



Department  
of Management

Course of Corporate Strategy

# "The advantages and potential of the new interconnected system of ports in Western Sicily"

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**The advantages and potential of the new  
interconnected system of ports in Western Sicily**

## **Abstract**

The following research is an analysis of the system of interconnected ports under the management of the newly born Port System Authorities, which arose following the passage in the Italian port system to Regionalization, the last and most recent phase of the development process of a port already analysed by Notteboom. The research focuses in particular on the port system authority that has the sea of Western Sicily under its jurisdiction. In fact, this is taken as a case study to analyse and deepen one of the problems that Notteboom has verified to exist in this phase of the process, namely the prevalence of politicization and local rationality, rather than systemic. In fact, the research studies the current configuration of the Western Sicily system, verifying how this does not have the most efficient possible organization of the ports under its management due to the aforementioned interference. The analysis starts from a quantitative basis consisting of the past performance of the authority's operational efficiency. The results are exploited in the interviews that have been conducted with key figures of this system, as they are directly involved and with a great deal of experience in the field, in order to extract from them estimates on the future performance of the Western Sicily Port System Authority (WSPSA) in two possible scenarios. The first consists of the current configuration of the system, while the second of a more specialized version of ports in certain maritime trades according to their vocation. From the comparison of the estimates of the two scenarios, the greater efficiency that adopting a greater and more suitable specialization of the Western Sicily's ports would lead to. The analysis also highlights the causes of the inefficiencies of the current configuration, as specialization is the best solution only when the port infrastructures connecting the system are present, capable of interconnecting the ports adequately. Therefore, the following research contributes to Notteboom's research on the success that Regionalization can provide by defining the context in which it can be applied and the suitable conditions that must be present.

*Key words:* Regionalization, Port, Politicization, Local rationality, Operational Efficiency

## **Preface**

The master's thesis "The benefits and possibilities of the new interconnected system of ports in Western Sicily" is in front of you. The qualitative interview-based research described in this thesis was conducted in accordance with the Supply Chain Management curriculum of Tilburg University. This thesis project was the final step in my dual degree between LUISS and Tilburg University. It was a wonderful and highly formative experience both academically and in life, allowing me to grow as a person by stepping out of the comfort zone to which I had been accustomed for a lifetime. Indeed, by going to live alone abroad, I have challenged myself by proving to myself what I am capable of by completing this course of study.

Therefore, I would like to thank my parents for supporting me on this path, allowing me to explore, grow, and learn. Just as I would like to thank my grandparents, who have always made me feel at the centre of their lives, and this has always stimulated in me a sense of duty to them, a desire to fulfil their expectations. I hope that with this work, this has been realized.

Finally, I would like to express my gratitude to all the interviewees who contributed their time and effort to this study. This research would not have been possible without their help. They, along with the others already mentioned, made this result possible.

Paolo Di Gaetano

# Table of Contents

<i>Abstract</i> .....	3
<i>Preface</i> .....	4
<i>Chapter 1 – INTRODUCTION</i> .....	8
1.1. <i>Problem Indication</i> .....	8
1.2. <i>Problem Statement</i> .....	10
1.3. <i>Conceptual Model</i> .....	10
1.4. <i>Research Questions</i> .....	11
1.5. <i>Thesis Outline</i> .....	11
<i>Chapter 2 – THEORETICAL FRAMEWORK</i> .....	12
2.1. <i>Overview - Italian Port System</i> .....	12
2.2. <i>Port Competitiveness</i> .....	14
2.3. <i>Port Regionalization</i> .....	17
2.4. <i>Challenges of the Regionalization</i> .....	20
2.5. <i>Problem Statement</i> .....	22
<i>Chapter 3 – METHODOLOGY</i> .....	23
3.1. <i>Research Design</i> .....	23
3.2. <i>Data Collection</i> .....	23
3.3. <i>Interviews and Sampling Strategy</i> .....	24
3.4. <i>Coding Approach</i> .....	25
3.5. <i>Validity &amp; Reliability</i> .....	28
<i>Chapter 4: FINDINGS</i> .....	30
4.1. <i>Extracts from the interviews</i> .....	30
4.2. <i>Computations Pre-Interviews</i> .....	36
4.3. <i>Interviewees' Estimates</i> .....	38
<i>Chapter 5: ANALYSIS</i> .....	42
5.1. <i>Introduction</i> .....	42

5.2.	<i>Trends</i> .....	43
5.2.1.	<i>Current Configuration of WSPSA</i> .....	43
5.2.2.	<i>Specialized Configuration of WSPSA</i> .....	44
5.3.	<i>Most Suitable Solution</i> .....	44
<b>Chapter 6: CONCLUSION</b> .....		<b>47</b>
6.1.	<i>Conclusion and Discussion</i> .....	47
	<i>What does port's operational efficiency consist of?</i> .....	47
	<i>How does the regionalization of ports make the system more efficient?</i> .....	47
	<i>What are the challenges of port regionalization?</i> .....	48
	<i>How do the politicization and local rationality influence the organization of a port system?</i> .....	49
6.2.	<i>Managerial Contributions</i> .....	50
6.3.	<i>Limitations and Future Research</i> .....	51
<b>REFERENCES</b> .....		<b>53</b>
<b>APPENDICES</b> .....		<b>56</b>
	<i>Interview Questions</i> .....	56
	<i>Interview Outlines</i> .....	59
	<i>Opinions of interviewees on Western Sicily's port specialization</i> .....	59
	<i>Scenario 1 - Current Configuration of the WSPSA</i> .....	62
	<i>Scenario 2 - Specialized Configuration of the WSPA</i> .....	65
	<i>Transcript Interviews</i> .....	68
	<i>Coding Schemes</i> .....	69
	<i>Coded Interviews</i> .....	73
<b>THESIS SUMMARY</b> .....		<b>74</b>

## *Table of Figures:*

<i>Figure 1- Map of the Western Sicily's ports .....</i>	<i>8</i>
<i>Figure 2 - Coding Scheme .....</i>	<i>26</i>
<i>Figure 3 - Coding Example: Interview 1 .....</i>	<i>27</i>
<i>Figure 4 - Coding Example: Interview 2 .....</i>	<i>27</i>
<i>Figure 5 - Partial Coding Table .....</i>	<i>28</i>
<i>Figure 6 - Relative distance map between WSPSA and Tunisia.....</i>	<i>45</i>

## *Table of Tables:*

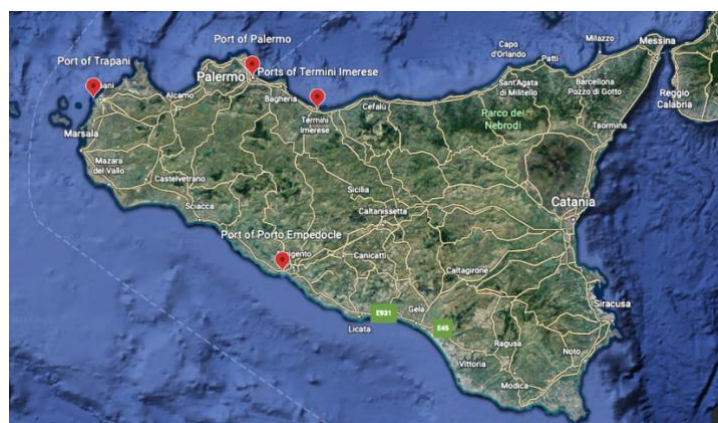
<i>Table 1 - Validity and Reliability in the research (Yin, 2003).....</i>	<i>29</i>
<i>Table 2 - Opinions of interviewees on Western Sicily's port specialization .....</i>	<i>34</i>
<i>Table 3- Annual values and percentage differences between the two periods considered.....</i>	<i>37</i>
<i>Table 4 - Future estimates of interviewees for scenario 1.....</i>	<i>38</i>
<i>Table 5 - Future estimates of interviewees for scenario 2.....</i>	<i>38</i>

# Chapter 1 – INTRODUCTION

## 1.1. Problem Indication

The panorama of port authorities in Italy was strongly revolutionized with the approval of Legislative Decree no. 169 of 4 August 2016 on "*Reorganization, rationalization and simplification of the regulations concerning the Port Authorities referred to in the Law of 28 January 1994*", which aims to relaunch the Italian port system. The main effect that this measure produced was the establishment of the "*Port System Authorities*", which aims to obtain a simplification of the decision-making process regarding matters relating to member ports of the network (e.g., investments, authorizations, collaborations, etc...) and greater efficiency through cooperation between geographically close ports. This reform therefore guarantees a strong centralization of strategic choices and considers the authorities as a single national port system, more than an articulation of autonomous institutions that operate in direct relationship with the national ones (ministries), achieving cooperation, and not competition, that enhances the "*Italy Wharf*". In Sicily, one of the Italian Region, this brought to the creation of three different Port System Authorities: the western one, the eastern one, and the Port System Authority of the (Messina) Strait. In particular, in this research the attention will be focused on the Maritime Port System Authority of Western Sicily, which manages and coordinates the seaports of Palermo, Termini Imerese, Trapani, Porto Empedocle.

Figure 1- Map of the Western Sicily's ports



The Porto Empedocle's port, which theoretically belongs to Western Sicily, will not be taken into consideration as it is not sufficiently relevant in size and role for the research on the



specialization of ports, in the period in which this is carried out, because *"to identify specialization efficiencies, it is [...] important to control for the size of the ports"* (Tovar and Wall, 2017) as *"the effect of specialization is greater for larger port authorities"* (Tovar and Wall, 2017).

The reform that has been approved therefore brings Italian ports into that phase of the development of a port called "regionalization", in which a new role of network coordinator is entrusted to the port authorities (Notteboom and Rodrigue, 2005). As the twenty-first century progressed, port authorities' attention was focused on developing strategic relationships between small and medium-sized seaports in order to face an increasingly fierce and above all international competition (Notteboom and Winkelmanns, 2001). The networked transport environment forces port authorities to network with *"overseas ports, neighbouring ports and/or inland ports"* (Notteboom and Winkelmanns, 2001). Indeed, obtaining a competitive position in the port industry increasingly entails broadening the strategic scope outside the port's geographical bounds. Ports have recognized that competition is conducted outside their physical limits, as demonstrated by their understanding of the importance of ensuring higher quality inland access in order to develop and survive. This is because obtaining strategic cooperation in port networks often involves fine-tuning the rules and making better use of limited resources (Notteboom and Winkelmanns, 2001). Regionalization, as such, therefore, provides a strategic solution to the internal distribution imperatives of the supply chain to increase efficiency, increase logistic integration and reduce distribution costs (Notteboom and Rodrigue, 2005).

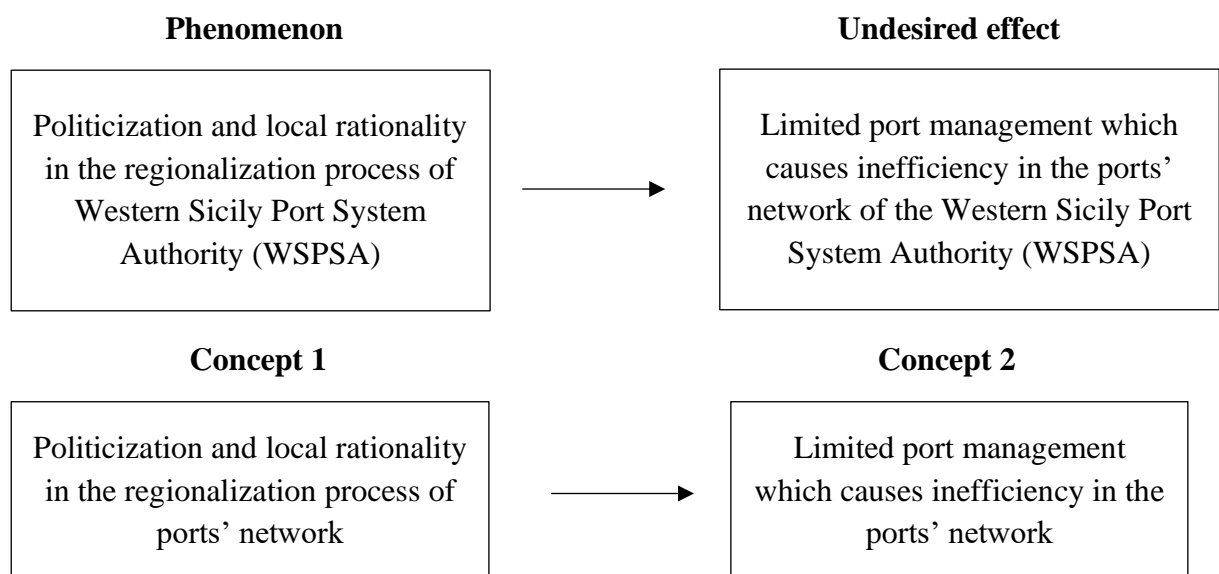
The problem is that during the regionalization phase, the overall system is affected by politicization and local rationality. Indeed, *"the lack of strategic cooperation in areas, where only limited cooperation and coordination could be found in the important fields of site issuing and hinterland connections (i.e., marketing, R&D, and telematics), is determined by the attention of many port authorities on stimulating the local economy (public objective)"* (Notteboom and Winkelmanns, 2001). Consequently, the public sector plays an important role in defining the collateral limits for what market participants can achieve in terms of regionalization. In fact, as can be seen from the data reported in the 2020-2022 Three-Year Operational Plan of the Western Sicily Sea Port System Authority, ports under its control do not have a particular specialization as each of them continue to deal with the various types of port traffic: passengers to / from the smaller Sicilian islands (Egadi); Ro-Ro traffic (cargo ships designed to carry wheeled cargo and railroad cars, that are driven on and off the ship on their

own wheels or using a platform vehicle); Ro-Pax passenger ships (ships equipped with slides that allow cars to get on or off the boat when in port, which also includes the transport of passengers); container handling; cruise traffic; various goods; car accompanying passengers; heavy vehicles embarked unloaded; bulk goods. As reported by various leading operators in the sector interviewed, the current organization of the ports of Western Sicily does not allow to fully exploit the potential of the port network managed by the Port System Authority of Western Sicily, because the latter is subject to an overall framework characterized by a system of infrastructures connecting the ports that is not adequate to guarantee efficient coordination between them, leading the authority to focus on the communities surrounding the ports. This prevents it from correctly applying system logic which instead would make it possible to achieve economies of scale and make the system more efficient by reducing total costs. This research will therefore be aimed at empirically identifying the inefficiencies currently present with this organization, in order to arrive at a solution that is more consistent with the reference system, trying to answer to the problem statement. Meanwhile, the analysis also contributes to Notteboom's research on the success that Regionalization can provide by defining the context in which it can be applied and the suitable conditions that must be present.

### 1.2. *Problem Statement*

How do the politicization and local rationality influence the organization of a port system?

### 1.3. *Conceptual Model*



#### *1.4. Research Questions*

1. What does port's operational efficiency consist of?
2. How does the regionalization of ports make the system more efficient?
3. What are the challenges of port regionalization?
4. How do the politicization and local rationality influence the organization of a port system?

#### *1.5. Thesis Outline*

The structure of this research project is as follows: after determining the business problem and its accompanying research questions in Section 1.4., the attention moves to developing a solid theoretical base. A collection of key concepts, useful for understanding the context in which the thesis is developed, is defined in detail in Section 2.1. This part is beneficial for developing fundamental information about the overall issue of this research and understanding the literature analysis performed in Chapter 2.

After establishing a clear theoretical foundation, Chapter 3 of the thesis describes the methodology. This chapter will go through validity and reliability, scope, case selection, data collecting, interview approach, and data analysis method.

The real case-based data collecting, and visualization occurs in Chapter 4. The data is displayed in this chapter based on the path followed during the interviews made to collect the data: start with the qualitative part, followed by the quantitative. Following that, in Chapter 5, the data is compared to the theoretical data acquired. This enables both research questions and, later, the problem statement to be addressed in Chapter 6.

Chapter 6 will finish the project by evaluating the research's limits and prospective future research alternatives, in addition to offering a combination of scientific and management implications of the collected data and outcomes.

Starting on page 64, you may find further information on the sources that were utilized and the appendices that were included. The purpose of these extra parts is to give the reader with the source of the utilized literature as well as a more in-depth comprehension of the acquired data.

## Chapter 2 – THEORETICAL FRAMEWORK

### 2.1. Overview - Italian Port System

*“Businesses do not compete, Supply Chains compete.”* Several scholars and business practitioners have asserted this slogan for more over a decade: organizations compete on a worldwide scale, and the competitive position achieved in the market is strongly dependent on the supply chain's (SC) ability and quality (De Giovanni, 2021).

The relevance of the reform brought by the Legislative Decree no. 169 of 4 August 2016, is particularly consistent due to the great importance that nowadays the maritime transportation is gaining according to the global trends. Around 90% of goods in the world travel by sea, with maritime transport and logistics accounting for 12% of global GDP. In Italy too, the role of ports is strategic. After the 2016's Decree, the national port system is made up of 58 main ports, dedicated to both freight and passenger transport, gathered under 16 Port System Authorities. The contribution to the national economy of the maritime system as a whole is approximately 3% of GDP (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020). Within this cluster, which includes a set of very diversified activities, ports play a fundamental role, regardless of the economic value directly produced, equal to 8.1 billion euros, 17.5% of the total sea's economy (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020). The port system in the Italian country, indeed, is strategic according to three dimensions. The first is purely economic, relating to the importance not only of the port / maritime cluster but also, and above all, of the production sectors connected to the port network and the link between the efficiency of the port sector and the competitiveness of the national production sector. The second is geo-economic, linked to the role of Italy in the international scenario and in the context of the new balances dictated by the change in strategic trade routes. The third relates to the central role of ports as essential nodes of an integrated and intermodal logistics system (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020). The economic dimension is closely linked to the role of Italy in sectors dependent on the transport of goods and people. The geo-economic dimension is linked to the possibility that the geo-political and commercial dynamics of the last decade find confirmation even in the post-Covid era. Covid 19 has caused significant disruption of entire cross-border value chains while also impacting demand: this occurred without changing the pre-existing performance paradigms focused on new indicators such as business sustainability, emphasizing the capabilities of companies across all industries (Trabucco & de

Giovanni, 2021). In this hypothesis, Italy will be asked to rethink its role in the international scenario from two perspectives: one Mediterranean, the other Eurasian. The Mediterranean perspective turns out to be particularly intriguing as it is useful in a future perspective of regionalization and shortening of value chains (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020). Finally, the role of ports as nodes of the logistic network is the third strategic element of Italian port system. An efficient and correctly integrated port network in the transport chain is strategic because (i) it stimulates and optimizes investments in logistics and is a driving force for greater inter-modality, (ii) it can be a tool to contribute to the fight against pollution and change climate and vehicle for the implementation of green interventions (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020).

