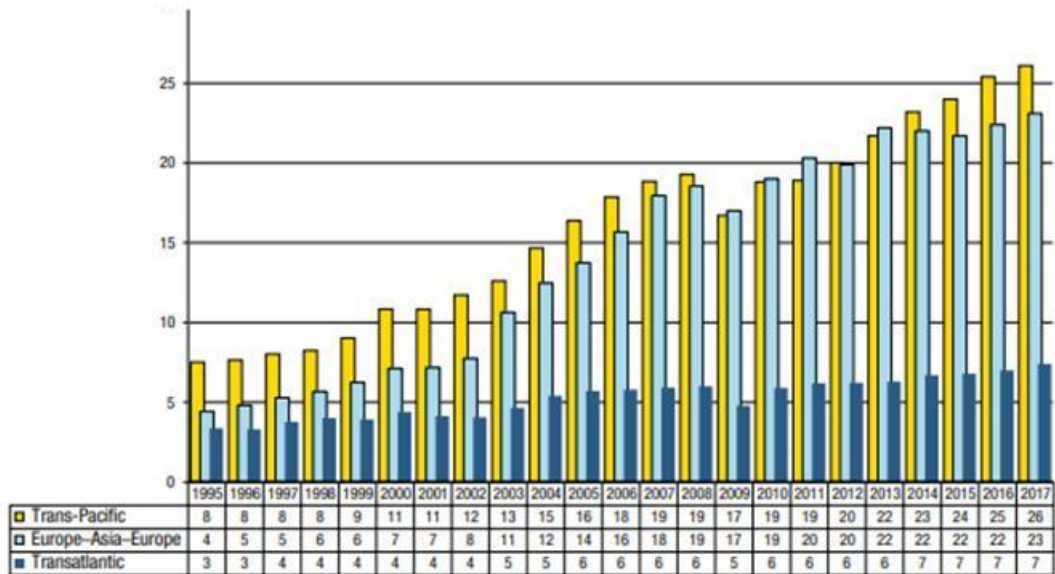


Source: UNCTAD, based on data from MDS Transmodal. For the complete data set for all countries, see <https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=92>.

Source: UNCTAD (2019)

Besides East Asia, also Europe and the United States can be considered relevant regions involved in maritime trade that have the busiest ports areas.

**Figure 1.3.3** Estimated containerized cargo flows on major East-West trade routes, 1995-2017  
(Million 20-foot equivalent units)



Sources: UNCTAD secretariat calculations, based on data from United Nations Economic Commission for Latin America and the Caribbean, 2010 (Global Insight database). Figures from 2009 onward are derived from data provided by MDS Transmodal, 2017 and Clarksons Research.

Note: Data for 2017 are estimated forecasts.

Source: UNCTAD (2017)

Comparing the major East-West trade routes in 2017, it is important to notice that the Europe-Far East route corresponds to 23 million TEU, being slightly lower than the transpacific flows between Asia and America (26 million TEU) but more than three times the Transatlantic route which is equivalent to 7 million TEU.

During the early 00's it used to be the most significant connection but later on, both Europe and America became much more interrelated with Asian countries moving almost the same amount of goods towards them.

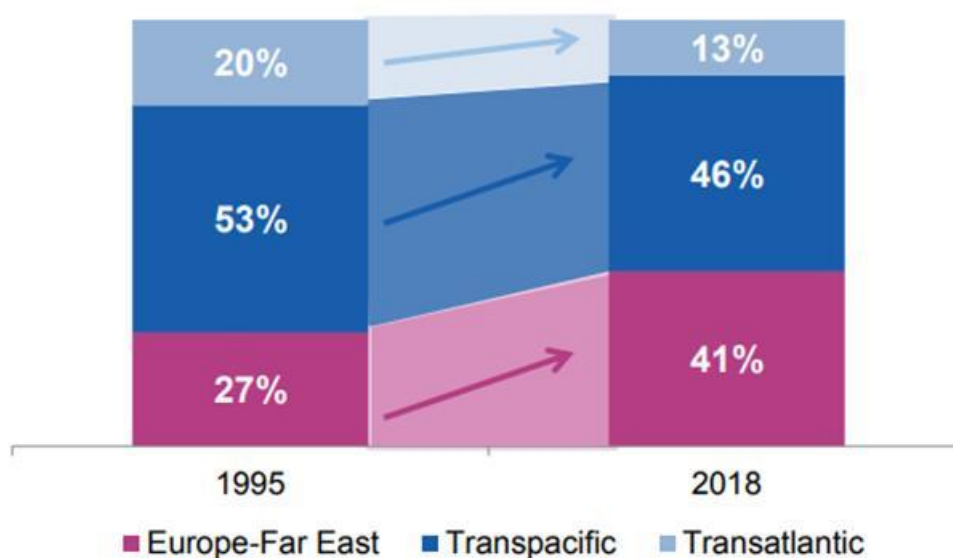
Therefore, the Europe-Far East route, connecting the European markets to the Chinese manufacturing sites through the Suez Canal and the Mediterranean, and the Transpacific are the two biggest trade routes but it is important to keep an eye on their evolution through years.

In 1995 the Transpacific route controlled 53% of the global traffic while the Europe-Far East only 27% but in the following years the situation has evolved considerably.

In fact, in 2018, the Europe-Far East route controlled 41% of the global traffic and the transpacific one 46% (UNCTAD, 2018<sup>14</sup>).

The relevance of this route explains why China wants to expand the Belt and Road Initiative, which is the most important international policy strategy, to the Eurasian region.

**Figure 1.3.4** Estimated containerized cargo flows on major East-West container trade routes, 1995-2018 (% TEU)



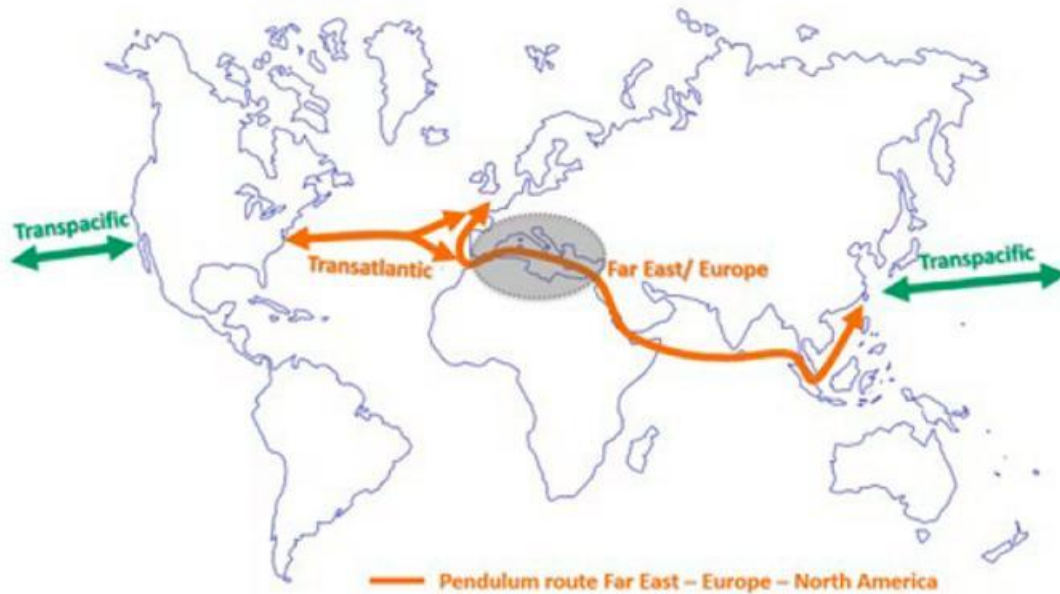
Source: SRM on UNCTAD (2018)

The consequent recovery of the centrality of the Mediterranean basin and its ports was favored mainly by the expansion of the Suez Canal in 2015, allowing it to implement its role as a strategic world's choke point as it is the shortest link between the East and the West connecting the Mediterranean Sea at Port Said and the Red Sea at Suez.

As a matter of fact, it doubled the daily capacity of cargo transit and it has no limits on containership size as it can host huge vessels (between 13.000 and 22.000 TEUs) allowing faster transit times along the intercontinental East-West connection.

<sup>14</sup> UNCTAD (2018), *Review of Maritime Transport 2018*, New York and Geneva: United Nations, [https:// unctad.org/en/PublicationsLibrary/rmt2018\\_en.pdf](https://unctad.org/en/PublicationsLibrary/rmt2018_en.pdf)

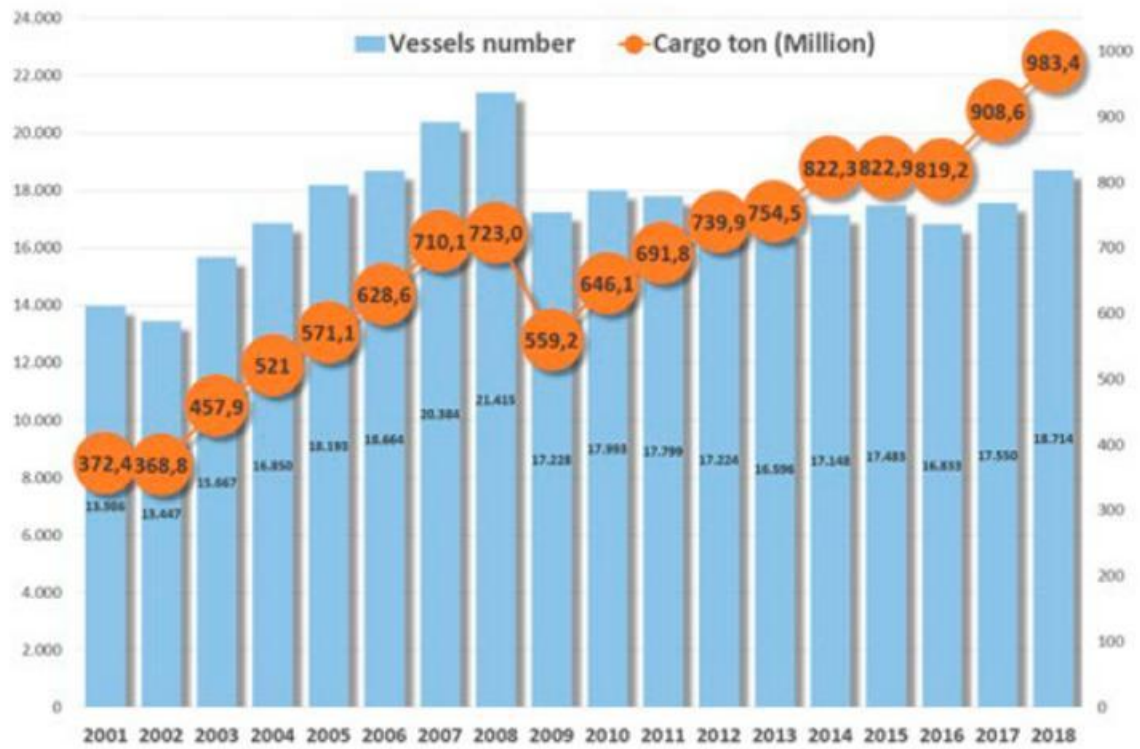
**Figure 1.3.5** The major East-West global container routes



Source: Tadini, M. (2019) A Geographical Overview of the Suez Canal Freight Flows: an Impact on the Mediterranean Sea and the Genoa port.

Observing the trend over the years (Figure 1.3.6), it emerges that 2009 was characterized by a dramatic decrease caused by the global crisis and the number of vessels remained almost the same until the enlargement of 2015, which was the turning point. Indeed, in 2014, the vessels number was 822 million tons with an increase of 983 million tons 2018 reaching an increase of 19,6%.

**Figure 1.3.6** Vessels traffic and cargo tonnage of the Suez Canal (2001-2018)



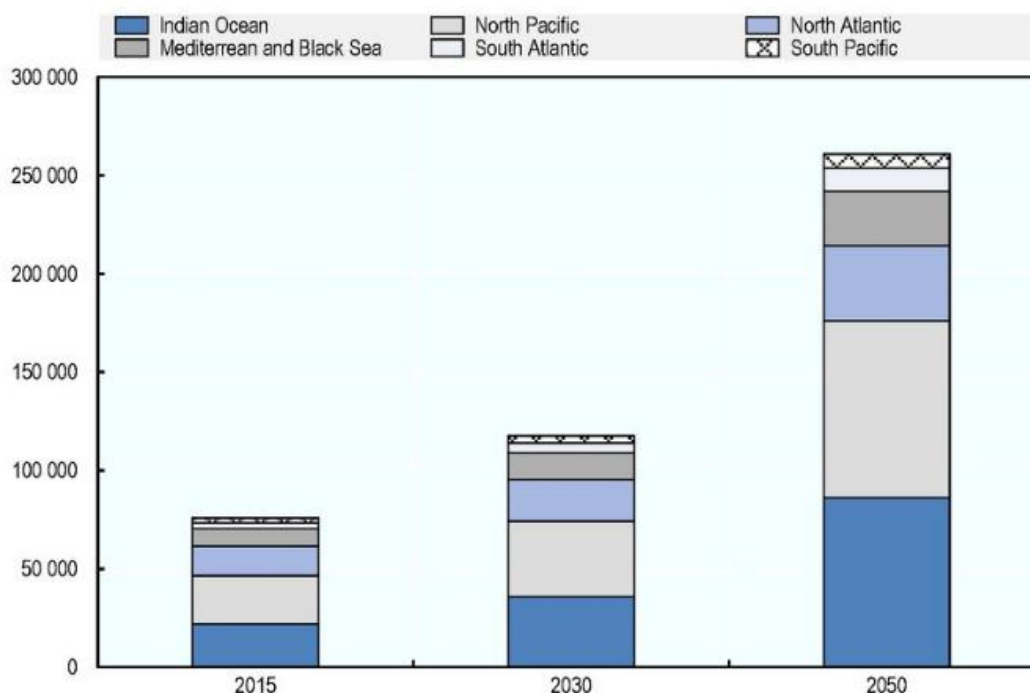
Source: Tadini M. (2019) A Geographical Overview of the Suez Canal Freight Flows: an Impact on the Mediterranean, based on elaboration of Assoport and Suez Canal Authority data, various years.

This growth consolidates the importance of Suez in the international maritime trade and in the geopolitical scenario.



**Figure 1.3.6** Maritime trade demand projections by region, 2015-50

Current demand pathway, billion tonne-kilometres



StatLink  <http://dx.doi.org/10.1787/888933972221>

Source: ITF (2019)

Considering future projections, one third of all maritime trade flows in 2050 will take place in the North Pacific and Indian Oceans determining an increase of almost four times between 2015 and 2050 of the economic value of freight flows.

The North Atlantic Ocean will remain the third-busiest maritime corridor, with 15% of maritime freight movements in 2050, some 38 trillion tonne-kilometres.

#### 1.4 The growing importance of the Mediterranean Sea basin

The strengthening of Asian economies is not the only phenomenon that is placing the Mediterranean basin at the centre of goods international trade.

The economic growth of Middle East and North Africa countries has been limited by political and economic instabilities particularly in Libya, Syria and Turkey but, in the medium term, the World Bank expects real GDP in the region to increase at 2.6% in 2020 and 2.9% in 2021<sup>15</sup>.

<sup>15</sup> Arezki, Rabah; Ait Ali Slimane, Meriem; Barone, Andrea; Decker, Klaus; Detter, Dag; Fan, Rachel Yuting; Nguyen, Ha; Miralles Murciego, Graciela; Senbet, Lemma. 2020. "Reaching New Heights: Promoting Fair Competition in the Middle East and North Africa." Middle East

The expected growth is heterogeneous and largely determined by the increase in oil production and infrastructure investments in the Gulf Cooperation Council (GCC) countries.

**Figure 1.4.1** Middle East North Africa Forecasts

(Annual percent change unless indicate otherwise)

	2016	2017	2018e	2019f	2020f	2021f
GDP at market prices (2010 US\$)						
Algeria	3.2	1.4	2.5	2.3	1.8	1.8
Bahrain	3.2	3.9	3.2	2.6	2.8	2.8
Djibouti	8.6	5.7	6.7	7.3	7.5	7.5
Egypt	4.3	4.7	5.5	5.7	5.9	6.0
<i>Fiscal year basis</i>	4.3	4.2	5.3	5.6	5.8	6.0
Iran	13.4	3.8	-1.5	-3.6	1.1	1.1
Iraq	13.0	-2.1	1.9	6.2	2.9	2.8
Jordan	2.0	2.0	2.1	2.3	2.4	2.7
Kuwait	2.9	-3.5	1.7	3.6	3.6	3.6
Lebanon	1.7	1.5	1.0	1.3	1.5	1.5
Morocco	1.1	4.1	3.2	2.9	3.5	3.5
Oman	5.0	-0.9	1.9	3.4	2.8	2.8
Qatar	2.1	1.6	2.3	2.7	3.0	3.0
Saudi Arabia	1.7	-0.9	2.0	2.1	2.2	2.2
Tunisia	1.1	2.0	2.6	2.9	3.4	3.6
United Arab Emirates	3.0	0.8	2.0	3.0	3.2	3.2
West Bank and Gaza	4.7	3.1	1.7	1.9	1.9	1.9

Source: World Bank.

Notes: e = estimate; f = forecast. World Bank forecasts are frequently updated based on new information and changing (global) circumstances. Consequently, projections presented here may differ from those contained in other Bank documents, even if basic assessments of countries' prospects do not significantly differ at any given moment in time.

