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"Constructuring" the First Maritime Globalization. Competing Shipping Subsidies and the Race for the Commercial Spaces 1881-1914

Giulio Mellinato

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Center for European Studies
Department of Economics, Management and Statistics
University of Milano – Bicocca
Piazza Ateneo Nuovo 1 – 2016 Milan, Italy
http://www.cefes-dems.unimib.it/

"Constructuring" the First Maritime Globalization.
Competing Shipping Subsidies and the Race for the Commercial Spaces 1881-1914.

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ABSTRACT
The aim of this paper is to investigate the process of politicization of the highest levels of the global commercial connectivity network, during its formative decades. The paper highlights the role played by the differences among the national approaches, along with some of the key mechanisms driving the development of the maritime sector during the considered period. As the preferred instrument for the development of the national system of long-range maritime connectivity, the shipping subsidies were diffused almost everywhere. However, the interactions with the institutional, sociotechnical and commercial national environments produced very dissimilar outcomes in different countries, with direct reflections in the construction of the commercial connectivity conditions, acting indirectly also over the evolution of the geopolitical scenario.

JEL classification: F02, F14, F52, N40, N70

> The legitimate use of power is permitted, and indeed necessary, in matters of trade policy
> Gustav Schmoller, 1898.[1]

During the final decades of the XIX century, the affirmation of the first global network of synchronized liner shipping increased not only the commercial connectivity of the world economy, but also the competition among the Great Powers, especially in continental Europe.[2] The possibility to extend the national economic sphere abroad was surely one of the main indicators of the power of a nation. Nonetheless, more importantly from our point of view, the opposite was equally undisputedly true: if a country was unable to safeguard its autonomous economic sphere, both domestically and abroad, it was believed to be in danger to fall under the influence of a stronger country. The idea of a close interconnectedness of sea power, economic prosperity and the accessibility of resources needed in the industrial age was popularized by the works of Alfred Mahan.[3] Inside his "philosophy", the safety of the sea commerce was the best guarantee for «the financial prosperity of countries, upon which depend not only the maintenance of land war but the reasonable welfare of populations».[4] So, the achievement of a higher level of control of the commercial maritime connections gradually became a political priority for every country interested in the maintenance, or the improvement, of the national status inside the existing geopolitical world order.

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[1] Gustav von Schmoller, *Die wirtshaftliche Zukunft Deutschlands und die flottenvorlage*, in: *Handels und Machtpolitik. Reden und Aufsätze im Auftrage der "Freien Vereinigung fur flottenvortrage"*, Stuttgart, 1900, pp. 1-38; p. 35 for the quotation.

[2] «Tous les peuples devenus puissants semblent avoir considéré que son développement ou son maintien devaient être encouragés par des régimes spéciaux et que ces régimes étaient justifiés par l'utilité qu'elle préntait, soit comme moyen d'expansion du commerce, soit comme instrument de relations impériales avec des colonies, soit comme élément éventuel de l'accroissement de la force militaire nationale»: René Verneaux, *L'industrie des transports maritimes au XIXe siècle et au commencement du XXe siècle*, Paris, 1903, p. 1.

[3] See, as an introduction, Jon Sumida, *Alfred Thayer Mahan, Geopolitician*, in: Colin S. Gray, Geoffrey Sloan (eds.), *Geopolitics, geography, and strategy*, Routledge, New York, 2013, pp. 39-62.

[4] Charles Carlisle Taylor, *The Life of Admiral Mahan. Naval Philosopher*, London, 1920, p. 322.

The aim of this paper is to show how the diffusion of shipping subsidies took place in a "constructural" way,[5] in the sense that the introduction of new subsidies by one country triggered a mechanism of learning-and-reacting by all the others, causing a shared restructuration of the entire logistics structure of commercial interrelations. The national and subsidized liner shipping systems became a core economic infrastructure,[6] at the same time performing some key political functions. The explanation of the different national degrees of success in finding a sound balance between all the issues at stake is an additional aim of this paper. Such issues were lively debated at that time, and they attracted some attention only recently. For this reason, there is a marked polarization in the sources used for this research: late-nineteenth and early-twentieth century studies on one side, and very recent scholarships on the other.

The first section of this paper presents the technical and organizational background, the second discusses the diffusion of the shipping subsidies (in the paragraphs 2-3), the third some structural and functional problems inside the system (paragrahs 4-5), and finally the conclusion will deal with the problem of the feeble endogeneity of the transport costs during this period.

1 – The sociotechnical background

Looking closely at the development of the conditions necessary for the European technologically superior connectedness to be fully effective, this research aims to capture the multifaceted reality of the transition from a connectivity system to another. As Alfred Mahan said, «the national power derives from engagement via the world's oceans along three key vectors: production (which leads to the need for international trade and commerce), shipping (both merchant and naval), and colonies and alliances (spread across the globe, forming a network of bases from which to project sea power)».[7]

In fact, during the second half of the XIX century, inside the highest level of the international system of commercial connectivity, the final affirmation of the best examples of vessels (combining steam for the propulsion, iron for the structure and liner shipping for the service to be performed) was far from being a mere matter of technology and economics.[8]

The technological changeover was not simple. The shift from sail to steam shipping interested the coastal traffic and connections between Great Britain and the Continent during the Fifties and Sixties, the North Atlantic during the Sixties and Seventies,[9] and the trade with the Indies and East Asia in the Seventies and Eighties.[10]

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[5] For details, see David L. Banks, Kathleen M. Carley, *Models for network evolution*, in: «The Journal of Mathematical Sociology», 21, nn. 1-2, 1996, pp. 173-196.

[6] As was recognized after the First world war, «shipping is peculiarly a key industry, in the sense that its activities are inextricably linked with those of commerce and industry as a whole»: Charles Ernest Fayle, *The War and the Shipping Industry*, Oxford University Press, Oxford, 1927, p. xii.

[7] As quoted in: James Stavridis, *Sea power: the history and geopolitics of the world's oceans*, Penguin Press, New York, 2017, p. 200. See also Jeremy Black, *Geopolitics and the Quest for Dominance*, Indiana University Press, Bloomington-Indianapolis, 2016.

[8] At that time, the following statement could be easily applied to every industrialized country: the «economic conditions affecting the merchant marine in the United States are not natural, but are in large measure the result of legislative action»: Walter T. Dunmore, *Ship subsidies. An economic study of the policy of subsidizing merchant marines*, Boston-New York, 1907, pp. 4-5.

[9] As an outcome of the American civil war, the British fleet acquired new market shares, in domestic trade and in the transport of goods for third parties as well, finding in this increased activities the financial resources needed for a quick transition from sail to steam. Cfr. John Glover, *Tonnage Statistics of the Decade 1860-70*, «Journal of the Statistical Society of London», Vol. 35, No. 2 (Jun., 1872), pp. 218-230. Actually, the tonnage of steam ships exceeded the tonnage of sailing ships in 1883 in Great Britain, in 1886 in France, in 1893 in Germany and in Austria-Hungary, and in 1907 in Italy: B. R. Mitchell, *International Historical Statistics, Europe 1750-1993*, MacMillan, London, 1998, pp. 710-720.

[10] Charles K. Harley, *The shift from sailing ships to steamships, 1850-1890: a study in technological change and its diffusion*, in: Donald N. McCloskey, *Essays on a Mature Economy. Britain After 1840*, Methuen & Co., London, 1971, pp. 215-237.