Ports and airports are the nodes of a long and articulated logistic network, whose efficiency is strongly correlated to the ability to intervene organically along the entire supply chain, ensuring resources and integrated planning. Otherwise, the resources used would not be effective in increasing the inter-modal capacity of the logistics network (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020). To allow the Italian port system to express itself at its best, however, it is necessary to address the critical issues that limit its potential.

The widespread perception among international operators is that the Italian one is an unreliable system (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020). This perception translates into the fact that, in many cases, the large shipping companies prefer, for the handling of cargoes between Europe and the Far East, the ports of Northern Europe rather than, for example, those of the North Tyrrhenian Sea, thus renouncing a significant savings in terms of navigation times. This apparently illogical choice is based on times and costs of ground services and connections with the centres of production / consumption. In these circumstances traders tend to favour greater predictability which allows for better and more effective logistics planning (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020). A further element of evaluation by the large shipping companies is the possibility of leveraging economies of scale capable of reducing the average cost per unit transported. Also in this area, a competitive advantage emerges for the ports of Northern Europe which, due to both physical specificities (such as the depth of the seabed) and of an economic nature (attributable to the size of the reference markets), allow shipping companies to concentrate high volumes of cargo to / from those destinations, with a lower cost per unit transported (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020). It is therefore necessary to strengthen port networks in Italy with investments that go in the direction of developing some strategic axes, capable of undoing the

knots that still bind a full development of the sector (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020). However, any investment in the port network or in road or railway service infrastructures, which is not part of a "*community*" approach, may prove to be wholly or partially ineffective (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020).

## 2.2. *Port Competitiveness*

The efficiency of a port system depends on the ability to act in a coordinated way, to enhance specializations and to ensure a high level of interconnection. In an integrated sector such as transport, in fact, the entire chain moves at the speed of its weakest link: congested interconnection networks and bottlenecks do not allow the offer of a reliable and efficient transport service (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020). Therefore, performance analysis in the area of port efficiency is critical.

From the perspective of ports as dynamic business networks, the issue of efficiency must be examined (Van der Lugt et al., 2007), as the overall value proposition is highly dependent on the ability of the entire port community to create resources, skills and capabilities in a "coopetitive" approach (Nalebuff et al., 1996). Indeed, the efficiency is related to the notion of port competitiveness, a multidimensional concept based on the ability of port authorities and commercial entities to undertake value-added operations within an interconnected business system whose success intimately depends on how much the whole system is competitive (Parola, Risitano, Ferretti, Panetti, 2017).

The multidimensional aspect of port competitiveness stems not only from the variety of elements that impact it, but also from the disparities in views among port users (Brooks, Schellinck, & Pallis, 2011). As a result, users place a distinct emphasis on port competitiveness drivers. Consequently, while port operators should prioritize the satisfaction of network business actors, Port Authorities should take on the role of community managers, capable of strengthening inter-organizational interactions within the ecosystem and, eventually, increasing port competitiveness (Verhoeven, 2010). The results of the recent studies of Parola, Risitano, Ferretti and Panetti, on the factors that influence the multidimensionality of ports' competitiveness led to the identification of the ten main drivers, "*in the decreasing order of relevance: port costs, hinterland proximity, hinterland connectivity, port geographical location, port infrastructures, operational efficiency, port service quality, maritime connectivity, nautical accessibility and port site*":

- Port costs: it consists of the cost that the port customer pays for the services received. The costs are divided into direct, such as port taxes and the cost related to storage and the loading / unloading activity, and indirect ones related to the period of port stops (Parola, Risitano, Ferretti, Panetti, 2017). As well as in many other industries, also in maritime one is in force the economic principle that, on equal terms, a lower cost is related to a greater competitiveness. Costs in ports are made up of tariffs collected by the Port Authority and port compensation levied to the terminal.
- Hinterland proximity: item that refers to the geographical distance between the port and the main hinterland markets served by a port itself (Parola, Risitano, Ferretti, Panetti, 2017).
- Hinterland connectivity: The effectiveness of inland transportation networks (e.g., rail and road transport) is referred to as hinterland connectivity (Parola, Risitano, Ferretti, Panetti, 2017).
- Port geographical location: geographical location is a broad term that relates to the port's geographical placement in relation “*to shipping networks, inland market regions, inland transport infrastructures, logistical centres, consuming markets, metropolitan areas, and so on*” (Parola, Risitano, Ferretti, Panetti, 2017).
- Port infrastructures: this is a factor that is assessed depend on the amount and provision of appropriate infrastructures, as well as their suitability in terms of customer demands and environmental considerations (Parola, Risitano, Ferretti, Panetti, 2017).
- Operational efficiency: A port's ability to efficiently use all of its resources in order to produce excellent “*operational performance (e.g., ship turnaround time, ship waiting periods due to congestion, cargo handling productivity, and so on)*” (Parola, Risitano, Ferretti, Panetti, 2017).
- Port service quality: This relates to the quality of (all) port facilities as well as the ability to differentiate the services provided from rivals (Parola, Risitano, Ferretti, Panetti, 2017).
- Maritime connectivity: it refers to the “*efficiency of marine transport networks (for example, the number and diversity of served destinations, logistical costs, and so on)*” (Parola, Risitano, Ferretti, Panetti, 2017).
- Nautical accessibility: This refers to a port's ability to accept big boats at any time, regardless of tide or weather conditions. It is influenced by natural elements (e.g., inland river depth, tide range, etc.) as well as the availability of physical infrastructure (e.g., locks, breakwaters, etc) (Parola, Risitano, Ferretti, Panetti, 2017).

- Port site: A factor that relates to the size of the overall port area, the quality of terminal design and common areas, and the port's suitability in relation to the demands of port users (Parola, Risitano, Ferretti, Panetti, 2017).

The drivers “port costs”, “hinterland proximity” and “hinterland connectivity” indicate that inland distance and accessibility to large shippers, as well as the availability of effective inland transportation networks, are the most important factors in improving gateway port competitiveness.

The drivers “port geographical location” and “maritime connectivity” indicate that a strategic position is regarded to considerably boost a port's attractiveness and, as a result, competitiveness for those cargo routing decision-makers (e.g., ocean carriers, freight forwarders) who are entirely in control of products between production plants and ports.

The drivers “port infrastructures” and “nautical accessibility indicate is often assumed that they are intimately tied one to the other (e.g., berth length, water depth, yard spaces, etc.). Several shipping companies ‘investments in mega-vessels, which confront unprecedented operating challenges, were undertaken to accommodate trade development and promote economies of scale in an intensely competitive context. These new standards have become a must-have for ports seeking to maintain their competitiveness.

The driver “operational efficiency” show that carriers consider port turnaround time to be "*unproductive*" for vessels. So, container handling speed and dependability are crucial to safeguarding shipping service timetables and, ultimately, maintaining the port competitiveness (Parola & Musso, 2007). Among the drivers that can affect the port's competitiveness, this driver will be the one highlighted since it is more closely related to the subject of the study because it considers the port's perspective rather than the users', allowing for comparison across time. Drawing the literature review, appropriate efficiency indicators were chosen, capable of summarizing the change in efficiency that a port system undergoes according to the changes made. In fact, if the operational efficiency is broken down to identify the factors underlying its value, these turn out to be total volume of freight transport, total volume of passenger transport, average unit cost of freight transport, average unit cost of transport passengers. The volume of traffic, whether they are passengers or freight, varies within a port system if its competitiveness and therefore its attractiveness vary. At the same time, a change in the average unit cost of both freight and passengers is also synonymous with a change in competitiveness and therefore attractiveness within a port system. In the case that we intend to analyse, then, the increase in the specialization of the ports of the system would make it possible to achieve economies of scale (greater volumes and lower costs) thanks to



*“the division of labour and management of resources, the use of specialist skills, learning by doing and product-specific scale economies, and the use of equipment and infrastructure specifically designed to be adapted to the needs involved in each type of port traffic”* (Tovar and Wall, 2017).

So, the related research question is going to be:

*What does port's operational efficiency consist of?*

### 2.3. *Port Regionalization*

However, these traditional drivers of port competitiveness are continuously affected by cutting-edge industry trends which have the potential to have a substantial indirect influence on port competitiveness. Recently some of the most influencing changes, which have been necessarily affecting the role of Port Authorities, have been *“economies of scale in shipping, governance changes, competition among ports in proximity”* (Parola, Risitano, Ferretti, Panetti, 2017).

The ship–port interaction is heavily influenced by economies of scale shipping in terms of port competitiveness since operational bottlenecks and port inefficiencies are unavoidable as a result of inadequate investment of infra- and supra-structures. The presence of inland facilities and efficient linkages (*“hinterland connectivity”*) matched to the increasing capacity of vessels is a significant element that may influence competitive dynamics among ports, assuring a greater degree of competitiveness. Those Port Authorities capable of establishing successful public–private partnerships and adopting long-term hinterland policies for constructing and managing such assets would likely acquire a competitive edge and market positioning in this respect (Verhoeven, 2010).

The second main cutting-edge trend concern the in-depth transformation of the governance of ports which involved every economy, both the advanced and the developing one, in the last twenty-thirty years (World Bank, 2007). It consists of the shift from the “public” model to the “landlord” one, where the public port authority delegates port operations to private companies as he continues to keep to himself the role of regulatory body and landlord’s one. Consequently, this has given in many countries the opportunity to adopt managerial behaviours in the reformed Port Authorities, achieving all the related advantages (Brooks & Cullinane, 2006; Debie, Lavaud-Letilleul, & Parola, 2013). Indeed, the introduction of agile and effective board of directors in the Port Authorities allows to keep up with the demand for speed of response from private companies thanks to a more streamlined decision-making process (Van

der Lugt et al., 2013). To this must be added, a greater coordination also vertically with the other public bodies of reference, such as the municipality and the ministry, which further strengthens the competitiveness of the port, as the decision-making authority also extends outside the port. This allows a better and more active management of the entire supply chain thanks to investments, which also involve the hinterland, aimed at better integrating the different transport nodes in order to increase inter-modality and therefore also efficiency, *“exploiting “time windows” opportunities”* (Jacobs & Notteboom, 2011; Parola & Maugeri, 2013). Thanks to this innovative governance setting, Port Authorities are able to broaden their range of action, including functions, objectives, and activities that are new to a public body like it. Among these can be cited as an example such as marketing and communication, ICT development and customer relationship management (CSR) (Parola, Satta, Penco, & Profumo, 2013).

The third trend is right the new governance approach which gives the possibility to better and more effectively manage emergent phenomenon of the growing interdependencies among ports geographically close to each other. The increased rate of interdependency originated *“a mixed combination of competitive and cooperative strategies, known as “coopetition””* (Heaver, Meersman, & Van De Voorde, 2001; Song, 2003). This recent trend leads to the addition of a new phase within the port development process, characterized by the collaboration between geographically connected ports in order to create new resources and capabilities, called *“port regionalization”* (Notteboom & Rodrigue, 2005). This enhanced port activity, as opposed to the normal one that only the landlord port authority benefit from, encompasses the whole port network achieving mutual goals (Notteboom and Winkelmanns, 2001). The advantages that push the Port Authorities to adopt this new collaborative approach are such that this transformation was inevitable. Indeed, cooperation with geographically close ports increases the competitiveness of the entire port network as it is able to *“moderate (unfair) competition among neighbouring ports and deal with the intensification of international competition”* (Notteboom et al., 2009; Wang, Ng, Lam, & Fu, 2012). This is due to the possibility of more effectively exploiting the spaces and infrastructures within the various ports, allocating them to a use in keeping with the technical and structural characteristics of each one, thus realizing the principle of specialization that leads the entire system to be more efficient. Furthermore, the cohesion between several ports also results in financial cohesion thanks to joint investments and activities, which increase the bargaining power both with external forces and vertically with higher authority bodies. In fact, the increased strategic importance obtained with the cooperation and integration among ports, that can lead to the creation of a shared *“brand name”*

or "lobby", allows port networks to be more attractive in the eyes of both public and private investors, consequently raising more State funds to further reinvest for the competitiveness of ports (Caballini et al., 2009).

Therefore, networking of ports between neighbouring ports can prevent port authorities from wasting precious resources in port rivalry by segmenting markets and coordinating services (Notteboom and Winkelmanns, 2001). This is very important for the success of a port because the ability of a port to fit into the economic system that revolves around the network of ports, and all the economic agents that have to do with it within the same supply chain, will determine its success. In other words, the port community must fully benefit from synergies with other transport nodes and other participants in the networks to which they belong (Notteboom and Rodrigue, 2005). This promotes the establishment of larger regional load centre networks that serve significant logistical hubs. The "*regional load centre networks*" are the main result of the port regionalization phase. This phase, in which the extension related to the incorporation of inland freight distribution centres and role of terminals as active nodes that model load centre development is considered, is characterized by strong functional interdependency and even joint development of a specific load centre and (selected) multimodal logistics platforms in its hinterland (Notteboom and Rodrigue, 2005). This ultimately leads to the formation of a "regional load centre network" (Notteboom and Rodrigue, 2005). The concept of a "*logistics pole*" is the logistical equivalent of the concept "regional load centre network", being that the latter is defined out of a cargo-flow perspective. A logistics pole can only perform well if an efficient regional load centre network is in place to guarantee the cargo linkages in and between logistics zones (Notteboom and Rodrigue, 2005). The availability of powerful information channels and systems, as well as the capacity to transmit knowledge across enterprises, are two of the most important factors influencing the performance of logistics poles and related regional load centre networks (Notteboom and Rodrigue, 2005).

So, the interests of port authorities are more concerned with overall efficiency and trade growth rather than pursuing the interests of a single category of linked economic agents, working together with the various stakeholders such as carriers, shippers, transport operators, labour, and government bodies. Indeed, even though its direct influence on cargo movements is minimal, the port authority can operate as a catalyst, playing a significant role in shaping regional load centre networks and logistics poles during the regionalization phase. Therefore, port authorities should encourage an effective intermodal system in order to safeguard goods in high-competition environments, creating strategic connections with other transportation networks aiming to cooperate on traffic management, site issuing, hinterland connections and

services, environmental protection, marketing, and research and development (R&D) (Notteboom and Rodrigue, 2005). This is possible because port regionalization allows for greater specialization of ports in the system, consequently achieving economies of scale (higher volumes at lower costs) through division of labour and resource management, use of specialized skills, learning by doing, and product-specific economies of scale, as well as the use of equipment and infrastructure specifically designed to meet the needs associated with each type of port traffic (Tovar and Wall, 2017).

So, it is necessary to conceive of logistics infrastructure as a unicum of nodes and networks, properly interconnected and sized, which allow cargo handling to be as smooth and free of bottlenecks as possible (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020). The optimization of logistics processes is therefore accomplished by exploiting connection between various actors. This approach seeks to fulfil consumer requirements while avoiding monetary costs and externalities such as climate change, air pollution, noise, vibration, congestion, and accidents (Sista, De Giovanni, 2021). In this environment, the possibility created by the use of aspects of the circular economy to improve the transformation process in network of ports, such as extending the life cycle of products thus helping to minimize waste. is now becoming significant in the literature (Maranesi & De Giovanni, 2020). From this point of view, the principle of making port-related infrastructure policy choices in a national and supranational logic is the trend that has been emerging in this sector in recent decades, and finally also in Italy with Legislative Decree no. 169 of Aug. 4, 2016, and the subsequent introduction of Port System Authorities. The application of regionalization in the Italian port system, although it allows to definitively overcome "the vision of ports as local assets" (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020), is nevertheless a new phenomenon that needs to be studied in order to verify its effectiveness as practical reality can differ and counter the related theory. Indeed, the research question about this aspect is:

*How does the regionalization of ports make the system more efficient?*

#### *2.4. Challenges of the Regionalization*

Despite the numerous advantages, the regionalization phase also faces criticalities that compromise its effectiveness. According to Notteboom and Rodrigue (2005), these are: *slow start, identification of port-related activities, the distribution of costs and benefits, free riders, over-optimism, politicization of and local rationality in the regionalization process*. We are

going to focus only on the last two issues, because of they are the one more related to the case it is analysed in the paper. First of all, Port Authorities can be subjected to excessive optimism on the potential of the system as it is not certain that the use of this approach is adaptable to any context. It may happen that, due to inadequate management of the port network, it is not possible to achieve cooperation between the members, and this leads to an overlap of skills that puts them in competition with each other (Notteboom and Rodrigue, 2005). Secondly, regionalization is a market-driven process in theory, but for the most part, ports still rely on governments to make the required expenditures in basic infrastructure, which should enable decent accessibility by land or water. As a result, the public sector plays an important role in setting the side limitations for what market participants may achieve in terms of regionalization. As a result, port regionalization is frequently revealed to be a process largely affected by political obligations rather than the 'invisible hand' of an efficient economy. Local rationale of port administrations and governments is also an important element. Any regionalization strategy developed by a port authority or local government has the interest in improving the port's competitive position; however, this does not always imply that the final configuration of the related load centre network provides the best solution for serving the larger hinterland regions as a whole (Notteboom and Rodrigue, 2005).