Source: World Bank (2019)

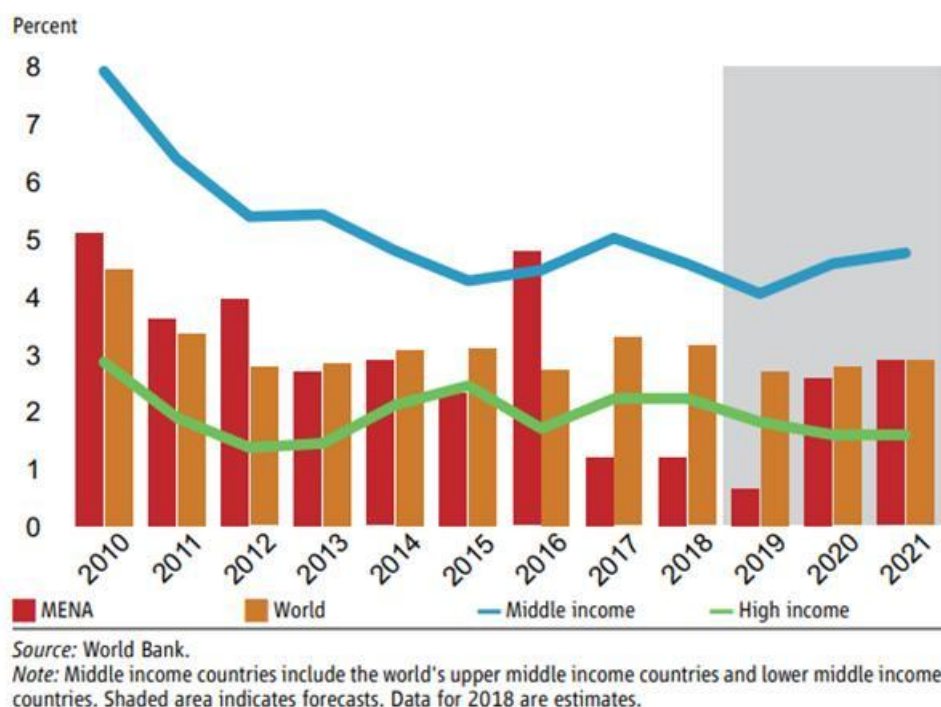
In addition, U.S. stopped applying sanctions to Iran's economy determining a slightly recover and a GDP growth of 1.1% in 2020 and 1.0% in 2021, although the risk of tensions between the two countries persists.

Iraq's economic growth is expected to peak at 6.2% in 2020 before decelerating to 2.9% in 2021.

On the other side, Egypt’s GDP is expected to reach 6.0% in 2021 driven by the foreseen implementation of projects in infrastructure and public works determined by the growth of both private and public investments<sup>16</sup>.

The economic growth of these countries, compatibly with political instability, will make these markets of great interest for European trade.

**Figure 1.4.2** Growth in MENA and the World



Source: World Bank (2019)

The economic growth of the countries of the African shore of the Mediterranean and the other shores of the same sea, the Asian one that goes from Turkey to Israel will add significant volumes to Far East-Europe trade implementing intra-Mediterranean flows (Costa, Haralambides, Roson 2019).

In addition, the African population growth in the second part of the century will determine an increase in the traffics that will be originated in this continent.

From a historical perspective, the Mediterranean has always been an important center for maritime trade, favoring the economy of its riparian countries.

<sup>16</sup> Arezki, Rabah; Ait Ali Slimane, Meriem; Barone, Andrea; Decker, Klaus; Detter, Dag; Fan, Rachel Yuting; Nguyen, Ha; Miralles Murciego, Graciela; Senbet, Lemma. 2020. “*Reaching New Heights: Promoting Fair Competition in the Middle East and North Africa.*” Middle East and North Africa Economic Update (October), Washington, DC: World Bank. Doi: 10.1596/978-1-4648-1504-1. License: Creative Commons Attribution CC BY 3.0 IGO, <https://openknowledge.worldbank.org/bitstream/handle/10986/32479/9781464815041.pdf>

The Mediterranean Sea involves a complex pattern of maritime trade and routes but now it is a trading area and a transit area linking all the countries overlooking this basin to the rest of the world through the hub and spoke structure of maritime networks.

The actual Mediterranean strategic relevance is supported by the strong growth in container traffic in the last 20 years and by the fact that the top 30 Mediterranean ports have handled 53 million TEUs compared to the 9 million in 1995 (SRM 2018). The Mediterranean Sea controls almost 9% of the global trade<sup>17</sup>.

The demand for freight transport will be expressed in a scenario increasingly influenced by elements of global importance and by how private agents react to them and by the government's ability to implement adequate policies.

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<sup>17</sup> Tadini M. (2019) *A Geographical Overview of the Suez Canal Freight Flows: an Impact on the Mediterranean Sea and the Genoa port*. Bollettino della Società Geografica Italiana serie 14, 2(1): 15-30. doi: 10.13128/bsgi.v2i1.220, <https://riviste.fupress.net/index.php/bsgi/article/view/220>

## **II. European trade and maritime transport scenarios**

Taking into consideration the global scenario previously explained, this chapter analyzes European trade evolution in recent years, with the growing importance of extra-EU market and the consequently implications in transport pattern.

The focus then will move to European maritime infrastructure and ports considering their fundamental role in global traffic flows.

Indeed, the main objective is to provide the basis to evaluate if EU transport infrastructure policy, that will be examined in Chapter III, is adequate to the EU transport pattern.

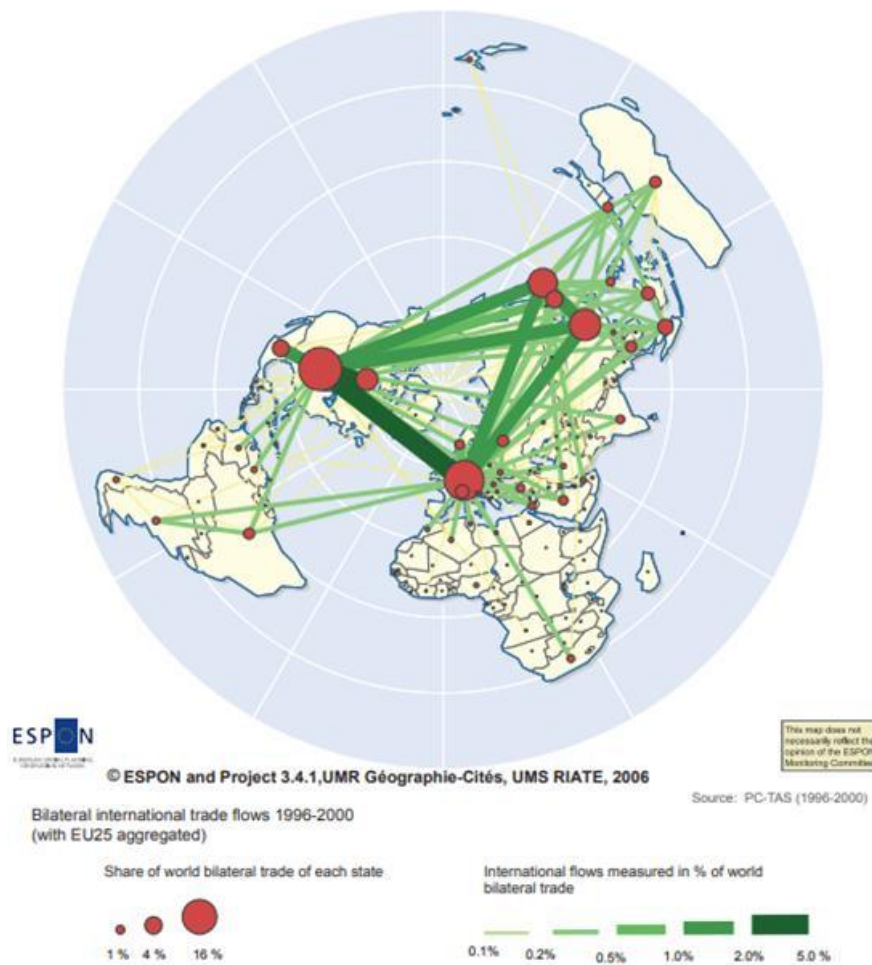
As a matter of fact, transport infrastructure must be adapted to megatrends that are influencing the global and European scenario in order to develop an efficient transport system.

### **2.1 The growing importance of extra-EU trade**

For many years Europe considered itself the largest world market and trading bloc and it was focused on the completion of the internal market.

The figure 2.1.1 shows the bilateral international trade flows for the period 1996-2000.

**Figure 2.1.1** World trade, 1996-2000



Source: PC-TAS (1996-2006)

The size of the circles indicates the share of the world bilateral trade of each state (EU is considered as a whole), while the international flows are represented through the green lines, pointing out that the world trade relationships were dominated by the so-called “Triad” (Ohmae 1985<sup>18</sup>), a triangle composed by North America, Europe and Japan.

As a matter of fact, until twenty years ago, the geography of international trade was dominated by the transatlantic relationship between Europe and the United States and between it and Japan.

The breakthrough was the “great recession” from 2008 to 2013, as it underlined that the markets outside Europe were growing quicker than the EU internal market and were becoming more important over time.

<sup>18</sup> Ohmae, K. (1985), *Triade Power: The coming shape of global competition*, London: Free Press

The growing importance of the markets outside EU and the consequently shift of the centre of gravity of the world economy towards these area were favored by a reduction in transport costs, thanks to the economies of scale in maritime transport and by advances in logistics and vertical integration, resulting from the fragmentation of the different phases of industrial production (Costa, Haralambides and Roson 2019).

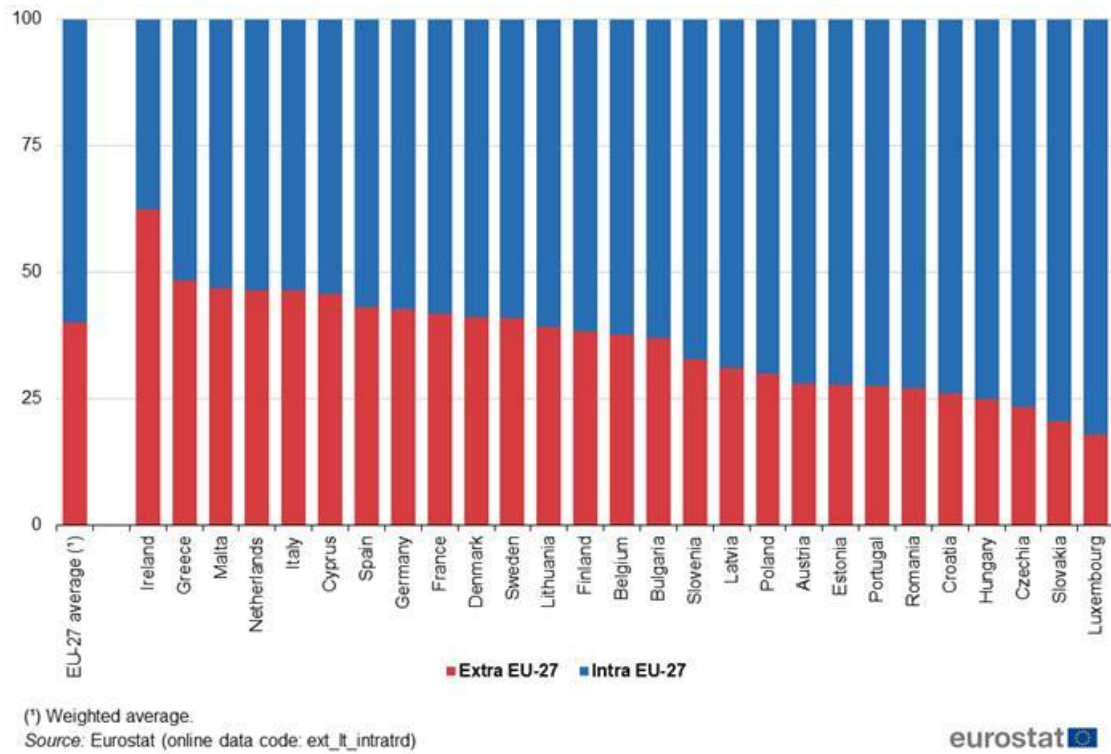
Before the economic crisis, EU considered emerging economies as suppliers of low-priced primary resources or places to relocate production and, hence, functional to its development.

Furthermore, the expansion of the European internal market towards neighboring developing countries, including Mediterranean countries, Africa, the Middle East, Caucasian states, other former Soviet republics, was aimed at increasing economies of scale in order to achieve continental growth.

Nowadays, the European Union remains the most economically integrated region in the world.

Currently, trade within EU countries is the most important component of trade for the Member States, accounting for around 60%, although there are significant differences between countries as the proportion of intra-EU trade and extra-EU trade varies reflecting historical influences and geographical location.

**Figure 2.1.2** Intra and extra EU-27 trade in goods, 2019  
(imports plus exports, % share of total trade)



Source: Eurostat (2020)

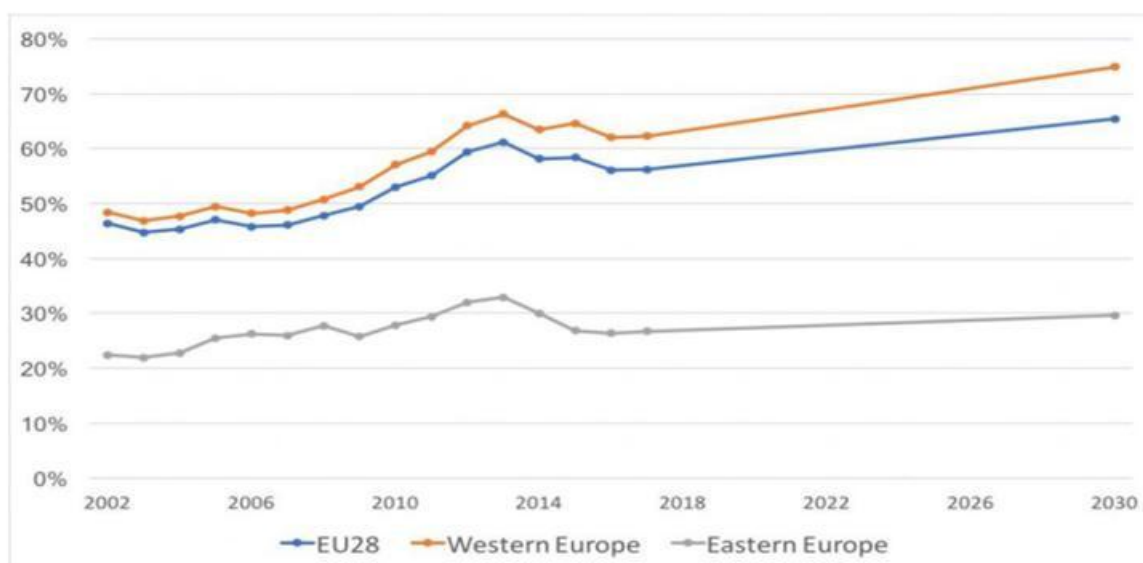
Both intra-EU trade and extra-EU trade consider exports and imports.

The former was higher than the latter in all countries except for Ireland, underlining that internal market is still more significant compared to the external one.

However, the ratio of extra-EU to intra-EU exports underlines the growing importance of extra-EU markets making phenomena that are changing the world economy of profound interest for the European Union, which is consequently becoming increasingly open to the world.



**Figure 2.1.3** Ratio Export Extra EU/Export intra EU: forecast to 2030



Source: Euro Commission, 2018. Figure created by Paolo Costa.

Since 2002, the ratio between extra-EU and intra-EU exports increased constantly reaching 0.478 in 2008. The great recession of 2009 determined a strong increment of 24% as the ratio reached 0.612 in 2015. Then, the ratio remained steady but forecasts for 2030 predict that this ratio will reach 65% on average for the European Union.

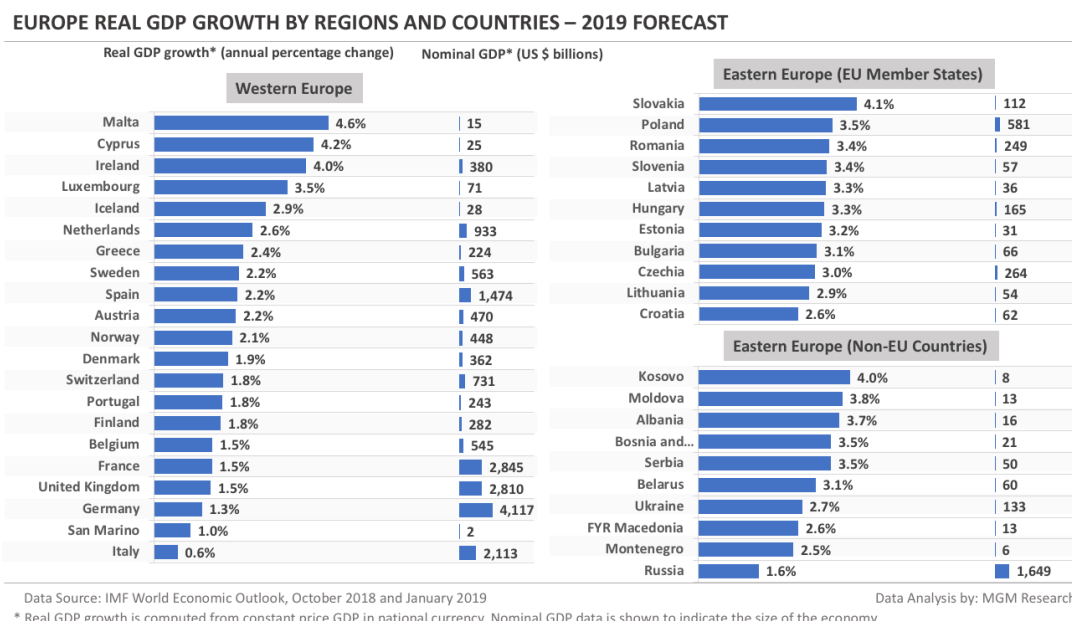
As a matter of fact, there are differences between Western Europe and Eastern Europe (Figure 2.1.3).

