THE CHINESE INFRASTRUCTURAL NETWORK TO CONQUER THE MEDITERRANEAN

Teresa Amodio*

Abstract

The contribution starts from the analysis of the complex system of maritime commercial transport in relation both to the geo-economic transformations connected with the changes in the geography of the flows and the routes, and to the consequences that derive in terms of ports at different scales. In this scenario the emergence of a new global competition among ports is deepened, as a result of the strategies adopted by large shipping companies, which seem to be increasingly influenced in the choice of ports by logistical and organizational conditions of greater advantage rather than only by the geographical location of the freight. In particular, a great interest is paid to Mediterranean ports that, favoured by the enlargement of the Suez Canal and by redevelopment operations started in order to gain attractiveness, have become the object of speculative interest by global investors, such as China, interested in consolidating their infrastructural and logistical bases in the Basin. China, in fact, has started to invest heavily in its ports and maritime terminals allowed in the Mediterranean, implementing the One Belt One Road. The project aimed at strengthening the role of China on a global scale, favouring international investment flows and commercial outlets for national productions, and it was based on the creation of a global network of infrastructures, on land and sea, to ensure a complete crossing from Asia to the Mediterranean.

1. Introduction

The research, from a methodological point of view, finds its theoretical basis in studies of a geographic nature that proficiently highlight how the China Mediterranean relations are strongly linked to the global transformations that saw the passage of the ocean pivots from West to East (Vallega, 1997).

The analysis of the Mediterranean is carried on from the point of view of the positioning of the Basin by virtue of the dynamics connected with transport and maritime traffic (Lucia, 1997). It highlights how the history of maritime relations on a global scale has been characterized by alternate events, effect of a perennial competition with other areas, such as the Atlantic or Pacific ones (Sellari, 2013).

The most significant events in the establishment of the maritime transport centrality of the Mediterranean are certainly identifiable in the opening of the Suez Canal in 1869,

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which facilitated the shortening of the routes connecting Europe and the East and the functional transformation of the Mediterranean ports, after the Second World War.
In the medium term there will be important repercussions especially on the main routes between the Mediterranean, the Red Sea and the Persian Gulf, also in consideration of the impracticability of many terrestrial routes due to the conflict situations in the area (Amato, Talia, 2015).
Furthermore, the considerable savings in operating costs and investment costs will induce shipping companies to choose the Suez-Gibraltar route to reach the United States rather than slow steaming through the Cape of Good Hope.
This choice is also closely linked to fuel costs (bunkers), since, with low oil prices, companies find more advantageous the option to lengthen routes by sailing at low speeds.

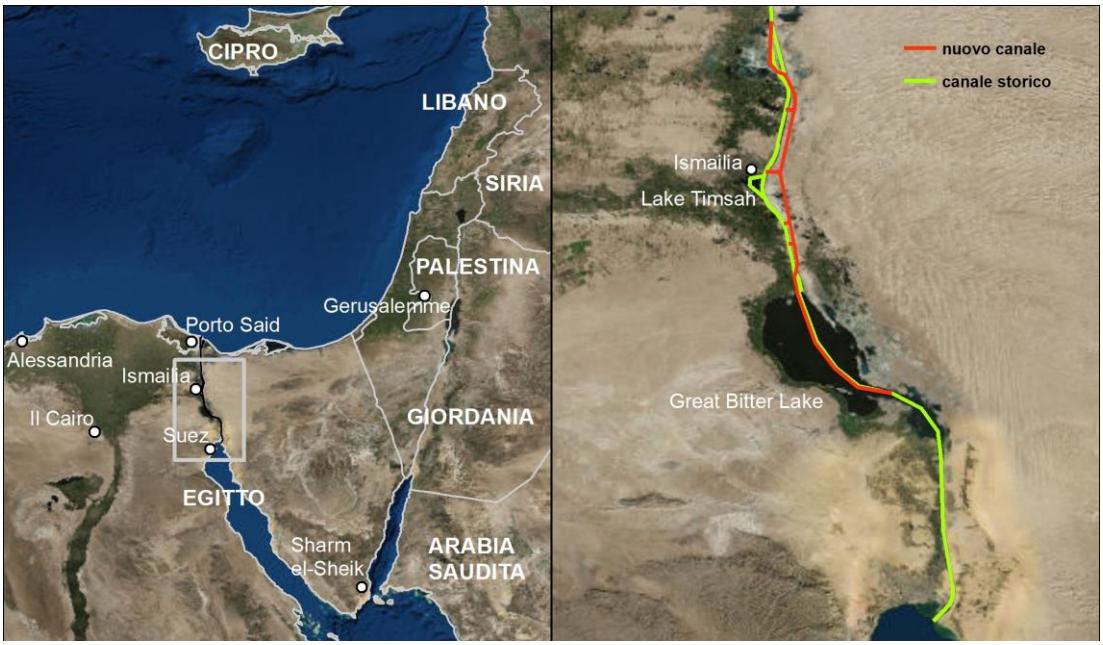

Figure 1: The doubling of the Suez Canal.
Source: processing on Google Earth.