Since 1870, the worldwide tonnage of steam ships had doubled every decade (more or less from 2.5 million tons in 1870 to 5 million in 1880, to 10 million in 1890), while the tonnage of sailing ships remained almost the same until 1890 (around 14 million tons), to gradually decline in the following decade, counting less than half of the world total since 1905. Meanwhile, starting from the very beginning of the 1870s, the cycles of the ever-volatile world market of maritime transport began to depend on the prices of steam transport, relegating the sail to a definitive subordinate and subsidiary function.[11] Moreover, the general index of transport costs witnessed a real reduction that could vary between 30% and 50% (depending on the routes) between the mid-XIX century and the First World War.[12]

During the decades 1880s and 1890s a handful of different, but converging dynamics altered profoundly the international maritime market. On the one hand, the diffusion of the metal hulls deepened the connections with the steel industry, and on the other, the increased necessities of fresh capital strengthened the ties with the financial sector, while the development of the web of transatlantic liner connections changed the dimensions and the structure of both national and international markets. As was said: «Liner services may be considered both a cause and an effect in stabilizing market conditions. Vast terminal storage facilities, elevators, cooperative marketing practices, and fast-working terminal equipment are placing the producer in a better position to develop regular markets».[13] The result was the emersion of a wider "networked" geography of the commercial interconnections around the world. The process of "shrinking distance" was not uniform or ubiquitous, and produced a situation where the time required for the connection was more important than the distance. In other words, the best ships were employed mostly inside some high-value routes, such as to connect some places faster than others.[14]

Such new kind of hyperconnections would not only have attracted greater percentages of traffic, but would have caused a permanent distortion in the network of connections, [15] with visible effects acting also over levels different from the economic one. The many and important strategic externalities enhanced by an efficient organization, able to use all the advantages of a commercial connectivity synchronized among steamships, railroads and telegraphic lines, were identified as an instrument of "soft power" literally transportable almost anywhere, with very important military possible reflections also in the sphere of the "hard power".[16]

The new scenario was marked by the affirmation of what we can call the 'synchronized connectivity'. At its higher levels, the international commercial transport system began to behave as a unified whole, synchronizing the activities performed by its sub-systems (liner steamshipping, railways, telegraphic communications), and multiplying the positive effects produced by the dynamic properties of each of them.[17] Different degrees of the "circuitry" of the system began to appear (the weather-dependent and comparatively cheap sail shipping, the erratic tramp steam shipping, the

[11] Martin Stopford, *Maritime Economics*, 3rd ed., Routledge, London-New York, 2009, p. 108.
[12] David S. Jacks, Christopher M. Meissner, Dennis Novy, *Trade Booms, Trade Busts, and Trade Costs*, CESifo Working Paper No. 2767, August 2009.
[13] Jesse E. Saugstad, *Shipping and Shipbuilding Subsidies. A Study of State Aid to the Shipping and Shipbuilding Industries in Various Countries of the World*, US Department of Commerce, Washington, 1932, p. 3.
[14] Barney Warf, *Time-Space Compression: Historical Geographies*, Routledge, New York, 2008.
[15] Michael H.F. Wilkinson, *Hyperconnectivity, Attribute-Space Connectivity and Path Openings: Theoretical Relationships*, in: Michael H. F. Wilkinson, Jos B.T.M. Roerdink (eds.), *Mathematical Morphology and Its Application to Signal and Image Processing*, Springer-Verlag, Berlin – Heidelberg, 2009, pp. 47-58.
[16] See, as introductions: A. T. Mahan, *The Influence of Sea Power upon History 1660-1783*, Boston, 1890; Frederick A. Kirkpatrick, *Imperial Defence and Trade*, The Royal Colonial Institute, London, 1914; and Ahmed S. Rahman, *Fighting the Forces of Gravity. Sea-power and Maritime Trade Between the 18th and 20th Centuries*, Department of Economics, United States Naval Academy, Working Paper 2007, n. 17.
[17] For ports see: Michael B. Miller, *Europe and the Maritime World. A Twentieth Century History*, Cambridge University Press, Cambridge-New York, 2012, pp. 23-60.

costly, but very reliable and predictable liner steamshipping), offering to the potential costumers not only the transport activity in itself, but an increasing variety of collateral services and opportunities.[18]

As a direct consequence,[19] the best conditions for connectivity were further concentrated in commercial hubs able to link with the maximum efficiency possible three kind of flows: the material ones (goods and people), the intangible (information) and the different logistic chains for the movement and the transhipment of goods from one vector to another, for example steamers and railway carriages. During this period, for the most relevant shipping companies, state subsidies became so important as to define some of the key strategic developments of the business.[20]

As a matter of fact, the possession of these new technologies allowed Europeans to "engineer empires" differently than in the past. [21] Doing so, new profit horizons and new levels of hegemony became available, especially for countries with few or no colonial possessions.[22] Nonetheless, these new levels of interaction (the hyperconnections, within which technology, economy and politics fed each other and formed a whole) were "imperial" even in the sense that they were mutually exclusive: where one was established, any other with similar characteristics was excluded, while only connections of a different level, less intense and profitable, were tolerated.

Actually, even if several commercial connections could coexist, in theory, and different maritime lanes could call the same ports and transport more or less the same goods, using very similar technologies, in reality the conditions for accessing the infrastructures of the new logistics (the allocation of spaces inside ports, the warehouses, the transfers between ships and railway wagons) were different, sometimes heavily discriminating between national and foreign operators. Indeed, the entire maritime transport system was intrinsically more complex than the terrestrial network, because it involved more numerous actors, with broader and more consolidated interests of an almost international nature. For these reasons, even the regulations were more complicated, and could easily be manipulated to create discriminations.

2 – The "synchronized" connectivity

Generally, all countries created some specialized institutions, in order to manage the issues related to maritime trade. But, while in the USA and in the UK the Department of Commerce and the Board of Trade were offices indirectly controlled by the government, in Germany, France, Norway (as in Italy and Austria-Hungary) all the maritime issues were centralized directly at a ministerial level.[23]

The opportunities offered by the new form of connectivity acted inside the deep structure of the power relations, so it was possible to maintain a liberal surface, under which a substantially protective practice was the undisputed rule, especially considering the privileged relationships between some European countries and their Colonies.[24]

One key intrinsic property of the "synchronized connectivity" was the activation of a new level of capacities and potentials inside every chain of relations based on communications: the first forms of value chain for merchandises, the supply chains for raw materials, and obviously the

[18] Adam W. Kirkaldy, *British shipping, its history, organization and importance*, London, 1914

[19] Masahisa Fujita, Tomoya Mori, *The role of ports in the making of major cities: Self-agglomeration and hub-effect*, in: «Journal of Development Economics», vol. 49, n. 1, 1996, pp. 93-120.

[20] For a survey regarding the most important companies active in the North Atlantic scenario see: Henry Fry, *The History of North Atlantic Steam Navigation*, London, 1896.

[21] Ben Marsden, Crosbie Smith, *Engineering Empires: A Cultural History of Technology in Nineteenth-Century Britain*, Palgrave Macmillan, Basingstoke - New York, 2005.

[22] Rudolf Kobatsch, *Internationale Wirtschaftspolitik, ein Versuch ihrer wissenschaftlichen Erklärung auf entwicklungsgeschichtlicher grundlage*, Manz, Wien, 1907, p. 176-187.

[23] Grosvenor Jones, *Navigation laws. Comparative study of principal features of the laws of the United States, Great Britain, Germany, Norway, France, and Japan*, Department of Commerce, Washington, 1916, pp. 152-166.

[24] Luigi Fontana Russo, *Grundzüge der Handelspolitik*, Leipzig, 1911, pp. 247-310.

upgrading of the chains of command and responsibility for every bureaucratic institutions, as firms, states, and Empires. All in all, the properties of this new kind of commercial organization soon became part of a more effective "portfolio of resources", indispensable to upgrade one country's status inside the international ranking, during the formal imperialism period.

The new properties of this high-level commercial connectivity were something very similar to a new resource (or a resource of a new kind, relational instead of being restricted within the national borders) exploitable by willing governments in order to enhance domestic utility, by using abroad more effectively some desirable opportunities. However, the adoption of this superior modality of "soft power" didn't come without costs. Firstly, the achievement of the technological superiority embedded inside the new kind of oceanic liner ships required specific skills, knowledge and building structures not easy to find outside Great Britain. Secondly, the shipping companies needed financial assistance to keep under control not only the high costs of the new services, but also the uncertainty of the market, while a ship used in liner shipping was bounded to a rigid schedule of calls, whether she was fully loaded or not.[25] In this sense, the "logistics revolution" at the end of the XIX century required to reverse the traditional relationship between the carrier and the freight. Within the new system, it was no longer the ship waiting for the cargo (so as to maximize the use of the holds), but the availability of the cargo had to precede the arrival of the ship in port, so as to allow her to respect both the timetable and the minimum level of profitability in using the cargo space.

As the competition increased, this form of infrastructure became more and more essential to ensure the full effectiveness of the economic aspects of the national sovereignty abroad, defining a new geo-economic gravity for the higher value-added levels of the international maritime economy. If telecommunications had long since become the "invisible weapon" of imperialism,[26] maritime connections were more visible, but certainly no less strategic within the power games now more and more intricately intertwined on the eve of the Great War.

Finally, with the intensification of the relations between shipping companies and governments (both quantitatively and qualitatively), more and more often some agency problems began to appear, but they were usually completely avoided and put apart, in view of the urgency that the whole maritime problem had assumed.

Synchronized connectivity became a sort of activator for the mobilization of state power outside the national borders, and so for the building of a higher level of statecraft. The countries capable to jump inside the new system challenged for primacy, or at least for an autonomous participation to the system, while the others remained minor players, inside the network of connections owned, and governed, by a more powerful nation.