While the ratio for the former is forecasted to reach 75% the latter still aims to exploit the potential of the internal market considering that this ratio is projected to reach only 30% by 2030.

Moreover, it is also important to notice that eastern countries are experiencing higher economic growth, that projected in the medium-long term could double the share of the “new Europe” in European GDP.

This could determine a proportional growth of the share of the European internal market, represented by these countries.

**Table 2.1.4** Europe real GDP growth by regions and countries – 2019 forecast



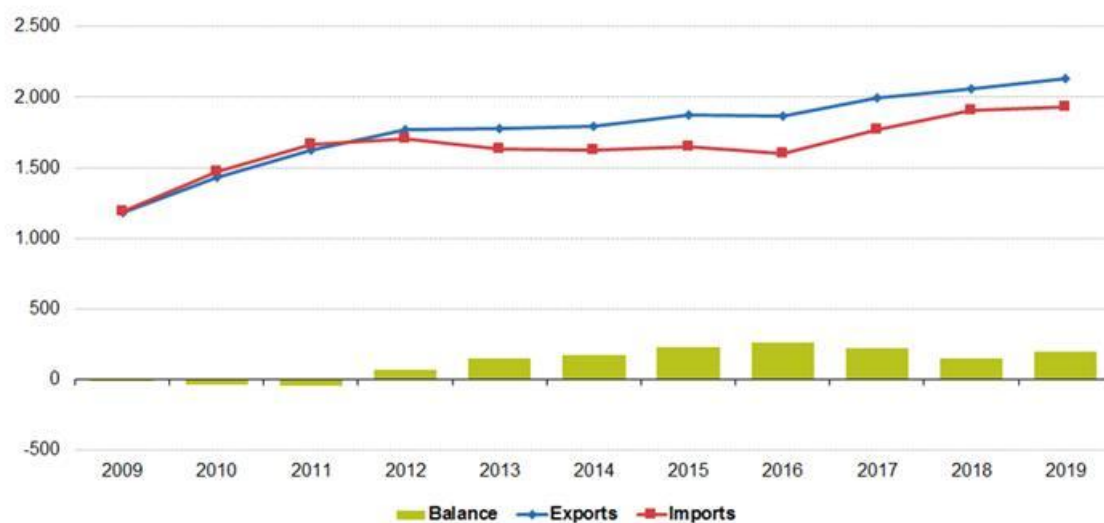
Source: IMF World Economic Outlook (October 2018 and January 2019)

Focusing on extra-EU trade evolution over the last ten years, both imports and exports have been affected by the financial crisis but then they recovered. The period between 2012 and 2016 has been characterized by a decline of imports and an increase of exports determining that the EU trade balance between 2013 and 2017 was positive (Figure 2.1.5).

Overall, between 2009 and 2019, extra EU-27 imports and exports increased constantly reaching respectively EUR 2,132 billion and EUR 1,935 billion with a total value of EUR 4,067 billion<sup>19</sup>.

<sup>19</sup> EUROSTAT (2020), international trade in goods, <https://ec.europa.eu/eurostat/statistics-explained/pdfscache/1188.pdf>

**Figure 2.1.5** Evolution of extra EU-27 trade, 2009-2019  
(EUR billion)



Source: Eurostat (online data code: DS-018995)

eurostat

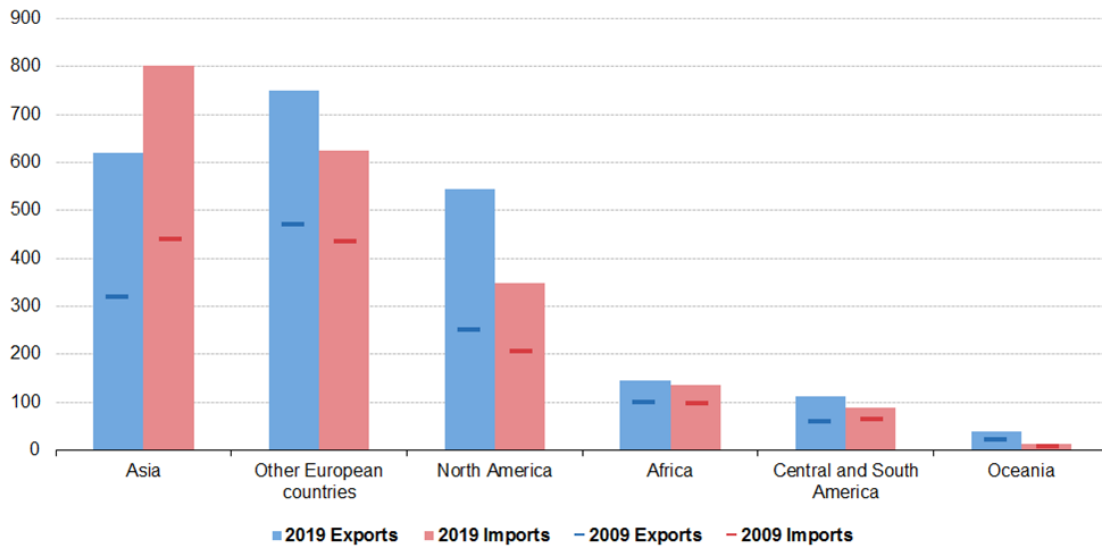
Source: Eurostat (2020)

Considering EU-27 trade by geographical zone in terms of both exports and imports in 2019 the importance of Asia-Europe trade flows is confirmed (Figure 2.1.6).

In fact, Asian countries, accounted for about 40% of EU imports and 28% of EU exports, reach a greater share compared to North America, which was the main trading partner for EU in the past. In 2019, it accounted for 17% of imports and 25% of exports. The importance of intra-Europe trade is even more underlined as it accounted 31% of imports and about one third of the total<sup>20</sup>.

<sup>20</sup>EUROSTAT (2020), Extra-EU trade in goods 2020, <https://ec.europa.eu/eurostat/statistics-explained/pdfscache/2667.pdf>

**Figure 2.1.6** EU-27 trade by geographical zone, 2009 and 2019  
(EUR billion)



Source: Eurostat (online data code: ext\_lt\_maineu)

eurostat

Source: Eurostat (2019)

## 2.2 Ports and maritime transport in EU

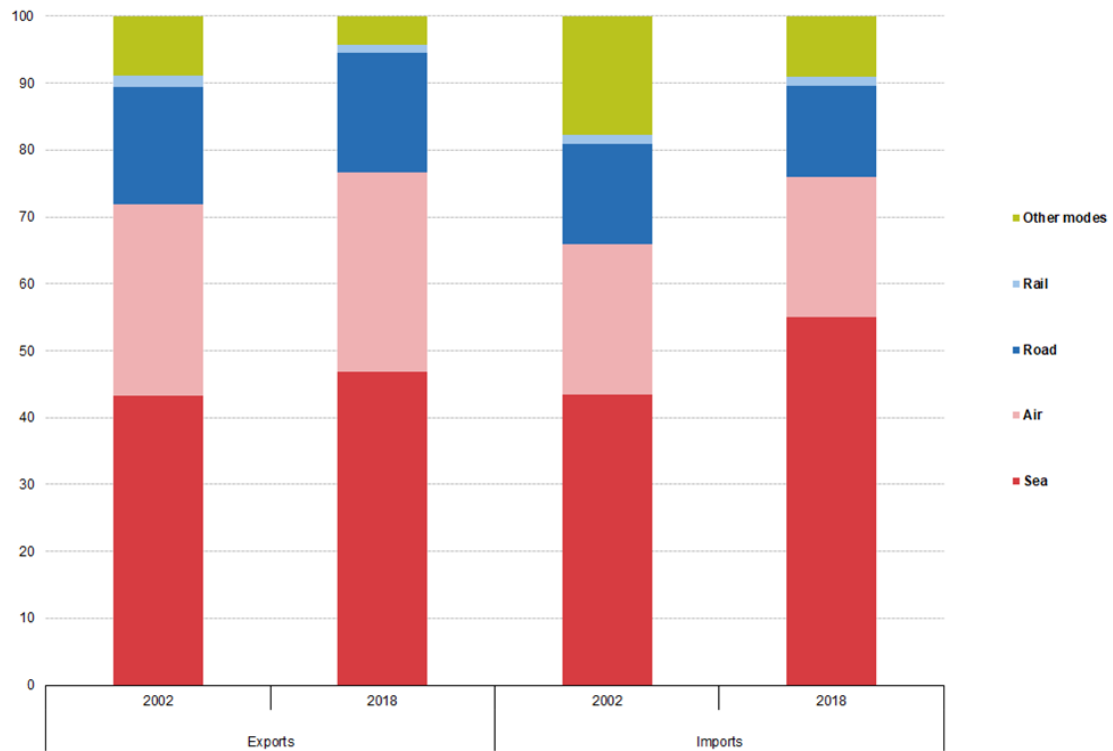
Most of extra-EU trade is carried by maritime transport. In 2018, it accounted for almost 47% of the extra-EU goods exports and for 55% of the extra-EU goods imports by value with a total amount of extra-EU transported goods of EUR 2,006 billion<sup>21</sup>. As represented by Figure 2.2.1 it was about twice as air transport in value terms (EUR 999 billion) and more than three times for goods transported by road (EUR 618 billion).

Analyzing the evolution of the modes of transport in EU between 2002 and 2018, the growth of the share of sea transport emerges both in terms of imports (11.6%) and exports (3.6%).

<sup>21</sup> Eurostat (2019), International trade in goods by mode of transport, [https://ec.europa.eu/eurostat/statistics-explained/index.php/International\\_trade\\_in\\_goods\\_by\\_mode\\_of\\_transport#Variations\\_by\\_Member\\_State](https://ec.europa.eu/eurostat/statistics-explained/index.php/International_trade_in_goods_by_mode_of_transport#Variations_by_Member_State)

**Figure 2.2.1** Value of extra-EU trade in goods, by mode of transport, EU-28, 2002 and 2018

(% of total)



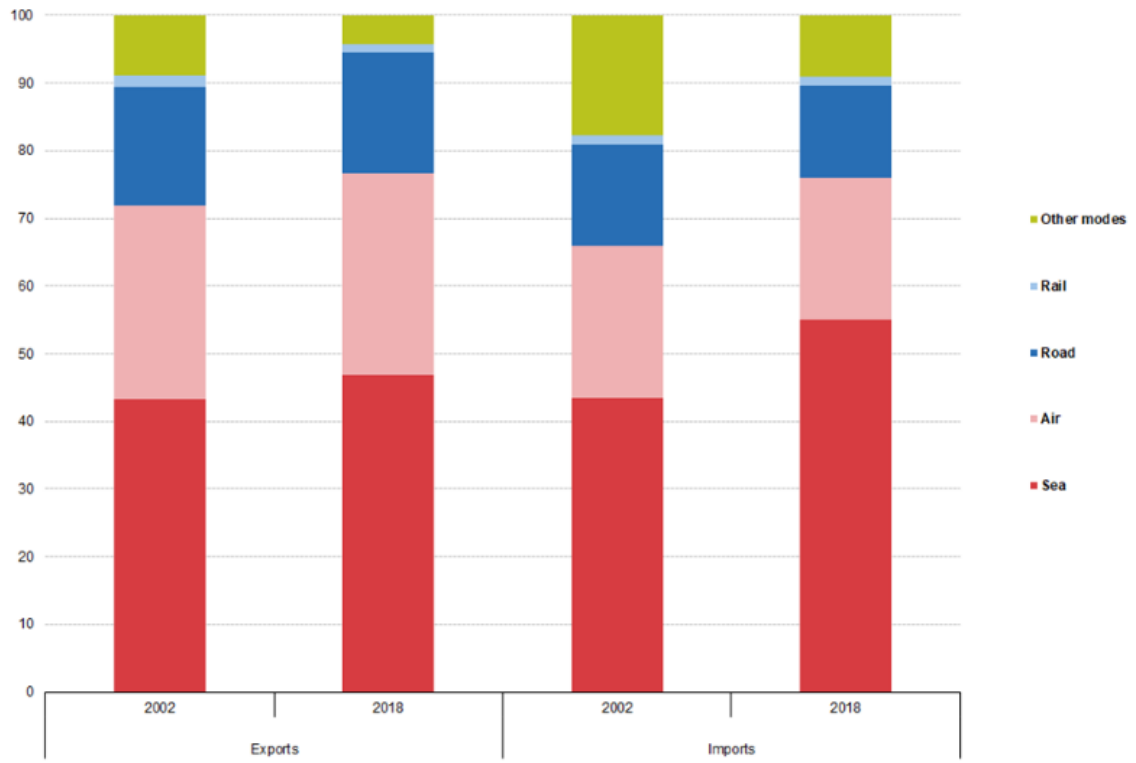
Source: Eurostat (online data code: DS-022469)



Source: Eurostat (2019)

Among the different modes of maritime transport used in extra-EU trade, maritime transport is the most used in the majority of Member States both in terms of imports and exports, especially in Greece, Portugal and Spain (Figures 2.2.2 and 2.2.3).

**Figure 2.2.2** Value of extra-EU exports, by mode of transport, 2018  
(% of total)

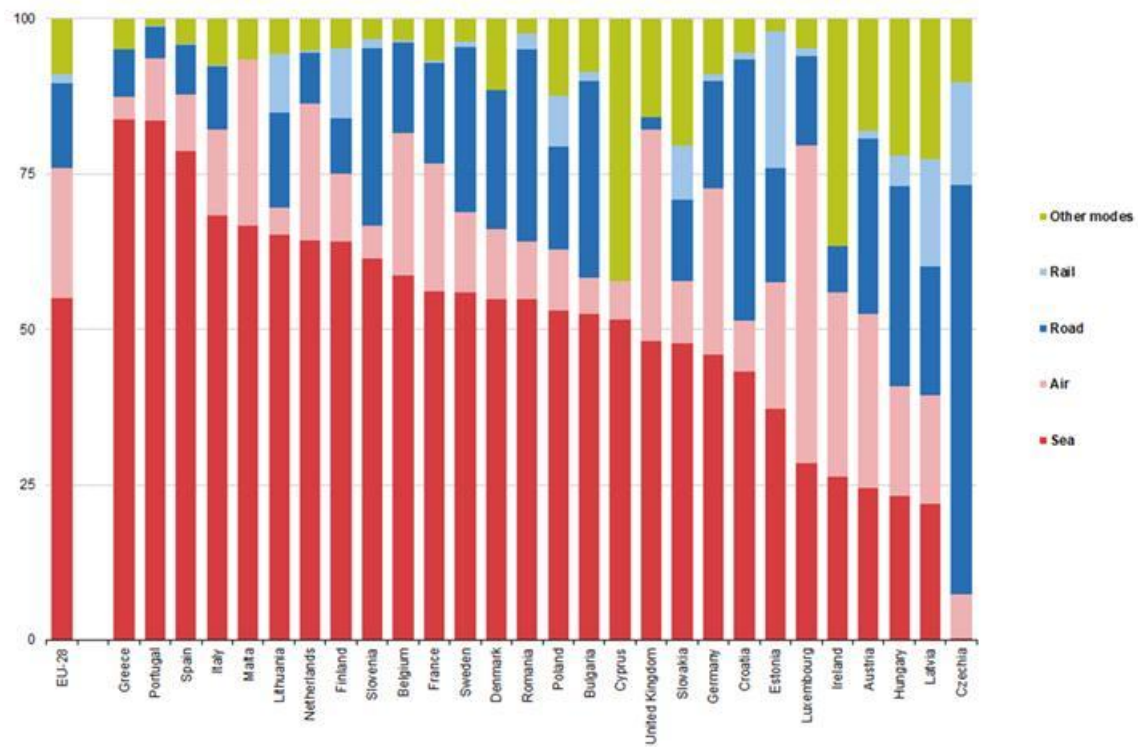


Source: Eurostat (online data code: DS-022469)



Source: Eurostat (2019)

**Figure 2.2.3** Value of extra-EU imports, by mode of transport, 2018  
(% of total)



Source: Eurostat (online data code: DS-022469)

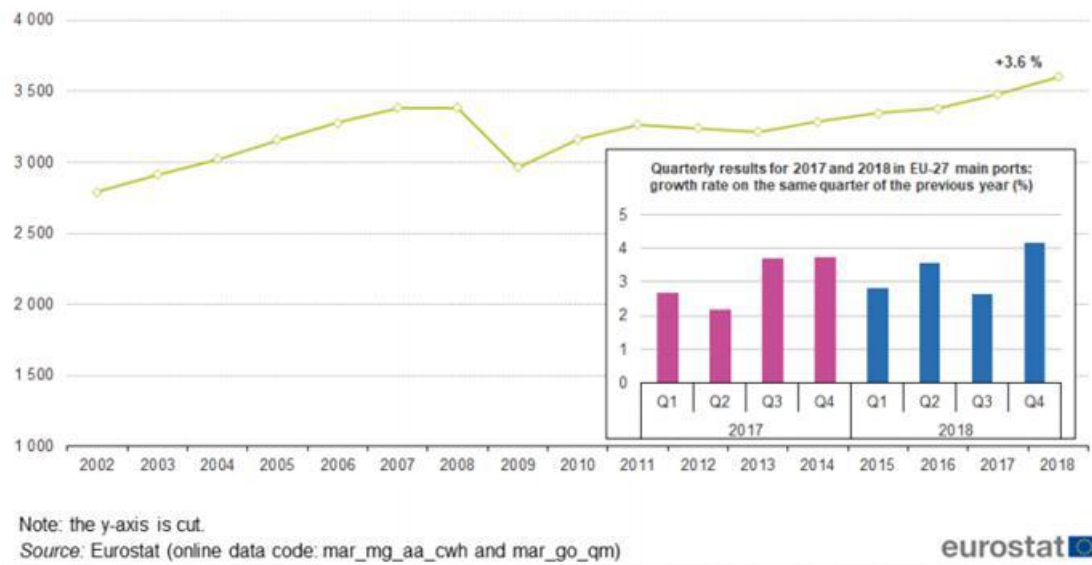


Source: Eurostat (2019)

In 2018 European ports handled 3.6 billion tonnes of total gross weight of goods. EU port freight activity has been affected by the economic crisis, it recovered in 2014 and then continued to grow until 2018 when it reached a new peak as it increased of 3.6% from 2017<sup>22</sup>.