In the theoretical studies about the territorial effects of the transformations of sea commerce (Vallega, 1997), it is precisely emphasized the passage from the "mercantile" phase to the "industrial" one in which the ports, not excluding the Mediterranean ones, were involved in a significant change, rapidly becoming maritime areas with a strong industrial vocation (MIDAs - Maritime Industrial Development Areas).
The research, based on these theoretical ideas, starts from the analysis of the complex system of maritime commercial transport in relation both to the geo-economic transformations connected with the changes in the geography of the flows and the routes, and to the consequences that derive in terms of ports at different scales.
In this scenario the emergence of a new global competition among ports is deepened, as a result of the strategies adopted by large shipping companies, which seem to be increasingly influenced in the choice of ports by logistical and organizational

conditions of greater advantage rather than only by the geographical location of the freight.
In particular, a great interest is paid to Mediterranean ports that, favoured by the enlargement of the Suez Canal and by redevelopment operations started in order to gain attractiveness, have become the object of speculative interest by global investors, such as China, interested in consolidating their infrastructural and logistical bases in the Basin.

2. The reference scenario

Since the Twentieth century, the shipping sector has been affected by the development of production models based on maximum flexibility. This has boosted, on the one hand, the relocation of economic activities in areas characterized by low-cost factors and, on the other, the shift of the economic axis of reference from the Atlantic to the Pacific, with significant effects on the reorganization of the global economic scenario (Labrianidis et al, 2011).
This process, in which the limits to mobility historically imposed by physical space have progressively reduced in favour of the development of networks, both tangible and intangible, has led to a significant increase in the international trade and, in particular, in the maritime traffic (Figure 2).

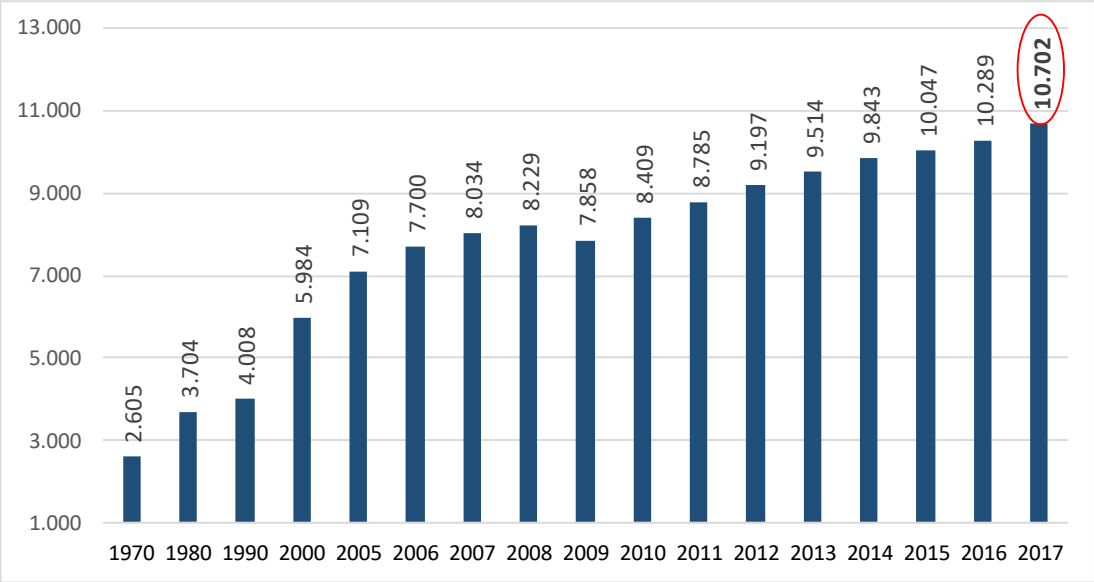

Figure 2: Goods transported by sea (millions of tons).
Source: processing on data Unctad, Review of maritime transport, 2018.

Since 2009, year of overcoming the global economic crisis, freight transport by sea has progressively increased, reaching for the first time, between 2015 and 2017, the threshold of 10 million tons, estimating for 2030 the achievement of a threshold of 17 billion tons.
The increase in traffic volumes has been supported, and in some ways encouraged, by important changes, both at organizational and structural level, that have affected this economic segment.