3 – Shipping subsidies

The need to introduce public subsidies, in order to sustain the shipping companies operating on long distance routes, emerged in England as soon as the steam navigation contended the richest routes with the sail shipping, and, surprisingly, it was not related with the international competition or a particular turn of the market. During the central decades of the XIX century, the British commercial fleet was in a position of uncontested supremacy, and the shipping business was as difficult and unpredictable as ever. The need for the introduction of the first public sustain came from inside the developing British imperial system of connections, when the weather-dependent sail ship voyages could be replaced by the scheduled linkages granted by the more reliable, and predictable

[25] Åke E. Andersson, *The four logistical revolutions*, in: «Papers in Regional Science», vol. 59, n. 1, 1986, pp. 1–12.
[26] Daniel R. Headrick, *The invisible weapon: telecommunications and international politics, 1851-1945*, Oxford University Press, Oxford-New York, 2012.

steamships. In 1837 the UK government introduced the first subsidies,[27] and in 1853 a more comprehensive approach was adopted,[28] starting the period of the "essential trade routes" policy.[29]

In brief, the structural history of the public funding to the shipping activities can be broadly divided into four periods. The first, was the one of the uncontested British sociotechnical superiority, both in the technology of steam shipping and in the organization of the maritime business sector. The second began in 1881, when France introduced the first comprehensive scheme of shipping subsidies, after a long parliamentary debate and a complex reshaping of the French influence inside the Mediterranean (loss of Suez, control in Tripoli, hegemony on the North-West African shores). As an effect of the French move, Paul Kennedy has seen the beginning of a new phase in 1884, when Great Britain lost the "inexpensive maritime supremacy" gained a long time before, and the German challenge began to be felt as a serious threat, starting a naval and maritime competition, that was based more on the financial resources committed by the single country involved, rather than on technology, economic competitiveness or purely strategic considerations. [30]

Since then, every time a country introduced a fundamental innovation, the international nature of the maritime business forced all the others to adopt some mirror-measures, in order to re-establish the equilibrium at a higher level of intervention. The official liberal surface of the maritime business made practically inapplicable every direct counter-measure (aiming for example at the exclusion of the foreign subsidized ships from the national market). So, the European shipping sector was condemned to an escalation in public funding, and a progressive enlargement of the market shares indirectly controlled by the governments.

The beginning of the third phase matured by the middle of the 1890s, when Germany introduced a complete new set of features inside the maritime business. The last phase started in different countries and in several forms around 1907, when, in one way or another, almost all the contracts signed between governments and shipping companies acquired some articles specifically related to the military use of the subsidized fleets in case of war. Inside the most contested routes, the technological evolution was clearly fostered by the intervention of the states, especially by the final decades of the XIX century, defining some key characteristics of the ships such as speed, dimensions and capacity.

At the end of this transactional learning process, the instrumental role attributed to the long-distance maritime transport system was quite the opposite in the two leading countries. While for the United Kingdom the maritime connectivity was an aim in itself (the strengthening of the existing links inside the Empire), for Germany it was an instrument to reach a wider end: the restructuring of the existing commercial order. For this reason, in Germany the shipping subsidies were not only more generous than in other countries, but the direct financial flow from the government to the most important national shipping companies was accompanied by a large series of helps and privileges, from the railways tariffs (*Deutscher Levante-Verkehr*) to the organization of spaces inside the German ports.[31]

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[27] Lincoln Paine, *The Sea and Civilization: A Maritime History of the World*, Knopf, New York, 2013, pp. 508-545.

[28] Pliny Miles, *The social, political, and commercial advantages of direct steam navigation and rapid postal intercourse between Europe and America*, London, 1859, p. 6; Freda Harcourt, *Flagships of imperialism: the P&O Company and the politics of Empire from its origins to 1867*, Manchester University Press, Manchester-New York, 2006.

[29] « Higher speeds in such cases were dictated by state demands for faster communication and greater punctuality, rather than simply by public demands for more rapid passages or by company desires to show off their latest steamers»: Crosbie Smith, *Coal, Steam and Ships: Engineering, Enterprise and Empire on the Nineteenth-Century Seas*, Cambridge University Press, Cambridge, 2018, p. 9.

[30] Paul M. Kennedy, *The Rise and Fall of British Naval Mastery*, Allen Lane, London, 1976, p. 178.

[31] The cost difference of rail transportation could reach 200%, acting in practice as an additional customs duty: Adam W. Kirkaldy, Alfred Dudley Evans, *The history and economics of transport*, London, 1915, p. 346.

In some cases, calculating the actual amount of the shipping subsidies is quite complicated, because the funding institutions were different from the government (in the UK, a massive flow of subsidies came from the Admiralty) and the ways in which the maritime activities were indirectly financed varied greatly. In Germany, as we will see, the railways played a major role in sustaining the maritime expansion.

The constructural theory has seemed to be the best point of view in order to analyze the succession of evolutionary steps inside this chapter of the history of globalization. This perspective highlights the centrality of the learning activities inside an evolving social network, [32] allowing a holistic view of the actors and their choices, and preserving the possibility to make a clear distinction between tactic moves and strategic aims.

A more orthodox approach could find some difficulties in dealing with the multi-level shape of this dynamic and competitive interaction among different national systems, devoted to the construction of a high performance maritime connectivity.[33] Though the final goal was common across different countries, the regulatory frameworks adopted in order to achieve that purpose were different, and they showed very different degrees of effectiveness. This variety depended not only on the economic and productive national structures, but also on their institutional background, on the degree of their participation to the technological evolution (or, better, on the resilience of their productive systems to the sociotechnical progress)[34] and, finally, on the inevitable path dependence effects, emerged during such a development.

During the first period, the prevailing attitude was to subsidize formally only the transport of mail, using the first steamboats operating over the Oceans. The United Kingdom began this practice rather early, in the late 1830s, to improve the communications among the most sensitive points of its commercial network, still far from being officially transformed into an Empire. In essence, the network of subsidized links constituted a level of elite connectivity, reserved for information, travelers and the most valuable cargo, as an alternative to those guaranteed by sailing ships and by the existing commercial companies, such as the East India Company. Over time, the importance of these connections grew with a parallel growth of their total mileage, and the public funding allocated to perform all the services required. In the period 1840-1900 it was estimated that the British government payed a total of about (current) 300 million US dollars in shipping subsidies.[35]

At this first step, the enactment of the new mechanical maritime connections was seen essentially as a national matter, as a higher-level complement for the existing network of connections, traditionally travelled by sailing ships. The subsidies were officially payed as a reimbursement for the transportation of mails and packages, although, more properly, they were real additions to the budgets of the shipping companies.[36]

The 1870s were a sort of watershed: on the one hand, the more secure, reliable, fast and cheap steam ships were no longer élite vectors, but their services could be available to almost everyone. On

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[32] «According to the constructural paradigm, social network change is the result of the ongoing learning process carried out by all individuals in the community»: David L. Banks, Kathleen M. Carley, *Models for network evolution*, in: Patrick Doreian, Frans N. Stokman eds., *Evolution of social networks*, Routledge, London-New York, 2005, pp. 209-232; p. 226.

[33] «si l'on veut analyser, d'une manière aussi précise que possible, les aspects multiples de cette révolution, il faut, comme nous allons le faire, se placer successivement à trois points de vue différents: commercial, politique, juridique»: Ambroise Colin, *La navigation commerciale au XIXe siècle*, Paris, 1901, p. 152.

[34] Frank W. Geels, *Technological Transitions and System Innovations. A Co-Evolutionary and Socio-Technical Analysis*, Edward Elgar, Cheltenham-Northampton, 2005.

[35] Walter T. Dunmore, *Ship subsidies. An economic study of the policy of subsidizing merchant marines*, Boston-New York, 1907, p. 84.

[36] Freda Harcourt, *Flagships of imperialism: the P&O Company and the politics of empire from its origins to 1867*, Manchester University press, Manchester-New York, 2006; William M. Fowler Jr., *Steam Titans. Cunard, Collins, and the Epic Battle for Commerce on the North Atlantic*, Bloomsbury, London, 2017.

the other hand, the diffusion of liner shipping downgraded both the sailing and the slower steam ships, splitting the market in two: liner high-value transportations, and tramp occasional services.[37]

We can recognize a sort of pattern, investigating the inner dynamic architecture of the maritime connectivity system during those years. This was the time of the "connectivity" level, when the subventioned lines were arranged in organized networks, also thanks to the coordinating effect introduced by the French subsidy system since 1881.[38] The French model was soon followed by other countries, and the result was the extension of a set of competing national webs of maritime interconnection. Observed as a whole, the system reached a higher level of organization, with a parallel development of frictions, as it is witnessed by the ongoing increase in subsidies, introduced in order to safeguard from external influences the existing national networks of maritime connectivity. During this period, some new properties emerged such as the development of logistic interconnections, the effects of their synchronization and some dynamics usually related with the emergence of hierarchies inside a network, as the network effect, or the hub effect.[39]

Actually, the first challenge to the British arrangement came from the United States,[40] but every attempt ended during the civil war, leaving the American government for a long time uncertain whether to challenge the UK supremacy in the North Atlantic with a policy of intervention, or to maintain a liberalist attitude.