With particular regard to Italy, the model outlined by the 2016 reorganization decree presents, at first reading, *“some critical issues that can be traced back, in addition to the feared duplication of decision-making centres and the uncertainty about the type of relationship between the Territorial Offices and the Port System, to the questionable identification of the Port System Authorities as maritime clusters rather than the result of a subdivision linked to administrative needs”* (Bigazzi, 2017). The issue under consideration has also left unchanged the Landlord Port Authority model, the financial autonomy of the Port System Authorities and the organization and regulation of economic activities carried out in the port (Bigazzi, 2017). In light of the reform, the Italian port system does not seem in line with the most recent regulatory interventions that are affecting other European realities based, instead, on the attribution to the so-called Third generation Port Authorities with a greater degree of autonomy and characterized by corporatization and privatization processes (Bigazzi, 2017), as they are affected by the politicization phenomenon.

As a result, the relevant research question will be:

*What are the challenges of port regionalization?*

## 2.5. *Problem Statement*

On the basis of what has been previously studied on the problem of politicization and local rationality in the context of regionalization, and therefore in the organization that takes place between the interconnected ports of the same system, there are academic gaps. In particular, what is missing is a study on the contexts and conditions that allow the correct application of Regionalization in order to benefits of its proven advantages. The present study, in fact, aims to investigate the limits with which a system of interconnected ports must confront, which are caused by the aforementioned problems of politicization and by the prevalence of local rationality over systemic one. This makes it possible to highlight the ideal conditions for the application of regionalization, showing that it cannot always be counted on.

This is observable in the case study taken into consideration by the Western Sicily Port System Authority, where it can be observed through the data of the three-year Operational Plan 2020-2022 the ports of the system are still "multi-purpose", meaning that they have a low level of specialization that does not allow the system to achieve full efficiency. Finally, the problem statement is:

*How do the politicization and local rationality influence the organization of a port system?*

## Chapter 3 – METHODOLOGY

### 3.1. *Research Design*

Since in-context research deals with the detailed examination of a particular case within a natural environment, it will be a case study. Moreover, the research is a longitudinal one as it analyses long term developments, considering past, present and possible future different scenarios. As regards the choice of research, the data collection methods are multi-method, that is, using both qualitative and quantitative methods. The modalities envisaged the consultation of the relevant literature and company archival data as regards the quantitative part. While the qualitative aspect took place through interviews with the people selected as the ideal sample for their knowledge and correlation with the topic.

Among the possible drivers that we saw in the previous chapter describing the competitiveness of a port, within this research we focus on the "Operational Efficiency" driver because it is the one most linked to the object of a research as it takes into account the point of view of the port itself rather than that of the users, allowing for a comparison over time. To do this, the main sub-KPIs to be referred to as operational efficiency drivers were taken into consideration:

- total volume of freight transport
- total volume of passenger transport
- average unit cost of freight transport
- average unit cost of passenger transport

These are the main components of the macro items of operating revenues and costs, which in turn are the elements necessary to calculate the added value that derives from the operation of the port. The analysis concerns their evolutionary trend between the performance before the reform that led to the transition to integrated and network management, and the one following the implementation of this new approach.

### 3.2. *Data Collection*

The quantitative data are secondary data being collected using the three-year Operational Plan 2020-2022 of the Western Sicily Port System Authority<sup>1</sup> (WSPSA), which takes into consideration the aggregate financial performance of the ports of Palermo and Termini Imerese before the reform, in 2016. The aggregate financial performance of all ports subject to the

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<sup>1</sup> [https://adsppalermo.portaletrasparenza.net/download/o\\_1fuqu4dna1a9u122j3td9tj1ohcg.pdf](https://adsppalermo.portaletrasparenza.net/download/o_1fuqu4dna1a9u122j3td9tj1ohcg.pdf)

jurisdiction of the WSPSA of after the reform, which adds to the ports already also mentioned those of Trapani and Porto Empedocle, is taken by the Final balance sheet aggregate data 2020<sup>2</sup>. As for the data relating to the volumes of commercial exchanges, both of goods and passengers, the source used is the site of the association of Italian port authorities "Assoporti", where it is possible to collect the statistics of recent years specifically for Western Sicily<sup>3</sup>.

Since the data are extremely variable and uncertain due to their nature, once it has been obtained the necessary quantitative data on the trend over time of the variables considered, estimates are collected from the interviewees on the future percentage variations of the KPIs compared to the current situation. The current situation consists in a currently incomplete specialization of ports for the reasons mentioned in the second chapter such as the influence of the social, economic, and political aspects specific of each port on the organization of the port network itself. On the other hand, in the alternative future scenario, whose future trend estimates are asked again of the KPIs considered in the research, effective specialization of the gates is implemented in the most congenial way for each of them. Once this type of data has been obtained, through a comparison between the two different scenarios of real and ideal evolution, the presence of hidden potential in the network of ports in Western Sicily will be demonstrated.

### 3.3. *Interviews and Sampling Strategy*

The interviews are semi-structured, in which some predetermined questions about a set of themes are asked but varies the order in which the themes are covered, and questions asked. In fact, the structure of the interviews turns out to be divided into two predefined parts. The first is the qualitative one that serves to extract from the interviewees their knowledge and opinion on the past and present situation of the Italian port system. This allows us to have insights from individuals who have lived and still belong to this sector, of which they therefore know its strengths and weaknesses. The second part of the interview is the quantitative part, which is based on data on past changes in the KPIs listed above over the past five years. These are exploited to summarize numerically the performance of the Western Sicily port system, so as to provide the interviewees with a baseline for their estimates of the future performance of the four KPIs under the two different scenarios. Furthermore, the interviews have been conducted "one-to-one", to get the opinion of every individual interviewee.

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<sup>2</sup> <https://adsppalermo.portaletrasparenza.net/download/p1f4s1sro4amu115b10dd10oc14dp3.pdf>

<sup>3</sup> <https://www.assoporti.it/en/autoritasistemaportuale/statistiche/statistiche-annuali-complesive/>



Being research on a process, the criterion used in choosing the sample of interviewees focuses on their quality, that is, on their deep level of knowledge on the subject. In fact, in this type of research the aim is to obtain an in-depth knowledge on the subject, while taking in consideration the point of view of several individuals, and then being able to generalize. Therefore, in selecting the sample of respondents, a non-probabilistic sampling strategy has been adopted, meaning that respondents are carefully chosen to get the best and right information. Consequently, the sampling strategy is purposive and, in particular, is carried out according to a critical case sampling criterion, that is, the selection of the most important cases that are most likely to provide the information being sought. Indeed, these primary qualitative data are collected interviewing:

- Actual President of Maritime Port System Authority of Western Sicily  
→ P-MPSAWS
- Former General Secretary of Maritime Port System Authority of Western Sicily  
→ GS-MPSAWS
- CEO of a port company operating in Termini Imerese's port  
→ TIPO
- CEO of one of the main port operators in Trapani's port  
→ TPO





The choice to interview the President of the WSPSA allows for investigating the vision that is currently present within the authority on both current performance and future trends. This interview turns out to be key in terms of comparison. In fact, by interviewing the former secretary general of the Port Authority who would help to investigate the situation prior to the change of approach in port management by Legislative Decree no. 169 of 4 August 2016 onwards, comparisons can be made with what was reported by the President itself. Furthermore, the figure of the President of WSPSA can also be used for a comparison between the Authority, a public body, and the port operators of the two ports of Trapani and Termini Imerese, as private subjects, in order to capture any differences and different visions on the subject.

### *3.4. Coding Approach*

This section will describe how the interview data were classified and coded before they were ready to be displayed and analysed. The first step was to define the various categories and subcategories. The categories chosen are based on the basic concepts of this research presented

in Chapter 2. Each top-level category (Specialization, Politicization and Local Rationality, Western Sicily Port System Authority) has a colour code. The associated subcategories are all represented by the same hue and can be further recognized by their distinct text codes. Figure 2 provides an overview of the (sub)categories, colour codes, text codes, and clarifying definitions.

Figure 2 - Coding Scheme

Category	Code	Colour Code	Definition
1. Specialization	SP		all data concerning the topic of specialization in ports
1.1. Trapani	SP-TP		all data concerning the topic of specialization in the port of Trapani
1.2. Palermo	SP-P		all data concerning the topic of specialization in the port of Palermo
1.3. Termini Imerese	SP-TI		all data concerning the topic of specialization in the port of Termini Imerese
2. Politicization & Local Rationality	PLR		all data concerning the topic of politicization and local rationality
3. Western Sicily Port System Authority	WSPSA		all data concerning the topic of the organization of the Western Sicily Port System Authority
3.1. Past	WSPSA-P		all data concerning the topic of the past organization of the WSPSA
3.2. Present	WSPSA-PS		all data concerning the topic of the actual organization of the WSPSA
3.3. Future	WSPSA-F		all data concerning the topic of the future organization of the WSPSA
4. Estimates	ESM		all data concerning the estimates for the future performances of the WSPSA in both scenario 1-2

The actual coding of the data was the second step in the procedure. Each interview has been meticulously examined for pertinent information. Every essential piece of information has been

allocated a colour and textual code. The figures below show two instances of coded interview segments.

Figure 3 - Coding Example: Interview 1

<p>interno poi ha un consiglio di amministrazione che ha fatto dai 20 presidenti dei diversi porti. Purtroppo, la nostra Italia vive di campanili che fa sì che si litighi tra chi deve essere porto/nodo tra Catania e Augusta, così come il fatto che in Sicilia ci sono tre autorità, così come in Puglia ce ne sono due. Allora aveva senso forse farne solo sei/otto sotto la guida di un'unica autorità centrale che riuscisse a fare un po' di sana gestione, diciamo così, più specialistica delle nostre infrastrutture portuali. Ora questo non significa che siamo come i porti del Nord Europa. Noi abbiamo una caratteristica diversa, la nostra portualità è diffusa lungo la costa. Quindi è chiaro che non riesce a mantenere infrastruttura economicamente e finanziariamente se gli dai una sola specializzazione. Civitavecchia oggi con le sole crociere morirebbe. Non avrebbe la portata finanziaria per gestire questo. Ha bisogno di movimentare merci, di specializzarsi nell'automotive, nel Ro-Ro, nelle autostrade del mare, cosa che ha fatto. Però ci vorrebbe una regia maggiore al centro per consentire comunque duplicazioni in funzioni che non dovrebbero essere svolte dal due porti limitrofi, due sistemi di limitrofi, perché non fanno altro che consentire dumping sulle tariffe; quindi, un abbattimento sulle tariffe e quindi un guadagno per il mercato con tariffe che diventano sottocosto e che in alcuni casi non pagano neanche il costo della gomma.</p>	<p>Paolo Di Gaetano PLR</p> <p>Paolo Di Gaetano SP</p> <p>Paolo Di Gaetano WSPSA-F</p>
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Figure 4 - Coding Example: Interview 2

<p>Speaker 2</p> <p>Lei ha messo il dito su un tema molto importante, quello della specializzazione dei porti, che forse spesso non è ben gradito dalla portualità e dalle istituzioni locali. Questo perché chiaramente ciascuna realtà e ciascun porto vorrebbe fare di tutto e vorrebbe fare quello che gli interessa. Quindi questa specializzazione è venuta, in parte, adempiuta solo perché l'autorità di sistema portuale in un'ottica punto di sinergia, di rapporto corretto con quelle che sono le necessità di ciascuna realtà, ha potuto cominciare a ragionare nel senso di specializzare i porti. Chiaramente se Palermo ha determinati problemi di traffico eccessivo nel settore delle merci varie alle rinfuse, che mal si adattano e mal si compendiano con quelli che sono i traffici passeggeri ha creato le condizioni per portare questo traffico di merci varie in un altro porto limitrofo. Oppure di pensare ad un traffico crocieristico anche in altri porti che potevano dare delle risposte positive in particolare per le condizioni del territorio, che potevano garantire nuovi percorsi, nuovi itinerari ai passeggeri.</p> <p>Perché proprio in relazione a quello che ho detto al punto precedente, è chiaro che se Palermo ha cominciato a spogliarsi dei traffici di merci varie alla rinfusa a favore di Termini Imerese o dei contenitori, perché è previsto proprio che i servizi terminalistici, dei contenitori, vengono passati ad altri porti sempre dell'autorità di sistema portuale, è chiaro che questo aumento di traffico merci deve essere guardato come un dato positivo. Purtroppo, in questo periodo temporale sono avvenute delle cose tremende l'ultima delle quali, quella della grave crisi bellica che ha coinvolto la Russia con l'Ucraina. Quindi con tutti i problemi correlati: aumenti dei costi dei noli, aumenti dei costi di determinate derrate alimentari provenienti dall'Ucraina, e quant'altro. Io sarei molto prudente e direi che, in questo momento fare stime particolarmente complesse, per quanto riguarda il comparto merci dei porti dell'autorità di sistema portuale penserei a una costanza, non mi sentirei di dire e parlare di aumento, ma di andamento costante, sicuramente sì.</p> <p>Guardi invece, per quanto riguarda i passeggeri e in particolare il traffico crocieristico, io vedrei un incremento, un aumento. Ora, se devo lasciarmi andare a percentuali, parlerei per l'autorità di sistema portuale di un 15/20%. Questo perché, con l'omogeneizzazione e il miglioramento dei servizi, con tariffe più chiare e con quello che sta avvenendo, per esempio nel porto di Palermo, ovvero la grossa concessione già rilasciata a Costa ed MSC, che quindi potranno</p>	<p>Paolo Di Gaetano PLR</p> <p>Paolo Di Gaetano SP-P</p> <p>Paolo Di Gaetano WSPSA-F ESM</p> <p>Paolo Di Gaetano ESM</p>
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The final stage in the coding technique was to enter the coded data into a table. This table can be found in the paper's appendix section. The coded information is arranged by interview and category in that table and is briefly summarizing the concepts said by the interviewee. Figure 5 depicts a portion of the table's setup to give you an idea of how it looks.

Figure 5 - Partial Coding Table

	SP			PLR	WSPSA			ESM
	SP-TP	SP-P	SP-TI		WSPSA-P	WSPSA-PS	WSPSA-F	
Interview 1: P-MPSAWS	Trapani should rely on the one hand on the traffic of containers, on the other hand on the ro-ro traffic to North Africa, therefore, above all to extra Schengen. But to do this, an alternative communication route is needed that allows him not to have to go through the city.	Palermo has its own reference market in cruise passengers, but it also has its own reference market for goods	Given the greater receptivity of Termini Imerese, as it is better connected to the motorway arteries, the WSPSA has recently been moving container traffic here	There is an excessive number of port system authorities, because it was necessary to satisfy the wishes of local authorities that did not allow more efficient forms: less authority, greater specialization	The competence between neighboring ports was present in the past and led them to adopt an offer policy: no specialization	There is an excessive number of port system authorities, because it was necessary to satisfy the wishes of local authorities that did not allow more efficient forms: less authority, greater specialization	To improve the system, it is necessary to adopt a greater direction at the center to still allow duplication in functions that should not be carried out by the two neighboring ports	So we expect that even those growth rates we have achieved in recent years may remain so, even be increased when that industry is up and running.
	There was no cruise terminal, there was no distinction between traffic, let's say, of national cabotage (the famous ferries to the islands), hydrofoils on one side and cruise traffic on the other	Passengers will go to Palermo as the capital city of the Region, therefore more famous and rich in monuments and museums to visit.	A type of specialization exists in the ports of Western Sicily, but only between Palermo and Termini Imerese as they are geographically close and well connected.	The problem is that the power of the Port System Authorities is limited to the maritime state property	By dealing with all types of maritime traffic, they led to an overall offer greater than demand: a waste of resources	The lack of complete specialization in Italian ports is also due to the characteristics of Italy itself: lack of adequate connection infrastructures, widespread ports along the coast, respect for the orography of the cities in which the ports are inserted in order not to compromise tourism	Italy must aim to know how to manage the added value. It is not quantity that makes wealth, it is quality, service to goods, logistics, intermodality, the capacity for interconnection, the capacity for dialogue between the different modes of transport. This makes a port system great.	I think the growth rates will remain constant. Because the war in Russia involved us little compared to Tuscany compared to Liguria, compared to Sardinia, because basically they didn't invest a lot of money in Sicily here.
	Trapani, being isolated, will do both	A type of specialization exists in	Port boating will do it in Termini Imerese.	The entire logistic chain needs to be		The functions in the ports are currently	The entire logistic chain needs to be	Making projections today is certainly

### 3.5. Validity & Reliability

In order to improve the reliability of the results, the relevant literature was first examined before starting the search in order to become familiar with the networked organization of ports. Subsequently, to proceed with the more in-depth analysis and collect more data, interviews were carried out with the most relevant figures. The results obtained from an interview are always characterized by threats to reliability, especially since interviews can be characterized by bias and errors on the part of the interviewer and on the part of the interviewees. For this reason, in the process of selecting the samples to be interviewed, an attempt was made to balance the different points of view, selecting the most representative figure. In fact, selecting an exponent of the management of the Port Authority prior to the reform and a current one, such as the president, made it possible to compare two different views on the role of the Authority. Just as a comparison is had between exponents of the public side and exponents of the private one, such as the operators of Trapani and Termini Imerese.