<sup>22</sup> Eurostat (2020), Maritime ports freight and passengers statistics, <https://ec.europa.eu/eurostat/statistics-explained/pdfscache/6652.pdf>

**Figure 2.2.4** Gross weight of seaborne freight handled in all ports, EU-27, 2002-2018 (million tonnes)



Source: Eurostat (2018)

EU ports are very different from each other considering that some of them are among the best performing in the world while others are in structural decline.

This gap limits both the functioning of the entire EU transport network and the economy of the Member States in which the declining ports are located.

In fact, the difference in performance generates significant traffic diversions with longer land and sea routes and an increase in transport emissions and congestion compromising the efficiency and sustainability of the European transport network as a whole.

Furthermore, this has a negative impact on the commercial opportunities of efficient ports which cannot develop short sea shipping links, that are an alternative to road transport in congested area, or implement traffic with regions where inefficient ports are located.

The Figure 2.2.5 shows the twenty major EU freight ports in 2018. Among them 11 were located on the coast of Mediterranean, 8 in the North Sea and one in the Atlantic (Map 2.2.6).



**Figure 2.2.5** Top 20 ports handling freight, 2013-2018  
(million tonnes)

Rank 2018	Port	2013		2014		2015		2016		2017		2018					Change 2018/2017 (%)	Change 2018/2013 (%)		
		Total		Total		Total		Total		Total		By direction		By type of cargo handled (%)						
		Inwards	Outwards	Inwards	Outwards	Inwards	Outwards	Inwards	Outwards	Inwards	Outwards	Total	Liquid bulk goods	Dry bulk goods	Large con-tainers	Ro-Ro Mobile units			Other cargo	
1	Rotterdam (NL)	=	411.9	418.6	436.9	431.9	433.3	303.2	138.3	441.5	47	17	28	3	5	1.9	7.2			
2	Antwerpen (BE)	=	172.0	180.4	190.1	198.7	201.2	109.2	102.8	212.0	35	6	51	3	5	5.4	23.3			
3	Hamburg (DE)	=	120.6	126.0	120.2	120.3	118.8	70.5	47.2	117.6	11	26	61	0	1	-1.0	-2.4			
4	Amsterdam (NL)	=	92.3	96.3	98.8	96.3	98.5	64.0	35.5	99.5	47	44	1	1	8	1.0	7.7			
5	Algeciras (ES)	=	67.6	75.6	79.4	83.4	83.5	48.6	40.1	88.6	36	2	57	1	4	6.2	31.1			
6	Marseille (FR) (*)	=	76.2	74.4	77.5	76.4	75.6	55.1	20.6	75.7	60	20	14	3	3	0.1	-0.8			
7	Izmit (TR)	=	60.7	58.6	64.2	66.0	72.7	48.3	24.2	72.4	35	31	23	0	11	-0.4	19.4			
8	Le Havre (FR)	+1	56.1	57.0	78.1	78.4	70.9	46.5	18.4	64.9	61	2	35	2	0	-8.5	15.7			
9	Valencia (ES)	+1	64.4	61.4	62.9	60.0	66.1	28.4	33.6	62.0	3	4	76	3	14	-6.3	-3.8			
10	Botaf (TR)	-2	53.5	55.0	57.6	58.3	60.1	7.9	52.8	60.7	92	7	0	0	0	1.0	13.6			
11	İskenderun-Hatay (TR)	=	46.0	47.3	49.1	49.3	55.2	38.4	19.0	57.5	11	76	9	0	3	4.2	25.0			
12	Trieste (IT)	=	62.6	59.4	59.1	54.4	54.0	45.6	11.8	57.4	57	6	15	12	9	6.2	-8.4			
13	Immingham (UK)	+1	39.5	42.0	48.4	50.1	55.3	41.7	14.0	55.6	34	30	4	30	2	0.5	40.8			
14	Barcelona (ES)	+3	62.6	59.4	59.1	54.4	55.0	29.3	25.3	54.6	28	8	51	12	1	-0.8	-12.9			
15	Allaga (TR)	-2	34.4	41.2	38.0	39.1	49.7	34.5	18.7	53.3	47	33	16	0	4	7.1	55.0			
16	London (UK)	=	43.2	44.5	45.4	50.4	49.9	44.8	8.4	53.2	29	28	26	15	3	6.7	23.1			
17	Genova (IT)	-2	40.8	43.4	43.4	45.0	50.7	31.0	20.5	51.6	35	4	42	19	0	1.8	26.3			
18	Bremerhaven (DE)	=	54.5	53.6	49.8	52.3	49.3	22.1	29.1	51.2	1	0	89	9	1	3.8	-6.1			
19	Piraeus (EL)	+2	40.2	41.4	38.3	41.0	45.2	26.0	25.0	50.9	2	1	88	10	0	12.7	26.7			
20	Bergen (NO)	-1	51.8	42.1	43.6	44.7	48.1	9.5	34.8	44.3	92	5	0	0	2	-7.9	-14.4			
<b>Total top 20 ports (*)</b>			<b>1 634.1</b>	<b>1 656.3</b>	<b>1 723.4</b>	<b>1 746.2</b>	<b>1 794.4</b>	<b>1 104.4</b>	<b>720.1</b>	<b>1 824.4</b>	<b>39</b>	<b>17</b>	<b>35</b>	<b>5</b>	<b>4</b>	<b>1.7</b>	<b>11.6</b>			

Note: (\*) column indicates number of positions lost or gained compared to 2017.

(\*) 2013-2014: partially estimated by Eurostat.

(\*) Total figure for the ports being part of the top 20 ports of the countries reporting data during the reference year concerned.

Source: Eurostat (online data code: mar\_mg\_aa\_pwhd)

Source: Eurostat (2020)

Among the top 20 ports handling freight in 2018, the Port of Piraeus is the one that recorded the largest growth of 12.7% compared to the previous year.

This growth was favored by Chinese massive investment that are involving port facilities under the Belt and Road Initiative (BRI).

As a matter of fact, COSCO Shipping, acquired a 51% stake in Piraeus Port Authority PPA in 2016 that could become 67% in future years, redeveloping this port.

The BRI that is still under development aims to improve trade connectivity involving more than 60 countries, including geographical areas located on the main sea routes from China to Europe and the Mediterranean.

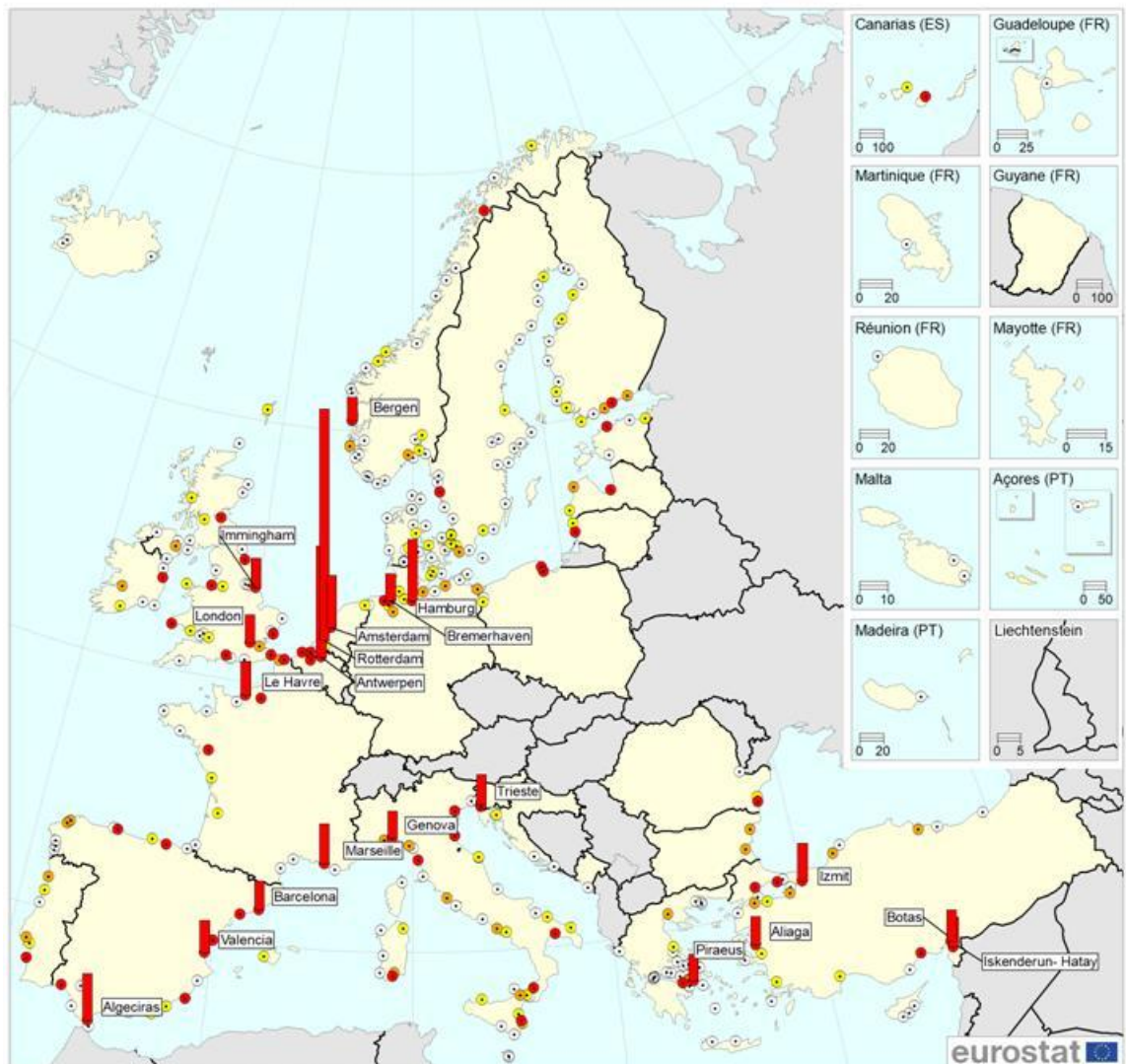
Considering the 3.6 billion tones of total freight in 2018, Rotterdam handled 441 million tones followed by Antwerp with 212 million tones and Hamburg with 118 million tones.

Rotterdam can be considered a central hub for EU imports, considering that about 69% of freight handled there was inwards transport<sup>23</sup> and almost half of freight was liquid bulk cargo. On the other side, Antwerp and Hamburg mainly handled large containers that accounted for 51% and 61% respectively.

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<sup>23</sup>Eurostat (2020), Rotterdam: the largest freight port in the EU, <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20200402-2>

**Figure 2.2.6** Main cargo ports by gross weight of freight handled in 2018 on the basis of gross weight of goods handled



Top 20 ports are named and their handling activity shown as bars.

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat  
 Cartography: Eurostat — GISCO, 01/2020  
 Map project: GISCO-2240

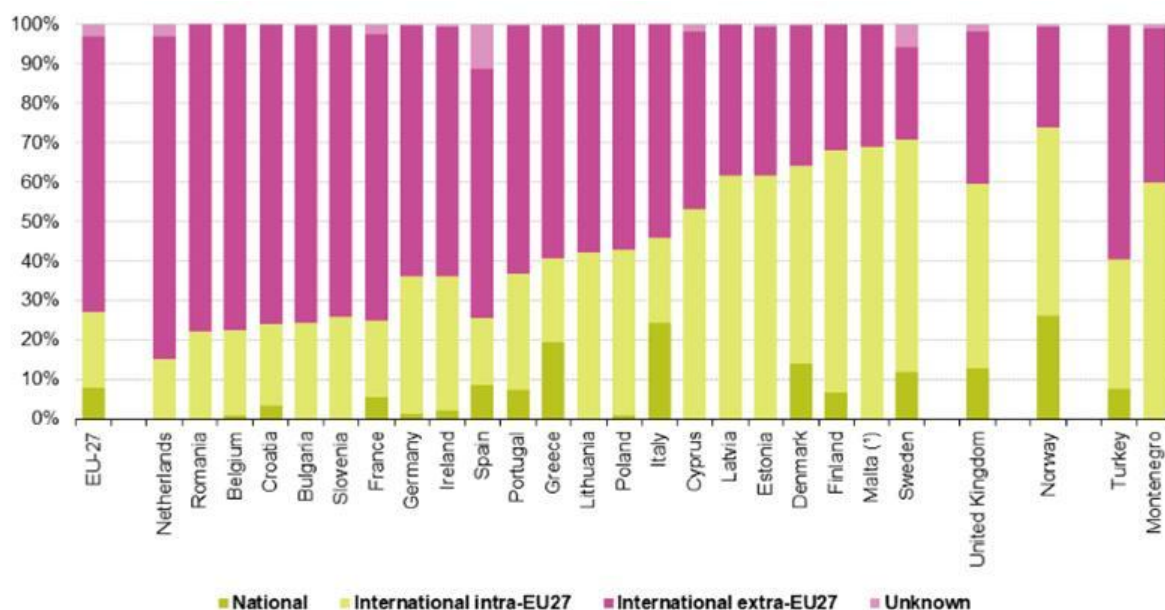
- 100 million tonnes
- 1 - 5 Mio
- 5 - 10 Mio
- 10 - 20 Mio
- > 20 Mio

0 200 400 600 800 km

Source: Eurostat (2020)

About the 70% of the freight that transited in seaports in 2018 was extra-EU transport, highlighting the role of maritime transport as the most used mode for carrying freight to or from the EU in tonnage terms. On the other side, intra-EU transport made up 19% of the maritime transport of goods while transport between national ports was 8% (Figure 2.2.7)

**Figure 2.2.7** Seaborne transport of freight between main ports in the reporting country and their partner ports grouped by main geographical areas, 2018 (% share in tonnes)



Note: the percentages of international intra-EU-27 and extra-EU-27 transport for non-EU-27 countries express the share of total transport with EU-27 and non-EU-27 countries respectively. Main ports are ports handling more than 1 million tonnes of goods annually.

(\*) Provisional data.

Source: Eurostat (online data code: mar\_mg\_am\_cwt and mar\_mg\_am\_cwt2)

eurostat

Source: Eurostat (2020)

The share of national seaborne trade was particularly high in countries with long shorelines and a large number of islands including Italy and Greece while countries with high shares extra-EU like the Netherlands, Romania and Belgium are favored by their efficient ports.

### 2.3 EU port infrastructure

Over the years, the role of seaports as the main link between maritime transport and any destination in the hinterland has strongly evolved. Indeed, they have gone from just

being places of loading and unloading goods and their storage to an entity that carries out activities that are directly or indirectly involved in maritime transport.

European seaports (EU-27) face substantial investment needs of around EUR 48 billion (EUR 5 billion annually) for the period 2018–2027<sup>24</sup>.

These investment needs are crucial in maintaining and enhancing existing infrastructure, creating new transport links and improving environmentally sustainable port operations in view of developing global trends.

First of all, the current transport infrastructure is geographically obsolete because it has been built on flows that are currently on the background i.e. the America-Europe trade relationship.

This development has determined a massive level of infrastructure for the ports geographically closest to those areas, notably the ports of the North Sea and the whole European transport system has adapted to this route implementing their hinterland.

Nowadays the Far East-Europe trade relationship is more important than the Transatlantic one, a major revision of the infrastructural transport focusing, in particular, on the role of ports is required, in order to be aligned with new maritime traffics.

Indeed, North Sea ports, despite their position, are considered the terminal for Asia-Europe maritime traffic flows while the Mediterranean transshipment captures about 10% of the traffic that crosses the Mediterranean Sea entering from Suez<sup>25</sup>.

In case of goods destined to southern Europe, for example, they arrive in the ports of the North Sea and then they reach their destination by land transport.

Containers arriving in mega-ports are consolidated or feedered with smaller vessels, rail or road, to regional and local ports determining the evolution of a complex hub-and-spoke network. Mega-cargoes require supply chain integration and the choice of the ports will also determine the links and the nodes of the land multimodal transport infrastructure network will have to be constructed, or implemented to deal with the

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<sup>24</sup> ESPO (2018), The infrastructure investment needs and financing challenge of European ports, [https://www.espo.be/media/Port%20Investment%20Study%202018\\_FINAL\\_1.pdf](https://www.espo.be/media/Port%20Investment%20Study%202018_FINAL_1.pdf)

<sup>25</sup> Costa, P. and Maresca, M. (2014) The European Future of the Italian Port System. Venice: Marsilio

consolidation and deconsolidation trends, along each supply chain route (Haralambides 2019<sup>26</sup>).