The second challenge came from a more deep and diffused dissatisfaction with the British system. In 1881, the French government introduced a bonus system for some shipping services offered to the market with particular characteristics (speed, frequency, kind of vessels), in addition to the mail transport subsidies that had been in place since the 1850s. More importantly, the French system was based over a comprehensive plan, aiming at the modernization of the entire maritime sector, providing subsidies for the navigation activities (miles covered), the transportation of goods and the technological improvement of the national fleet. For the first time, a government recognized the comprehensive nature of the new form of the connectivity system, aspiring to improve together the quantity and quality of the services offered to the market, the profitability of the shipping companies, and the technical operability of the shipyards.

The French subsidy system was very precise in determining the amount of the financial aid to the shipping sector. During a first period (1881-1893) the French government payed a total of 6,110,048 current US dollars in construction bounties, and other $ 35,154,160 in navigation bounties. During the second period (1893-1913) the grand total of the construction bounties (considering both hulls and machineries) increased to 30,697,460 dollars, and the navigation bounties to 50,339,485 dollars.[41] Substantially, the French subsidy system has assigned annually to the shipbuilding sector an average of 470,000 dollars during the first period, and 1,461,784 dollars/year during the second, and to the shipping sector 2,704,166 dollars/year and 2,397,118 dollars/year respectively. In addition, approximately $ 5 million a year were allocated to shipping companies in the form of reimbursements for mail transport.[42]

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[37] Lane C. Kendall, *The Business of Shipping*, Chapman and Hall, London, 1986, pp. 18-20.
[38] René Veneroux, *L'industrie des transports maritimes au XIX siècle*, Paris, 1903.
[39] Paul Krugman, *The hub effect: or, threeness in interregional trade*, in: Wilfred J. Ethier, Elhanan Helpman, J. Peter Neary (eds.), *Theory, Policy and Dynamics in International Trade*, Cambridge University Press, Cambridge, 1993, pp. 29-37.
[40] Vivian Vale, *The American Peril, Challenge to Britain on the North Atlantic 1901-04*, Manchester University Press, Manchester-Dover, 1984.
[41] Grosvenor R. Jones, *Government Aids to Merchant Shipping*, Department of Commerce, Washington, 1916, pp. 141-144.
[42] Ibidem, p. 163.

Italy entered the competition in 1885 with a system of bounties similar to the French one, without a previous system of mail subventions. During the period 1886-1910 the government payed to the maritime sector a total of about 25,133,000 dollars, divided in 10,818,000 dollars for construction bounties (572,469 dollars/year) and 14,312,000 for navigation bounties (432,717 dollars/year) with other minor amounts.[43]

The Habsburg Empire was relatively early in adopting a system of shipping subsidies, with the introduction of mail subventions in 1851 and the upgrading to an extended system in 1872, and the separation between two national organizations (Austrian and Hungarian) since 1888. The Austro-Hungarian system was fully reorganized in 1907, finally adopting the German arrangement.

Germany joined the race in 1885, granting a railroad discounted tariff for every cargo to be loaded on German ships for exportation (as well as for raw materials and equipment directed to the national shipyards), and in 1886 directly introducing subsidies for the prominent German shipping companies. The German system, however, remained mainly based on discounts and advances, rather than on direct subsidies, and this made it extremely difficult, even for contemporaries, to draw up a comprehensive estimate of the government subsidies effectively payed to support the national merchant fleet.[44]

Starting from different premises, the US system was reflecting well the sociotechnical aspirations of the country, giving us a clear picture about the relative importance attributed to the different kinds of vessels. In 1891 the US Congress introduced a system of shipping subsidies based on the technical characteristics of the national ships involved in international trade.[45] A first class of steamers (iron or steel hull, screw propulsion, 8,000 gross tons or more, with an operating speed of 20 knots or more) were allowed $4 per mile on the outward voyage. For the second class, the requirements were iron or steel hull, at least 5,000 gross tons and 16 knots, allowing $2/mile. For the third class: iron or steel hull, 2,500 gross tons, 14 knots, and $1/mile; for the fourth and last class, the hull could be iron, steel or wood, 1,500 gross tons, 12 knots an hour, with a subsidy of only $0.66% per mile on the outward voyage, one sixth of the first class steamers. All vessels of the first three categories had to be approved by the Secretary of the Navy before being employed under mail contracts, and were required to be suitable for mounting and working at least four 6-inch guns.[46]

Such a varied picture does not allow for straight comparisons among countries. However, the available information can provide at least some indications about the dimensions and the main dynamics affecting the international commercial connectivity market.

Tab. 1 – Total expenditures for shipping subsidies (current US dollars).

[43] Ibidem, pp. 179-180.
[44] Maxime Gerville-Réache, *Subventions et les primes à la marine marchande en France et en Allemagne*, Paris, 1908.
[45] It was the *Ocean Mail act*, of March 3, 1891.
[46] Jesse E. Saugstad, *Shipping and Shipbuilding Subsidies. A Study of State Aid to the Shipping and Shipbuilding Industries in Various Countries of the World*, US Department of Commerce, Washington, 1932, p. 60.

Year	USA[47]	France[48]	UK[49]	Italy[50]	Austria[51]	Hungary[52]
1892	82075	6708663	413650	2416600	1255557	210487
1893	222355	6860275	413650	2293854	1260424	210487
1894	453854	6490319	413650	2511982	1323688	210487
1895	484392	7130326	389320	2377050	1323688	210487
1896	777162	7744498	389320	2526300	1343154	231420
1897	1104072	8114087	389320	2523400	1416152	231420
1898	882606	8130361	389320	2881534	1508615	231420
1899	752146	9069416	389320	2977150	1547547	231420
1900	967574	9894354	389320	3263939	-	231420
1901	845862	10509830	3726305	3648636	-	273846
1902	1144299	12045460	3802470	3148135	-	273846
1903	1176343	11115357	3806775	3508544	-	273846
1904	1209617	12274229	3897075	3446668	-	273846
1905	1200637	12041775	3938330	3644200	-	273846
1906	1252563	12165802	3166535	3726155	-	303916
1907	1062838	12197921	2755510	3376290	2339186	303916
1908	970488	13130851	2387725	3752103	2379786	303916
1909	955556	12217678	2689495	3870412	2440686	303916
1910	912103	11850982	2691635	3528653	2501586	303916
1911	884648	11826242	3135775	3833407	2561586	303916
1912	829217	12765523	3408545	3151389	2623386	612073
1913	1059126	12885555	3422945	3979222	2623386	967548

[Sources: see footnotes 47-52]

This competition involved a great variety of countries, including Japan, Spain, Russia, Turkey and Brazil. Everywhere, clearly at different levels of ambition, the opportunities for a high-level connectivity with the international economy guaranteed by the national system of maritime mobility were considered strategic, to the point of justifying huge and increasing expenses, especially at the turn of the XIX and XX centuries. The different domestic systems dedicated to maritime mobility went into parallel and articulated processes of nationalization everywhere, in the form of huge and prolonged transfers of resources from the State to the various operators within the maritime sector. At the same time, the progressive nationalization of maritime transport services linked the activities of the subsidized shipping companies to the general geostrategic position that was chosen by the

[47] Jesse E. Saugstad, *Shipping and Shipbuilding Subsidies*…, p. 62. Note that the figures refer to the fiscal year, ending June 30.

[48] Jesse E. Saugstad, *Shipping and Shipbuilding Subsidies*…, pp. 129-147; the figures comprehend shipping and construction subsidies, and navigation and equipment bounties.

[49] Jesse E. Saugstad, *Shipping and Shipbuilding Subsidies*…, pp. 250-255; the figures are relative only to the Royal Mail Co. Contracts and, since 1901, to the Foreign and Colonial Mail Subsidies for Asia and Australia, the Americas, and Africa.

[50] Jesse E. Saugstad, *Shipping and Shipbuilding Subsidies*…, p. 280; the figures include all the different forms of subsidies and bounties paid by the Italian government.