Finally, the latter also contribute to increasing the reliability of the research as regards collecting different opinions on the system and on what could be the most correct management and the most suitable specialization, thus adopting the points of view of two port operators

operating in different ports (still in the same network). This triangulations of multiple informants have given reliability to the research. Because a research design is designed to reflect a coherent set of claims, certain logical tests may be used to assess the quality of any given design. However, four tests are typically employed to determine the quality of any empirical social research. Because case studies, such as this one, are a type of research, the four tests are also applicable to case studies. There are four types of validity: “construct validity, internal validity, external validity, and reliability” (Yin, 2003). This is more clearly visible thanks to the table below.

Table 1 - Validity and Reliability in the research (Yin, 2003)

Type of validity	Methods used to address it
<p><i>Construct validity:</i> “Establishment of correct operational measures for the concepts being studied”</p>	<ul style="list-style-type: none"> <li>• Triangulations of multiple informants: different internal representatives</li> <li>• Result: emergent data are filtered from bias as much as possible</li> </ul>
<p><i>Internal validity:</i> “Establishing causal relationship whereby certain conditions are shown to other conditions, as distinguished from spurious relationships”</p>	<ul style="list-style-type: none"> <li>• Use of conceptual framework:</li> <li>• Result: conceptual framework augmented/ relationship between variables in conceptual framework identified and substantiated.</li> </ul>
<p><i>External validity:</i> “Establishing a domain in which the study’s findings can be generalised”</p>	<ul style="list-style-type: none"> <li>• Analysis of the general process of ports’ development</li> <li>• Result: revised framework applicable to different port system</li> </ul>
<p><i>Reliability:</i> “Demonstrating that the operations of a study can be repeated with the same results”</p>	<ul style="list-style-type: none"> <li>• Development of (interview) questionnaire</li> <li>• Result: methodology transparent and repeatable</li> </ul>

## Chapter 4: FINDINGS

### 4.1. *Extracts from the interviews*

From the interviews conducted with an audience of people directly involved in what is the history of the Western Sicily Port System Authority (WSPSA), it was possible to draw what was the logic behind the introduction of this entity, what were the achieved successes, what were the failures, and consequently what are the developments that the system authority must undertake. As explained in detail by President of the WSPSA, the first step towards the port system authorities in Italy was Law 84/94 which allowed the birth of 23 port authorities, at the time called port authorities (the difference with “port system authority” in terms is substantial, as we will see). This law was absolutely innovative in that it had transformed the concept of port infrastructure, making it pass from an infrastructure that under the public did everything and managed everything, to a non-economic public body that on the one hand regulated the market, and on the other hand built the infrastructures, and still promoted traffic, but basically had a publicity function.

Unfortunately, in this regard, as stated by the President himself, “*central coordination failed*”, leading the port authorities to adopt an offer-like policy, which became a mechanism by which all ports could do everything. This, in addition to creating a situation in which supply was significantly higher than market demand, led the market itself to take advantage of this imbalance as it is natural that it led, as all the interviewees recalled, to competition between the different ports and consequently between the different authorities, nationally as well as in western Sicily. In fact, as the former general secretary of the Sicilian port authority recalls, before this new organization and unitary management by a port system authority, there was no effective coordination between the ports, despite neighbouring or in any case belonging to a regional context. Each port, in order to maintain its own trades and interests, did everything it could, working independently.

Interviewee GS-MPSAWS:

*“Surely the fact that there was this non-homogeneity, non-complementary organization, has led to dysfunctions and a loss of competitiveness compared to other ports, in particular compared to foreign ports, but not only. Some operators, some*

*companies, for example cruises, I say it as a lived experience, to avoid what we can call the costs and charges that they could have in the port of Palermo, autonomously turned to one of the neighbouring ones [...]. Clearly the quality of the services then received was not positive at all, it was not at all up to standards and adequate with respect to what the port of Palermo could offer. So, then there were usually isolated experiences, because yes the companies certainly always want to save, but the quality of the services then suffers a lot.”*

Since there was no direction at a territorial level and due to the same characteristics of this sector, there was an overlap of entrepreneurial activities, which caused economic inefficiencies. Then, at a certain point, a correction of these inefficiencies became necessary, through the adoption of a single system thought, which led to the creation of the Port System Authorities. The Trapani's port operator remembers how, *“before 2017, the concept of the port system was in fact an economic concept, not a legal concept”*. With this rule, which legally introduced the system of port authorities, it has become a legal concept with the aim of solving the problem of competition by assigning a function to each specific port, contained within a coordination system. Therefore, to ensure maximum competition, a system was envisaged in which ports adopted a specialization according to their own vocation. The Termini Imerese's port operator underlines how port systems push precisely to identify the type of traffic and the functionality of a port and to avoid that the ports of the same system enter into competition because in fact *“they must try to create a system, to synthesize and avoid conflicts.”*

Despite the good intentions behind the creation of these authorities, it is already at this moment that politicization and territorial logic come into play. Sicily represents an excellent example, where there are three authorities, since more authorities have been created than those actually necessary *“precisely to carry out the powers that the authorities of certain areas claimed”* (cit. P-MPSAWS). This then turned out to be absolutely inefficient, as the competition between neighbouring ports was simply extended to geographically close port systems, which inevitably also compete for the same limited maritime traffic. The Trapani's port operator also noted these difficulties, as all this is exactly the opposite of the juridical spirit that animated law 84/94, which was instead the introduction of the approach hidden behind port system authorities. Then, it becomes clear that there are unfortunately unavoidable elements that characterize the port system authorities as a public body, such as: politicization, having to support the local

economy precisely, the needs of city centres close to the port same which claims more function that must be performed. Due to these factors, the system as a whole fails to specialize its ports as efficiently as possible. Indeed, the operator of Trapani states that *“overlapping of entrepreneurial activities and therefore economic inefficiencies, in my view they still exist, and which can be solved and therefore governed that economic system through a single thought in a system”*.

The President of WSPSA agrees, stating that *“then it would have made more sense perhaps to make only six / eight authorities under the guidance of a single central authority that could manage better a more specialized management of the port infrastructures”*. This idea is supported also by the former General Secretary of WSPSA: *“Probably the fact that, for example, three authorities of the port system (eastern, western and the Messina Strait) were created at the regional level, perhaps could have had better answers with the creation of a single regional system authority . Because this regionalism was not created, it did not come to an end, due to influence exercised by previous port entities”*. Substantially, a greater central direction would be needed to allow duplications in functions that should not be carried out by two neighbouring systems, because they do nothing but allow for "dumping" or lowering on tariffs, therefore a gain for the market with tariffs that go below the cost.

At the same time, the President points out that it must be admitted that Italy itself, due to its characteristics, is not suitable for a clear specialization of ports. First of all, the Italian ports are widespread along the coast, requiring the ports themselves to be more flexible as they have to cover much larger areas, compared for example to the ports of Northern Europe. Furthermore, this consequently causes the presence of a greater number of ports which inevitably subtracts each other the traffic of any type of transport. So, *“it is clear that an Italian port would not be able to maintain an infrastructure economically and financially, if only one specialization is entrusted to it”*, says the President of WSPSA. However, this specialization could be achieved with all the advantages that it entails, as is already the case of Northern Europe, if it were possible to arrange adequate infrastructures for the connection of specialized ports, which are currently lacking in quality. However, the problem turns out to be that the extension of the authority's power is limited to the port area only, leaving the connecting infrastructures required for the specialization of ports outside the authority's control. Indeed, in President's opinion, it is the entire logistics chain that must be reformed and made less bureaucratic. Until that moment, some ports will have to be a multi-purpose that must be managed until an



interconnection is created, allowing it to become a port that can also perform other functions. Therefore, this greater number of ports and authorities, given the more widespread coastline and, at the same time, the lack of connecting infrastructures between them sufficiently suitable for an efficient connection, forces the authorities to adopt a specialization "linked to the territory".

Interviewee P-MPSAWS:

*"So, the specialization is not in making and managing a single type of traffic, but in taking the traffic necessary to generate the filling of a ship from their communities. But it depends on two factors. First of all, it depends on the infrastructures you have available, it depends on the connections, therefore on the inter-modality, on the dialogue between the different modes of transport, i.e., the ports you have at your disposal. So, specialization, as you understand it, exists, but only between Palermo and Termini Imerese. So, it exists there because there are the infrastructures. Trapani has yet to be connected. So, evidently today it cannot find its own specialization: it is a multi-purpose that must be managed until an interconnection with the artery is created, in this case with the motorway A29, which allows it to become a port that can also perform other functions. In that case the specialization is a specialization linked to the territory."*

This type of specialization linked to the territory, the only economically sustainable solution within the WSPSA in current conditions, allows for example to have an overlapping of offers also in the field of passenger traffic which, as the TPO interviewee states, *"constitutes a greater tourist offer, and not a limit, a problem in terms of competition"*. Furthermore, still the port operator of Trapani, underlines the importance of the role that the System Authority plays in this context, coordinating the different realities as they offer the same services but in different places: *"It is obvious, however, that in commercial proposal of this tourist offer, the direction must be the same, the investments must go in that direction and the thought must be precisely in terms of territorial marketing, the thought must be consistent with all this"*. But all this it is not always effective, as interviewee TPO highlights that *"the situation is different with regards to goods, where the speeches can be different and there we must be careful so that there is no overlapping of the quay offer or embarkation and disembarkation services"*.

The port operator of Termini Imerese has a contrary opinion, seeing limited the power of the Authority as he believes that *"in the end the operator, the shipping company, makes the final choice, depending on where it is convenient"*.

In a hypothetical scenario, in which the connection infrastructures of the ports are present and at the same time it is free from local rationality and politicization, a possible specialization of the ports of Western Sicily that could be adopted, which would make the system more competitive and attractive, managing to attract higher volumes of commercial traffic, and consequently to increase turnover, has been asked to interviewees. Opinions are mixed, even if there are points of agreement:

*Table 2 - Opinions of interviewees on Western Sicily's port specialization*

Opinions on Western Sicily's port specialization		Interviewees			
		P-MPSAWS	GS-MPSAWS	TIPO	TPO
Palermo	- Passengers (Cruises) - Goods (Ro-Ro)	- Passengers (Cruises, ferries, scheduled services) - Goods (Ro-Ro)	Passengers	Passengers (Cruises)	
Trapani	- Containers - Ro-Ro	- Containers - Passengers (Cruises, Ro-Pax)	- Passengers - Ro-Pax	- Containers - Ro-Pax	
Termini Imerese	Containers	- Containers - Ro-Ro	Containers	Ro-Ro	

As previously mentioned, all subjects generally agree that it is not possible to carry out a total specialization in the various ports of Western Sicily. Nevertheless, there are some points of contact regarding the destination that some of the ports should take. Everyone agrees on assigning Palermo to passenger traffic, in particular the cruise line, but at the same time both the current President and the former Secretary General of the System Authority, having in mind what the responsibilities of this public body are, argue that it should not be left behind the Ro-Ro traffic to supply the main city in Sicily.

Interviewee P-MPSAWS:

*“Palermo has its own reference market in cruise passengers, it also has its own reference market for goods, because it serves a community that is made up of two and a half million people. I have to worry that the goods that reach these two and a half million people arrive through the port of Palermo.[...]”*

Interviewee GS-MPSAWS:

*“The project is just that, that is, the port of Palermo remains and will remain more and more in the next few years a port for passengers, that's it [...].”*

About the port of Trapani, the interviewees agree in seeing container traffic as the main destination of use, but being more isolated than the other ports, as it is lacking in the quality of the connection infrastructures, and a strong Tunisian community that allows numerous commercial exchanges precisely with Tunisia, it has yet to cover more than one kind of trafficking.

Interviewee P-MPSAWS:

*“The main Tunisian community of Sicily which is in Mazara del Vallo. So, it is normal that Trapani has to count on the one hand to the containers, on the other hand to the ro-ro traffic for North Africa, therefore, above all to extra Schengen. But to do this he must first have a communication route that allows him not to use the city artery, but to use an alternative artery.”*

Interviewee TPO:

*“I believe that the container traffic should go to Trapani and Trapani, imagine further investments that could easily be made, could change from a regional port to a transshipment port. [...] And Trapani in this situation, I'm talking about cabotage, could have a line for Tunisia, due to its historical and territorial vocation, also due to its proximity to Tunisia.”*

Finally, Termini Imerese, contrary to what was previously supposed, seems to be directed, according to the interviewees, more towards container traffic rather than trailers, as suggested by the port operator of Trapani. This discrepancy must be taken into consideration taking into account that there are personal interests, which Interviewee 4 himself admits are present in his statements: *“[...] If all the arguments about vocation are true, even if on this I obviously have an interest in the company I represent, but it is a legitimate interest and therefore I reason on the basis of the investments already made that deserve to be rewarded [...]”*. He argues that

the goods normally choose the ports closest to the place of production because the cost of transporting the positioning, what is called inland cost, must be as low as possible. This is why he believes that Trapani, since there is a large industrial offer given by Fincantieri, which is an Italian public company operating in the shipbuilding sector, constitutes an interesting offer from this point of view as it is well equipped.

Interviewee P-MPSAWS:

*“So, in Palermo the container terminal has no reason to exist, so I took it, I moved it, I'm moving it to Termini Imerese, where it clearly has a greater capacity for receptivity, it has a connection with the arteries that is much greater [...]”*

Interviewee TPO:

*“I believe, for example, that it does not make sense, from my point of view, but also according to objective criteria, to move the containers from Palermo to Termini Imerese because it reproduces the same situation as in Palermo [...] Termini Imerese, due to its position, it can intercept goods from Western Sicily, Central Sicily, as well as from Eastern Sicily. So, it has both interesting performances in terms of load interception and an industrial system that is powered by large numbers. [...]”*

#### 4.2. Computations Pre-Interviews

As regards the calculation of the authority's performance in recent years, in order to make a comparison between the situations prior to the reform of the Italian port network and the one following its implementation, the following quantitative calculations were made using the data provided in the documents of the WSPSA.

The data were calculated, as mentioned in the previous chapter, using two different periods: before (2016) and after the reform (2020). The reason behind is to analyse what the evolutionary trend has been up to now. In fact, the purpose of the result collected is to allow the interviewees to make predictions on the trend of the WSPSA in two different future scenarios, one in which the current state of things does not change, and one in which is adopted a greater and specific specialization in each of the member ports. To do this, four main KPIs were used, which allow to analyse the performance of the Sicilian port system authority in detail, namely: total volume of freight transport, total volume of passenger transport, average unit cost of freight transport, average unit cost of passenger transport. To obtain part of these data, which are synonymous with the performance of the Port System Authority, the so-called

“Operational Revenues” were used, whose budget macro area is called “Different Revenues”. On the contrary, there is a specific budget item for the authority's operating costs. Finally, the result of these operations is more correctly called “Added Value”, rather than Profit, as it considers only the variable items (derived from operations), and not the fixed ones, in the financial statements.

*Legend:*

- Total volume of freight transport = Vf
- Total volume of passenger transport = Vp
- Operating Revenues = OR
- Operating Costs = OC
- Revenue per unit of good = Rg = OR / Vg
- Revenue per unit of passenger = Rp = OR / Vp
- Average unit cost of freight transport = Cf = OC / Vg
- Average unit cost of passenger transport = Cp = OC / Vp
- Value Added = VA = OR – OC

$$\text{Percentage Change} = \frac{(\text{Final Value} - \text{Initial Value})}{\text{Initial Value}} \times 100$$

*Table 3- Annual values and percentage differences between the two periods considered*

<b>Evolutionary Performance Trend</b>	<b>Time</b>		<b>Percentage Change</b>
	<b>2016</b>	<b>2020</b>	<b>2016-2020</b>
Total volume of freight transport	6 725 833	8 537 951	27%
Total volume of passenger transport	1 921 933	1 856 456	-3%
Operating revenue	11 222 800	16 675 899	49%
Operating costs	4 837 556	6 995 143	45%
Revenue per single good	1.669	1.953	17%
Revenue per single passenger	5.839	8.983	54%
Average unit cost of freight transport	0.719	0.819	14%
Average unit cost of passenger transport	2.517	3.768	50%
<b>Value Added = VA</b>	<b>6 385 244</b>	<b>9 680 756</b>	<b>52%</b>

### 4.3. Interviewees' Estimates

It follows the interview questions related to the future estimates of the variables mentioned above for the two different scenarios, one with the current conformation of the authority (Scenario 1) and the other with the perfectly applied specialization (Scenario 2). The results have been reported in the tables below. Because of the unpredictability of the data, which is impacted by global events and occurrences, the interviewees were unable to make future quantitative forecasts and instead restricted the forecasts to providing qualitative estimations. These have been used to understand the foreseeable trends and the applicability of the assumptions previously developed via the usage of the relevant literature.

Table 4 - Future estimates of interviewees for scenario 1

Scenario 1	Interviewees				Average Changes
	P-MPSAWS	GS-MPSAWS	TIPO	TPO	
Total volume of freight transport	+	=	-	++	↑
Total volume of passenger transport	++	+	+	++	↑ ↑
Average unit cost of freight transport	+	+	+	++	↑
Average unit cost of passenger transport	+	-	+	-	=

Table 5 - Future estimates of interviewees for scenario 2

Scenario 2	Interviewees				Average Changes
	P-MPSAWS	GS-MPSAWS	TIPO	TPO	
Total volume of freight transport	+	=	-	++	↑

Total volume of passenger transport	+	+	=	++++	↑ ↑ ↑
Average unit cost of freight transport	-	-	++	-	↓
Average unit cost of passenger transport	-	-	++	-	↓

As far as the “total volume of freight transport” is concerned, almost all of the interviewees agree on a growth forecast for this item, with a voice out of the chorus constituted by the port operator of Termini Imerese. Indeed, the optimism behind the growth in freight volumes is supported within the authority by positive expectations about the renovation and modernization of the ports under its jurisdiction. On the contrary, the Termini Imerese port operator states that *“we are in an unfortunately bad phase of the economy where Italy has proved weak, very weak and totally unable to cope with an extraordinary event, first of all with the pandemic and then secondly, with the current war that has brought us practically to crash our economic system.”* And he goes on to say that the cause of these conditions are to be linked to a national policy in the last thirty years focused on saying *“no to everything”*, for many different reasons. Consequently, he justifies his pessimistic opinion saying: *“[...] we are at least 25 years late. A quarter of a century behind everything, everything”*.