The relationship between Far East and Europe involves the use of increasingly large container carriers up to 18,000 TEU while the relationship between the Far East and North America is focused on container carriers under 10,000 TEU<sup>27</sup>.

The strong infrastructure investment made during last decade in North Sea ports, allows them to accommodate 20,000-TEU vessels enabling to reach economies of scale despite the longer journey in reaching those countries (generally 30 days) compared to the EU southern ports (24 days).

Nevertheless, the progressive replacement of existing ships with larger ones has many consequences on both maritime ports and land as it involves a consolidation of the connected logistics structures that must adapt to these new flows.

In order to reach economies of scale, mega-ships have to sail with a full cargo and consequently, cooperation with carriers through global maritime alliances has increased enabling carriers to fill each ship with their containers reducing the number of larger ships.

Moreover, handling a container arriving on a large ship is more difficult than deal with a container arriving on a smaller one, considering that cargo handling time per TEU is higher after a certain ship size.

As a matter of fact, crane productivity cannot be stretched much beyond 30 moves/h and the only way to serve a larger ship in the same time is by adding more and bigger cranes in terms of air draft and outreach. However, increasing crane density reduces their productivity, nullifying also the advantages of having bigger hatches (Haralambides 2019<sup>28</sup>).

In addition, big ships impose substantial demands on port capacity, without paying properly, considering that the same space where once three Panamax ships (three berths) could be placed, now only two of the latest generation mega-ships that are about

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<sup>26</sup> Haralambides, H.E. (2019) '*Gigantism in container shipping, ports and global logistics: a time-lapse into the future*'. Maritime Economics & Logistics

<sup>27</sup> Costa, P. and Maresca, M. (2014) *The European Future of the Italian Port System*. Venice: Marsilio

<sup>28</sup> Haralambides, H.E. (2019) '*Gigantism in container shipping, ports and global logistics: a time-lapse into the future*'. Maritime Economics & Logistics

400 m long can be housed. This results in a decrease in the use of berths and ship-to-shore cranes (StS), as larger ships mean a lower call frequency.

This could be compensated by the increase in traffic to the port by the carriers with larger ships but this does not happen because the size of the call is only moderately correlated with the size of the ship.

In addition, fewer larger ships and fewer port calls are required to meet a certain amount of annual demand, resulting in a reduction in the use of the berth and crane, affecting the capital costs of the port and of the terminal operator (Haralambides 2019<sup>29</sup>).

Ports in order to be capable to deal with mega-ships must have deep waters, extensive land spaces and sustainable and well-functioning hinterland connections by rail, road and inland waterways.

The adaptation of existing infrastructure in terms of size, such as deepening of the mooring, canals, locks and the extension of berths, quays, locks could ensure compliance with these necessary conditions.

At the same time, this could lead to a port disruption, resulting in a creation of port overcapacity or an underutilization of inland infrastructures if the lack of port capacity represents a "missing link" in the networks.

Furthermore, the trends towards smaller ships and direct calls will be favored by trade regionalization. In fact, the growth of intra-regional trade in Asia, leads to smaller distances and therefore smaller ships.

Therefore, Asian port and logistic infrastructure will be developed accordingly to this trade, making it possible for these ships to be used for trade between Far East-Europe in place of dedicated large containerships destined for North Sea.

Anyway, gigantism in maritime transport will have serious consequences for ports unable to adapt, such as smaller port facilities.

Consequently, it becomes important to evaluate the advantages of gigantism with the obsolescence of a large portion of European ports and logistics infrastructure.

A rebalancing towards the Mediterranean and the ports of southern Europe would reduce the overall transport costs and the level of pollution and congestion of the European transport network, increasing the sustainability of the whole system.

A significant example of this problem, as it has been demonstrated (Cappelli, Libardo, and Fornasiero 2011<sup>30</sup>) is that a container that leaves from China to Munich via

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<sup>29</sup> Haralambides, H.E. (2019) '*Gigantism in container shipping, ports and global logistics: a time-lapse into the future*'. Maritime Economics & Logistics



Rotterdam rather than Venice could produce at least 78 kg of additional CO<sub>2</sub> per TEU and up to 600 tons of CO<sub>2</sub> for 8,000 TEU containers. Thus, if Venice would handle one million TEU more per year departing from the Far East with EU destination, there would be a reduction of CO<sub>2</sub> equal to approximately 125,000 tons / year, in addition to savings in time and lower fuel costs.

Ports are the links between shipping networks and economic activities in the hinterland. Thus, an important element which make ports efficient and competitive at global level is its connections to inland modes of transport, together with its capacity good sea access and the extensive port areas for handling and stocking freight.

North Sea ports are well connected to hinterland transport. For instance, Rotterdam port is linked to more than 400 international rail connections and various terminals have rail transshipment facilities enabling the direct loading of the cargo onto a train<sup>31</sup>.

Therefore, Southern European ports should invest in the networks connecting ports to the internal market that are inadequate, too. Ports must be linked with railways, roads and inland waterways in order to promote sustainable growth in transport and enable transfer from ports to the hinterland.

In fact, the success of a good port is determined also by a solid connection to its immediate surrounding inland area and by the development of infrastructures for smooth transport flows.

They cover transport infrastructure that facilitate continuous flows between maritime terminals to port users located in the ports and from maritime terminals to rail or inland waterway terminals.

In addition to geographical and technological disruption in maritime ports, many global trends have to be taken into consideration.

Sea ports well connected both by sea and by land make ports a suitable place also for the development of logistical activities. Therefore, the land and associated users are essential for the development of logistics areas and production areas near the terminals.

For the development of storage areas, warehouses and terminals it becomes fundamental to invest in port superstructure which are important for the supply of port services related to transport.

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<sup>30</sup> Cappelli, A., Libardo, A., and Fornasiero, E., (2011) L'impatto del trasporto intercontinentale di merci: Modelli per la misura degli effetti delle scelte, IUAV, Venezia

<sup>31</sup> PORT OF ROTTERDAM, <https://www.portofrotterdam.com/en/doing-business/logistics/connections/intermodal-transportation>



Another important aspect is related to the environmental sustainability of port operations. As a matter of fact, all transport modes must invest in greener technologies and in smarter logistic chains, optimizing movements in order to reach the target of decarbonization of the economy. Moreover, the Directive on the deployment of alternative fuels infrastructure requires, for example that all maritime ports located in the TEN-T core network are equipped with LNG (liquefied natural gas) refueling points by 2025.

Therefore, investing in energy-related infrastructure and infrastructure for reducing environment footprint becomes increasingly important.

Examples of infrastructures that could reduce environmental impact are increasing coastal protection, or implement natural walls to reduce negative effects on local communities such as noise.

Furthermore, the strong digitalization of transport procedures determines higher investments in ICT and digital infrastructures, such as a digital port community platform, enabling the flow of information.

Besides, the rise in e-commerce has determined a demand for sites for port related logistics and manufacturing.

There are consequently many more requirements for developing new and adapting existing port infrastructure than simply increasing their capacity.

Thus, the importance of maritime investment at European level becomes clear, given the growing importance of extra-EU countries that are mainly reachable through air or sea transport.

In addition, the development of the trade relationship between Asia and Europe and the growing importance of the Mediterranean Sea basin represent a great opportunity for the European Union.

In fact, at the European level the choice is between exploiting further North Sea ports and their economies of scale, despite the extra days of journeys and the environmental issues or investing in the ports of the south that are characterized by a significant geographical advantage.

Investing in the latter could offer gates to Asian cargos, by implementing their infrastructure and achieving capacity and efficiency comparable to North Sea ports.

From the European perspective there is the opportunity to correct a historical transport and logistics arrangement that today is anachronistic and barely sustainable (Costa 2014<sup>32</sup>).

The new traffic geography requires a shift of transport to the south. Being stuck to transport networks that can now be considered geographically obsolete would lead to an increase in additional costs incurred by port users but also to a higher level of congestion and pollution, causing disadvantages for Europe as a whole.

The coordinated use of all transport infrastructures along the routes of global traffic is crucial and it involves the fundamental agreed governmental role at every level: national, European and global, given their involvement in infrastructure provision in choosing among different routes. However, the role of potential private investors and the supply chain users should be also taken into consideration.

The European Union must be able to respond to this scenario by focusing transport policies on maintaining efficient access to the European productive core and therefore on infrastructures that favor trade between Member States which still remains fundamental, but at the same time must increase accessibility to areas that have been developing recently, opening up to new markets through port gateways.

Finally, EU should implement its transport infrastructural policy considering the infrastructural plan developed by extra-EU countries, namely China's Belt and Road Initiative.

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<sup>32</sup> Costa, P. Maresca, M. (2014), *The European Future of the Italian Port System*, Venezia, Marsilio

### **III. The Trans-European Transport Network**

The overview of the global transport scenario in the first chapter underlines the importance of maritime transport in freight trade and the relevance of the traffic between Far East-Europe and consequently the Mediterranean Sea basin.

The second chapter shifts the focus to the evolution of trade in Europe, which is increasingly taking into consideration new global traffic and analyzes the situation of ports, explaining the importance of infrastructure investments in a scenario which is constantly changing.

Indeed, all these phenomena require an adaptation of the infrastructure networks to the new technological requirement and geographical flows.

Based on these assumptions, this chapter focuses on the transport infrastructure policy implemented at European level, namely TEN-T.

In particular, after analyzing how it has been implemented over the years, the focus will move to the significance given to ports, taking into consideration the CEF investments from 2014 to 2017, in order to understand if they are adequate to the new commercial flows and the new transport demand.

#### **3.1 The implementation of the TEN-T Network**

The European Union has recognized the importance of transport since the Treaty of Rome of 1957 as it emerges the need to build a Single Market to promote the four fundamental freedoms of movement (of citizens, goods, capitals, and services).

The trans-European network policy for transport, energy and telecommunication infrastructure and its guiding principles were first agreed in 1992 in the Maastricht Treaty but its legal basis were provided in the Treaty on the Functioning of the European Union.

The Article 170 establishes that “the Union shall contribute to the establishment and development of trans-European networks in the areas of transport, telecommunications and energy infrastructures [...]. Within the framework of a system of open and competitive markets, action by the Union shall aim at promoting the interconnection and interoperability of national networks as well as access to such networks. It shall

take account in particular of the need to link islands, landlocked and peripheral regions with the central regions of the Union”<sup>33</sup>.

The trans European network – Transport (TEN-T), that is the transport infrastructure policy at EU level, focuses on the creation of a Single European Transport Area comprising all types of transportation and strengthens social, economic and territorial cohesion in the EU.

By contrast, many Member States, identifies transport infrastructure investments as an opportunity to fight unemployment that had a very high rate in the 1990s.

The main objective was to combine a Keynesian approach to boost aggregate demand with the benefits of a substantial reduction in transport costs (Costa 2019<sup>34</sup>).

As a matter of fact, unit costs of production have been reduced, the markets for inputs and outputs have been expanded and the Single Internal market became higher competitive at international level increasing growth capable of creating jobs (Haralambides 2019<sup>35</sup>).

All these principles are still considered valid, even if, during the implementation period, the environmental and energy issues and their consequently related objectives emerged. Moreover, the reduction of the level of transport pollution could encourage a modal shift towards rail, sea and inland navigation rather than road and air transport.

In 1996, the Council and the European Parliament set the first guidelines on the establishment of the TEN-T policy but in 2004, the eastward enlargement of the EU determined an even greater need of cohesion among regions and territories requiring a revision of the project.

Finally, after many comprehensive revisions, the new Regulation (EU) No 1315/2013 on Union guidelines for the development of the trans-European transport network (TEN-T) entered into force on 22 December 2013, defining the general objectives and specific technical requirements for the network.

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<sup>33</sup> REGULATION (EU) No 1315/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU

<sup>34</sup> Costa, P., Haralambides, H., and Roson, R.(2019) A European Public Investment Outlook , 8. *From Trans-European (Ten-T) to Trans-Global (Twn-T) Transport Infrastructure Networks. A Conceptual Framework*, UK: Open Book Publishers, 2020, <https://doi.org/10.11647/OBP.0222>

<sup>35</sup> Costa, P., Haralambides, H., and Roson, R.(2019) A European Public Investment Outlook , 8. *From Trans-European (Ten-T) to Trans-Global (Twn-T) Transport Infrastructure Networks. A Conceptual Framework*, UK: Open Book Publishers, 2020, <https://doi.org/10.11647/OBP.0222>

The TEN-T network has a dual-layer structure that consists of a “core network” layer to be completed by 2030 and a “comprehensive network” layer to be realized by 2050, that both include all modes of transport.

The comprehensive network, that covers all EU territory in order to ensure accessibility and connectivity to all the regions, has been achieved according to a bottom up approach based on Member States initiative while EU coordinated it at the planning stage.

On the other side, the core network that represents the most strategically important part of the comprehensive network has been carried out according to a top down approach and was strongly coordinated both in the planning and implementation phases.

The core network has been programmed in order to be considered indivisible and sustainable by Member States.

It has been identified indivisible because the objective of its realization can be reached with the completion of the whole network and not just a part of it, and sustainable because it has been identified in its essential part to be compatible with EU financial and implementation abilities.

Indeed, the TEN-T network embraces an implicit redefinition of the European spatial planning by defining a much more rational and strict transport network, with the aim of directing expenditure towards a smaller number of projects with which it is possible to achieve real EU added value.

In 2004, 30 priority projects were defined within the TEN-T while in 2013, only 9 Core Network Corridors (CNC) were established. This highlights the effort to focus on the fundamental aspects of the infrastructure transport policy required by the European Union.

The Corridors have been defined by the Regulation as “an instrument to facilitate the coordinated implementation of the core network [...] contributing to cohesion through improved territorial cooperation” and “shall be focused on a) modal integration, b) interoperability and c) a coordinated development on infrastructure, in particular cross border sections and bottlenecks”.

These Corridors should be intermodal, cross at least three Member States and be connected to maritime ports. Their development involves the realization of alternative fuels infrastructure favoring the decarbonization of the transport system.

With the realization of the TEN-T network, priority is given to infrastructures which aim to reduce negative externalities such as reducing the level of pollution and road congestion.

Carrying out cross-border and coordinated transport projects in different Member States is very difficult and it could determine the creation of divergent systems generating even more bottlenecks.

The TEN-T network is not a set of national interests and some transnational links as before, considering that the current network has been determined by the application of a complex and strategic procedures.

Actually, it has been determined by stakeholders consultation, recommendation from six groups of experts, large-scale public consultation, verification by the Council of Transport Ministers and the impact assessment and many bilateral and multilateral consultations with Member States. They gave the proposal an assessment that can be hardly questioned.

The network was created based on an analysis and selection method of alternatives considering both geographical and conceptual criteria applied in two phases.

In the first phase, the main urban nodes were identified, i.e. the capitals of all the Member States, all the mega cities, and all the large urban areas or relevant conurbations.

Ports and airports directly belonging to these areas were also considered nodes, as well as those that exceed a certain volume threshold or meet certain geographical criteria and the most important cross-borders.

In the second phase, these main nodes were connected with multimodal arches, i.e. roads, railways and inland waterways, based on their feasibility and, where possible, using the existing infrastructure.

Moreover, the new Guidelines gave relevance to the implementation of those infrastructures such as ports and airports that carry freight transport and allow the increase of the competitiveness of the European Union in a global scenario.

Therefore, a major awareness of the need to integrate the European economy in the global one emerges, considering that previously European transport policy has always aimed at establishing a Single internal Market as Europe considered itself self-sufficient.

The financial outlay planned for this policy is also significant considering that the “Connecting Europe Facility”, the financial pillar of TEN-T policy entered into force in

2013, involves about EUR 24,05 billion for transport related to the period 2013-2020, while the transport budget established for the period 2007-2013 was EUR 8 billion.