[51] The calculations for Austria were particularly complicated, with the collection of different sources. For the years 1892-1899 cfr. Royal Meeker, *History of Shipping Subsidies*, MacMillan, New York, 1905, p. 120. (original in UK sterling, converted in US dollars using the Saugstad's rate of conversion); for 1907-1913 cfr. Edwin M. Bacon, *Manual of ship subsidies; an historical summary of the systems of all nations*, Chicago, 1911, p. 47, where the reimbursement of the Suez canal tolls is excluded. These figures are consistent with the calculations made by Friedrich Weichs-Glon, *Oesterreichische Schiffahrtspolitik*, Wien-Leipzig, 1912, p. 1, who indicated the sum of 134318000 Austrian kronas (27266554 US$) for the total of the shipping subsidies payed in the entire period 1900-1910, and with Vito Dante Flore, *L' industria dei trasporti marittimi in Italia*, vol. 2, *L' azione dello Stato tra il 1860 e il 1965*, BIM, Rome, 1970, p. 401, indicating 15015000 Italian lire (equal to 2897895 US$) as the total for the year 1913 only.

[52] Jesse E. Saugstad, *Shipping and Shipbuilding Subsidies*…, pp. 418-424.

national political élites, which ended up becoming almost a hidden, but influential, stakeholder of the companies themselves.[53]

On the political level, the new commercial connectivity systems led to significant changes in the development of a new conception of hegemony, which no longer required the cumbersome structures of territorial imperialism, as demonstrated by the case of the British presence in Latin America. [54] European policymakers became well aware of the fact that a technologically up-to-date merchant fleet was the best instrument to guarantee some fundamental benefits for the entire national economic system, and not just a limited commercial advantage in the trade with some foreign markets. In other words, the new level of connectivity among the different parts of the world, generated by a fully developed mechanical mobility (with reduced costs, increased volumes transported, and improved quality and reliability of travel) had started to provide new tools for the projection abroad of the economic sovereignty of a country, with the consequence of creating symmetrical conditions of subordination for others.

The longstanding British interpretation of the "sea power" policy envisaged a rather clear distinction between the activities of the military fleet and the merchant fleet. In Germany the approach to the question was quite more up to date, and the two sides, maritime and naval, were much more intertwined and interdependent,[55] exactly in order to be more effective than the British approach.[56] Between 1885 and 1900, the German government issued a coordinated series of measures at the advantage of the two main German shipping companies. At the end, the result was the raise of the task entrusted to the national liner shipping, making it a complete tool for enlarging the sphere of the country's economic interests, especially towards the Pacific and Africa, where German politics found quite difficult to affirm itself.[57] The best steamships were turned in instruments for expanding the country's political and economic influence.

After Germany extended its network of hyperconnections inside the Pacific region, in 1901, the British reaction was quite articulated. In 1902-1903, to stop an American attempt to undermine the British superiority in the North Atlantic routes, a complex intervention merging subsidies, bounties and loans at very favorable terms was introduced,[58] while in the following years a renegotiation of the terms of the accords with some primary shipping companies secured the British positions inside some other strategic theaters of operations.[59] It was during this last phase that the British government financed the Cunard Line (which had previously been favored in the allocation of public aid) to order a new class of supertransatlantic liners,[60] which would have had to defeat the American competition and block the road to the emerging German threat.

Quickly all the other Powers followed, inflaming a race for the largest, fastest and most luxurious transatlantic liners. At the same time, public spending increased everywhere, within a market quantitatively in expansion, but where the margins of profitability for the maritime businesses

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[53] Cfr. Edwin M. Bacon, *Manual of Ship Subsidies. An Historical Summary of the Systems of All Nations*, Boston, 1911; Royal Meeker, *History of Shipping Subsidies*, Publications of the American Economic Association, 3rd series, 1905.

[54] Barry Gough, *Profit and power: informal empire, the navy and Latin America*, in: Raymond E. Dummett (ed.), *Gentlemanly Capitalism and British Imperialism. The New Debate on Empire*, Routledge, London – New York, 1999, pp. 68-81.

[55] Percy Arthur Silburn, *The Evolution of Sea-Power*, London, 1912; Rudolf v. Labres, *Politik und Seekrieg*, Berlin, 1903

[56] Archibal Hurd, Henry Castle, *German Sea-Power. Its Rise and Progress, and Economic Basis*, London, 1913, pp. 97-107.

[57] Michelle Murray, *The Struggle for Recognition in International Relations Status, Revisionism, and Rising Powers*, Oxford University Press, Oxford, 2019, pp. 87-112.

[58] Vivian Vale, *The American Peril, Challenge to Britain on the North Atlantic 1901-04*, Manchester University Press, Manchester – Dover, 1984.

[59] Andrew Porter, *Victorian Shipping, Business and Imperial Policy. Donald Currie, the Castle Line and Southern Africa*, Royal Historical Society-The Boydell Press, Woodbridge-New York, 1986.

[60] J. Kent Layton, *The Edwardian Superliners: A Trio of Trios*, Amberly Publishing, Stroud, Gloucestershire, 2012.

were reducing, exactly as a consequence of the intensification of the competition. The various governments invested remarkable resources for the achievement of objectives with uncertain economic profitability, but very important on the political level. A sort of vicious cycle, with increasing commitments on one side, and profit margins more and more difficult to maintain on the other.

Moreover, especially after the beginning of the XX century, the idea of a full politicization of the shipping subsidies conquered an even larger audience, renovating the urgency of stronger measures in order to maintain the position already acquired. It was said that «Considered from this point of view, the subsidies correspond to new political necessities which increase their character and which suggest that, far from disappearing in the near future, they will be multiplied and strengthened in the various countries, all jealous of preserving the most valuable elements of their power or security».[61]

All in all, the shipping-subsidies system can be seen as a complex instrument of governance for a sector extremely difficult to be institutionalized (because it operated largely outside the recognized national spaces) but at the same time crucial for the achievement of some results considered indispensable for strengthening the fitness of a country inside the international competition. The decisive step was the subtraction of the higher levels of the oceanic liner shipping from the pure market logic.[62]

In practice, such an approach subliminally led to the weakening and the degradation precisely of those aggregating mechanisms that the nationalizing action intended to intercept, with the result to subordinate them to the ambitions of expansion of the economic sovereignty of a Great Power. With everyone trying to build up its own order, the outcome was a global disorder.[63]

4 – An unstable system

During the 1890s, the German initiative at first in the Pacific, and then almost everywhere, pushed the system towards an even higher standard. We can call it the "connectability" level, adapting a concept recently introduced to study the evolution of the containerization in the international trade.[64] In brief, the concept of connectability was first introduced in order to understand the dynamic behavior of composite systems, where the interacting units were some subsystems and not simple nodes.[65] From this point of view, it is easier to observe the architecture of these meta-systems, pointing out their structure and, especially, their hierarchical configuration.

The theory has highlighted the fact that connectability is heavily dependent on the input conditions, and, in effect, during the 1890s some new properties appeared. Hyperconnections, or faster and privileged connecting routes, were introduced (and subsidized) in order to link directly local system to the mother country, or to interlock small local networks with the main routes. This

[61] René Verneaux, *L'industrie des transports maritimes au XIXe siècle et au commencement du XXe siècle*, Paris, 1903, p. 177 and ff.
[62] B. Olney Hough, *Ocean Traffic and Trade*, Lasalle Extension University, Chicago, 1914, p. 164.
[63] Emory R. Johnson, Grover G. Huebner, *Principles of ocean transportation*, New York-London, 1918, pp. 462-486; Grosvenor Jones, *Navigation laws. Comparative study of principal features of the laws of the United States, Great Britain, Germany, Norway, France, and Japan*, Department of Commerce, Washington, 1916.
[64] Marco Fugazza, Jan Hoffmann, *Bilateral Liner Shipping Connectivity Since 2006*, Unctad, Policy Issues in International Trade and Commodities, Research Study Series n. 70, New York-Geneva, 2016; Agustina Calatayud, John Mangan, Roberto Palacin, *Connectivity to international markets: A multi-layered network approach*, in: «Journal of Transport Geography», vol. 61, 2017, pp. 61–71.
[65] E. J. Davison, *Connectability and Structural Controllability of Composite Systems*, in «Automatica», vol. 13, 1977, pp. 109-123.

enlarged the role of the commercial positionality of the most important logistic hubs (the greatest ports in the world),[66] allowing an even closer synergization not only among different logistic actors (steamshipping, railways and telegraphic communications), but between this group and other actors inside the national economy, as heavy industries, banks and insurance companies. The effects were so wide as to enlarge not only the commercial space, but actually the 'commercial sovereignty' of a country, as it was the case of Germany in the Pacific region,[67] in Africa,[68] or in Latin America,[69] directly challenging the British position within those regions.[70] Actually, at this point, the maritime system became a matter of power, and not only one of the many economic issues at stake.[71]

The final organization, the one still under formation during the last years before the outbreak of the war,[72] was the one we can call "hyper-connectability", aimed at the full 'territorialization' of portions of the world commercial order,[73] using an even higher efficiency of the sociotechnical infrastructure, in order to generate the availability of new empowering properties inside the interconnected network.[74]

The timeliness of a national system of maritime connectedness became a commodity, as its reliability, its (lower) levels of risk and its overall optimization. In wider terms, the quality and the attractiveness of a national mobility system became a sort of immaterial resource, or an implementable asset, manageable in order to reach ends of both economic-commercial or geostrategic nature. Especially because the different participants to the system would be increasingly commercially bound one with the others, de facto enhancing also the polarization of the entire network of interrelations. During the years 1907-1910, the last wave of maritime laws had precisely the purpose of governing this development, to produce favorable outcomes for one country's own network of sea connections in a direct way, and indirectly for the entire national economic system.