As regards the “total volume of passenger transport”, all the interviewees agree in a prospect of growth of this item in Western Sicily with the current conformation of the System Authority. The reasons are similar for all, but above all concentrated on the role played by the end of the critical phase of the pandemic and the relative reopening of most countries.

Also as regards the average unit cost of freight transport, all the interviewees agree on a growth prospect of this item for the System Authority, meaning a damage for the latter. Also, in this case the reasons are similar, but above all concentrated on the role played by the war that at the time of the interviews is raging between Russia and Ukraine, strategic countries for the supply of fuel and grain respectively.

Finally, with the current conformation, the interviewees expressed conflicting opinions about the future estimates for the average unit cost of passenger transport. Those who estimate growth take into account the current global situation, including global warming and above all the geopolitical consequences that the Russian war is already causing, which is characterized by

an increasing number of bottlenecks in the supply chains, of which the President of the Port Authority is perfectly aware.

Interviewee P-MPSAWS:

*“[...] There is a great need in the country not so much to reform the single mode of transport, in this case the Authorities and the Ports, but there is a need to review the entire logistics chain [...]. The bottlenecks that exist are evident, under everyone's eyes, but we are unable to solve them because we are bogged down in a bureaucratic system that unfortunately is full of rules and really very complicated.”*

Moving on to the currently utopian scenario of complete specialization of the ports of the Western Sicily system, the considerations made by the interviewees tend to lead to final conclusions similar to the one related to the “Scenario 1”, as regards the volumes of both traffics. On the contrary, future estimates on the costs of such traffics in this scenario are far better than the previous ones. In fact, the considerations are almost identical with a greater amount of optimism about trend of the driver "total volume of freight transport" and "total volume of passenger transport". The wide optimism of the interviewee 4 stands out.

Interviewee TPO:

*“Obviously, greater organization and new traffic in terms of organizational improvement represent a synergy [...] If companies are enabled to not lose critical mass, and I refer to containers and to be able to improve their industrial offer, for example being able to rationalize and further improve the efficiency of equipment, I can say that to 35% increase in total volume of freight transport”*

*“In this almost utopian scenario, therefore, in which it is possible to have this inter-modality, thanks to the specialization only in Palermo passengers, [...] I can imagine a 100% increase of total volume of passenger transport as a number not far from reality.”*

As for the average unit cost of freight and passenger transport, on the other hand, as we said, the interviewees are almost all clearly more optimistic about the effects of the application of the specialization, except for the Termini Imerese port operator, expecting a decrease.

Interviewee TPO:



*“[...] ports with organized spaces, allow goods to be loaded, unloaded faster and therefore ultimately a reduction in costs. Therefore, a specialization, a vocation, a rationalization of the port spaces can guarantee there a greater competition from the cabotage shipowners, with the inevitable consequence that the unit cost of goods decreases, imagining a situation of normality in which obviously the cost of diesel does not weigh, I imagine a reduction of the unit cost of the goods of 20, 30% which is guaranteed by this competition on the main route that concerns the Mediterranean, which is that of Palermo.”*

## Chapter 5: ANALYSIS

### 5.1. *Introduction*

The current conformation of the WSPSA, as highlighted in the previous chapter, is still not very specialized for various reasons, and therefore unable to fully exploit the resulting advantages. This chapter analyses the answers obtained by the interviewees in order to draw general conclusions from what is the specific case analysed in Western Sicily, thus trying to understand when it is appropriate to specialize the ports and when they are forced to continue to perform several functions simultaneously for the good of themselves and the surrounding community they serve.

As mentioned above, the current maritime traffic of the system's ports is reported in the WSPSA's 2020-2022 Three-Year Operational Plan. What you immediately notice looking at the data is the fact that all ports, at the time of drafting the Plan, welcome almost all types of traffic despite the partial specialization in progress that they are trying to adopt and whose accomplishment will take place in 2027, according to the Authority. As stated by the President of the Authority himself, whose declarations have been reported previously, the current conformation that the WSPSA possesses consists of a partial specialization, although progress is gradually being made, present only between the port of Palermo and Termini Imerese, as geographically closer and better connected. While, at the moment, the port of Trapani is in a situation where it is forced to be "multi-purpose", due to its greater isolation from the rest of the ports in the system. In fact, as can be read from the document "Three-year Operational Plan 2020-2022", the port of Trapani is specialized in passenger traffic to/from the Egadi and Pantelleria islands, in container traffic and, to a minor extent, in cruise traffic. While the Termini Imerese port has a particular interest in bulk (wheat, fertilizers), as well as for various goods, it is also used for the embarkation of gravel from Sicilian quarries. Finally, that of Palermo has been recently the most generic port of the system managing all kind of maritime traffic; that means cruise traffic; traffic of goods handled with ro-ro ships, which account for over 80% of global traffic; traffic of passengers arriving/ departing with ro-ro ships and fast vehicles; traffic relating to the import / export of new cars.

## 5.2. Trends

For reasons of unpredictability of the data, due to their highly variable nature as they can be influenced by global events and phenomena, the interviewees were unable to provide future numerical estimates but limited themselves to providing qualitative estimates. These have been exploited to understand in each case what are the possible future trends, and the adequacy of the hypotheses previously formulated through the use of the literature on the subject. Through the codification, categorization and processing of the data collected by the interviewees, it was possible to compare them structurally with the literature. All taking into consideration the role and work that the interviewee carries out, therefore what their interests and point of view may have been, in order to avoid suffering bias.

### 5.2.1. Current Configuration of WSPSA

As regards the estimate of the Total Volume of Freight Transport, the reasoning behind it takes into consideration the optimism of the majority of the interviewees, but at the same time also their underlying motivations. For example, the desire of the President of the WSPSA to put in a good light the work done so far by the authorities. Furthermore, TIPO's negative observations, linked to the current inadequacy of the Italian system and recent historical developments, have solid foundations supported by the reality of the facts. For this reason, taking into consideration these opinions as well as the good work carried out so far by the WSPSA which will allow to reach the necessary conditions to obtain the advantages presented in the literature, the final forecast on the trend of this item is one of not excessive growth

The estimate on the trend of Total Volume of Passenger Transport is of a great growth following the end of the critical phase of the COVID-19 pandemic in an area with major tourist attractions such as Western Sicily. This vision has been confirmed with absolute agreement by the interviewees.

The unanimity of the interviewees is also present in the forecast on the item of Average Unit Cost of Freight Transport, due to the recently erupted Russian-Ukraine war. I also take their side, as it is clear that this war will hit the entire energy sector that feeds the same supply chains. Finally, the estimate on the Average Unit Cost of Passenger Transport is troubled by conflicting opinions. While the P-MPSAWS and the TIPO think it could increase, the other two respondents are more optimistic and foresee a decline. Both sides in my opinion have strengths, as the two extraordinary events of the Russia-Ukraine war and the removal of restrictions for

COVID-19 balance each other. Given the topicality of these events, it is still difficult to predict the consequences that may arise from both events.

### *5.2.2. Specialized Configuration of WSPSA*

The estimates made for the Total volume of freight transport and Total volume of passenger transport items of the interviewees remained indifferent. Likewise, my concluding observations on the estimate of their future trend are not changed, but rather confirm what is seen in the literature review, that is, as a greater specialization brings greater efficiency that allows the port system to be more competitive and attractive for maritime traffic.

It is for the average unit cost of freight transport and the average unit cost of passenger transport that we observe in particular the realization of the hypotheses discussed at the beginning of the paper. Despite the contrast of the port operator of Termini Imerese, I support the majority of the interviewees who foresee a cost reduction in an ideal scenario of total specialization of the Western Sicily system, as the ports system agree that it is more competitive. As discussed above, this is due to the division of labour and management of resources, the use of specialist skills, learning by doing and product-specific scale economies, and the use of equipment and infrastructure specifically designed to be adapted to the needs involved in each type of port traffic "(Tovar and Wall, 2017).

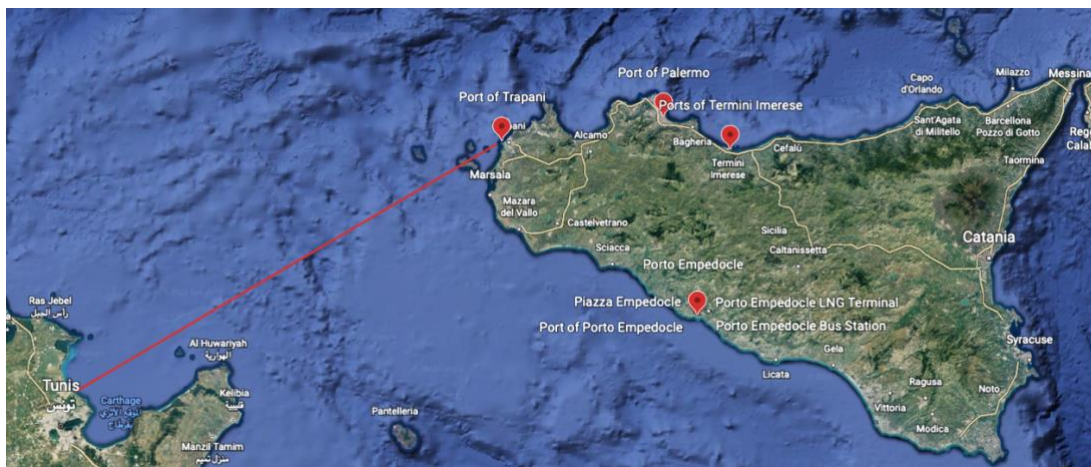
### *5.3. Most Suitable Solution*

The result of this analysis, as confirmed by the interviewees, was that, observing the overall trends reached, it is clear the convenience that greater specialization can bring within a system of adequately interconnected ports. This is because, compared to the current configuration, the volumes of both passenger and freight traffic are estimated to continue to grow while the average unit costs relating to the two previous types of traffic would be reduced, thus being able to better resist the recent global disruptive phenomena.

According to the answers of the interviewees, the specialization that the majority supports being most suitable for the ports of western Sicily, given the current but not ideal conditions, is for the port of Termini Imerese certainly in both Ro-Ro traffic (on wheels) and Container traffic, given the proximity to the motorway network and the nearby port of Palermo, as well as the greater centrality in the Sicilian peninsula compared to the other ports of the network. For the port of Palermo, a specialization in passenger traffic would be envisaged, given the limited spaces available as well as the congestion that is created in and out of the port due to

the simultaneous presence of both freight and passenger traffic, abandoning any other type of transport. This is because there is no more space in which to expand, and the port is located in the centre of the city with the presence of trucks which is certainly cumbersome for city traffic. For the port of Trapani, given the large spaces available in the port and the already significant presence of machinery and related port operators, we should aim at a specialization in container transport, also given that it is located on the tip of Sicily which places it in the centre of the Mediterranean becoming an important transit point for goods, above all with the North Africa's countries as Tunisia.

Figure 6 - Relative distance map between WSPSA and Tunisia



On the basis of the information extracted from the interviews, it immediately emerges that the result of the application of greater specialization in the ports of a network is approved by the interviewees, which improves the operational efficiency drivers and consequently increases their competitiveness, confirming what has been declared from literature.

In fact, in this utopian scenario of complete specialization of the ports of the Western Sicily system, the considerations made by the interviewees lead to final conclusions similar to the previous ones as regards the volumes of both trades. On the contrary, future estimates on the costs of such traffic in this scenario are better than the previous ones, as it would be possible to make the port system more competitive and attractive for traffic, thus attracting greater volumes. When this happens, thanks to obtaining the advantages of specialization such as division of labour and resource management, the use of specialized skills, learning by doing, product-specific economies of scale, the use of equipment and infrastructures specifically designed to be adapted to the needs of each type of port traffic. All this reduces the average unit cost of the transport of goods and passengers and, consequently, increases profits.

But an essential condition is necessary in order to be able to obtain this type of organization of ports. The ports of a network must be adequately connected to each other with the infrastructures that can ensure inter-modality and cooperation between the various ports, also called Regionalization.

## Chapter 6: CONCLUSION

### 6.1. *Conclusion and Discussion*

Now all data collected through interviews has been analysed and reflected against the literature, a conclusion can be drawn based upon this.

#### *What does port's operational efficiency consist of?*

The concept of efficiency is linked to the concept of port competitiveness, a multidimensional concept based on the ability of port authorities and commercial entities to conduct value-added operations within an interconnected business system whose success is intimately related to how competitive the entire system is (Parola, Risitano, Ferretti, Panetti, 2017). While port operators should emphasize network business actor satisfaction, Port Authorities should assume the position of community managers, capable of enhancing inter-organizational connections within the ecosystem and, finally, increasing port competitiveness (Verhoeven, 2010). The findings of recent research conducted by Parola, Risitano, Ferretti, and Panetti on the factors influencing the multidimensionality of port competitiveness resulted in the identification of 10 key drivers.

#### *How does the regionalization of ports make the system more efficient?*

Port regionalization is the last stage in a port development process, which consists of cooperation and coordination with neighbouring ports in order to create an interconnected system of ports. Coordination of member ports takes the form of specialization in the functions best suited to each of them, depending therefore on both the geographical and industrial characteristics that characterize each port. Connecting ports within the same system allows for the accumulation of resources and the production of new ones. Unlike typical port activity, which benefits solely the owning port authority, this enhanced port activity incorporates the whole port network in attaining common goals (Notteboom and Winkelmanns, 2001). By segmenting markets and coordinating services, port networking between nearby ports helps avoid port authorities from squandering important resources due to port rivalry (Notteboom and Winkelmanns, 2001). This is critical for a port's performance since the ability of a port to integrate into the economic system that revolves around the network of ports and all economic agents that deal with it within the same supply chain determines its success.

Based on the information gathered from the interviews, it is clear that the application of greater specialization in network ports is supported by the interviewees, which improves operational efficiency drivers and, as a result, increases their competitiveness, confirming what has been stated in the literature. In reality, in this ideal scenario of total specialization of the Western Sicily system's ports, the interviewees' thoughts led to final findings comparable to the previous ones in terms of the trades' volumes. On the contrary, future projections of the expenses of such traffic in this scenario are better than earlier ones since it is conceivable to make the port system more competitive and appealing to traffic, drawing bigger volumes. When this occurs, the benefits of specialization (such as division of labour and resource management, the use of specialized skills, learning by doing, product-specific economies of scale, and the use of equipment and infrastructures specifically designed to meet the needs of each type of port traffic) contribute to reduce the average unit cost of transporting goods and passengers and, as a result, an increase in profits. However, an essential condition is required in order to acquire this form of port organization. The ports of a network must be sufficiently connected to one another by infrastructure that ensures inter-modality and collaboration among the various ports. A process known as regionalization.

*What are the challenges of port regionalization?*

The regionalization phase is confronted with key difficulties that jeopardize its efficacy. Notteboom and Rodrigue (2005) cited politicization and local rationality as potential barriers to regionalization. It is possible that insufficient management of the port network prevents members from cooperating, resulting in overlapping competencies that put them against one other (Notteboom and Rodrigue, 2005). This state is revealed to be the outcome of the two essential concerns raised, as observed by the interviewees. Indeed, for the most part, ports continue to rely on governments to fund basic infrastructure, which should provide for reasonable access by land or sea. As a result, the public sector has a significant impact on the path that ports in a port system follow. As a result, port regionalization is frequently a process affected by political commitments rather than economic logics of efficiency. Local rationality of port administrations and governments is also critical. Any regionalization strategy developed by a port authority or local government has the goal of increasing the port's competitiveness; however, this does not always imply that the final configuration of the relevant cargo centre network provides the best solution for serving the larger hinterland regions as a whole (Notteboom and Rodrigue, 2005). Indeed, the interviews revealed that the Port System



Authority's administration of a network of interconnected ports is susceptible to diverse pressures determined both by the demands of each port's target population and by continuing individualistic thinking within the Authorities themselves. In truth, rivalry and the desire to own the greatest traffic may be found among Authorities from the same Region.

*How do the politicization and local rationality influence the organization of a port system?*

This research has set itself the objective of investigating more in depth one of the concerns identified by Theo E. Notteboom & Jean-Paul Rodrigue in the paper "Port regionalization: towards a new phase in port development", but which was not explored further . In fact, this paper shows the inefficiencies that can occur in the development process of a port network if this is influenced by non-economic reasoning, such as politicization and the prevalence of local rather than systemic logics, which limit its growth potential. This is observable in the inefficiencies still present in the Italian Port System Authorities both between the ports within them, due to the only partial specialization, and of the Italian port system as a whole since, as the information gathered through the interviews shows, there is an excessive number of port authorities compared to those which would really be needed, precisely to satisfy the *"local economic aspirations of officials and politicians"*.

The result of this research is therefore the convenience and efficiency of a port system by organizing itself into a coordinated network of ports that divides the typical functions of a port in the most appropriate way in order to maximize the performance of each of the ports, and therefore of the system as a whole. But only if the conditions and characteristics that allow its feasibility, both structural and geographical, are present. If the necessary conditions exist, meaning that the ports of the system are effectively connected with adequate infrastructures, bringing the ports together under a single management that manages and coordinates them and giving each of them a specific address based on the port's vocation, is the best solution as confirmed by the President of the System Authority. The problem remains that the Authority's decision-making power is confined to the port areas only, while all the intermodal infrastructures are beyond its control. This makes the Authority's work extremely complicated since, as suggested by the President, a reform of the entire Italian bureaucratic system is necessary.

