REVISITING THE COOPERATION MATRIX FOR CLASSIFYING CASES OF PORT COOPERATION — CASE STUDY: NORTHERN ADRIATIC PORTS

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ABSTRACT: *The maritime industry has witnessed transformational changes due to the structural developments in the competitive landscape among maritime stakeholders. These trends lead to cooperation between ports, particularly those sharing common hinterland. This paper extends the existing frameworks for analysing cases of port cooperation among adjacent ports by exploring the relevance of the presence or absence of a national border, thus proposing an upgraded version of the matrix for classifying cases of port cooperation. We operationalize our theoretical findings with a case study of the North Adriatic (NAPA) ports. We conduct in-depth, semi-structured expert interviews with relevant port stakeholders in order to position the NAPA ports within the matrix, as both a group of ports and individual port-pairs.*

Key words: *port cooperation matrix, Northern Adriatic ports, port cooperation, cross-border cooperation, port stakeholders*

JEL classification: L90; L9; R40

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1 INTRODUCTION

According to Robinson (1998, p. 32), 'Port growth is a function of the production outcomes of firms in the port's adjacent space—or of that space to which it is linked, either in landward space or in areas linked across water or ocean', which implies that the location is central to the development of port growth. This paradigm may have changed significantly in the last two decades. Many scholars recognize that ports can no longer rely on the loyalty of their users, since ports face increasingly international users that may switch ports relatively easily. This has been caused not only by the increasing containerization of cargo, which has in turn enabled greater intermodality of the seaborne trade (Malchow & Kanafani, 2004), but also by the concentration and consolidation of the shipping industry,

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which has created large, vertically and horizontally integrated, global shipping lines (Seo & Ha, 2010). Recent developments, such as the 'Belt-and-Road Initiative' (BRI) reviving the old land trade route – Silk road – by rail between Asia and Europe and the new shipping routes in the Arctic (Hong, 2012), additionally affect the competitive landscape among ports. In any case, all these trends lead to cooperation between ports, particularly those sharing common hinterland.

The majority of global seaborne trade by containers is now controlled by the ten largest vertically and horizontally integrated container shipping lines (UNCTAD, 2018; Alphaliner, 2019). Furthermore, the use of containers as a transportation unit is markedly increasing each year, due to the obvious benefits of standardization in transportation.[4] More recently, it has become apparent that the shipping lines are not only controlling the transportation by sea, port and terminal operations and hinterland delivery operations, but also the activities that were traditionally provided by the freight forwarders. These include, among others, customs processes, warehousing, cargo manipulation and last-mile delivery. Considering the trajectory of these trends, it has become imminent that the key decision making in routing of container traffic has shifted to shipping lines. For ports and port authorities this should be the key strategic consideration.

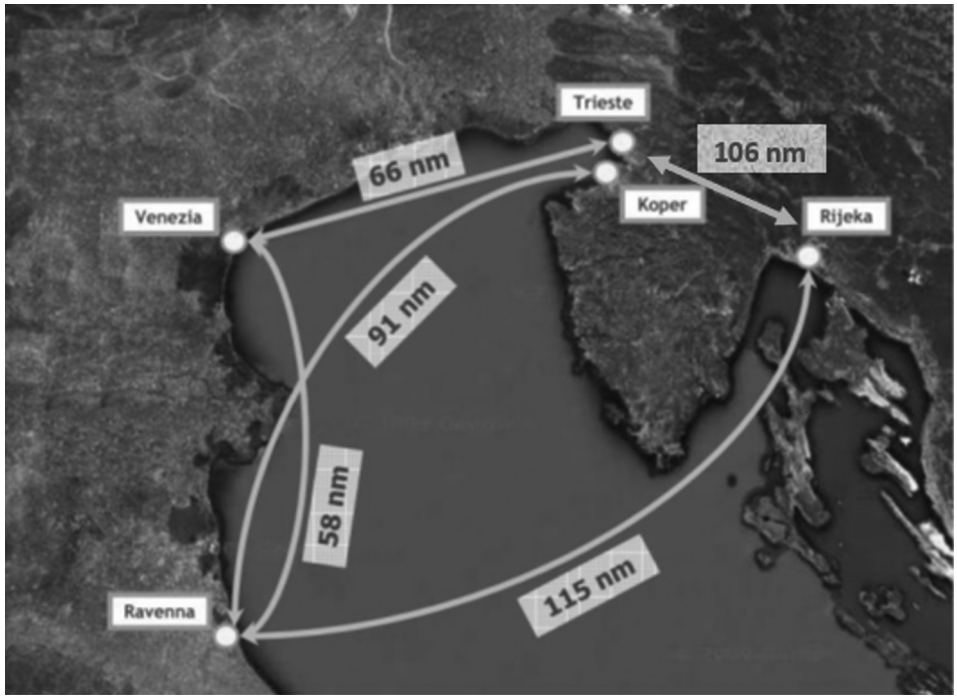
Cooperation among ports has been mentioned by many authors as one of the possible forward going trends in the maritime industry (Notteboom, 1997; Wang, 1998; Park et al., 2006; Li & Oh, 2010; Hwang & Chiang, 2010). Most research describes and explains context-specific cases of port cooperation (Song, 2002; Yap & Lam, 2006; Seo & Ha, 2010, Wang et al., 2012 or more recently Wu & Yang, 2018; Trujillo et al., 2018; Huo et al., 2018). Some studies have categorized and classified types of possible port cooperation strategies (De Langen & Nijdam, 2009; Freemont & Lavaud-Letilleul, 2009). However, limited research has been made on providing an overarching understanding of port cooperation, which would not only help better assess the extent of port cooperation, but also shed more light on the options and possibilities for its improvement (McLaughlin & Fearon, 2013; Stamatović et al., 2018). The existing research frameworks are therefore of limited use in explaining varying levels of port cooperation or even absence thereof in regions where various ports serve a shared hinterland. This paper attempts to build on the current understanding of port cooperation among adjacent ports by extending the existing framework for classifying cases of port cooperation and applies the new framework to the ports in the North Adriatic region.