In effect, the constructural run-up could have seemed only quantitative at the beginning, when the mail subsidies aimed only at the preservation of the number of ships involved in oceanic regular connections. Then it turned into qualitative, when the first French comprehensive maritime law meant to improve the technological level of the national fleet. Numerous countries followed, adapting the British or the French examples to their necessities, or possibilities. Finally, the approach became systemic, with the full development of the German style, especially after the appointment of Alfred Ballin as top manager of the Hamburg-based shipping company Hapag, in 1899.[75]

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[66] Eric Sheppard, *Positionality and globalization in economic geography*, in: Giovanna Vertova ed., *The Changing Economic Geography of Globalization. Reinventing space*, Routledge, London – New York, 2006, pp. 40-66.

[67] Paul M. Kennedy, *Bismarck's Imperialism: The Case of Samoa, 1880–1890*, in «The Historical Journal», vol. 15, n. 02, June 1972, pp. 261 – 283.

[68] John Lowe, *The Great Powers, Imperialism and the German Problem, 1865-1925*, Routledge, London – New York, 1994.

[69] Victor Bulmer-Thomas, *The Economic History of Latin America since Independence* [2 ed.], Cambridge University Press, Cambridge, 2003.

[70] Christian Groteswold, *Die deutsche Schiffahrt in Wirtschaft und Recht*, Stuttgart, 1914.

[71] Ellis J. Barker, *Modern Germany; her political and economic problems, her foreign and domestic policy, her ambitions, and the causes of her successes and of her failures*, New York, 1915.

[72] Some aspects of the German system were adopted by some prominent British shipping company just before the outbreak of the war. Cfr. Paul Overzier, *Die Zusammenschlußbewegung in der englischen Handelsschiffahrt*, in Weltwirtschaftliches Archiv, v. 15, 1919/1920, pp. 22-33.

[73] Saskia Sassen, *Territory, Authority, Rights: From Medieval to Global Assemblages*, Princeton University Press, Princeton, 2006.

[74] Gianmarco Ottaviano, Jacques-François Thisse, *Agglomeration and economic geography*, in J. Vernon Henderson, Jacques-François Thisse (eds.), *Handbook of Regional and Urban Economics*, Elsevier, Amsterdam, vol. 4, 2004, pp. 2563-2608.

[75] G. A. Ritter, *The Kaiser and His Ship-Owner: Albert Ballin, the HAPAG Shipping Company, and the Relationship between Industry and Politics in Imperial Germany and the Early Weimar Republic*, in: H. Berghoff, J. Kocka, D. Ziegler

Leaving aside the unique British position, during the first phases of the process, the second-rank positions inside the maritime world order were still contendible. Nevertheless, after the full development of the German initiative, it became clear that the differences between national systems were too deep to obtain margins of efficiency close to the German ones.

We have a snapshot of the situation in 1902, as a result of a Parliamentary investigation carried out in Italy. The Commission charged with the inquiry was able to make a comparison between the amounts payed in shipping subsidies by various countries, and the improvement in the quantity and quality of their national fleets, taking into consideration the average age, speed and dimension of the ships, and their total tonnage.

Tab. 2 - Shipping subsidies payed in 1902 (Italian lire).[76]

England	Mail subsidies	25,000,000
	Admiralty subsidies	2,600,000
	Total	27,600,000
France	Mail subsidies	26,400,000
	Navigation bounties	27,773,290
	Fishery	5,576,450
	Total	49,749,740
Austria-Hungary	Mail subsidies	8,866,000
	Navigation Bounties	3,854,119
	Total	11,306,750
Germany	Mail subsidies	10,806,750
	Fishery	500,000
	Total	11,306,750
Japan	Mail subsidies	13,315,000
	Navigation Bounties	3,718,243
	Total	17,033,243
United States	Mail subsidies	7,168,000
	Fishery	1,605,000
	Total	8,773,000
Italy	Mail subsidies	10,191,829
	Navigation Bounties	9,329,722
	Total	19,521,551
Russia	Mail subsidies	8,140,000
Holland	Mail subsidies	1,146,000
Denmark	Mail subsidies	500,000
Greece	Mail subsidies	198,000

Tab. 3 - The increase in the technical potentiality of the national fleets (1892-1902).[77]

States	Annual expenditure for the merchant marine (Italian lire)	[index of the] Potential increase in the decade 1892-1902	Ratio between the expenditure and the increase of the fleet potential
England	27,600,000	702	39,316
France	49,749,740	16	3,169,358
Austria-Hungary	12,720,119	44	289,093

(eds.), *Business in the age of extremes: essays in modern German and Austrian economic history*, German historical institute, Washington, 2013, pp. 15-39.

[76] *Atti della Commissione Reale pei Servizi Marittimi*, vol. 4, *Indagini comparative sulla marina mercantile dei vari Stati*, Tipografia della Camera dei Deputati, Rome, 1907, pp. 93; the numbers express only the amount of the direct shipping subsidies. All the other subsidies (railways transportation discounts, taxes exemptions, other privileges) are excluded.

[77] Ibid., p. 95.

Germany	11,306,750	239	47,308
Japan	17,033,243	51	333,985
United States	8,773,000	193	45,456
Italy	19,521,551	40	488,038
Russia	8,140,000	51	159,608
Holland	1,146,000	15	25,466
Denmark	500,000	26	19,230
Greece	198,000	17	11,647

The French ratio was by far the worst, and the German was the best one in continental Europe. An in-depth analysis of the reasons behind this difference is beyond the limits of this study, but it is clear that both systems shared a heavy involvement of the State inside the maritime business.[78] Furthermore, we can consider that in France the three stages of the shipping subsidies policy (the laws of the years 1881, 1893, 1902-1912) went in parallel with the development of an increasingly harsh protectionist policy, with the tariffs introduced in 1881, 1892 and 1910, being anyway unable to reach a satisfactory position inside the international markets.[79] For some reason, the French system appeared locked inside a vicious cycle: the more the government paid, the more inefficient the system of subsidies seemed to become.

From this point of view, the structure of the world commercial connectivity system became increasingly rigid, notwithstanding its incredible expansion in quantitative terms.

Germany was the first to pursue at full the new possibilities, inside a wider shift of the German foreign policy, searching for a new hegemonic repositioning, particularly outside Europe and especially using navy/maritime tools.[80] Actually, in German's eyes, the question was not seen as a challenge of the existing order, but rather as the result of the extension overseas of the better German organization and efficiency.[81] The further ramification, and the improvement, of the web of the existing commercial connectivity were used as the best way to technically legitimize such a program of ascendency, while a variety of initiatives and publications spurred the idea of a cultural legitimation for the new wave of German colonialism.[82]

Why were the French and the German outcomes so different? I will try to provide a two-level explanation for such a discrepancy.

Firstly, we can say that the international long-distance commercial connectivity system worked, and evolved, accumulating an increasing level of agency-related issues. The on-the-books subsidy system was extremely difficult to transform in reality, considering the instability of the market, the ongoing technological development and the international nature of the maritime business, where most of the active life of each great liner ship was outside the control of the state which financed her activities. Certainly, the respect of some rules (the mileage to be covered, the choice of national shipyards for building new ships, the characteristics of the services, etc.) was easy to verify,

[78] Achille Villate, *How France Protects Her Merchant Marine,* «The North American Review», v. 184, 1907, pp. 157-169; Georg Jaensch, *Die deutschen Dampfersubventionen, ihre Entstehung, Begründung, und ihre volkswirtschaftlichen Wirkungen*, Berlin, 1907.

[79] «The French show a spirit in striking contrast to that of their great commercial rivals; they acquiece in England's supremacy, and submit even to be passed by Germany, with little thought, apparently, of fighting to keep their share in trade»; Clive Day, *A History of Commerce*, New York, 1914, p. 415.