In terms of transport consistency, the adoption of an ever-increasing containerization has led to an exponential increase in fleet size and load capacity, which, thanks to the reduction in transport costs for each single TEU[1], has made possible the introduction of economies of scale, even in this specific transport segment.
Downstream of this, a phenomenon defined as naval gigantism has been developed and, however, it demonstrates the technological achievements related to the size of the ships. It has made possible the transition from a first generation of container ships, the converted cargo ship, with a low capacity, to carriers classified as ultra large container vessels (ULCV), built to guarantee a load capacity of more than 14,000 TEUs.
The economic strength is necessary for the management of the fleets meant that, from the point of view of shipping equipment, the proliferation of shipping companies, mostly large-sized, has been organized to provide an articulated series of services. This service is suitable for handling vast quantities of goods among the various world production areas, which have become the main beneficiaries of productivity gains deriving from the progressive unitization of the loads in the international logistics.
The result is a scenario based on the presence of few large companies, the only ones able to operate on a global scale, mainly based on the contractual capacity strengthened by the signing of commercial agreements.
Currently, based on the Alphaliner[2] data for the first months of 2017, the world fleet is worth over 6 thousand ships used in scheduled services worldwide, with a growth of 1.5% and a total capacity of about 20,2 million TEUs. In addition, the data on the international order book suggest a growth in the size of the ships that will allow, in 2020, to have 1.043 units of more than 7.500 TEU, of which 105 are even higher than 18.000 TEU.
This impressive endowment is held by thirty shipping companies classified worldwide that, with a load capacity of 18,544,597 TEU, have a hold share of 93.2% of the world total (Table 1).

1980	1992	2003	2006	2015	2017
26%	42%	58%	71%	88%	93,2

Table 1: Percentage in the world fleet of the first 30 companies.
Source: processing on data Alphaliner.

Among these companies highly specialized in container transport, the first six, each of them exceeding one million TEUs transported, have a total load capacity of 12.376.393 or 62,2% of the world total.
Analysing the geographical distribution of the legal offices related to the first thirty shipping companies, it is evident that the greatest concentration is based in the Asian countries, the absolute owners of the world shipping supremacy.
On the western front, five carriers, headquartered in Europe, namely in Copenhagen, Geneva, Marseilles, Hamburg and Aharaus, with 10.234,898 TEU, represent 51,2% of the world fleet (Figure 3).

[1] Twenty-foot Equivalent Unit, the standard volume measurement in ISO container transport, corresponding to about 20 feet, or 40 total cubic meters.
[2] The ranking of the first hundred companies in the world takes into consideration both the current fleet, consisting of owned and hired vessels, and orders waiting delivered to armaments, https://www.alphaliner.com/.

From the point of view of the offer, there has been a further concentration process characterized by the establishment of strategic alliances[3] among the main carriers. Controlling about 90% of the market, they leave a very modest traffic percentage to be managed from the other operators, obtain considerable bargaining power towards terminal operators and Port Authorities and constitute the backbone of world container traffic (Wang Z. et al, 2016).
The set of outlined transformations developed in a system characterized by the redefinition in the geography of the routes, as evidenced by the strong increase in passages coming from China and directed towards the East coast of the United States. It contributed significantly to the saturation of the Canal of Panama and to the use, alternatively, of the so-called pendulum [4] paths between Far East and the Mediterranean, as the first stretch, and, in continuation of the transit, from Northern Europe to North America.

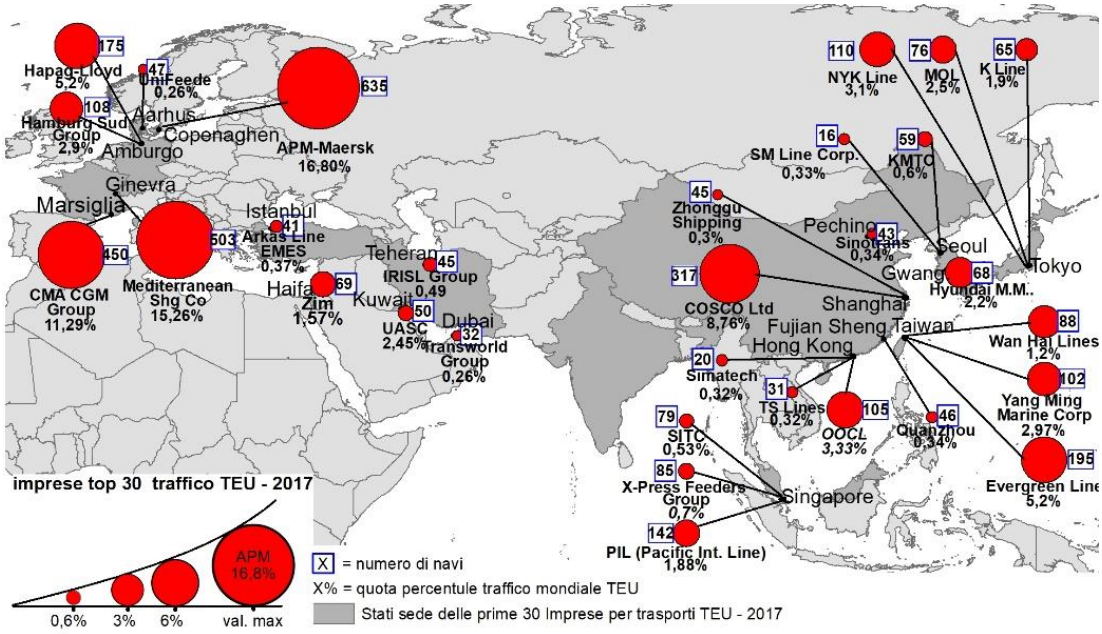

Figure 3: Top 30 shipping companies in the container sector.
Source: processing on data Alphaliner, TOP 100 Operated fleets, 2017.