The scientific and management consequences of this study and its conclusion will be covered in subsequent sections. This is followed by explanations of research constraints and then future research possibilities.

## 6.2. *Managerial Contributions*

This research analysed the situation of the Port System Authority of the Western Sicilian Sea, which presents a situation similar to other port networks: ports that are aware of the advantages that regionalization brings, but then come up against a constraining context outside the maritime one. These are the inadequacy of the infrastructure linking ports and the spread of the Italian coastline, given that almost the entire country faces the Mediterranean, which do not allow ports to specialize in a single type of traffic in order to achieve the greater efficiency, which is otherwise achieved through specialization and the consequent increase in competitiveness and profit.

The results of this study project can be used by port logistics experts to support their thinking behind specific strategic decisions regarding the organizational design of a Port System Authority. This research's result allows them to choose a port specialization management approach suitable for a comparable situation, based on a built theory rather than the consequence of opportunistic and inefficient reasoning for the system as a whole. In fact, the study places limits on the applicability of regionalization, despite the fact that it is also an increasingly popular phenomenon because of its convenience, helping managers make more thoughtful choices by looking at theory but also at its feasibility in the real world. As a result, port authorities' managers should promote an effective intermodal system in order to protect goods in high-competition environments, by establishing strategic links with other transportation networks with the goal of cooperating on traffic management, site issuing, hinterland connections and services, environmental protection, marketing, and research and development (R&D) (Notteboom and Rodrigue, 2005). However, as previously mentioned, the decision-making power of a port authority is limited to the maritime state property which does not allow to have control over the conditions necessary for it to be possible and convenient to adopt "regionalization", such as the infrastructures for good interconnection between systems. For this reason, one thing that should be done, as suggested by the interviewees who live these limits on their own skin every day, is to make the central government aware of the inefficiencies of the country which are reflected in minor public bodies. This can be done through a reform

of the bureaucracy that would streamline the decision-making processes regarding the construction of the infrastructure that the country needs.

### 6.3. *Limitations and Future Research*

The following research has been characterized by limitations that offer insights for better and more detailed studies in the future. Due to lack of time on their part, the four interviewees were the only ones to immediately grant availability to the interview. This has led to the fact that, in addition to the lack of data, there is an absence of perspectives external to the context of Western Sicily. Even if this situation was not optimal and slightly damaged the reliability of the results obtained, they can be defended with confidence. Furthermore, the lack of precise quantitative estimates by the interviewees who expressed themselves mainly qualitatively, due to the intrinsic difficulty of the type of data processed that do not allow forecasts, makes the research improvable. In this very respect, research on the issues raised in this article can be improved. In particular, given the limited means in calculating and managing the great unpredictability of the data in this sector which make it difficult to make precise future estimates, the development of a mathematical model that more precisely shows the validity of the hypotheses demonstrated so far, would give them even more solidity. Furthermore, a greater number of interviewees, who can thus provide even more different points of view and above all conflicting opinions, allows us to broaden our vision on the subject, extending the sample of interviewees to other authorities in the Sicily region. It would be equally interesting to receive internal opinions from the ministry and / or the central government on the matter, to understand how aware they are of the current situation of the Italian port system, and what is being done to improve further.

Finally, despite the advantages of specialization that manages to be pursued in port systems such as the Dutch one due to its adaptability to this type of approach, in Italy it is currently not possible due to its characteristics, which means widespread ports along the coast and lack of infrastructure. suitable connection. As stated by the President of the WSPSA: *"We are aware of these limitations, so much so that we are already proceeding towards that greater specialization, with a whole series of works that are part of the body's operational plan for the next few years which plans to see the works completed. in 2027 "*. In fact, all the recent Italian port policy, both nationally and in particular for western Sicily, is already aimed at improving the connection infrastructures, in order to achieve specialization. For this reason, it is advisable to conduct more in-depth research, once the work of the WSPSA is completed, to verify that

the results achieved remain the same or not. Similarly, it may be interesting to apply this research also within the port system of another nation, which has already the conditions necessary for the maximum exploitation of an interconnected port system.

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## APPENDICES

### Interview Questions

#### Qualitative Part

1. Good morning. Could you give us a brief account of his career?
2. What is your relationship / involvement with the Western Sicily Maritime Port System Authority?
3. When was he involved? / What was his role in the Maritime Port System Authority of Western Sicily in the past?
4. Before the Legislative Decree n. 169 of 4 August 2016, which introduces the port system authorities, how was the competition between neighbouring ports and their overlapping of functions and activities dealt with?
5. Who was responsible for resolving disputes between competing ports?
6. In this context, have ports adopted some sort of specialization in a particular type of trade, reducing costs, achieving economies of scale and increasing know-how?
7. For port customers, how was the quality and cost of the services offered compared to ports outside Italy? Can it be said that the competitiveness of ports has been conditioned by the lack of collaboration between them?
8. Do you think of an episode in which you remember that the previous system limited the potential of your organization in some way? Could things have been different if the current system of regionalization were already in place?
9. Despite the advantages, politicization and logic of local economies. Effects?

#### Quantitative Part

10. Between 2016, the year identifiable as the last year before the change of approach, and 2021, the year instead attributable to the complete implementation of the "Regionalization", the performance of the "total freight volume" KPI was +27%. What do you think will be the trend of the "total volume of freight transport" in the next 5 years with the current conformation of the Port Authority of western Sicily?
11. Why?



12. Between 2016, the year identifiable as the last year before the change of approach, and 2021, the year instead attributable to the complete implementation of the “Regionalization”, the performance of the “total passenger transport volume” KPI was -3%. What do you think will be the trend of the "total volume of passenger transport" in the next 5 years with the current conformation of the Port Authority of western Sicily?
13. Why?
14. Between 2016, the year identifiable as the last year before the change of approach, and 2021, the year instead attributable to the complete implementation of the “Regionalization”, the performance of the “average unit cost of freight transport” was + 14%. What do you think will be the trend of the "average unit cost of freight transport" in the next 5 years with the current conformation of the Port Authority of western Sicily?
15. Why?
16. Between 2016, the year identifiable as the last year before the change of approach, and 2021, the year instead attributable to the complete implementation of the “Regionalization”, the performance of the “average unit cost of passenger transport” KPI was + 50%. What do you think will be the trend of the "average unit cost of passenger transport" in the next 5 years with the current conformation of the Port Authority of western Sicily?
17. Why?
18. If instead a clearer specialization were implemented, compared to the current one in which it appears that the ports of western Sicily still partially handle all types of transport (freight, passengers), how do you think the KPI "total volume of goods transport" would vary?
19. Why?
20. If instead a clearer specialization were implemented, compared to the current one in which it appears that the ports of western Sicily still partially handle all types of transport (goods, passengers), how do you think the KPI "total volume of passengers transport" would vary?
21. Why?
22. If instead a clearer specialization were implemented, compared to the current one in which it appears that the ports of western Sicily still partially handle all types of

transport (goods, passengers), how do you think the KPI "average unit cost of freight transport" would vary?

23. Why?

24. If instead a clearer specialization were implemented, compared to the current one in which it appears that the ports of western Sicily still partially handle all types of transport (goods, passengers), how do you think the KPI "average unit cost of passenger transport" would vary?

25. Why?

## Interview Outlines

### Opinions of interviewees on Western Sicily's port specialization

- Palermo

Interviewee P-MPSAWS:

*“Palermo has its own reference market in cruise passengers, it also has its own reference market for goods, because it serves a community that is made up of two and a half million people. I have to worry that the goods that reach these two and a half million people arrive through the port of Palermo and maybe not going to Catania by making the trucks go more than 200 km to then take those goods to Palermo.”*

Interviewee GS-MPSAWS:

*“The project is just that, that is, the port of Palermo remains and will remain more and more in the next few years a port for passengers, that's it. Maybe you didn't say it. But in addition to the very important cruises there is also a passenger compartment with ferries, both connections with the smaller islands and the Aeolian Islands, Ustica, but also passengers for regular scheduled services. [...] Ferries not only carry passengers but are used both for the transport of mobile homes, vehicles, accompanying passengers, but also for semi-trailers and articulated vehicles. And herein lies the challenge. The problem because I think that we absolutely cannot eliminate this kind of traffic for Palermo.”*

Interviewee TIPO:

*“It is clear that this is a correct interpretation of things because the circumstance dictates it. It is clear that in Palermo goods cannot circulate at all because it is badly connected with a whole system of traffic, let's say, non-existent.”*

Interviewee TPO:

*“Palermo has the characteristics to become the first port in the Mediterranean as a passenger movement, especially linked to cruising.”*

- Trapani

Interviewee P-MPSAWS:

*“The main Tunisian community of Sicily which is in Mazara del Vallo. So, it is normal that Trapani has to count on the one hand to the containers, on the other hand to the ro-ro traffic for North Africa, therefore, above all to extra Schengen. But to do this he must first*

*have a communication route that allows him not to use the city artery, but to use an alternative artery.”*

Interviewee GS-MPSAWS:

*“Trapani, I see it for various bulk cargo containers and also cruises, as well as passenger services for the smaller islands (Egadi).”*

Interviewee TIPO:

*“We have Trapani which is well connected to the port; therefore, a container exits and is on the highway. But being in the tip of Sicily, which from the maritime point of view is in the centre of the Mediterranean, however from the terrestrial point of view it is not so equidistant from the industrial areas.”*

Interviewee TPO:

*“I believe that the container traffic should go to Trapani and Trapani, imagine further investments that could easily be made because with draft 11 to 12 having a port that from a regional port can also be a transshipment port. [...] And Trapani in this situation, I'm talking about cabotage, could have a line for Tunisia, due to its historical and territorial vocation, also due to its proximity to Tunisia.”*

- Termini Imerese

Interviewee P-MPSAWS:

*“So, in Palermo the container terminal has no reason to exist, so I took it, I moved it, I'm moving it to Termini Imerese, where it clearly has a greater capacity for receptivity, it has a connection with the arteries that is much greater; therefore, he has a return that is certainly higher than what he would have kept in Palermo.”*

Interviewee GS-MPSAWS:

*“For Termini Imerese, as you have well said, various bulk goods and containers, I see that the containers can all be brought to Termini Imerese and Trapani in the next few years.”*

Interviewee TIPO:

*“However, from the terrestrial point of view Trapani is not so equidistant from the industrial areas which are the first to use this type of services. This is why we talk about bringing containers to Termini Imerese.”*

Interviewee TPO:

*“I believe, for example, that it does not make sense, from my point of view, but also according to objective criteria, to move the containers to Termini Imerese from Palermo because it reproduces the same situation as in Palermo and a public and private structural*

*investment would be necessary, in my opinion uneconomic or in any case with a possibility of return on investment in the very long term. [...] Termini Imerese, then intercepting goods from Western Sicily, but due to its position it can intercept goods from central Sicily, also for charity part of eastern Sicily. So, both one of the interesting performances in terms of load interception and an industrial system that is powered by large numbers. [...]"*

## Scenario 1 - Current Configuration of the WSPSA

- Total Volume of Freight Transport

Interviewee P-MPSAWS:

*"[...] we keep the estimates until today, at least until 2027, the year [...] in which we would have finished all the infrastructural assets of our four airports. From there then the industries to which we have given, let's say thus, fuel, [...] will go up and running and therefore we expect that those growth rates we have achieved in recent years may remain so, or even be increased when that industry goes up to speed [...]"*

Interviewee GS-MPSAWS:

*"I would be very wise, and I would say that, at this moment, making particularly complex estimates, as regards the cargo sector of the ports of the port system authority I would think of a constancy, I would not feel like saying and talking about an increase, but of constant trend, surely."*

Interviewee TIPO:

*"[...] a future estimate is for a reduction in goods since, due to recent historical developments and the inadequacy of the Italian system, less will be produced in Italy and consequently less will be transported [...]"*

Interviewee TPO:

*"[...] I believe that the data can not only be confirmed, but it can increase, I know, to 30% because I repeat, the significant increase in cabotage goods, especially from Palermo and from eastern Sicily, certainly the figure will be on the rise, no doubt is bound to increase."*

- Total Volume of Passenger Transport

Interviewee P-MPSAWS:

*"[...], this year we have, in a pandemic year, 302 cruise ship items, 200 in 2019. When you have 102 berths, in a pandemic year after two further years of pandemic, and in 2019-year pre-pandemic you were 100 less, it means a crazy, spatial rebound."*

Interviewee GS-MPSAWS:

*"As for passengers and cruise traffic in particular, I would see an increase, an increase. Now, if I have to let myself go to percentages, I will speak for the port system authority of 15/20%. This is because, with the homogenization and improvement of services, with clearer tariffs and with what is happening [...]"*

Interviewee TIPO:

*"[...] because there will be a surge after the let's say this, general lockdown that we have had in Italy; therefore, people will be much more tempted to leave and move."*

Interviewee TPO:

*"I believe that we can go to double-digit numbers, also considering the investments made such as the two maritime stations made in Trapani, the one inaugurated yesterday in Palermo and at the end of the year there will be another delivery of port infrastructures linked to passengers. This is easy to predict, because in 2020 the system stopped [...]"*

- Average Unit Cost of Freight Transport

Interviewee P-MPSAWS:

*"[...] It can increase if those conflicts, which certainly do not affect Sicily, but affect the cargo, therefore the turn of the ships, because it is not that a ship that arrives in Sicily only serves Palermo, it is obviously loaded for other destinations [...]"*

Interviewee GS-MPSAWS:

*"In this period of time some terrible things have happened, last of which, that of the serious war crisis that involved Russia with Ukraine. So, with all the related problems: increase in freight costs, increase in the cost of certain foodstuffs from Ukraine, and so on."*

Interviewee TIPO:

*"The cost of transport will increase exponentially. I can't give you a figure, but there will be a substantial increase in transport."*

Interviewee TPO:

*"[...] because if we go to the current figures due to the war and the cost of fuel, this number is already higher now. In my opinion the number is more than 50% because you have to consider the cost of diesel during the pandemic and the cost of diesel after the war, the values are double, that is double."*

- Average Unit Cost of Passenger Transport

Interviewee P-MPSAWS:

*"[...] It can increase if those conflicts, which certainly do not affect Sicily, but affect the cargo, therefore the turn of the ships, because it is not that a ship that arrives in Sicily only serves Palermo, it is obviously loaded for other destinations [...]"*

Interviewee GS-MPSAWS:

*"As for passengers and cruises, however, I said that I am particularly optimistic, and I foresee better trends both in terms of volume and possibly also cost reduction."*

Interviewee TIPO:

*"There too, I foresee more or less the same increase, also because then we had a decrease in prices. This was caused by the lack of demand due to the lockdown, therefore empty ships, and planes, which automatically forced very advantageous rates. So, a really very low price and therefore there will be a substantial increase there to deal with all that has been lost along the way in the last couple of years."*

Interviewee TPO:

*"I believe that the exact same considerations that we have made for cabotage apply to passengers regarding the entry of new operators and port spaces that allow such entry freely.", i.e., [...] "a specialization, a vocation, a rationalization of port spaces can guarantee greater competition there from the cabotage shipowners, with the inevitable consequence that the unit cost of goods decreases, imagining a situation of normality in which obviously the cost of diesel does not weigh."*



## Scenario 2 - Specialized Configuration of the WSPA

- Total Volume of Freight Transport

Interviewee P-MPSAWS:

*“Clearly certain, without doubt the volume of goods and passengers can increase with greater specialization”*

Interviewee GS-MPSAWS:

*“I do not see large increases in volumes of goods, I do not foresee them. I can think of a maintenance, a constancy in the volume of goods.”*

Interviewee TIPO:

*“In my opinion yes, despite the increase in specialization with a consequent increase in the competitiveness of western Sicily, I still believe that the volume of goods decreases by 25%”*

Interviewee TPO:

*“Obviously, greater organization and new traffic in terms of organizational improvement represent a synergy [...] If companies are enabled to not lose critical mass, and I refer to containers and to be able to improve their industrial offer, for example being able to rationalize and further improve the efficiency of equipment, I can say that to 35% increase in total volume of freight transport”*

- Total Volume of Passenger Transport

Interviewee P-MPSAWS:

*“Clearly certain, without doubt the volume of goods and passengers can increase with greater specialization”*

Interviewee GS-MPSAWS:

*“[...]Quite different, however, in the greater volume of passengers, cruises and heavy vehicles (drivers, semi-trailers) [...]”*

Interviewee TIPO:

*“In my opinion yes, despite the increase in specialization with a consequent increase in the competitiveness of western Sicily, I still believe that the volume of passengers increases by 25%”*

Interviewee TPO:

*“In this almost utopian scenario, therefore, in which it is possible to have this inter-modality, thanks to the specialization only in Palermo passengers, [...] I can imagine a 100% increase of total volume of passenger transport as a number not far from reality.”*

- Average Unit Cost of Freight Transport

Interviewee P-MPSAWS:

*“When it would be possible to specialize, the direct consequence is that costs would be able to decrease, thanks to the increase in know-how”*

Interviewee GS-MPSAWS:

*“I would think of a 10% cost reduction, no more. This is because, it is true, a reorganization / specialization can lead to a reduction in costs of scale, but the period is what it is, the costs for the restructuring, for the reorganization there will be for the preparation of equipment and for the procedures. , also with regard to containers. So, I would not be convinced of an excessive cost reduction [...]”*

Interviewee TIPO:

*“The cost of transport will increase exponentially. I can't give you a figure, but there will be a substantial increase in transport.”*

Interviewee TPO:

*“[...] ports with organized spaces, allow goods to be loaded, unloaded faster and therefore ultimately a reduction in costs. Therefore, a specialization, a vocation, a rationalization of the port spaces can guarantee there a greater competition from the cabotage shipowners, with the inevitable consequence that the unit cost of goods decreases, imagining a situation of normality in which obviously the cost of diesel does not weigh, I imagine a reduction of the unit cost of the goods of 20, 30% which is guaranteed by this competition on the main route that concerns the Mediterranean, which is that of Palermo.”*

- Average Unit Cost of Passenger Transport

Interviewee P-MPSAWS:

*“When it would be possible to specialize, the direct consequence is that costs would be able to decrease, thanks to the increase in know-how”*

Interviewee GS-MPSAWS:

*“I would think of a 10% cost reduction, no more. This is because, it is true, a reorganization / specialization can lead to a reduction in costs of scale, but the period is what it is, the costs for the restructuring, for the reorganization there will be for the preparation of equipment and for the procedures. , also with regard to containers. So, I would not be convinced of an excessive cost reduction [...]”*

Interviewee TIPO:

*[...] we had a decrease in prices. This was caused by the lack of demand due to the lockdown, therefore empty ships, and planes, which automatically forced very advantageous rates. So, a really very low price and therefore there will be a substantial increase there to deal with all that has been lost along the way in the last couple of years.*

Interviewee TPO:

*“I believe that the same exact considerations apply to passengers as we have made for freights regarding the entry of new operators and port spaces that allow such entry freely.”*

## **Transcript Interviews**

All the interviews are available upon request. This appendix provides a list of all the interviews transcripts available.