[80] John J. Mearsheimer, *The Tragedy of Great Power Politics*, W. W. Norton & Company, New York – London, 2001, pp. 186-188.

[81] John Lowe, *The Great Powers, Imperialism and the German Problem, 1865-1925*, Routledge, London –New York, 1994, pp. 14-15.

[82] Since 1898, the Deutscher Flottenverein was very actively supporting the naval policy of the German Empire. See Friedrich Hünemörder, *Deutsche Marine- und Kolonialgeschichte im Rahmen einer Geschichte der Seefahrt und des Seekrieges*, Kiel, 1903.

while other aspects were not, especially in relation to the real conditions of operation chosen by the shipping companies. For example, the real enforcement of every measure necessary to maintain the higher standard of competitiveness, the real-time adaptability to the changing conditions of the market, the efficacy in controlling costs and in searching for every possible source of income inside the market, without relying too much on state subsidies.

At a deeper level, the effectiveness of the different national systems remained linked with the different ways followed in trying to find a solution for the agency issues, potentially separating the goals of the principals (the governments, the political élites, the moneylenders) and those of the agents, such as the shipping companies and all the other maritime operators directly involved inside the business. The problems of agency were not only related with asymmetries in the availability of crucial information, or the possible emergence of a selfish attitude in the agents' behavior. It was a matter of how the governments decided to put themselves in front of this problem, by redefining the real terms of the commercial freedom in the case of a business essentially exporting a set of services (we have called it connectivity), in the form of the economic exploitation (mostly outside the domestic territory) of some crucial aspects of the national productive system. In any case, the freedom of the maritime business was put under question.

In Germany the agency issues were managed (and controlled) *ex ante*, with a system of indirect support.[83]On the contrary, France tried to manage the agency issues organizing an *ex post* system of verification and control, which proved to be poorly effective.

We can take advantage of some external checks. For example, Austria-Hungary followed closely the German model. In the Habsburg Empire, the State was directly involved inside the governance of the Austrian Lloyd shipping company since the 1840s, assuming also some managerial functions after the reforms in 1891 and 1907. The last reform stated that 3 out of 8 members of the Board of Directors should be indicated by the Vienna government, and the President should be nominated directly by the Emperor.[84] The Minister of Commerce should approve *in advance* every change in the freight contracts, in the routes followed and in the use of the ships. Likewise, every new construction needed a preemptive approval by the Minister, also because every new ship could be converted in an auxiliary vessel in case of need. At this point, the formal approbation of the annual balance sheet by the public authorities was only a formality.[85]

Italy followed the French example. Here, all the controls were indirect and subject to a formal parliamentary approval. Especially the latter was a point of great weakness, because some prominent Italian shipowners and shipbuilders were personally present inside the Parliament (both as members of the Chamber of Deputies or the Senate), and directly managed the discussions about shipping subsidies, defending their own interests. The final result was the practical nonexistence of a coherent national policy for the maritime commercial connectivity, and a very feeble governance of the sector by an only partially coherent set of specific measures, aimed more at protecting some local or sectorial interests at stake, than at creating a coordinated and focused policy. Italy failed to grasp the general

[83] Karl Thisse, *Deutsche Schiffahrt und Schiffahrtspolitik der Gegenwart*, Leipzig, 1907; Kurt Himer, *Die Hamburg-Amerika Linie im sechsten Jahrzehnt ihrer Entwicklung, 1897-1907*, Hamburg, 1907; Paul Neubaur, *Der Nordeutsche Lloyd. 50 Jahre der Entwicklung, 1857-1907*, Leipzig, 1907; Reinhold Thiel, *Die Geschichte des Norddeutschen Lloyd: 1857–1970*, Hauschild, Bremen, 2001; Frank Broeze, *Shipping policy and social-darwinism: Albert Ballin and the Weltpolitik of the Hamburg-America Line 1886-1914*, «The Mariner's Mirror», 1993, vol. 79, n. 4, pp. 419-436.

[84] Giuseppe Stefani, Bruno Astori, *Il Lloyd Triestino. Contributo alla storia della navigazione marittima*, Mondadori, Milano, 1936.

[85] *Atti della Commissione Reale pei Servizi Marittimi*, v. 4, *Indagini comparative sulla marina mercantile dei vari Stati*, Tipografia della Camera dei Deputati, Rome, 1907, pp. 16-19.

aspects of the transformations underway, so keeping the national commercial fleet in a disadvantaged condition, even inside the Italian ports.[86]

Austria-Hungary and Italy can be presented as two counterfactual verifications of the inner validity of the German and French approaches to the maritime subventions. Without the problem of leadership, we can say that the two mid-size countries were located at the semi-periphery, with great ambitions but limited resources. Austria-Hungary was able to climb the international rankings of the maritime powers, while Italy remained in a quite unsatisfactory position, unable to solve the inefficiencies of the system, mostly related with the aforementioned agency issues.[87] The different degrees of efficacy of the two models reproduced itself, also outside France and Germany.

5 – Structures and functions

By the mid of the first decade of the new Century, a new stage of the competition started to define itself. The German position as a primary actor in liner shipping was undisputed[88] inside an international market where the maritime cartels (the "conferences") were more effective than ever in limiting competition, fixing prices and distributing market shares.[89] In other words, the German superior system was able to affirm itself, limiting all the others but the British one, taking advantage of the very institutions created decades before exactly for preventing the competition of some new entrant, as in the case of the shipping cartels.[90]

In 1914, the two largest German shipping companies were by far the greatest in the world,[91] with services all around the globe, managing a complete "commodification" of the timeliness of their services.[92] The introduction of a fully synchronized interconnectivity of their services allowed the reduction of dead times, the overcoming of the traditional seasonality of (commercial) voyages and passages, and subverted the usual dependence of transportation activities under the availability of goods to be transported. Inside their scheduled arrangements, the transportation opportunities became available before the actual arriving of passengers and cargo, inside the all-scheduled (and mostly interconnected) timetables of liner shipping companies, railways and logistic operators.

In a small time span, all the other countries began a run-up to chase the German supremacy. Great Britain adopted a new system in 1908, securing the lanes towards India, Australia and the Pacific. In France, the system of shipping subsidies was renovated in 1906 (in 1908 the French government payed more than 13 million US dollars in shipping subsidies, the yearly maximum for the entire period, for all countries), extended to the colonies in 1911 and finally prolonged in 1912. In Austria-Hungary the system was renovated in 1907, augmenting the subsidies but also the

[86] Vito Dante Flore, *L'industria dei trasporti marittimi in Italia*, v. 2, *L'azione dello Stato tra il 1860 e il 1965*, Biblioteca informazioni marittime, Roma, 1970; Ludovica De Courten, *La marina mercantile italiana nella politica di espansione, 1860-1914: industria, finanza e trasporti marittimi*, Bulzoni, Roma, 1989.

[87] Giulio Mellinato, *L' Adriatico conteso: commerci, politica e affari tra Italia e Austria-Ungheria (1882-1914)*, Franco Angeli, Milano, 2018, pp. 175-219.

[88] «We owe to the Germans almost every innovation, convenience, comfort, and luxury which today distinguish the trans-Atlantic ships of all nations from their prototypes of fifteen years ago»: B. Olney Hough, *Ocean Traffic and Trade*, Lasalle Extension University, Chicago, 1914, pp. 10-11.

[89] J. Russell Smith, *Influence of the Great War upon Shipping*, Oxford University Press, New York, 1919, pp. 3-25.

[90] Alan W. Cafruny, *Ruling the Waves. The Political Economy of International Shipping*, University of California Press, Berkeley, 1987, pp. 14-17.

[91] Douglas Owen, *Ocean Trade and Shipping*, Cambridge University Press, Cambridge, 1914, p. 53.