There has also been a process of revision of the strategic choices made by the shipping companies that, although not being the only players in shipping[5], have a decisive influence on the fate of the port systems.
The shipping companies, although generally orientated towards the choice of large ports, characterized by high levels of demand for maritime transport, and the related

[3] The Ocean Alliance, composed of CMA CGM / APL, COSCO Shipping, Evergreen, OOCL; the Alliance, composed of Hapag Lloyd/UASC, NYK, MOL, K-li, Yang Ming; the 2M, formed by Maersk and MSC + HMM.
[4] The *pendulum* routes are structured to generate a trip and a return on the same route, following the Suez-Gibraltar axis.
[5] Entrepreneurs, shippers, carriers, shippers, terminal operators, logistic providers, etc.

market, carefully evaluate also the infrastructural endowment and the handling[6] costs, with emphasis on more complex services and/or additional values.
They also take into consideration other types of factors, essentially attributable to the characteristics of the ports (geographical positioning, infrastructural equipment, efficiency, links to land infrastructures and presence of logistics support centres).
The efficiency that concerns port operations is linked with various parameters such as the times and costs of services, the degree of reliability, the continuity or the quality of services, availability, costs of logistics activities.
Moreover, some carriers have started to manage the terminals directly to reduce the stopping times of the ships and maximize efficiency, also influencing the choices of the competitors (Siviero, 2010), so that, in the presence of terminals managed by the company, the latter will have a greater incentive to touch that port rather than another. It contributed to a natural selection process of which benefited the realities that could achieve conditions of greater attractiveness, and where, at the same time, back port infrastructures focused on logistic and intermodal systems able to support the needs of the chain.
The choices made by the carriers, in relation to the routes of origin and destination of goods and the types of ports that best meet the needs of navigation, affect the performance of the ports.
Thus, the most dynamic ones have had to face a review of the strategies, starting massive infrastructural investments aimed at modernizing the structures and lowering the seabed to make it suitable for hosting the new mega ships. At the same time, interventions on the improvement of logistics are realized, in order to make the goods sorting faster, more efficient and economically sustainable, in relation to the growing and ever more demanding request from operators.
These transformations have helped to redefine the role and functions of the ports and their regions of reference through a selection process that has seen emerging situations with greater attractiveness, also in terms of back-port conditions, focusing on logistic and intermodal systems adapted to support supply chain needs.
The result is a new spatial configuration of the world port ranking, in the geography of trade, characterized by an ever-increasing functional demarcation between transhipment hubs, with an international vocation and deputies to the transhipment of containers, and more specifically regional ports in the short sea shipping.
Furthermore, ports of the same type have started to compete in terms of resource allocation and interception of flows. Some ports have become more easily replaced due to reduced transport costs, and have been deprived of the typical geographical privileges of the past.

2. The geography of commercial ports

Looking on a world scale at the geographic distribution of the main ports, which are also the main provinces of goods, it can be noted that, in 2017, based on the world ranking of the first hundred ports characterized by a handling threshold of more than 1,000.000 of TEU, the broad weight of the Asian continent emerges. The latter, in the containerized transport segment, holds almost half of the ports, and the strength of

[6] Term used to indicate the port handling related to the boarding / disembarking activities of a container and related crane operations, apron and related services.

China has recorded an amount of total handled quantities of 54,560,410 TEU (1% more than in 2014). Among the first 100 ports[7], 46 are located in Asia and 20 of these are located in China (Figure 4).
In a good position is the Northern Range area[8], where 10 ports are located, followed by the Mediterranean Basin which boasts the presence of 12 large ports and equally significant handling capacity.
The Middle East area has seven of the top 100 ports in the world, three of which are in the United Arab Emirates.
The American port system is characterized by the presence of 9 US ports and 2 Canadian ports, as well as by 10 port entities located in the southern part of the continent, while only two ports are located respectively in Oceania and in Africa.