- Transcript 1: P-MPSAWS
- Transcript 2: GS-MPSAWS
- Transcript 3: TIPO
- Transcript 4: TPO

## Coding Schemes

	SP			PLR	WSPSA			ESM
	SP-TP	SP-P	SP-TI		WSPSA-P	WSPSA-PS	WSPSA-F	
Interview 1: P-MPSAWS	Trapani should rely on the one hand on the traffic of containers, on the other hand on the ro-ro traffic to North Africa, therefore, above all to extra Schengen. But to do this, an alternative communication route is needed that allows him not to have to go through the city.	Palermo has its own reference market in cruise passengers, but it also has its own reference market for goods	Given the greater receptivity of Termini Imerese, as it is better connected to the motorway arteries, the WSPSA has recently been moving container traffic here	There is an excessive number of port system authorities, because it was necessary to satisfy the wishes of local authorities that did not allow more efficient forms: less authority, greater specialization	The competence between neighboring ports was present in the past and led them to adopt an offer policy: no specialization	There is an excessive number of port system authorities, because it was necessary to satisfy the wishes of local authorities that did not allow more efficient forms: less authority, greater specialization	To improve the system, it is necessary to adopt a greater direction at the center to still allow duplication in functions that should not be carried out by the two neighboring ports	So we expect that even those growth rates we have achieved in recent years may remain so, even be increased when that industry is up and running.
	There was no cruise terminal, there was no distinction between traffic, let's say, of national cabotage (the famous ferries to the islands), hydrofoils on one side and cruise traffic on the other	Passengers will go to Palermo as the capital city of the Region, therefore more famous and rich in monuments and museums to visit.	A type of specialization exists in the ports of Western Sicily, but only between Palermo and Termini Imerese as they are geographically close and well connected.	The problem is that the power of the Port System Authorities is limited to the maritime state property	By dealing with all types of maritime traffic, they led to an overall offer greater than demand: a waste of resources	The lack of complete specialization in Italian ports is also due to the characteristics of Italy itself: lack of adequate connection infrastructures, widespread ports along the coast, respect for the orography of the cities in which the ports are inserted in order not to compromise tourism	Italy must aim to know how to manage the added value. It is not quantity that makes wealth, it is quality, service to goods, logistics, intermodality, the capacity for interconnection, the capacity for dialogue between the different modes of transport. This makes a port system great.	I think the growth rates will remain constant. Because the war in Russia involved us little compared to Tuscany compared to Liguria, compared to Sardinia, because basically they didn't invest a lot of money in Sicily here.
	Trapani, being isolated, will do both containers and Ro-Ro traffic.	A type of specialization exists in the ports of Western Sicily, but only between Palermo and Termini Imerese as they are geographically close and well connected.	Port boating will do it in Termini Imerese, because evidently it has the space and a different capacity	The entire logistic chain needs to be reviewed to allow the full potential of a system of interconnected ports to be expressed: bureaucracy reform		The functions in the ports are currently decided on the basis of the functionality for the community surrounding the port, as this in Italy is within the cities.	The entire logistic chain needs to be reviewed to allow the full potential of a system of interconnected ports to be expressed: bureaucracy reform	Making projections today is certainly more difficult, especially due to the pandemic and the conflict in Ukraine.
	Trapani, like any other port not sufficiently connected to other ports in the network, is a "multi-purpose" port with a specialization linked to the territory. When there is the necessary interconnection then he will be able to specialize following his own vocation.		A type of specialization exists in the ports of Western Sicily, but only between Palermo and Termini Imerese as they are geographically close and well connected.			The main problem at the moment concerns the presence of goods in the ports and the infrastructures inside the port, which are totally redone, but those outside the port unfortunately still languish.		If those conflicts stop, they will subside, otherwise if Covid returns strong if the war continues it is clear that transport costs will be higher and higher.

	SP			PLR	WSPSA			ESM
	SP-TP	SP-P	SP-TI		WSPSA-P	WSPSA-PS	WSPSA-F	
Interview 2: GS-MPSAWS	<p>Trapani, I see it suitable for various bulk cargo containers and even cruises, as well as passenger services for the smaller islands (Egadi).</p>	<p>Palermo has certain problems of excessive traffic in the sector of various bulk goods, which are poorly integrated with passenger traffic, so much so as to create the conditions for bringing this traffic of various goods to another neighboring port.</p>	<p>For Termini Imerese, I believe it is suitable for various bulk goods and containers. In fact, in the next few years the containers can all be brought to Termini Imerese, but also Trapani.</p>	<p>Each port, apart from its vocation, has its specificity and its traffic flows that derive from the economy, from local demand and above all from the equipment present.</p>	<p>Before this new organization and unitary management by a port system authority, there was no effective coordination between ports, albeit neighboring or in any case belonging to a regional context.</p>	<p>In this period of time, extraordinary events took place, the last of which was the serious war crisis that involved Russia and Ukraine. This brings with it a whole series of consequences: increases in freight costs, increases in the costs of certain foodstuffs from Ukraine, and so on.</p>	<p>I would be very cautious and would say that making estimates is particularly complex at the moment. As for the cargo sector of the ports of the port system authority, I would think of a constancy, I would not feel like saying and talking about an increase, but certainly a constant trend.</p>	
		<p>The idea and the project is just that, that is, the port of Palermo remains and will remain more and more in the next few years a port for passengers.</p>		<p>The application of regionalism would have been more efficient, that is, a single port system authority in the single region, instead of the three port system authorities (eastern, western and strait) that were created at the behest of politics: politicization.</p>	<p>There was no authority that regulated or could resolve disputes. The only authority that could be addressed was the maritime authority.</p>		<p>Thanks to the homogenization and improvement of services that is taking place, with clearer rates and with what is happening in the world, I expect better trends both in terms of volume and possibly also cost reductions,</p>	
		<p>Passenger ferries are often also used for the transport of trailers. I think that this kind of traffic cannot possibly be eliminated for Palermo. Corrective measures and solutions will need to be found to mitigate and improve congestion.</p>		<p>Total specialization is a bit difficult, especially for local wills.</p>	<p>Each port, in order to maintain its own trades and interests, worked and did everything it could do.</p>		<p>Freight transport would be a bit negative, especially for what is the international scenario and the consequent increase in freight costs.</p>	
					<p>The fact that there was no homogeneity and a complementary organization led to dysfunctions and inefficiencies compared to other ports, especially foreign ones. The consequence is that the operators took advantage of this lack of specialization by taking advantage of the services of the most convenient of the neighboring ports.</p>		<p>A reorganization, a specialization, can lead to a reduction in costs of scale but the period is what it is, and there will be costs for the restructuring and reorganization, the preparation of equipment, for the procedures, also for the containers. So I would not be convinced of an excessive cost reduction.</p>	

	SP			PLR	WSPSA			ESM	
	SP-TP	SP-P	SP-TI		WSPSA-P	WSPSA-PS	WSPSA-F		
Interview 3: TIPO	<p>Trapani has a port that is well connected to the motorway arteries, because a container leaves the port and is located on the motorway. The problem is the geographical position of the city and the port with respect to the rest of Sicily and Italy. Being in the western tip of the region, from a maritime point of view it is in the center of the Mediterranean, but from a terrestrial point of view it is not so equidistant from the industrial areas which are the first to use this time</p>	<p>In Palermo, goods cannot move easily because the port is badly connected with a whole system of traffic which is non-existent. The lack of alternative routes to the city center, suitable and specialized for the transport of heavy vehicles, makes Palermo unsuitable for unloading containers having to cross schools, urban centers, etc ...</p>	<p>Due to its characteristics, but above all for the defects that the other two large ports of the Western Sicily port system have, the port of Termini Imerese is suitable for container transport.</p>	<p>The port company works within a limited area, it deals purely with that service, that is, it cannot provide many services, it only does that. So automatically the fixed costs are very high, so no matter how much you can make a drop in prices, then everything ends up towards a standardization of prices.</p>	<p>There has been a shift from a more active role of all operators with regard to port-related decisions, which however had the negative effect of causing congestion in the decision-making phase within the authority, to the other extreme in which it is alone. the President to decide and the category of logistics operators finds itself a little more passive, we could say, towards the authorities.</p>	<p>There has been a shift from a more active role of all operators with regard to port-related decisions, which however had the negative effect of causing congestion in the decision-making phase within the authority, to the other extreme in which it is alone. the President to decide and the category of logistics operators finds itself a little more passive, we could say, towards the authorities.</p>	<p>To solve the problem of competition that exists also between the system authorities in the Sicilian region, they should be collected in a single authority that has all of Sicily under its jurisdiction.</p>	<p>I see the next few years as tragic. Unfortunately, we are in a bad phase of the economy where Italy has proved to be weak, very weak and totally unable to cope with an extraordinary event, first of all with the pandemic and then secondly, with the current war that has practically brought us into crash our economic system. And this unpreparedness is because we have been wrong in the last thirty years to say no to everything, leading us today to be at least 25 years late on everything.</p>	<p>The volume of goods will decrease because there are no raw materials, which leads to an increase in their cost such as to jeopardize the production of all sectors and consequently of the goods transported. Furthermore, all the projects that are currently underway (large infrastructures, bridges, tenders) could be stopped, stopping the innovation process.</p>
	<p>Screenshot</p>			<p>Politicization and local economic logic are precisely at the very basis of the presence in Sicily of more authorities, more than they would have needed. And then between these same authorities there is an implicit competition, in which each tries to attract as much traffic as possible, instead of letting them go elsewhere, even if in Sicily itself. So, in practice, they are against each other.</p>		<p>Port systems push precisely to this, push to identify the type of traffic and the functionality of a port and avoid that the ports of the same system enter into competition because in fact it must try to create a system, to make a synthesis and prevent another system of ports if we can take advantage of it.</p>	<p>Where a commodity is transported from is essentially indifferent. Indeed, the specialization that a port assumes should be decided in agreement with the shipping companies. Because they decide where to scale their ships based on where they are convenient, where they find a terminal, a company, a service, or even an optimal value for money.</p>	<p>We had a drop in prices, caused by lack of demand due to the lockdown. So empty ships and planes, which automatically introduced very advantageous tariffs during the most critical phase of the pandemic. So there will be a substantial increase in those prices to deal with all that has been lost along the way in the last couple of years.</p>	<p>I expect an increase of at least 25% in terms of passengers, because there will be a surge after the let's say this, general lockdown that we have had in Italy; therefore, people will be much more tempted to leave and move. So there will be a surge, an initial surge, which will be the one that will plug that hole that we had during the lockdown, and then have a new drop caused by the tripling of prices, in general of everything that is from the cost. energy at the cost of diesel and the whole series of things.</p>

	SP			PLR	WSPSA			ESM	
	SP-TI	SP-P	SP-TI		WSPSA-P	WSPSA-PS	WSPSA-F		
Interview 4: TPO	<p>In Tapani there are two port companies with three port cranes, a definitely millionaire investment, which makes it suitable for accommodating container traffic certainly better than Palermo. Palermo currently has a Paceco crane, therefore an overhead crane, dated which if it were to be replaced would require millionaire investments.</p>	<p>Palermo at this point, disengaging those docks, will have to be part of cabotage because it is always the capital. I know that Naples, the so-called postal, remains there; therefore, part of the traffic that Gimaldi does may also go there.</p>	<p>Termini Imerese both for its central position in Sicily, undoubtedly has a vocation for fast maritime transport, cabotage and short-distance north-south maritime transport, is perfectly aligned in the Palermo-Berlin corridor. And in my view, the port companies that operate will have increasingly interesting advantages for them if that port goes in this direction.</p>	<p>Italy calls itself a logistics platform in the Mediterranean, ports have a different history, there are many micro-economies that obviously you cannot sacrifice. And therefore the economic history of Italian ports is absolutely different from that of Northern Europe. It may look a little like the Spanish ones, but not that much.</p>	<p>The three ports, let's call them northern, did everything. As in the container sector, competition was even created between ports. Consider that these are regional traffic and therefore this competition leads to poverty, because practically it goes to intercept the same traffic. So there is no real competition between ports, but there is competition between ports that certainly generates diseconomies in <i>one case only</i>.</p>	<p>The 2017 law legally introduced the system port authorities, imagining as a solution to the competitive problem a destination of use of one port over another. In other words, to ensure maximum competition, a system was envisaged in which ports had either a specialization or a cultural element from the past.</p>	<p>Economic inefficiencies still exist and can be solved by governing the economic system in which they occur, through a single system thought.</p>	<p>So we know that today both the pandemic and the war are creating a delay in the deliveries of goods, and a restriction of the supply of hold that are creating damage to the various industrial systems and above all an impressive increase in the cost of transport, especially of transport from Eastern Europe.</p>	<p>due to the war and the cost of fuel, the average unit cost of freight transport is already higher. In my opinion the number is more than 50% because you have to consider the cost of diesel during the pandemic and the cost of diesel after the war, the values are double, that is double.</p>
	<p>And Tapani in this situation, I'm talking about cabotage, could have a line for Tunisia, due to its historical and territorial vocation, also due to its proximity to Tunisia, and perhaps a line or to Livorno because the traffic, operators, Transporters especially from Marsala and Tapani have particularly strong relationships with the logistics platforms of Central Italy, especially Livorno.</p>	<p>Palermo has the characteristics to become the first port in the Mediterranean as a passenger movement, especially linked to cruising</p>	<p>Termini Imerese, then intercepting goods from western Sicily, but due to its position it can intercept goods from central Sicily, even for the sake of part of eastern Sicily. So let it be one of the interesting features in terms of load interception and an industrial system that is powered by large numbers.</p>	<p>For example, if you were to choose Termini Imerese for the transport of a product whose production takes place closer to Tapani, from the point of view of an expert logistics operator that choice would respond only and exclusively to political logic, because it cannot absolutely respond to economic logic, with the risk, among other things, of being unpopular with the shipping companies.</p>	<p>As there was no direction at a territorial level, there was the risk of overlapping entrepreneurial activities and therefore economic inefficiencies.</p>	<p>Since these are regional ports, the principle is valid according to which goods (especially large ones, for example wind towers) choose the ports closest to the place of production, because the cost of transporting the positioning, what in English is called inland cost, it must be as low as possible.</p>	<p>In the short term, extreme competition benefits the market. There is no doubt, however, that the market to be truly protected must have continuity of industrial activity; therefore there must be a concentration of activities, a breakeven point that can be reached more easily, a critical mass in terms of turnover that guarantees the investment, precisely with a vocation as you rightly defined before one port over the other.</p>	<p>Because then the goods, if I have unloading or loading, loading or unloading goods that are difficult to load and unload (I am referring to the project) and I have the equipment that I can renew because I do not lose traffic, it is clear that the traffic increases, but also the health of that system increases and this then means new jobs, because in the end then the social impact, the advantage, the wealth must be redistributed.</p>	<p>Obviously, greater organization and new traffic in terms of organizational improvement represent a synergy. That is, if that port is not equipped to seize that opportunity, it also loses the advantages that come from the outside. Here we are? so the number will definitely be positive. If companies are enabled to not lose critical mass and I am referring to containers and to be able to improve their industrial offer, for example being able to nationalize and further improve the efficiency of the equipment, essentially buying new means that in any case pass from the fact that no traffic is lost.</p>
	<p>Moving the containers to Termini Imerese from Palermo reproduces the same situation as in Palermo, requiring public-private structural investment, that would be in my opinion uneconomic or in any case with a possibility of return on investment in the very long term. The traffic is regional and belongs to western Sicily. In fact, I</p>	<p>I see Palermo as a huge port of landing boats and these ports or these tourist realities of the extreme western part of Sicily as a truly reference point for the tourist offer. And in this sense also luxury yachting, which are then billed in the area.</p>	<p>Termini has a physiological silting problem, and therefore needs these dams and protection. I believe that from a technical nautical point of view, it continues to have certain problems; therefore, I also see difficulties with the landing of container ships.</p>	<p>We are aiming precisely at Termini Imerese, because the logic can be political, not following the economic vocation of a port, the legal spirit that animates the new law 84. 94 of 2017. This is a contradiction that exists, but it is exactly the opposite of the logic of the system port authorities.</p>	<p>Before 2017, the port system concept was an economic concept, it was not a legal concept.</p>				



## **Coded Interviews**

All the coded interviews are available upon request. This appendix provides a list of all the coded interviews transcripts available.