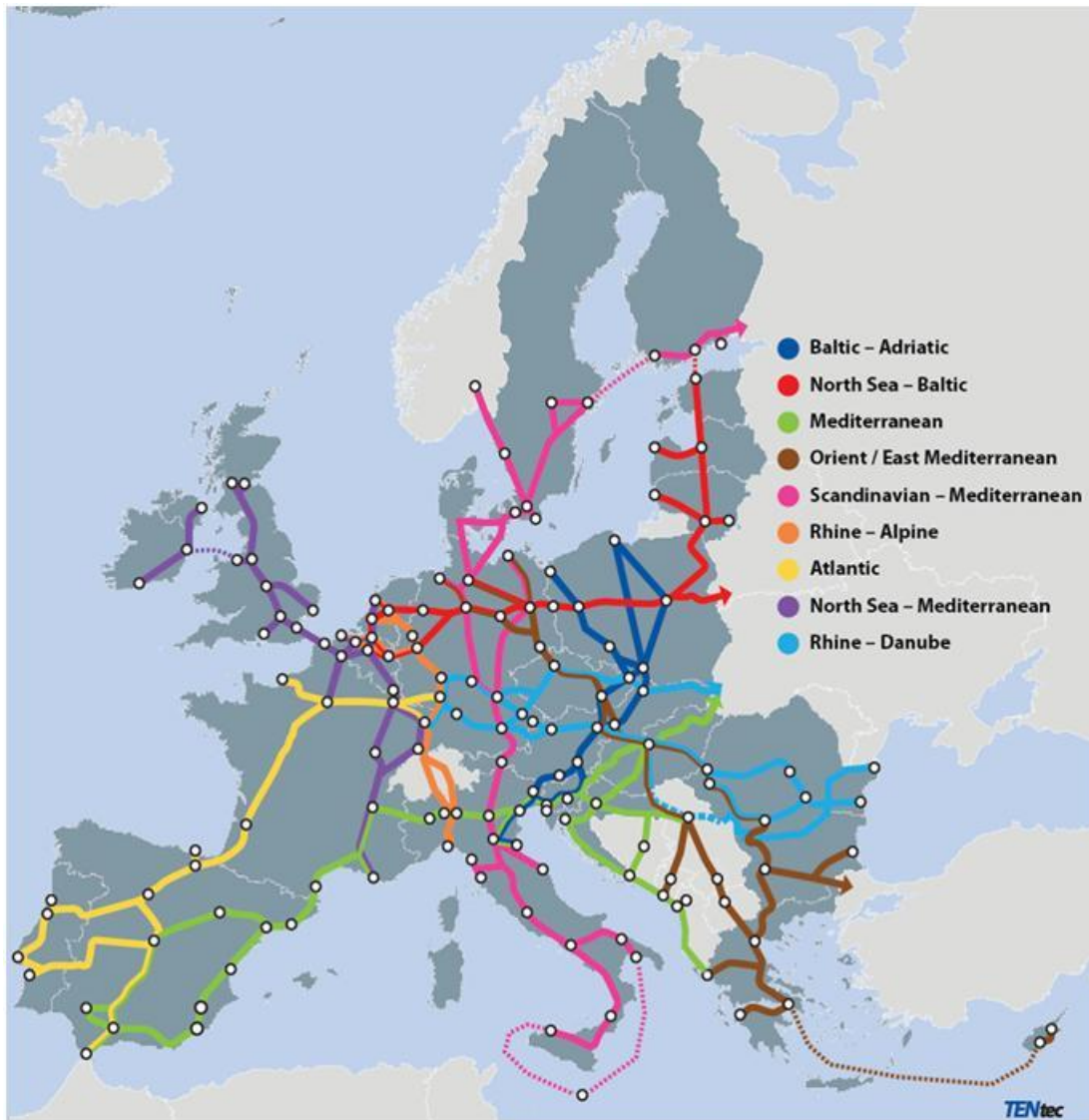
The TEN-T policy also implemented two horizontal priorities: the 'Motorways of the Sea' (MoS) and the European Railway Transport Management System (ERTMS) which complement and extend the 9 Core Network Corridors.

MoS aims to introduce new intermodal maritime-based logistics chains focusing on Short Sea Shipping in Europe, increasing connectivity between core and comprehensive ports.

On the other hand, ERTMS is the railway priority which targets to improve the railway mode of transport. In detail, it consists of a software-based system for railway traffic management and safe regulation promoting EU trains interoperability.

Every corridor and project is led by a European Coordinator that together with the Member State draw up a work plan that includes the characteristics of the corridor, its objectives and must be updated periodically.

**Figure 3.1.1** TEN-T core networks corridors



Note: the nine TEN-T core network corridors are based on the CEF and TEN-T Regulations (1316/2013 & 1315/2013); they have been created as a coordination instrument to facilitate the completion of major parts of the core network of strategic importance.  
Source: European Commission, Directorate-General for Mobility and Transport, TENtec information System

Source: European Commission, Directorate-General for Mobility and Transport, TENtec information System

Regulation (EU) No 1315/2013 states that the core network “should enable Union action to concentrate on those components of the trans-European transport network with the highest European added value, in particular cross-border sections, missing links, multimodal connecting points and major bottlenecks serving the objective, set out in the White Paper, of reducing greenhouse gas emissions from transport by 60 % below 1990 levels by 2050”.



However, overcoming these issues has been very difficult. Missing links, in particular at land cross-border sections, are a major obstacle to the free movement of goods and passengers within and between the Member States.

As a matter of fact, every country has been characterized by its own national transport network that has developed with different times, methods and territorial coverage.

A meaningful example is the need to overcome the technical barriers, particularly in the rail sector which is characterized by incompatible standards such as the different measures of the distance between rails. Among the 365 cross-border rail connections identified by the Commission, 149 (41%) of them are not operational today<sup>36</sup>.

Secondly, the process of completing EU enlargement has been very long and complex, making the creation of a transport infrastructure policy even more difficult.

Besides, EU countries have a different rate of infrastructure development which is lower in Eastern region. The fragmented transport infrastructure level among the transport modes does not allow to exploit the potential of multi-modal transport making it difficult to remove infrastructure bottlenecks and to bridge missing links. In fact, many of Europe's freight terminals such as maritime ports, airports and urban nodes are not adapted to make multi-modal connections.

Among the main corridors, the Rhine-Danube corridor (18%) followed by the North Sea and Baltic corridor (14%) received the largest share of funding. Considering the various modes of transport, rail transport is the one that has received the most funds (78.8%), followed by inland waterways (8.4%) and road infrastructure (6.7%). Maritime transport gets 4.3% of the EU funds, and Mediterranean ports, despite the increase of sea transportation in this area, received only 1.45%.

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<sup>36</sup> Sippel L., Nolte J., Maarfield S., Wolff D., Roux L. (March 2018) , *Comprehensive analysis of the existing cross-border rail transport connections and missing links on the internal EU borders*, Brussels: European Commission  
[https://ec.europa.eu/regional\\_policy/sources/docgener/studies/pdf/cb\\_rail\\_connections\\_en.pdf](https://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/cb_rail_connections_en.pdf)

**Figure 3.1.2** Distribution of EU TEN-T funds by transport mode and core corridor

TEN-T Corridors	Inland Waterways		Maritime			Multimodal total	Rail		Road		Total	TEN-T Corridors
	total	Med	North	other	total		total	total	total	total		
Atlantic	34,7	0	0	76,9	76,9	61,3	1319,2	53,8	1545,9	Atlantic		
Baltic Adriatic	0	67,3	0	136,8	204,1	50	1876,1	246,5	2376,7	Baltic Adriatic		
Mediterranean	10,7	182,8	0	0	182,8	89,3	2449,7	148,1	2880,6	Mediterranean		
North Sea Baltic	67,5	0	13,4	58,4	71,8	11,3	2432,3	496,6	3079,5	North Sea Baltic		
North Sea Med	1153,5	0	115,5	73,8	189,3	44,7	340	89,3	1816,8	North Sea Med		
Orient-East Med	33,9	32	0	2,2	34,2	25,9	1708	188	1990	Orient-East Med		
Rhine Alpine	27,6	6,4	8	4,1	18,5	23	570,1	62,9	702,1	Rhine Alpine		
Rhine Danube	381,9	0	0	10,8	10,8	15,3	3285,3	81,4	3774,7	Rhine Danube		
Scan Med	0	6	0	80,5	86,5	41,1	2036,6	0	2164,2	Scan Med		
<b>TOTAL</b>	<b>1709,8</b>	<b>294,5</b>	<b>136,9</b>	<b>443,5</b>	<b>874,9</b>	<b>361,9</b>	<b>16017,3</b>	<b>1366,6</b>	<b>20330,5</b>	<b>TOTAL</b>		

Source of data: Euro Commission, 2018. Figure created by Paolo Costa

Forecasts estimate that the completion of the Core Network by 2030 could raise GDP of 1.6% compared to a situation without further TEN-T investment beyond 2016 and it could result in job creation of around 7,5 million person-years between 2017 and 2030 both related to construction and to wider economic benefits thanks to improved connectivity<sup>37</sup>.

In September 2018, the Commission launched public consultations with the aim of examining the progress made in implementing the TEN-T since 2013 in order to verify the compliance with the TEN-T provisions and the implementation progress. This assessment is crucial in view of the TEN-T review in December 2023 to evaluate the effectiveness of this policy.

### **3.2 TEN-T policy: maritime transport**

The need for well-connected port infrastructure was highlighted in both the 2011 White Paper on Transport and the Single Market Act II, considering them essential to improve EU growth potential, making the EU transport system more sustainable and inclusive in support of the internal market. Ports, by serving regional and local maritime traffic, ensure the territorial continuity of the EU by connecting peripheral and island areas.

Moreover, the importance of ports as international infrastructures has been partially recognized by the trans-European transport network which identified 319 ports, 83 in the core network and 236 in the comprehensive one that handle 96% of goods transiting through the EU ports<sup>38</sup>.

TEN-T considers them as nodes from which to organize multimodal logistics flows using short sea shipping, trains and inland waterway connections to minimize road congestion and energy consumption.

Each of the Nine Core Corridors starts or ends with one or more maritime ports and then crosses Europe connecting the main productive and commercial areas.

Their role is fundamental as they allow to connect the EU market with global market guaranteeing the most efficient solution for freight transport outside and inside Europe.

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<sup>37</sup> Schade W., Maffii S., Hartwig J., de Stasio C., Fermi F., Martino A., Welter S., Zani L. (2018) The impact of TEN-T completion on growth, jobs and the environment – FINAL REPORT Part I Draft. Report on behalf of the European Commission. Karlsruhe, Milan. <https://download.repubblica.it/pdf/2019/politica/tav-2019.pdf>

<sup>38</sup> European Commission (2013) *PORTS: GATEWAYS OF THE TEN-T*, [https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/site/brochures\\_images/ports2013\\_brochure\\_lowres.pdf](https://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/site/brochures_images/ports2013_brochure_lowres.pdf)

The corridor map was drawn starting from the perspective that the major European sea ports are located over the coast between Hamburg and Le Havres but it aims to enforce a port redistribution strategy allowing a more balanced use of port infrastructures between North and South Europe, developing a more efficient and sustainable transport system by 2030.

Besides, as stated by the Guidelines, the maritime dimension of TEN-T is represented by Motorways of the Sea (MoS) which consists of short-sea shipping routes, ports, associated maritime infrastructures, equipment, facilities and relevant administrative formalities.

According to the EU Regulation No 1315/2013, Motorways of the Sea “shall contribute towards the achievement of a European maritime space without barriers and shall include: (a) Maritime links between maritime ports of the comprehensive network or between a port of the comprehensive network and a third-country port where such links are of strategic importance to the Union; (b) Port facilities, freight terminals, logistics platforms and freight villages located outside the port area but associated with the port operations, information and communication technologies (ICT) such as electronic logistics management systems, and safety and security and administrative and customs procedures in at least one Member State; (c) Infrastructure for direct land and sea access”.

This project aims to deploy efficient sea routes and to increase cohesion between maritime links with hinterland by connecting Core Network Corridors. In fact, the introduction of a new intermodal maritime-based logistics chain contributing to door-to-door integrated transport systems reduces bottlenecks in the EU’s transport network and it can be considered as a more sustainable alternative to road transportation.

In order to be eligible under the MoS priority, actions must involve activities in two Member States.

**Figure 3.2.1** Map of motorways of the sea



Source: European Commission

This project is composed by four corridors that involve different geographic areas:

- Motorway of the Baltic Sea (linking the Baltic Sea Member States with Central and Western Europe countries);
- Motorway of the Sea of Western Europe (leading from Portugal and Spain via the Atlantic Arc to the North Sea and the Irish Sea);
- Motorway of the Sea of south-east Europe (connecting the Adriatic Sea to the Ionian Sea and the Eastern Mediterranean, including Cyprus);

- Motorway of the Sea of south-west Europe (Western Mediterranean, connecting Spain, France, Italy and including Malta and linking with the Motorway of the Sea of south-east Europe and including links to the Black Sea)<sup>39</sup>.

Motorways of the Sea support both work projects and studies related to the implementation and testing of new and innovative concepts. Examples of work projects include infrastructure and facilities up to the terminal site, intermodal terminals in ports and hinterland and ways to ensure year-round navigability such as facilities for dredging or ice breaking. Third countries can take part only to studies with or without a pilot action.

The Detailed Implementation Plan establishes three pillars on which MoS priorities are based: (1) improving the environment, (2) integrating the maritime transport in the logistics chain and (3) improving safety, traffic management and the human element.

Regarding the first pillar, relating to the environment, MoS entailed the vision of a competitive and sustainable transport system with the aim of increasing sustainability, while reducing emissions, expressed by the White Paper on Transport in 2011. Therefore, they supported the use of alternative fuels (such as LNG) and exhaust gas cleaning systems (EGCS).

The second pillar, based on the importance of maritime transport for both human activities and for the economic growth of the EU, encompasses actions aimed at promoting the integration of MoS into commercial and logistic services. Examples are the strengthening of maritime connections between the main ports by improving access to terminals and connections with the hinterland such as the “Fresh Food Corridors Action” that aims at improving the intermodal logistic connection between the Mediterranean and Northern Europe.

The third pillar includes activities to promote high safety standards, developing, for example, new programs for traffic management and flow monitoring improving information sharing among all the maritime stakeholders. The investment in human capital and digitalization of ICT services such as software development will determine benefits for the whole port industry.

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<sup>39</sup>European Commission, Motorways of the Sea  
[https://ec.europa.eu/transport/modes/maritime/motorways\\_sea\\_en](https://ec.europa.eu/transport/modes/maritime/motorways_sea_en)

Examples of actions included in this pillar are the FAMOS Freja and FAMOS Odin actions aiming at improving the navigational safety in the Baltic Sea region through hydrographic surveying and electronic navigational chart production.

### **3.3 The Connecting Europe Facility (CEF)**

European Commission estimates that the total investment amount, needed between 2021-2030, required to complete the core network, is EUR 500 billion and about EUR 1.5 trillion including the TEN-T comprehensive network and other transport investments<sup>40</sup>.

TEN-T networks are partly financed by the European Union, Member states and partly by the private sector.

EU finances these projects through different funds including the CEF, ERDF, Cohesion Fund and EIB instruments.

Among them, the Connecting Europe Facility (CEF) can be considered the main EU co-funding instrument for TEN-T and it was established in with the Regulation (EU) No 1316/2013.

CEF aims “to support the development of high performing, sustainable and efficiently interconnected trans-European networks in the fields of transport, energy and digital services focusing on initiatives that lead to a further integration of the European Single Market” (European Commission 2019).

As a matter of fact, it combines the infrastructure development in these three sectors creating synergies among them and connecting and integrating the EU regions.

Focusing on transport sector, the main objective is to support the completion of both levels of the TEN-T core and comprehensive networks in the time set.

In addition, according to the Article 4, it must have two of the four following objectives:

- Strengthening the cohesion of the Union;
- Increasing efficiency (e.g. removal of bottlenecks, filling of gaps, cost-efficient use, innovative technical and operational strategies);
- Increasing sustainability (e.g. security of fuel supply, CO2 reduction);
- Providing benefits to infrastructure users.

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<sup>40</sup> European Commission (September 2017) *Delivering TEN-T, facts & Figures*, [http://www.connectingeu.eu/documents/Delivering\\_TEN\\_T.pdf](http://www.connectingeu.eu/documents/Delivering_TEN_T.pdf)



The CEF budget, established for the period 2014-2020, is EUR 30.4 billion of which EUR 28.8 billion is in the form of grants. The amount dedicated to the transport sector is EUR 24.05 billion. In this budget EUR 11.3 billion are allocated for projects in the Member States, eligible for support from the Cohesion Fund<sup>41</sup> to further improve their infrastructure and to reduce differences between countries.

The responsibility for defining policies and priorities falls on DG MOVE (the Directorate-General for Mobility and Transport). Concerning the transport budget INEA manages EUR 22,4 billion out of the EUR 24,05 billion allocated to the sector. CEF offers financial support to projects through innovative financial instruments such as guarantees and project bonds, usually in combination with EIB loans that are mostly oriented to raise private sector investments in infrastructure and to incentivize the participation of other public-sector actors. Through specific "Blending Calls", projects, that are most in line with the technical requirements of the core and the comprehensive network, are selected, bringing further advantages to those of the individual state, creating European added value.

Between 2014 and 2017, among the different transport modes, rail projects received 72% of the CEF budget, road projects the 7% of the funds granted while maritime projects only captured 4% of the funds (Table 3.3.1).

Since 1992, the European Commission began to focus on more efficient and sustainable transport methods, in particular on rail transport. In 2011, the Commission set the objective of transferring, by 2030, 30% of road freight transport on journeys of over 300km to other modes of transport such as railways or inland waterways and to transfer more than 50% by 2050<sup>42</sup>.

Although the strong investment in rail infrastructures that were built for the needs of freight transport demand at the time of construction and now require an extensive upgrade, EU rail transport performance is inadequate in terms of volume transported and modal share. On average, road transport accounts for 75% of the market, while rail has actually declined slightly since 2011 (European Court of Auditors 2017).

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<sup>41</sup> Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Greece, Hungary, Latvia, Lithuania, Malta, Poland, Portugal, Romania, Slovakia and Slovenia

<sup>42</sup> COM(2011) 0144, White Paper Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system, 28.3.2011



**Table 3.3.1** Funding granted according to transport mode label

<b>Mode of Transport</b>	<b>Eligible proposals</b>	<b>Funded proposals</b>	<b>Funding granted 2014-2017</b>	<b>Share</b>
Rail Transport	540	253	16.741.776.854	72%
Maritime transport	223	84	973.154.067	4%
Multimodal (incl. combined transport)	221	77	1.274.068.120	5%
Road Transport	271	134	1.684.669.285	7%
Inland waterway transport	103	52	1.656.573.354	7%
Air transport	126	53	1.047.795.618	4%
<b>Total</b>	<b>1.484</b>	<b>653</b>	<b>23.378.037.298</b>	

Source: Analysis based on INEA's data and publicly available information on project evaluation

Source: ESPO analysis based on INEA's data and publicly available information on project evaluation (2018)

The 3 series of transport calls in 2014, 2015, 2016 supported 653 projects, granting more than EUR 23 billion, representing over 90% of the total granted budget.

Among all the maritime transport proposals (Table 3.3.2), Motorways of the Sea (MoS) is the project that received the majority of funds, followed by pre-identified projects on the corridors and pre-identified projects on other sections of the Core Network which received respectively 30% and 20% of the funding.