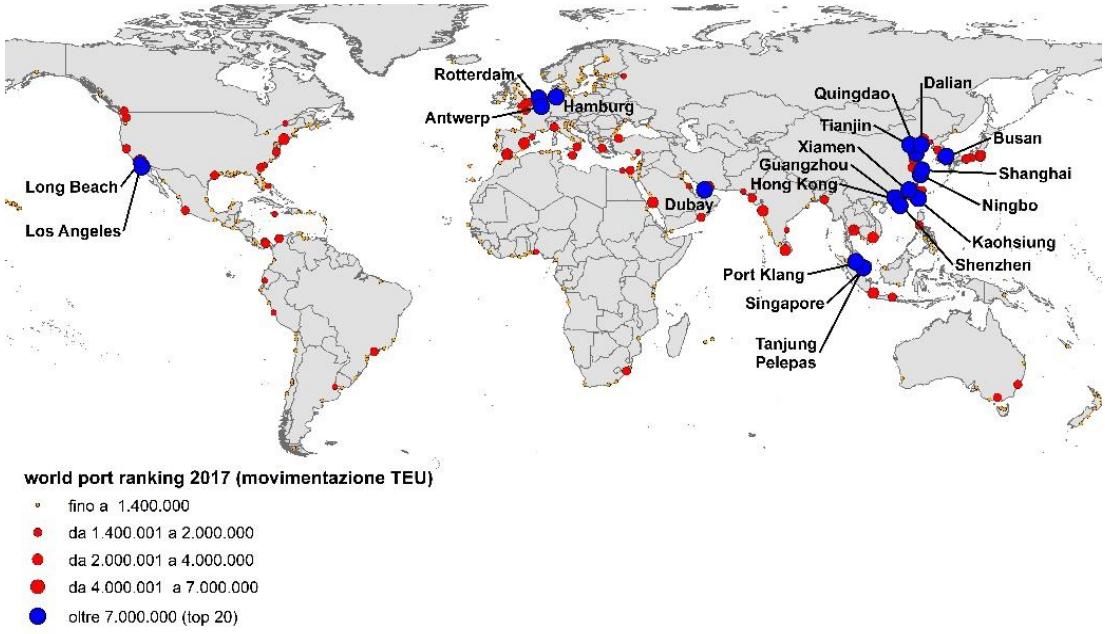

Figure 4: Port rankings worldwide for TEU handling.
Source: processing on Container Management data.

In the context of a constellation of world ports, represented in red, the first twenty ports are shown in blue, with the exception of the two Americans from Los Angeles and Long Beach and the three Northern Europeans Rotterdam, Antwerp and Hamburg are all located in the Asian area.
These first twenty ports also have significant market shares, ranging from 11,7%, on the world total, to Shanghai, to the value of 2,1 of Long Beach.
Even from a general standpoint, the top twenty ports in the world are all in the East, and these, with the exception of the port of Dubai, are almost all Chinese (seven out of ten) (Figure 5).
At the top of the world rankings are, in fact, the Shanghai ports (36.537.000 TEU), Singapore (30.922.300 TEU) and Shenzhen (24.204.000 TEU).
Following these ports there are Ningbo-Zhou Shan (China) in Hong Kong (China), Busan (South Korea), Guangzhou (China), Qingdao (China) and Tianjin (China).

[7] http://www.lloydsmaritimeacademy.com/.
[8] Antwerp, Bremen, Hamburg, Le Havre, Rotterdam, Zeebrugge.

To find European ports you have to get to the eleventh position, where the port of Rotterdam is located, stable compared to the previous year, followed by Antwerp (14th place) and Hamburg (18th).
More distanced are the ports of Bremerhaven (25th place), Valencia (30th), Algeciras (31st) and Felixstowe (35th).
Among the Italian ports which obtained a position in the ranking of the first 100 container ports in the world, there is Gioia Tauro, in 64th position with a traffic of 2.547.000 TEU.
Among the ports of destination, however, Genova, with a movement of 2.242.902 TEU is located at 71st place, ahead of Kobe (Japan) and behind Sydney (Australia). For Genova the first twenty positions in the world remain a mirage, but in this ranking the port has managed to overcome a port that has always been its competitor in the Mediterranean represented by the one of Barcelona, which differs for eight positions and 277.662 TEU handling.
The data on traffic volumes, aggregated by country, outline the supremacy of the Far East-Gulf-Mediterranean-Europe trajectory that has established itself with considerable intensity during the last few years.