[92] Reinhold Thiel, *Die Geschichte des Norddeutschen Lloyd: 1857-1970*, Hauschild, Bremen, 2001; Frank Broeze, *Shipping policy and social-darwinism: Albert Ballin and the Weltpolitik of the Hamburg-America Line 1886-1914*, in: «The Mariner's Mirror», 1993, vol. 79, n. 4, pp. 419-436.

obligations for the shipping companies, with an explicit mention of the possible full militarization of the subsidized merchant fleet in case of war. In Italy, a series of decrees was introduced in the years 1906, 1907, 1910, until a new comprehensive law was approved in 1913. During the same period, also the other countries introduced some reformations of their shipping laws, almost everywhere augmenting the funds, along with the bounds for the shipping companies.[93]

Unfortunately for them, it was not a matter of quantity. The success of the German system was due to its capacity to develop some new functional properties, while all the others countries continued to invest resources in the strengthening of their sets of structural equipment. The ultimate goal of the German system was to make the flows channeled by the national maritime connectivity system as cheap, reliable and effective as possible,[94] giving to all the involved actors (shipping companies, shipyards, ports, railways, logistic operators, etc.) a clearly defined instrumental function inside an integrated operational framework.[95]

In all the countries except for Germany and Austria-Hungary, the attention was fully concentrated over the infrastructures and their technical capabilities (dimensions, speed and loading capacity of ships, warehouses, trains, etc.), assuming that an extended and powerful structure was *per se* a sufficient instrument for coping with the necessities of internationalization of a developing economy. Maybe it was true at the beginning of this process, during the period of the essential trade routes and the mail subsidies, but it was clearly inadequate when the competition was no longer among different means of transport (sail, tramp steamshipping, liner steamshipping), but among competing national systems of commercial connectivity. With the concentration inside two gigantic shipping companies of the bulk of the state subsidies, and the full involvement of the industrial and financial interests, the German maritime system proved to be extremely effective also from a technical point of view. It was successful in maintaining a high rate of expansion even in decades of relative stability of freight rates, notwithstanding the overabundance of tonnage.[96]

One of the most significant aspects of the functional approach adopted by Germany was the specialization of the operators, inside a coherent design aimed at the repositioning of the country inside the world order.[97] The achievement of the best possible efficiency in the process of setting up the oceangoing maritime infrastructure was a paramount question for the economic development of Germany,[98] the only European country with a clear planning concerning the global projection of the national economy. In other words, Germany was the only country consciously developing a commercial policy at a global scale, not only geographically, but also adopting a level of approach adequate to the magnitude of the problems involved. The German maritime policy fostered the integration of the interdependencies among all the operators of the logistic chain, with the activation of synergies (so to say, lowering costs and increasing efficiency and reliability) and the creation of a higher level of connectedness, not only abroad, but also within the national economic system.[99]

As we have seen, Germany remained the only one pursuing this line of operation, but the chase triggered by the German initiative fostered all the other countries at least to pay more in subsidies, to maintain their market shares and their more or less privileged areas of economic

[93] Grosvenor R. Jones, *Government Aids to Merchant Shipping*, Department of Commerce, Washington, 1916
[94] Franz Ulrich, *Preussische verkehrspolitik und staatsfinanzen*, Springer-Verlag, Berlin-Heidelberg, 1909.
[95] Edwin J. Clapp, *The Port of Hamburg*, Yale University Press, New Haven, 1912.
[96] Martin Stopford, *Maritime economics*, Routledge, London-New York, 2009, pp. 755-757.
[97] At that time, such an approach was seen as intrinsically treacherous, as its results: «Between 1880 and 1899 German imports increased from £143,000,000 to £ 218,000,000, and exports from £ 147,000,000 to £ 289,000,000»: Charles Sanford Terry, *German Sea-Power*, Oxford University Press, Oxford, 1914, p. 10.
[98] Emanuel Ullmann, *Der deutsche Seehandel und das Seekriegs- und Neutralitätsrecht*, Munchen, 1900.
[99] Cornelius Torp, *The great transformation: German economy and society 1850-1914*, in: Helmut Walser Smith (ed.), *The Oxford handbook of modern German history*, Oxford University Press, Oxford, 2011, pp. 336-358.

influence. The massive flow of resources lowered even more the costs of transportation payed by the final users, sparkling the exceptional boom of the last phase of the first wave of globalization.

Clearly, many other factors mattered: the characteristics of the economic development of the country, the institutional background, the availability of resources, and many others. However, as far as the maritime connectivity was concerned, the apparent "invisibility"[100] of the maritime contributions inside the development of the national economies is strikingly contradicted by the fact that, although sometimes indirectly, at that time the key role of maritime transportation was fully recognized by almost every scholar dealing with the explanation of the economic expansion they were witnessing.[101]

6 - Conclusion

With the strengthening of the national controls over the properties of the synchronized mobility, the productivity of the higher layers of the long-distance maritime connectivity began to depend more and more from the level of public aid. Such a dynamic was hidden beneath the sustained growth trend,[102] as to allow an illusory interpretation of public interventions such as non-structural and fundamentally negligible. In reality, support practices were so widespread as to push on the marginal fringes of the market those who could or did not want to adopt them.[103] Subsidies, incentive policies, non-tariff barriers, apparently non-economic privileges, and other discriminatory practices were in fact widespread, and tacitly accepted everywhere, representing a mass of opportunities whose concession was such as to exert a considerable influence on the real working conditions of the international market for commercial mobility. It was the state interventions that created a privileged network of "highways of commerce" inside the oceangoing connectivity system, addressing and controlling the most important shares of the material and immaterial flows of goods, people and power.[104]

The process determining the real transport conditions was implemented by governmental interventions not only via the direct subventioning of the maritime transport activities (especially the oceanic liner steamshipping), but also by the integration of the most technologically advanced maritime connectivity activities inside a single framework. A further evolution led to the coordination of other logistic activities (ports, railways) with the timeliness of the shipping lanes and with an increasing set of coordinated activities, from shipbuilding to the institutions created for supporting the geopolitical aspirations of a country. At this higher level, the full connectability properties of the network became available, but only for countries capable to realize an up-to-date reorganization of their entire commercial mobility system. At this point, some agency issues became undefeatable for some of the competitors, blocked by a too strong path dependence.

The constructional features of this process varied over time, beginning in Great Britain. The first goals were to foster the development of the timeliness granted by the steam ships, at the same

[100] Gelina Harlaftis, Stig Tenold, Jesús M. Valdaliso, *Epilogue: A Key Industry or an Invisible Industry?*, in: Gelina Harlaftis, Stig Tenold, Jesús M. Valdaliso eds, *The World's Key Industry. History and Economics of International Shipping*, Palgrave Macmillan, Basingstoke, 2012, pp. 263-272.

[101] As an example, there is a 140-pages long bibliography compiled by the chief bibliographer of the Library of Congress: *A List of Books (with References to Periodicals) on Mercantile Marine Subsidies*, Third Edition, Washington, 1906.

[102] Saif I. Shah Mohammed, Jeffrey G. Williamson, *Freight Rates and Productivity Gains in British Tramp Shipping 1869-1950*, NBER Working Paper n. 9531, February 2003.

[103] Gelina Harlaftis, *A History of Greek-Owned Shipping. The making of an international tramp fleet, 1830 to the present day*, Routledge, London-New York, 1996.

[104] Emil Fitger, *Die wirtschaftliche und technische Entwicklung der Seeschiffahrt von der Mitte des 19. Jahrhunderts bis auf die Gegenwart*, Leipzig, 1902.

time avoiding the possible market uncertainties and the business variabilities. The mail subventions were the instrument for this first phase of simple stabilization of the new opportunities. But, over time, such first intervention was perceived as an alteration of this specific segment of the market, a possible threat that had to be challenged. A quite articulated evolution that, at the end, arrived at an almost complete superimposition of the finest example of maritime architecture with the international image of a nation.[105]

Through a long process of mutual confrontation, with several trials and errors, two strategies emerged: on the one hand the French one, decentralized and aimed at creating opportunities that economic operators were then free to develop and strengthen mostly on their own. On the other, the German one, more concentrated and aimed directly at a strategy of economic expansion in which the State and the shipping companies collaborated closely, both during the planning and the realization phases. Great Britain, after a first period marked by very limited interventions, substantially followed the French model, even if in the 1910s shipowners multiplied their appeals for the adoption of a German-style policy.[106] The other countries followed one or the other model, with mixed success.

The cost of transport has long been identified as one of the key elements of the first wave of globalization, and its relations with other economic dynamics remain yet to be fully explained.[107] What I believe we can say, however, is that the trend in the transportations costs was not exactly as disjoined from the institutional context as it has been assumed.[108]

[105] Mark A. Russell, *Steamship nationalism. Transatlantic passenger liners as symbols of the German Empire*, «The International Journal of Maritime History», v. 28, n. 2, 2016, pp. 313–334.
[106] Chamber of Shipping of the United Kingdom, *Report and Proceedings of the Twenty-Seventh Annual Meeting*, London, 1904-05, pp. 58-60.
[107] Maurice Obstfeld, Kenneth Rogoff, *The six major puzzles in international macroeconomics: is there a common cause?*, In: Ben Bernanke, Kenneth Rogoff eds., *NBER Macroeconomics Annual*, MIT Press NBER macroeconomics annual, Cambridge, 2000, pp. 339-390.
[108] David S. Jacks, Krishna Pendakur, *Global Trade and the Maritime Transport Revolution*, NBER Working Paper No. 14139, June 2008, p. 7.