**Table 3.3.2** Funding of maritime transport proposals per priority

Priorities during Calls 2014-2017	Eligible proposals	Successful proposals	Budget granted (€)	%
Pre-identified projects on the Core Network corridors (2014-16)	40	16	290.780.985	30%
Pre-identified projects on the other sections of the Core Network (2014-16)	12	8	190.714.575	20%
Motorways of the Sea (2014-17)	118	49	401.538.686	41%
Projects on the Core and Comprehensive Networks (2014)	22	2	5.536.140	1%
Multimodal logistics platforms (2014-16)	6	1	2.788.991	0,3%
Nodes of the core network (2015-16)	2	2	1.174.992	0,1%
New Technologies & innovation (2015-2016)	15	1	1.741.815	0,2%
Core network corridors (2017)	5	4	74.400.283	8%
Other sections of the core network (2017)	1	1	4.477.600	0,5%
Innovation (2017)	2	0	0	0
<b>Total</b>	<b>223</b>	<b>84</b>	<b>973.154.067</b>	

Source: Analysis based on INEA's data and publicly available information on project evaluation

Source: ESPO analysis based on INEA's data and publicly available information on project evaluation (2018)

CEF funds to Motorways of the Sea contributes strongly to the development of short shipping sectors and favors an increase in cooperation between port authorities, operators and maritime stakeholders.

The proposed long-term budget for the EU for the period 2021-2027 is EUR 42.3 billion including EUR 30.6 billion for the transport sector, and an unchanged Cohesion Fund. The focus remains on developing the TEN-T Network, digitalization and decarbonization, for instance by investing in alternative fuels infrastructure. The majority of investment fund is forecasted to be allocated on environmentally friendly transport, namely rail transport (60%).

An important novelty compared to the previous CEF funding period is that EUR 6.5 billion will be dedicated to adapt the TEN-T network to military mobility requirements to enable a civilian- military dual-use of the infrastructure.

Transport policies in EU are characterized by divergent national priorities that limit the quality of transport services as their infrastructure planning does not give a high priority to multinational cross-border investments.

Indeed, if the decision to build infrastructure depended on individual states, there would be a risk of structuring a transport network at European level made up of a series of individual networks instead of an integrated system able to meet the needs of the European Union as a whole.

Consequently, TEN-T and CEF support projects aimed at creating EU added value, which, as already stated, focuses mainly on the missing and cross-border links, strengthening multimodality and ensuring interoperability of networks across borders and modalities.

Apparently, the current TEN-T policy, with the inclusion of ports and airports, underlined the importance of connecting the internal market to the rest of the world making it clear that previous policies, which underestimated the role of these two nodes, were no longer adequate to the evolving global scenario.

However, the CEF funding in the period 2014-2017, made clear the contrast between the recognition of the role of ports with the choice of the mode of transport that received the majority of investments.

In fact, only 4% of the CEF funds has been allocated to ports, while investments in transport infrastructures at European level have been focused on rail transport and its technological and organizational innovation problems that require huge investments.

Among the investment in maritime trade, MoS are still focused to better connect the core network, bridging the existing gaps between core and comprehensive ports. These investments are still focused on the development of the internal market as they do not involve third countries.

Moreover, TEN-T policy aims to close missing links and remove bottlenecks, with a strong focus on cross-border connections, defining them as a section which ensures the continuity of a project of common interest between the nearest urban nodes on both sides of the border of two Member States or between a Member State and a neighboring country. This definition refers only to a part of the network as it involves only land-based cross-border sections, and not maritime cross-border links.

The intersection points between the TEN-T network and the global one are mainly made up of airports for people and ports for goods and both can be considered international infrastructures.

Ports, even if located in one Member State, create a value for the society that goes beyond national borders as they are Europe's gateways for international trade, increasing connectivity on the sea side and enhance it with the hinterland.

Indeed, ports are not only a component of maritime transport but they increase the cross-border dimension as they can be connected to a number of other ports and countries on the sea side while land-based project is mostly limited to creating a cross-border link between two countries.

In addition to their importance as gateways infrastructure to international trade, ports bring economic benefits to the supply chain they support. These benefits are increasingly distributed across different actors and a wide geographical space hard to be assessed.

Ports brings also societal value by reducing road congestion, making short shipments more competitive and promoting modal shift in order to reduce the costs for society generated by traffic congestion (unreliability, increase in energy consumption, emissions and travel times).

From an environmental point of view, the implementation of ports allows the reduction of negative externalities for the residents. The use of clean fuels leads to a better quality of the air while the reduction of CO<sub>2</sub> emissions in the port cluster allows to achieve the decarbonization of the economy and the mitigation of climate change in view also of the Paris Agreement that aims to reduce emissions.

The new proposal for the Connecting Europe Facility 2021-2027 adopted by the European Commission establishes an increase of the funding compared to the period 2014-2020.

However, it is mainly due to the increase in energy and digital elements and the additional components of military mobility which consists of 20% of the proposed CEF transport budget.

Based on these considerations, CEF funding for the period 2021-2027 should be allocated more appropriately in order to invest in maritime trade allowing to integrate the European internal market in a global scenario that is continuously evolving, and they should focus in particular to Southern Europe ports in order to make them able to accommodate Asian cargoes.

Consequently, the concept of "EU added value" should be overhauled in order to consider also the value creation concerning trade and societal benefits for EU citizens.

### 3.4 TEN-T network beyond the internal market

Extra-EU trade has gained importance in recent years, compared to the times when the TEN-T network was implemented and now it has become necessary to take into account the dramatic changes at a global level.

Therefore, investments in the external nodes of the core network, namely multiport gateway systems, should be prioritized. As multimodal transport nodes, European seaports depend on a well-functioning TEN-T network and therefore fully support the objective of establishing an efficient, sustainable, digital, and safe European transport network, providing accessibility and connectivity to all EU regions.

In addition to the infrastructure development and the cross-border links, the efficient use and the modernization of the existing network become more and more relevant. In this regard, infrastructure developments and transport operations need to be more closely coordinated. Concerning ports, the growing importance of the Mediterranean basin, determined by the growth of traffic flows between Far East-Europe is an opportunity that must be caught by implementing ports located in that area which have a geographical advantage.

The extension of the TEN-T network outside the EU has always been seen from the perspective of “closing” the European infrastructure system, extending this network to neighboring countries with the aim of implementing and enlarging the internal single market. Extending European infrastructure policy towards the world is completely different (Costa 2019<sup>43</sup>).

Therefore, TEN-T policy should become more outward-looking, with an explicit requirement to take into account major policy initiatives sponsored by extra-EU countries. The wrong transport infrastructure policy favors inefficiencies affecting traffic flows.

This can be done by investing in airport nodes and in particular in ports but also through physical coordination of the EU transport network with global transport infrastructure policies. The currently most evident example, also favored by the growth of the commercial relationship between the Far East - Europe is the Eurasian land and maritime network, namely the Chinese Belt and Road Initiative (BRI), also considering

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<sup>43</sup> Costa, P., Haralambides, H., and Roson, R.(2019) A European Public Investment Outlook , 8. *From Trans-European (Ten-T) to Trans-Global (Twn-T) Transport Infrastructure Networks. A Conceptual Framework*, UK: Open Book Publishers, 2020, <https://doi.org/10.11647/OBP.0222>

the investments of this policy in the Mediterranean Sea basin, as in the case of Piraeus Port.

This is an opportunity for the European transport system as EU relations with third countries should be based on a peer-to-peer approach to create a fruitful partnership in the infrastructure (European Commission, 2010).

The BRI, which represents a brilliant manifestation of the renewed Chinese presence on the world scene (Costa 2019), aims to achieve greater economic integration and development through better connectivity.

The sharp increase in traffic in Piraeus Port means that the trade routes are not definitive and China considers South-Eastern Europe and the maritime route that passes through the Suez Canal and Mediterranean strategically important.

Moreover, European Union should also take into account the Chinese “Balkan Silk Road” which is a plan that should ideally connect Beijing to Athens and then reach Skopje, Tirana, Sarajevo, Belgrade and Budapest.

**Map 3.4.1** The Balkan Silk Road



Source: Financial Times (2017)

EU reactions to this policy are mixed despite President Xi Jinping assurance, during his latest European visit, that China would welcome a combined effort to connect BRI to the TEN-T network in the next future.

However, European transport policy should take into account this policy, considering that the countries of Southern Europe are the first access gateways to the European continent as regards Chinese traffic, it becomes important to create reciprocity conditions in such a way that Europe should be able to seize this Chinese policy as an opportunity and not just a project that revolves around Chinese interests. At European level, a balance needs to be found between a mutually satisfactory political and economic relationship with China and safeguarding key infrastructures.

**Figure 3.4.2** Potential TEN-T/BRI dovetailing



Source: Paolo Costa (2019)

The evaluation of the implementation of Regulation (EU) no. 1315/2013, that will be carried out by December 2023, is an opportunity to review the policy in the light of the changes in freight transport flows, the development in investments in national transport infrastructure and the need for change, identifying new means for dealing with the geographical and technological obsolescence of all current networks. Particular attention must be given to ports, as they are most important missing nodes to deal with in this maritime global driven scenario.

## IV. COVID-19: the world economic downturn

The considerations made so far are based on data prior to the COVID-19 pandemic which resulted in a significant structural breakdown that damaged the world economy. Indeed, the health crisis that the world is facing nowadays alters all the realities, assumptions and strategies previously defined by governments.

Even if, providing a complete and total vision of this phenomenon is very complex because of its high uncertainty, continuous and rapid evolution, the purpose of this chapter is to give a general perspective of this situation always keeping the focus on maritime transport and ports.

Thereby it is possible to realize the global impacts of the disruption created by COVID-19.

### 4.1 The health and economic crisis

First of all, COVID-19 has been a global health crisis, with a high number of infections and victims worldwide but it has also determined dramatic economic consequences.

The needed lockdown measures, aimed at avoiding the collapse of health care systems, implemented at national level, have slowed down the increase of the number of infections but at the same time they have affected even more the global economy, business activities, labour supply and undermined confidence in the future.

Recovery will be highly uncertain considering that it strongly depends on the future trends of contagion and the effectiveness of policies implemented at governmental level. If the epidemic persists the restrictions on movements should be reintroduced further worsening the economic situation and requiring even longer recovery times.

Until there are suitable treatment measures, global policymakers will keep on walking on a tightrope (OECD 2020<sup>44</sup>).

OECD, in order to try to forecast the future global outlook, has defined two equally likely scenarios based on different trends in contagions which are not exhaustive but allow to identify the different possibilities and consequently adapt the policies to better manage both cases.

The first “double-hit scenario” involves a second wave of infections in the fourth quarter of 2020 with consequent lockdown measures. This virus outbreak, even if less

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<sup>44</sup> OECD (2020), *OECD Economic Outlook, Volume 2020 Issue 1, No. 107*, OECD Publishing, Paris, <https://doi.org/10.1787/0d1d1e2e-en>



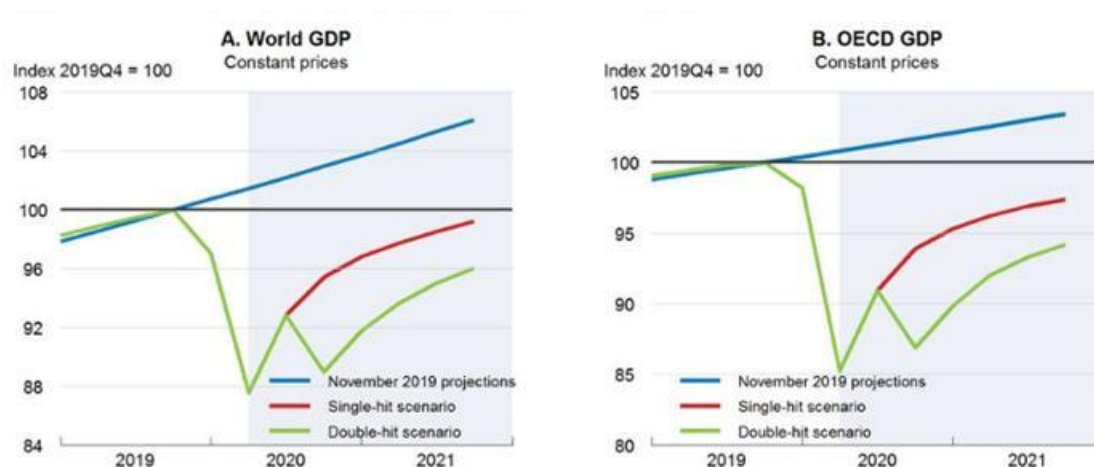
intensive, could be determined by inefficient containment, test, tracing and isolating measures. Concerning 2021, no further outbreaks are expected, but this cannot be established with certainty, remaining a significant downside risk.

The “single hit scenario” forecasts that a second wave will be avoided, mainly because the current containment procedures are supposed to overcome the outbreak.

In both alternatives, all economies are expected to face a deep recession in 2020 followed by a gradual recovery in 2021.

In the first case, World GDP will drop of about 7.8% this year, but in 2021 it may increase of 2.8% while the OECD GDP is projected to decrease by approximately 9.3%. On the other hand, in the second scenario global GDP will decline of 6% while OECD of 7.5% in 2020. In this outlook, growth forecasts will be higher for the 2021, because of the starting increase by the end of this year (5.3%).

**Figure 4.1.1** A collapse in output followed by a slow recovery  
World GDP and OECD GDP, index 2019-Q4=100



Note: November 2019 projections are from the November 2019 OECD Economic Outlook.  
Source: OECD Economic Outlook 107 database; and OECD Economic Outlook 106 database.

StatLink <https://doi.org/10.1787/888934140126>

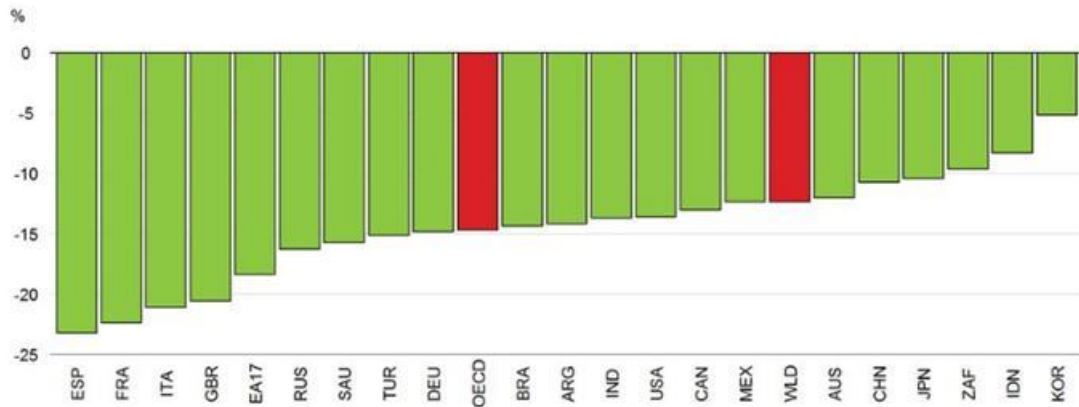
Source: OECD (2020)

The world economy is experiencing the deepest recession since the Great Depression in the 1930s (OECD 2020<sup>45</sup>). As a matter of fact, the second quarter of 2020 has been

<sup>45</sup> OECD (2020), *OECD Economic Outlook, Volume 2020 Issue 1, No. 107*, OECD Publishing, Paris, <https://doi.org/10.1787/0d1d1e2e-en>

characterized by a decrease in global GDP of about 12.5%, while the European output declined by over 18%.

**Figure 4.1.2** An unprecedented output collapse is occurring in the first half of 2020  
Per cent change in GDP between 2019Q4 and 2020Q2



Note: GDP at constant prices. Data for China refer to the change in output between 2019Q4 and 2020Q1.  
Source: OECD Economic Outlook 107 database.

StatLink  <https://doi.org/10.1787/888934140145>

Source: OECD (2020)

There have been multiple economic effects, as consumption and the production of services have decreased considerably due to social distancing and lockdowns.

The reduction in production led to the labor market being severely damaged. In fact, the OECD unemployment rate touched 8.4% in May 2020 with 54.5 million unemployed, after an unprecedented 3.0 percentage point increase in April, to 8.5%, the highest level in a decade.

**Figure 4.1.3** Unemployment rate

Total, % of labour force, Jan 2008 – May 2020



Source: OECD (2020)

Despite the re-opening of the economies, even in the most optimistic scenario, the unemployment rate across the OECD could reach 9.4% in the fourth quarter of 2020.

Government support has been very important through effective short-term work programs which allow employers to reduce the working hours of their employees who can also receive financial support for the unworked hours.

International trade was also affected by the blocking measures and the closure of cross borders which led to a sharp drop in trade. The latest data available on UNCTAD, collected in Figure 4.1.3, showed a drop of around 27 % in the second quarter of 2020.

**Figure 4.1.4** Global merchandise trade values

(Growth rate over previous quarter, seasonally adj. series)



Source: UNCTAD (2020)

Closing borders between regions has led to an even greater fragmentation of countries. Each State has dealt in different ways the problems connected with the health care system and the policies in support of companies and workers.

This situation is characterized by a strong uncertainty, mainly due to the unpredictable evolution of the epidemic as outbreaks could hit areas that seemed to have already passed this stage, requiring necessary further lockdown measures.

This global epidemic has produced negative effects all over the world. In particular emerging markets and developing economies, limited by lower health care capacity and low-incomes, are already in a precarious situation and require external support and strong multilateral cooperation.

Furthermore, it will be important to evaluate how people will react, considering that voluntary social distancing will affect spending.