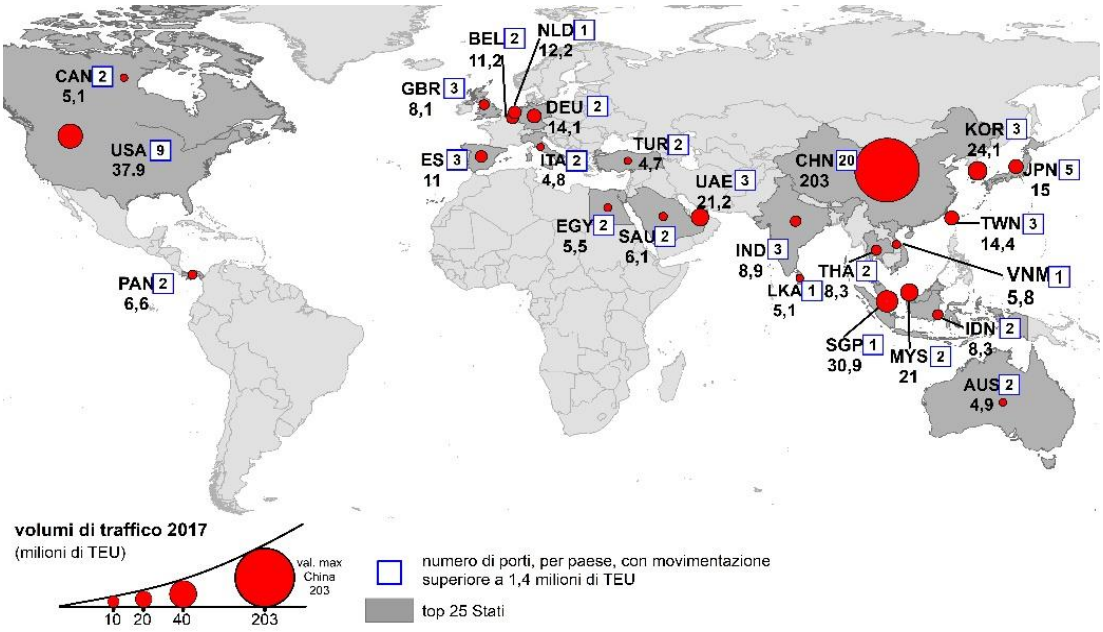

Figure 5: First 25 States for TEU handling capacity and number of ports, 2017. Source: processing on Container Management data.

China and the other Far East countries follow, but with considerable detachment, the ports of the USA and the Gulf; to follow the Northern Range and the European countries bordering the Mediterranean (Figure 4).
The first place in the ranking by country is occupied by China with 20 ports, followed by the US with 9 and Japan with 5 ones.
According with the new logics of the commercial routes and the related new logistic-port structures, even the Mediterranean ports have been fully involved in the dynamics of the sector.

Overall, the Mediterranean area, in 2017, was affected by the crossing of 98.928.015 TEUs, compared to 83.746.008 in 2008, with a total increase doubled by 18.13% (+15.184.015 TEU), the various ports register differentiated growth rates.
The new centrality assumed by the area, in overall terms, has had significant repercussions on the port system, determining a sort of differentiation/competition between different ports, characterized respectively by different connotations, potentials and development prospects (Figure 6).
In the first positions there are the ports with movement, for 2017, exceeding 5 million TEU, such as Rotterdam (12.385.168), Antwerp (10.037.318), Hamburg (8.910.000) and Bremen (5.488.999). These are followed by significant freight rates, between 2.500.000 and 5.000.000 TEUs, such as Algeciras (4.759.571), with high growth rates (5.5%), Valencia (4.722.273, +2,3%), Piraeus (3.749.709, +12.3%), and again Felixstowe (3.700.000), Marsaxlokk (3.080.000), Port Said (3.000.000), Tanger Med (2.963.654) and Ambarli (2.802.000).
Piraeus, which rose from 2% in 2008 to 12% in 2017 and Tanger Med from 4% to 10%, but also the port of Genoa, which rose from 7% to 8% market of the top 10 of the Mediterranean, becoming the third port for better growth performance.
In terms of container handling, Italy, at the European level, is behind the main competitors (in the order, Germany, Spain and the Netherlands).

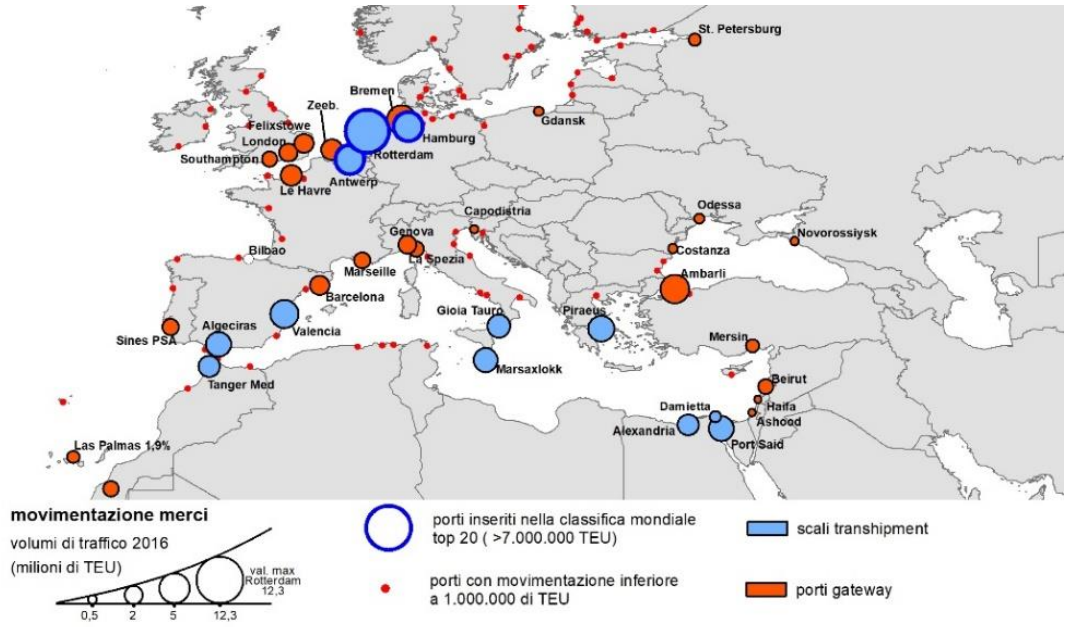

Figure 6: Classification of ports by type of handling.
Source: processing on SRM data.