- Coded Transcript 1: P-MPSAWS
- Coded Transcript 2: GS-MPSAWS
- Coded Transcript 3: TIPO
- Coded Transcript 4: TPO

# THESIS SUMMARY

## Introduction

The panorama of port authorities in Italy was strongly revolutionized with the approval of Legislative Decree no. 169 of 4 August 2016 on "Reorganization, rationalization and simplification of the regulations concerning the Port Authorities referred to in the Law of 28 January 1994", which aims to relaunch the Italian port system. The main effect that this measure had was the establishment of the "Port System Authorities", which aims to obtain a simplification of the decision-making process regarding matters relating to member ports of the network (e.g., investments, authorizations, collaborations, etc...) and greater efficiency through cooperation between geographically close ports. This reform therefore guarantees a strong centralization of strategic choices and considers the authorities as a single national port system, more than an articulation of autonomous institutions that operate in direct relationship with national institutions (ministries), with a view to cooperation and not competition that enhances the "Italy Wharf". The reform that has been approved therefore brings Italian ports into that phase of the development of a port called "regionalization", in which a new role of network coordinator is entrusted to the port authorities (Notteboom and Rodrigue, 2005). Regionalization, as such, therefore, provides a strategic solution to the internal distribution imperatives of the supply chain to increase efficiency, increase logistic integration and reduce distribution costs (Notteboom and Rodrigue, 2005). The problem is that during the regionalization phase, the overall system is affected by politicization and local rationality, which can influence the decision-making phase of the organization process of the member ports of a given Port System Authority, leading to an inefficient structure that does not fully exploit their intrinsic potential. So, in this paper the problem statement, which will be addressed, is:

*How do the politicization and local rationality influence the organization of a port system?*

In Sicily, one of the Italian Region, this brought to the creation of three different Port System Authorities: the western one, the eastern one, and the Port System Authority of the (Messina) Strait. In particular, in this research the attention will be focused on the Maritime Port System Authority of Western Sicily, which manages and coordinates the seaports of Palermo, Termini Imerese, Trapani. Porto Empedocle. The Porto Empedocle's port, which theoretically belongs to Western Sicily, will not be taken into consideration as it is not sufficiently relevant in size and role for the research on the specialization of ports, in the period in which this is carried out.

## Literature Review – Research Questions

The efficiency of a port system depends on the ability to act in a coordinated way, to enhance specializations and to ensure a high level of interconnection. In an integrated sector such as transport, in fact, the entire chain moves at the speed of its weakest link: congested interconnection networks and bottlenecks do not allow the offer of a reliable and efficient transport service (Montanino, Camerano, Dell’Aquila, Giuzio, Valdes, 2020). Therefore, performance analysis in the area of port efficiency is important.

In the perspective of ports as dynamic business networks, the issue of efficiency must be examined (Van der Lugt et al., 2007), where the global value proposition is strongly reliant on the capacity of the whole port community to create resources, skills, and capacities in a "coopetitive" approach (Nalebuff et al., 1996). Indeed, the efficiency is related to the notion of port competitiveness, a multidimensional concept based on the ability of port authorities and commercial entities to undertake value-added operations within an interconnected business system whose success intimately depends on how much the whole system is competitive (Parola, Risitano, Ferretti, Panetti, 2017). While port operators should prioritize the satisfaction of network business actors, Port Authorities should take on the role of community managers, capable of strengthening inter-organizational interactions within the ecosystem and, eventually, increasing port competitiveness (Verhoeven, 2010). The results of the recent studies of Parola, Risitano, Ferretti and Panetti, on the factors that influence the multidimensionality of ports’ competitiveness led to the identification of the ten main drivers. Among the drivers that can affect the port's competitiveness, the “Operational Efficiency” driver will be the one highlighted in this study since it is more closely related to the subject analysed because it considers the port's perspective rather than the users', allowing comparison across time.

### 1. *What does port's operational efficiency consist of?*

However, these traditional drivers of port competitiveness are continuously affected by cutting-edge industry trends which have the potential to have a substantial indirect influence on port competitiveness. Recently some of the most influencing changes, which have been necessarily affecting the role of Port Authorities, have been “*economies of scale in shipping, governance changes, competition among ports in proximity*” (Parola, Risitano, Ferretti, Panetti, 2017).

The last two trends, in particular, lead to the addition of a new phase within the port development process, characterized by the collaboration between geographically connected ports in order to create new resources and capabilities, called “*port regionalization*”

(Notteboom & Rodrigue, 2005). This enhanced port activity, as opposed to the normal one that only the landlord port authority benefit from, encompasses the whole port network achieving mutual goals (Notteboom and Winkelmanns, 2001). In other words, the port community must fully benefit from synergies with other transport nodes and other participants in the networks to which they belong (Notteboom and Rodrigue, 2005). So, this effective intermodal system could be crucial in order to safeguard goods in high-competition environments, creating strategic connections with other transportation networks aiming to cooperate on different functions. This is possible because port regionalization allows for greater specialization of ports in the system, consequently achieving economies of scale (higher volumes at lower costs) through division of labour and resource management, use of specialized skills, learning by doing, and product-specific economies of scale, as well as the use of equipment and infrastructure specifically designed to meet the needs associated with each type of port traffic. Therefore, networking of ports between neighbouring ports can prevent port authorities from wasting precious resources in port rivalry by segmenting markets and coordinating services (Notteboom and Winkelmanns, 2001). This is very important for the success of a port because the ability of a port to fit into the economic system that revolves around the network of ports, and all the economic agents that have to do with it within the same supply chain, will determine its success. In fact, it is necessary to conceive of logistics infrastructure as a unicum of nodes and networks, properly interconnected and sized, which allow cargo handling to be as smooth and free of bottlenecks as possible (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020). The optimization of logistics processes is therefore accomplished by exploiting connection between various actors. This approach seeks to fulfil consumer requirements while avoiding monetary costs and externalities such as climate change, air pollution, noise, vibration, congestion, and accidents (Sista, De Giovanni, 2021). From this point of view, the principle of making port-related infrastructure policy choices in a national and supranational logic is the trend that has been emerging in this sector in recent decades, and finally also in Italy with Legislative Decree no. 169 of Aug. 4, 2016, and the subsequent introduction of Port System Authorities. The application of regionalization in the Italian port system, although it allows to definitively overcome "the vision of ports as local assets" (Montanino, Camerano, Dell'Aquila, Giuzio, Valdes, 2020), is nevertheless a new phenomenon that needs to be studied in order to verify its effectiveness as practical reality can differ and counter the related theory.

## *2. How does the regionalization of ports make the system more efficient?*

Despite the numerous advantages, the regionalization phase also faces criticalities that compromise its effectiveness. According to Notteboom and Rodrigue (2005), these are: *slow start, identification of port-related activities, the distribution of costs and benefits, free riders, over-optimism, politicization of and local rationality in the regionalization process*. We are going to focus only on the last two issues, because of they are the one more related to the case it is analysed in the paper. First of all, Port Authorities can be subjected to excessive optimism on the potential of the system as it is not certain that the use of this approach is adaptable to any context. It may happen that, due to inadequate management of the port network, it is not possible to achieve cooperation between the members, and this leads to an overlap of skills that puts them in competition with each other (Notteboom and Rodrigue, 2005). Secondly, regionalization is a market-driven process in theory, but for the most part, ports still rely on governments to make the required expenditures in basic infrastructure, which should enable decent accessibility by land or water. As a result, the public sector plays an important role in setting the side limitations for what market participants may achieve in terms of regionalization. As a result, port regionalization is frequently revealed to be a process largely affected by political obligations rather than the 'invisible hand' of an efficient economy. Local rationale of port administrations and governments is also an important element. Any regionalization strategy developed by a port authority or local government has the interest in improving the port's competitive position; however, this does not always imply that the final configuration of the related load centre network provides the best solution for serving the larger hinterland regions as a whole (Notteboom and Rodrigue, 2005).

### 3. *What are the challenges of port regionalization?*

On the basis of what has been previously studied on the problem of politicization and local rationality in the context of regionalization, and therefore in the organization that takes place between the interconnected ports of the same system, there are academic gaps. In particular, what is missing is a study on the contexts and conditions that allow the correct application of Regionalization in order to derive its proven advantages. The present study, in fact, aims to investigate the limits with which a system of interconnected ports must confront, which are caused by the aforementioned problems of politicization and by the prevalence of local rationality over systemic one. This makes it possible to highlight the ideal conditions for the application of regionalization, showing that it cannot always be counted on.

This is observable in the case study taken into consideration by the Western Sicily Port System Authority, where it can be observed through the data of the three-year Operational Plan 2020-2022 the ports of the system are still "multi-purpose", meaning that they have a low level of specialization that does not allow the system to achieve full efficiency.

4. *How do the politicization and local rationality influence the organization of a port system?*

### **Methodology**

Since in-context research deals with the detailed examination of a particular case within a natural environment, it will be a case study. Moreover, the research is a longitudinal one as it analyses long term developments, considering past, present and possible future different scenarios. As regards the choice of research, the data collection methods are multi-method, that is, using both qualitative and quantitative methods. The modalities envisaged the consultation of the relevant literature and company archival data as regards the quantitative part. While the qualitative aspect took place through interviews with the people selected as the ideal sample for their knowledge and correlation with the topic.

Among the possible drivers that we saw in the previous chapter describe the competitiveness of a port, within this research we focus on the "Operational Efficiency" driver because it is the one that is more linked to the object of a research as it takes into account the point of view of the port itself rather than that of the users, both allowing for a comparison over time. Drawing the literature review, appropriate efficiency indicators were chosen, capable of summarizing the change in efficiency that a port system undergoes according to the changes made. In fact, if the operational efficiency is broken down to identify the factors underlying its value, these turn out to be total volume of freight transport, total volume of passenger transport, average unit cost of freight transport, average unit cost of transport passengers. These are the main components of the macro items of operating revenues and costs, which in turn are the elements necessary to calculate the added value that derives from the operation of the port. Since the data are extremely variable and uncertain due to their nature, once it has been obtained the necessary quantitative data on the trend over time of the variables considered, estimates are collected from the interviewees on the future percentage variations of the KPIs compared to the current situation. The current situation consists in a currently incomplete specialization of ports for the reasons mentioned in the second chapter such as the influence of the social, economic, and political aspects specific of each port on the organization of the port network

itself. On the other hand, in the alternative future scenario, whose future trend estimates are asked again of the KPIs considered in the research, effective specialization of the gates is implemented in the most congenial way for each of them.

Once this type of data has been obtained, through a comparison between the two different scenarios of real and ideal evolution, the presence of hidden potential in the network of ports in Western Sicily will be demonstrated.

To classify and code the interview data before they were ready to be displayed and analysed, the first step was to define the various categories and subcategories. The categories chosen are based on the basic concepts of this research presented in Chapter 2. Each top-level category (Specialization, Politicization and Local Rationality, Western Sicily Port System Authority) has a colour code. The associated subcategories are all represented by the same hue and can be further recognized by their distinct text codes. Figure 2 (page 26) provides an overview of the (sub)categories, colour codes, text codes, and clarifying definitions.

The actual coding of the data was the second step in the procedure. Each interview has been meticulously examined for pertinent information. Every essential piece of information has been allocated a colour and textual code. The figures at page 27 show two instances of coded interview segments.

The final stage in the coding technique was to enter the coded data into a table. This table can be found in the paper's appendix section. The coded information is arranged by interview and category in that table and is briefly summarizing the concepts said by the interviewee. Figure 5 at page 28 depicts a portion of the table's setup to give you an idea of how it looks.

## **Results**

### *1. What does port's operational efficiency consist of?*

The concept of efficiency is linked to the concept of port competitiveness, a multidimensional concept based on the ability of port authorities and commercial entities to conduct value-added operations within an interconnected business system whose success is intimately related to how competitive the entire system is (Parola, Risitano, Ferretti, Panetti, 2017). While port operators should emphasize network business actor satisfaction, Port Authorities should assume the position of community managers, capable of enhancing inter-organizational connections within the ecosystem and, finally, increasing port competitiveness (Verhoeven, 2010). The findings of recent research conducted by Parola, Risitano, Ferretti, and Panetti on the factors influencing the multidimensionality of port competitiveness resulted in the identification of 10 key drivers.

## *2. How does the regionalization of ports make the system more efficient?*

Port regionalization is the last stage in a port development process, which consists of cooperation and coordination with neighbouring ports in order to create an interconnected system of ports. Coordination of member ports takes the form of specialization in the functions best suited to each of them, depending therefore on both the geographical and industrial characteristics that characterize each port. Connecting ports within the same system allows for the accumulation of resources and the production of new ones. Unlike typical port activity, which benefits solely the owning port authority, this enhanced port activity incorporates the whole port network in attaining common goals (Notteboom and Winkelmanns, 2001). By segmenting markets and coordinating services, port networking between nearby ports helps avoid port authorities from squandering important resources due to port rivalry (Notteboom and Winkelmanns, 2001). This is critical for a port's performance since the ability of a port to integrate into the economic system that revolves around the network of ports and all economic agents that deal with it within the same supply chain determines its success.

Based on the information gathered from the interviews, it is clear that the application of greater specialization in network ports is supported by the interviewees, which improves operational efficiency drivers and, as a result, increases their competitiveness, confirming what has been stated in the literature. In reality, in this ideal scenario of total specialization of the Western Sicily system's ports, the interviewees' thoughts led to final findings comparable to the previous ones in terms of the trades' volumes. On the contrary, future projections of the expenses of such traffic in this scenario are better than earlier ones since it is conceivable to make the port system more competitive and appealing to traffic, drawing bigger volumes. When this occurs, the benefits of specialization (such as division of labour and resource management, the use of specialized skills, learning by doing, product-specific economies of scale, and the use of equipment and infrastructures specifically designed to meet the needs of each type of port traffic) contribute to reduce the average unit cost of transporting goods and passengers and, as a result, an increase in profits. However, an essential condition is required in order to acquire this form of port organization. The ports of a network must be sufficiently connected to one another by infrastructure that ensures inter-modality and collaboration among the various ports. A process known as regionalization.

## *3. What are the challenges of port regionalization?*



The regionalization phase is confronted with key difficulties that jeopardize its efficacy. Notteboom and Rodrigue (2005) cited politicization and local rationality as potential barriers to regionalization. It is possible that insufficient management of the port network prevents members from cooperating, resulting in overlapping competencies that put them against one other (Notteboom and Rodrigue, 2005). This state is revealed to be the outcome of the two essential concerns raised, as observed by the interviewees. Indeed, for the most part, ports continue to rely on governments to fund basic infrastructure, which should provide for reasonable access by land or sea. As a result, the public sector has a significant impact on the path that ports in a port system follow. As a result, port regionalization is frequently a process affected by political commitments rather than economic logics of efficiency. Local rationality of port administrations and governments is also critical. Any regionalization strategy developed by a port authority or local government has the goal of increasing the port's competitiveness; however, this does not always imply that the final configuration of the relevant cargo centre network provides the best solution for serving the larger hinterland regions as a whole (Notteboom and Rodrigue, 2005). Indeed, the interviews revealed that the Port System Authority's administration of a network of interconnected ports is susceptible to diverse pressures determined both by the demands of each port's target population and by continuing individualistic thinking within the Authorities themselves. In truth, rivalry and the desire to own the greatest traffic may be found among Authorities from the same Region.

*4. How do the politicization and local rationality influence the organization of a port system?*

This research has set itself the objective of investigating more in depth one of the concerns identified by Theo E. Notteboom & Jean-Paul Rodrigue in the paper "Port regionalization: towards a new phase in port development", but which was not explored further. In fact, this paper shows the inefficiencies that can occur in the development process of a port network if this is influenced by non-economic reasoning, such as politicization and the prevalence of local rather than systemic logics, which limit its growth potential. This is observable in the inefficiencies still present in the Italian Port System Authorities both between the ports within them, due to the only partial specialization, and of the Italian port system as a whole since, as the information gathered through the interviews shows, there is an excessive number of port authorities compared to those which would really be needed, precisely to satisfy the "local economic aspirations of officials and politicians".

The result of this research is therefore the convenience and efficiency of a port system by organizing itself into a coordinated network of ports that divides the typical functions of a port in the most appropriate way in order to maximize the performance of each of the ports, and therefore of the system as a whole. But only if the conditions and characteristics that allow its feasibility, both structural and geographical, are present. If the necessary conditions exist, meaning that the ports of the system are effectively connected with adequate infrastructures, bringing the ports together under a single management that manages and coordinates them and giving each of them a specific address based on the port's vocation, is the best solution as confirmed by the President of the System Authority. The problem remains that the Authority's decision-making power is confined to the port areas only, while all the intermodal infrastructures are beyond its control. This makes the Authority's work extremely complicated since, as suggested by the President, a reform of the entire Italian bureaucratic system is necessary.

### **Limitations and Future Research**

The following research has been characterized by limitations that offer insights for better and more detailed studies in the future. Due to lack of time on their part, the four interviewees were the only ones to immediately grant availability to the interview. This has led to the fact that, in addition to the lack of data, there is an absence of perspectives external to the context of Western Sicily. Furthermore, the lack of precise quantitative estimates by the interviewees who expressed themselves mainly qualitatively, due to the intrinsic difficulty of the type of data processed that do not allow forecasts, makes the research improvable.

In this very respect, research on the issues raised in this article can be improved. In particular, given the limited means in calculating and managing the great unpredictability of the data in this sector which make it difficult to make precise future estimates, the development of a mathematical model that more precisely shows the validity of the hypotheses demonstrated so far, would give them even more solidity. Furthermore, a greater number of interviewees, who can thus provide even more different points of view and above all conflicting opinions, allows us to broaden our vision on the subject, extending the sample of interviewees to other authorities in the Sicily region. It would be equally interesting to receive internal opinions from the ministry and / or the central government on the matter, to understand how aware they are of the current situation of the Italian port system, and what is being done to improve further.