Political support is crucial at this stage and must be aimed at strengthening health systems and limiting virus epidemics through testing and social distance. In addition, governments should be able to support the recovery by maintaining liquidity support. The prospects for future growth depend on numerous factors such as efficiency of the

containment measures, considering that they have been managed differently by individual states and the effectiveness of government policy responses.

Furthermore, in a world strongly interconnected through supply chains, international investments, flows of people and goods, all economies are significantly affected by interruptions in supply and demand (OECD 2020).

In addition, all those trends present before the outbreak of the pandemic, such as, for example, tension between countries could make recovery even more difficult and precarious.

#### **4.2. The effects on the transport sector**

The transport sector has been dramatically affected by COVID-19 as measures to decrease contagion also reduced transport activity, in particular concerning passengers also because of the fears of contracting and spreading the virus.

Freight flows were less affected because essential services have been operating, although there was a decrease due to the fall in the economic activity and the interruption of supply chains.

Estimating the effects of the virus and the consequent restrictive measures on transport is very complex but at the same time it is fundamental for developing adequate policies. For this reason, based on the data used for the ITF Transport Outlook 2019, the International Transport Forum tried to estimate the impacts for freight transport.

The results estimate that global freight transport could decline by 36% compared to the level expected without COVID-19 by the end of 2020<sup>46</sup>.

According to the model, inter-urban freight transport would reduce by 37% the global transport volumes compared to estimates without COVID-19 and regional differences are significant. Indeed, a strong reduction is projected in ASEAN countries, Russia, Central Asia and India.

The reduction in urban freight transport will be lower, 8%, mainly because of the increase in e-commerce. As a matter of fact, the closure of many retailers selling non-essential goods and measures aimed at social distancing determined a rise in online sales.

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<sup>46</sup> ITF (2020), *COVID-19 TRANSPORT BRIEF: How Badly will the Coronavirus Crisis Hit Global Freight*, <https://www.itf-oecd.org/sites/default/files/global-freight-covid-19.pdf>

**Figure 4.2.1** Projected Covid-19 impact on freight and associated CO<sub>2</sub> emissions for 2020  
(by region and freight type, percentage change on projections pre-Covid-19)

Regions	Urban freight activity	Inter-urban freight activity	CO <sub>2</sub> emissions urban freight	CO <sub>2</sub> emissions inter-urban freight
ASEAN countries	-16	-53	-22	-42
China	-3	-27	-10	-23
India	-14	-51	-20	-46
Japan and Korea	-10	-33	-17	-26
Russia and Central Asia	-6	-53	-13	-54
Other Asia	-5	-32	-12	-25
Oceania	-3	-42	-10	-41
Middle East	-6	-36	-13	-31
North Africa	-15	-36	-21	-25
Southern Africa	-12	-32	-19	-41
Other Africa	-10	-50	-16	-38
South America (Andean)	-14	-50	-20	-37
South America (South Cone)	-5	-35	-12	-31
Caribbean	-15	-43	-21	-39
Central America	-12	-39	-19	-35
North America	-10	-37	-17	-35
Scandinavia	-15	-41	-21	-37
Western Europe	-12	-43	-19	-37
Eastern Europe	-14	-40	-20	-36
Global	-8	-37	-14	-30

Legend: Urban freight activity: red  $\Delta \geq 15\%$ , orange  $\Delta \geq 10\%$ ; inter-urban freight activity: red  $\Delta \geq 50\%$ , orange  $\Delta \geq 40\%$ ; CO<sub>2</sub> emissions from urban freight activity: red  $\Delta \geq 20\%$ , orange  $\Delta \geq 13\%$ ; CO<sub>2</sub> emissions from inter-urban freight activity: red  $\Delta \geq 40\%$ , orange  $\Delta \geq 33\%$

Sources: ITF (2020)

With the aim of reducing damage to transport and connectivity, European Commission issued a Communication “COVID-19: Guidelines on the progressive restoration of transport services and connectivity”.

They are general principles applicable to all modes of transport that provide support to authorities and stakeholders during the recovery path of the transport sector that should be safeguarded to ensure functional supply chain.

In fact, these guidelines give more information on the management of the health emergency in the transport sector, also giving importance to the protection of both workers and passengers.

Maritime transport carries about 80% of freight trade, including goods of primary importance for citizens such as essential commodities and equipment.

However, also ports have been affected by the disastrous consequences of this economic crisis as demonstrated by the decrease in volumes of container exchange in the first months of 2020<sup>47</sup>.

World container trade volumes decreased by 8.6% in February 2020 compared to the same month in the previous year. In addition, there was also a cancellation of scheduled departures on the Far-North-Europe route of 46%.

Figure 4.2.2 makes this comparison by dividing the data by regions, highlighting a larger drop in the Far East than in other regions even if these data depend very strongly on the phase that the relative geographical area is facing in relation to the contagions and the restrictive measures.

**Figure 4.2.2** Changes in container volume by world region, 2020

	Change Jan 2019 to Jan 2020 (%)	Change Feb 2019 to Feb 2020 (%)
<b>Far East</b>	0.0	- 17.5
<b>Europe</b>	0.7	- 4.0
<b>North America</b>	- 0.3	- 7.0
<b>Australasia and Oceania</b>	- 6.5	- 2.8
<b>Indian Subcontinent and M. East</b>	3.7	6.1
<b>South and Central America</b>	2.4	2.8
<b>Sub-Saharan Africa</b>	5.4	7.4

Source: International Transport Forum, CTS

Source: ITF (2020)

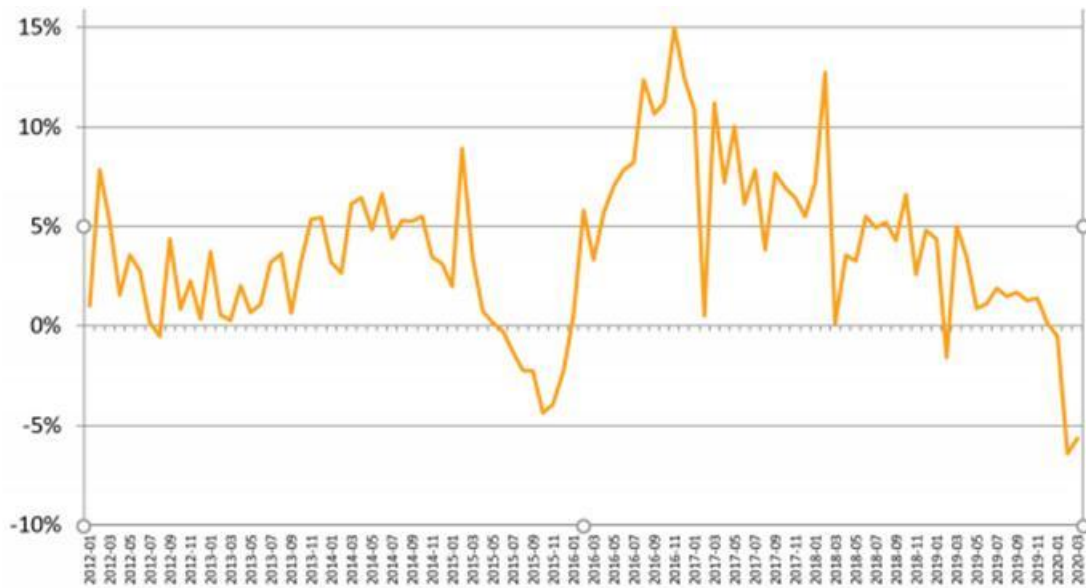
Global port measures implemented with the outbreak have damaged the shipping industry considering, for example, that since February the major global ports have adopted a 14-day quarantine period for ships arriving from the countries concerned.

The damage to the maritime industry is also represented by the volumes managed in the main global container ports between February and March compared to the same months last year, underlining a 6% decrease.

<sup>47</sup> ITF (2020), *COVID-19 TRANSPORT BRIEF: Global Container Shipping and the Coronavirus Crisis*, <https://www.itf-oecd.org/sites/default/files/global-container-shipping-covid-19.pdf>



**Figure 4.2.3** Changes in container volumes handled by major ports<sup>48</sup>, January 2012-  
March 2020



Source: International Transport Forum, port authorities and terminal operators (2020)

UNCTAD has published "A 10-point action plan to support international commercial logistics" with the aim of helping governments present and international organizations to resume the cross-border movement of goods and people.

In this document it is argued that, given the importance of maritime trade, it is essential to guarantee uninterrupted shipments and to provide the continuous development of port activity ensuring the constant security of shipping chains while preserving the flow of trade.

This must be done through the application of health measures in order to safeguard passengers and workers health and to minimize the impacts on international trade, for example, by decreasing working hours that allows to reduce physical contact between workers and maintain social distance and implementing paperless transactions.

In a context of crisis such as the one we are facing, it also becomes essential to encourage international trade in critical goods, accelerating the customs clearance and release of critical goods at ports and border crossings.

<sup>48</sup> Container ports included are: Shanghai, Ningbo, Hong Kong, Shenzhen, Guangzhou, Qingdao, Tianjin, Dalian, Busan, Singapore, Los Angeles, Long Beach, Vancouver, New York/New Jersey, Houston, Virginia, Savannah, Piraeus, Algeciras, Valencia, Barcelona, Genoa, La Spezia, Port Said East, Rotterdam, Antwerp, Hamburg, Gothenburg, Jawaharlal Nehru Port, Colombo, Melbourne, Sydney. Monthly volumes include March 2020 for most of these ports, with the exception of New York/New Jersey, Algeciras, Hamburg and Melbourne (until February 2020).



Concerning trade and transport, the European Commission projected relevant internal border-crossing points on the TEN-T as “green lane” border crossing (Map 4.2.4) to ensure freight movement across EU and facilitate emergency transport services.

They are open to all freight vehicles whatever the type of goods they carry, the driver's origin and destination and nationality to guarantee services of general interest and national economies and to protect EU supply chains.

The procedures for crossing the green lane must be minimized and checks and screening must be carried out without drivers having to leave their vehicles.

Aiming at facilitating transport, the Commission recommends Member States to take action to ensure the free movement of all workers involved in international transport, regardless of the mode of transport. Moreover, enhanced hygiene and operational measures are also needed in airports, ports, railway stations and other internal transport hubs in order to grant the safety of transport workers.

All these principles should also be applied to third countries if they are essential to ensure that goods move freely in the EU.

**Map 4.2.4** Internal border-crossing points on the TEN-T as “green lane” border crossing



Source: European Commission (2020)

The EU Commission underlined the importance of maintaining the functioning of the Single Market in the “Guidelines for border management measures to protect health and ensure the availability of goods and essential services” presented in April.

Concerning ports, the European Commission has proposed an amendment to the Port Services Regulation (EU) 2017/352 in order to provide flexibility in terms of reduction, deferment, waiver or suspension of port infrastructure rights.

This proposal has been further improved by the agreement between the Council and the Parliament which gives the port management bodies the competence to choose which measures, on a case-by-case basis to always adopt in compliance with national legislation. All measures taken from 1 March 2020 to 31 October 2020 are subject to this temporary modification.

### **4.3 Some remarks**

In a highly uncertain context like the one the world is experiencing now, it becomes really difficult to make growth forecasts. All the forecasts made so far consist of a wide variety of data which subjected to rapid evolution.

However, the role of ports and maritime trade in freight transport remains fundamental. For this reason, in this period, foreseen by the type of scenario that occurs, it will be important to facilitate exchanges and keep ports open to allow the delivery of essential goods such as vital medical equipment. To guarantee the continuity of international trade, it is essential to safeguard the greeting conditions of port workers to avoid the risk of spreading the virus among employees that would block port operations in the traffic of goods.

The role of ports is fundamental in the recovery process. European ports and governmental policies must be able to guarantee short-term financial sustainability for the maritime industry and commercial sectors within ports. Consequently, guaranteed CEF support is essential and must be aimed at the recovery of the ports most often damaged by their role in the TEN-T network, such as ports with important passenger traffic and tourism-related activities including ferry connections and cruises. Furthermore, the necessary delay in the construction of transport structures due to restriction measures, such as blocking in construction times, require greater flexibility in deadlines, but should not fall within the principle of the use of losses (ESPO 2020).

The European Sea Ports Organization argues that it is currently not possible to establish a long-term EU transport strategy as there is no indication of the duration and impact of

the current crisis. Consequently, it proposes a two-step approach as the priority must be to develop a reboot and recovery plan to overcome this crisis and bring the European economy back on track safely and promptly.

As long as there is no cure for the virus, the resumption of economic activities will have to be based on coexistence with COVID-19, making measures to reduce contagions fundamental. At the same time, the current transports infrastructure policies and financial instruments to promote them, in particular the CEF should be further strengthened with the aim of recovering from the crisis and pursuing previously planned investments. Through port investments it is possible to start with an economic recovery. When the crisis situation stabilizes, a new normal situation can start, involving a new long-term transport strategy that will set long-term objectives, ambitions and initiatives for the European port sector in face a new post-crisis reality.

The COVID-19 outbreak has affected the entire EU, but its impacts differ between Member States, regions and areas.

Indeed, Member States and EU institutions and agencies should closely cooperate in order to restore connectivity and public confidence in transport services. Until an effective vaccine is developed and widely available, a second wave of infections or clusters of outbreaks remain possible, making an entirely risk-free environment for travel not feasible, but risks should be minimized as much as possible throughout the outbreak.

## Conclusions

The current economic scenario is changing rapidly: demographic growth, GDP and volume merchandise trade underline the growth of the Asian countries and the increase in maritime relationships between the Far East and Europe.

The growing importance of economies located on the Mediterranean coasts and the increase in traffic in the reporting channel underline the centrality of the Mediterranean Sea basin.

In light of these changes in the global scenario, however, European ports are geographically obsolete because they were built and implemented on the basis of commercial traffic that has been overshadowed, i.e. the Transatlantic relationship. Indeed, the most developed ports are those on this route: the North Sea ports which capture most of the trade in the Mediterranean, determining longer journeys for Asian cargoes and increasing in CO<sub>2</sub> emissions. On the other hand, investing in Southern ports infrastructure in order to achieve capacity and efficiency comparable to the North Sea ports could allow to exploit their geographical advantage and reduce negative externalities.

Trade relations between the Far East and Europe are however expected to grow in the coming years, therefore infrastructure policy should be able to adapt to these trade exchanges and not persevere in a policy which is not relevant for the current scenario.

Furthermore, European transport policy has always been focused on building the Single Market. Connecting every point of the European Union is fundamental to facilitate the movement of people and goods, but now it is no longer sufficient.

The TEN-T and its financial pillar, the Connecting Europe Facility (CEF) reflect this attitude as they are focused on reducing land cross borders and missing links, allocating only 4% of CEF funds for the period 2014-2020 to maritime transport.

The forecasts regarding extra-EU trade underline its growth requiring a policy more oriented towards external markets.

Fundamental elements to achieve this objective are ports which are commercial entities with financial autonomy. However, EU funds are fundamental in cases that provide wider societal value, such as capacity for future growth or environmental issues. The long process of developing the TEN-T network has been characterized by many reviews due to the EU enlargement process.

Nevertheless, extra-EU traffic did not receive the adequate importance, with particular reference to China and the Asian continent and all the inclusion of this policy in a global scenario. In order to integrate more closely into this, it is important to consider policies and in particular the Chinese Belt and Road Initiative (BRI), in recognition of its effects on the European maritime infrastructure.

The investment in the port of Piraeus and the significant increase in traffic underlined how Chinese investments influence commercial shipping routes.

The key message that emerges from this thesis is that the TEN-T network must be able to adapt to extra-EU countries development as focusing on the European internal market is no longer sufficient.

The new proposal for the CEF 2021-2027 adopted by the European Commission establishes an increase of the funding compared to the previous period but it is mainly due to the increase in energy and digital elements and the additional components of military mobility which consists of 20% of the proposed CEF transport budget.

The transition from "trans-European to trans-global transport infrastructure networks" (Costa, Haralambides and Roson, 2019<sup>49</sup>) requires a rebalancing of European funds towards infrastructure gateways, i.e. ports and airports and at the same time the interplay between EU transport policies with global ones, in particular the Chinese Belt and Road Initiative and the TEN-T.

The TEN-T revision, to be concluded by 2023, represents an opportunity to be seized. However, the current global economic scenario has been characterized by a deep crisis due to COVID-19. As the phenomenon is characterized by strong uncertainty, the structural breakdown in the global economy is evident.

From an economic point of view this crisis can be compared to that of 2008-2009 but the uncertainty on the impacts due to the unpredictable evolution of the contagions affects even further the situation.

Social distancing has been a fundamental condition for reducing contagions but it has determined an even severe damage to the commercial and transport sectors.

A rapid socio-economic response from governments is fundamental to reduce the negative impacts on businesses activities and workers.

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<sup>49</sup> Costa, P., Haralambides, H., and Roson, R.(2019) A European Public Investment Outlook , 8. *From Trans-European (Ten-T) to Trans-Global (Twn-T) Transport Infrastructure Networks. A Conceptual Framework*, UK: Open Book Publishers, 2020, <https://doi.org/10.11647/OBP.0222>

In any case, ports have a primary role for the transport of essential goods and they are also important in the economic growth. However, they have been affected, as major worldwide ports saw a 6% decrease in 2020 compared to the previous year.

The implementation of policies that keep ports open and protect the workers is essential to ensure the delivery of basic necessities and the continuity of international trade.

Therefore, once the situation stabilizes, compatibly with the economic scene that will emerge in the near future, investments in this type of infrastructure must however remain a priority at the European policy level, focusing in particular on passenger ports.

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