3. The Belt and Road Initiative and the presence of China in the Mediterranean

The role of China in global maritime transport and the growing interest in sector investments carried out in the Mediterranean basin derive from the economic importance of the maritime economy, which for the country has a value of approximately 970 billion dollars and contributes the 9,4% of GDP (OECD, 2014).

The consolidated economic-maritime vocation has been supported, in recent years, by logistics and infrastructural initiatives and investments aimed at commercial growth, and, thanks to the expansion of the Suez Canal, to the implementation of expansion strategies in the direction of a strong Chinese presence in the Mediterranean.
This strategy is carried out through the establishment of a very strong shipping group, the Cosco Shipping, based in Shanghai, which is the largest in the world. With 1.114 ships, it holds the first place in terms of fleet capacity of ownership with regard to cargo ships (365 vessels, 33.52 million tons of gross capacity), the fourth in the world rankings of the segment of container ships with a fleet of the capacity of 1.58 million TEU containers.
China has started, for years, through this shipping group, a very incisive penetration strategy in the ports and port terminals of the Mediterranean, in the Gulf and in Northern Europe, pursuing different routes, namely (Ministry of Transport of the PRC, 2011):

- the acquisition of infrastructures, including terminals and ports where it now holds important shares of participation;
- the strict policy of alliances and the choice of the most productive global routes in terms of business to be pursued.

The Belt and Road Initiative (BRI) project[9] has been central, with the aim of fostering Eurasian integration through the development of infrastructures for the growth of local markets and the increase in trade.
More precisely, the ambitious project of transnational industrial and financial policy, starting from the development of transport and logistics infrastructures, aims to promote the role of China in global relations, favouring the flow of international investments and the commercial outlets for national productions.
The BRI, which will activate between 1.000 and 1.400 billion dollars of investment to build and strengthen maritime, road, port and railway works, involves the participation of a number of countries between 60 and 100, including China, in which almost 30% of wealth and over 60% of the world's population are concentrated (Figure 7).
Even if BRI is proposed as an open and participatory platform, China reserves itself a role at least of primus inter pares, in a logic of internal politics marked by a trajectory of external expansion. It reflects previous policies and ideas that the BRI represents the first real attempt on the Chinese side to conceive a design of integration of the global order in a Sino-centric way.
The substantial investment program, which envisages the creation of both land and sea lines, is aimed at creating a global network of infrastructures able to guarantee a complete crossing of Asia, up to the Mediterranean, also involving Italy.
The different actions, recovering the suggestion of the ancient Silk Road, travelled by caravans coming from China to Europe through Asia and the Near East, will allow China to increase trade relations with Eurasia and, in particular, with the Mediterranean countries.
This perspective, which appears to be the Chinese challenge-proposal to change the geopolitical scenarios, seems oriented to define a new world order, based on the expansion of Chinese influence in the global economic context, with a view to going out of China.

[9] http://www.cn.undp.org/content/china/en/home/belt-and-road.html.

The country, in fact, going beyond a more traditional protectionist approach, aims at overcoming distances and barriers and conditioning the Western economic system.
The project, in detail, provides two trajectories:

- the Belt, consisting of six terrestrial corridors that, starting from China, cross Central Asia to reach the heart of Europe;
- the Road, the sea route connecting the Chinese port hubs with the Indian Ocean and the Mediterranean, passing through the Straits of Malacca and Suez.

The terrestrial route of the plan retraces the route of the ancient Silk Road on a railway track and aims at connecting the major production centres of central China with Russia and the markets of central and northern Europe, passing from Iran and Turkey.
The maritime route is the South route that connects the ports of the Chinese east coast with the main ports of Southeast Asia and Africa, establishing a system of integrated landings, from which the traffic is redirected, through Suez, towards the Mediterranean and, from here, to the European markets.
The plan is supported by specific Beijing agreements with Indonesia, Malaysia, Thailand, India and Sri Lanka.
The project includes also a third segment, consisting of the so-called Cino-Pakistani corridor, about 3 thousand kilometres long, which aims at connecting the regions of eastern China with the Indian Ocean and in particular the port of Gwadar, Pakistan, from which the traffic is redirected by sea to North Africa and Europe.
In terms of volumes, the maritime component, with the related logistic infrastructures, is more relevant within the project compared to the continental corridors, cantered on the development of rail links.
This rationalization seems to have two objectives.
On the internal front, the aim is to continue and strengthen the Chinese government's commitment to foster the development and security of the most backward and turbulent western provinces, including that of Xinjiang in the first place, transforming them into strategic junctions of the Eurasian corridors.
On the outside, the main aim is to reorganize global supply chains in a functional way to Beijing's interests.
The complex project, in fact, includes a part of the activities that strongly and directly involve the ports in the Mediterranean, whose potential has been fully understood by China.
In short, it is a matter of blocking the passage from and to Europe, which is the first import market for Chinese goods, which 60% passes from the Suez Canal.
In the official BRI routes, the Mediterranean, as the landing point of the Road, is presented as the terminal part of the Maritime Silk Road, the connecting segment of the Chinese ports with those of Southern Europe, through a series of intermediate stops in the Indian Ocean making the Basin to acquire new strategic value.

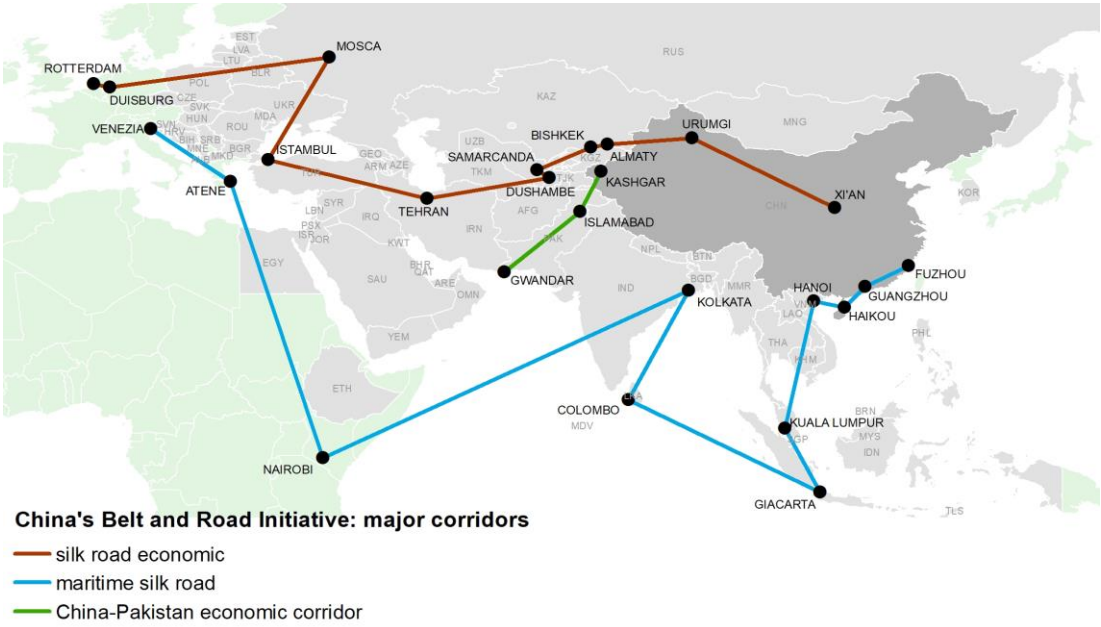

Figure 7: The Belt and Road Initiative.
Source: China Council on Foreign Relations.

In this perspective, specific investments have already been made to consolidate the presence in the Northern Range, firstly, by means of the placement in Hamburg of its control centre for all intra-European services and, secondly, with the purchase, in Holland of 35% of the Rotterdam Terminal, of 20% of those of Antwerp and Zeebrugge.
As for the southern side of Europe, one of the largest investments concerned the acquisition, in 2016, of 67% of the Piraeus port authority.
Other investments have been made in the management of the port terminals with the modality of purchasing company shares.
The oldest and most famous investment is the one made in Egypt to purchase the company that manages the Suez Canal Container Terminal, carried out to gain the control of the port market connected with the traffic in the Suez Canal.
In 2016 COSCO obtained the concession for the container terminal in Algeciras, Spain, which is one of the most important ports in the Mediterranean for the transhipment of containers and oil products.
In 2015, China joined a holding company for the container terminal in Kumport, in the port of Ambarli, the third largest in Turkey, located on the northwest coast of the Sea of Marmara.
Furthermore, the Chinese positioning is also consistent in the East Med area, where an important port asset has been acquired, the one of Haifa in Israel.
Last, only in order of time, it is the investment in Italy for the creation of a joint venture that will take over the management of the future container terminal of Vado Ligure.
On the whole, in relation to the Chinese project, whose economic, infrastructural and political importance is indisputable, Europe expressed doubts. First of all, due to the fact that the Chinese penetration strategy should show consistency with the European projects relating to transport infrastructures. At the same time, issues related to the compliance of the Chinese procedures with respect to the European standards on occupational safety and the conditions of employment contracts have been solved.

This way of looking at the BRI is the conclusion of a reasoning that interprets the Silk Road not only as a mere transport project, but as an expansionist strategy towards which attitudes of reflection begin to emerge, aimed at identifying how and if, the project, which is undoubtedly interesting for China, can have positive implications also for European countries.
Overall, the outlined scenario suggests some critical reflections that, however, differ according to the scale taken into consideration.
In the Euro-Mediterranean area, the presence of extremely different port regions and in mutual competition weakens the scenario towards international players whose bargaining power, investment and rooting increases proportionally to the lack of shared local strategies.
In this context, further risks could derive from the fact that a good part of the maritime traffic is based on random conditions connected, for example, with the strong Chinese presence, currently almost exclusively dependent on the Mediterranean maritime economy, which could go into a decline.
Furthermore, it should be noted that the special back-country economic zones, strongly connected to international investors, first of all the Chinese ones, are often not very connected to the settlement territories and, therefore, unable to constitute a real driving force for development of the local economy.

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