The North Adriatic region is represented by five ports from three different EU member states: Ravenna, Venice, and Trieste in Italy, Koper in Slovenia, and Rijeka in Croatia. As of late 2017, all five of them are also members of the North Adriatic Port Association (NAPA) and are hereafter referred to as the NAPA ports. These ports serve as an excellent, perhaps even unique, example for demonstrating a case of cross-border cooperation among ports in vicinity. The distance between the most distant ports Rijeka and Ravenna is 115 nautical

4 from approximately 200 million TEU in 2000 up to 750 million TEU in 2016 (World Bank, 2019)

miles. The shortest distance is the one between Trieste and Koper, which is merely 13 nautical miles (Figure 1).

Figure 1: *NAPA ports by nautical distance (source: Ports of NAPA, 2017)*



These adjacent ports lie in three different countries which, despite all of them being members of the EU, have different approaches to port governance, transport infrastructure strategies and national agendas on development priorities. NAPA ports rely, largely, on serving contestable hinterlands of the CEE and SEE region, aspiring to become the gateway to the afore mentioned regions. This is however complicated by the fact that, despite the substantial geographical advantages of the area, NAPA face scale differences to the North European hub ports (Notteboom & De Langen, 2015). The infrastructure capacity represent a large impediment and is unable to cope with the existing and growing throughput, which manifests itself in railroad bottlenecks (Koper, Trieste, Rijeka), insufficient terminal quay capacity (Koper), or even lack of space for terminal expansion (Rijeka), and shallow shore unable to accommodate ultra large vessels (Venice), among others. Not only do NAPA ports face inter-range competition from the Hamburg-Le Havre region, they also face inter-port competition, due to the dyssynchronous port policies and incongruent port management models (service port Koper vs. landlord ports Trieste, Rijeka, Venice). Finally, initiatives to connect the port of Piraeus to the CEE region by rail via Serbia up to Budapest in Hungary further endanger their ambitions. Also, since the NAPA region is a

turnaround region for the shipping lines (Stamatović et al., 2018), this requires additional economic justification of making a port call to NAPA. Finally, as already mentioned, given the omnipotent position of the shipping lines, the bargaining power of each individual port is severely limited. Given the plethora of challenges upon them, the NAPA ports seem a clear case of adjacent ports which would benefit from multilateral, cross-border cooperation. In addition, the NAPA ports as an example allow us to evaluate national and cross-border perspectives simultaneously.

This paper attempts to build on the current understanding of port cooperation among adjacent ports by extending the existing framework for classifying cases of port cooperation. First, we review the main literature on port cooperation in general, and more specifically the theoretical conceptualizations of port cooperation that have been introduced thus far. Second, we observe several cases of port cooperation in adjacent ports in both national and cross-border contexts. Third, we propose an upgraded version of the matrix for classifying cases of port cooperation and propose a research design to evaluate the positioning of the NAPA ports within the matrix. Fourth, we present the NAPA ports in greater detail, summarize the findings of our research and elaborate on the positioning of NAPA within the matrix, from both national and cross-border contexts. The final section summarizes our findings and suggests areas for further research.

2 LITERATURE REVIEW

2.1 Port cooperation as a survival strategy

Malchow and Kanafani (2004) claim that port activity no longer depends on port's immediate hinterland, due to the development of intermodal transport. Fageda (2005) confirms this claim and adds that intermodal transport has enlarged the gravitational centres of ports and in many cases has given rise to competition between ports, where it was previously non-existent. De Langen (2007) goes further by saying that captive hinterlands have diminished, and that huge competition is in fact happening in the contestable hinterlands, i.e. "those regions where there is no single port with a clear cost advantage over competing ports". Acciaro et al. (2017) also find that port competition takes place on both sides: maritime and inland. Additionally, the rapid development of international container and intermodal transportation has drastically changed the market structure from one of monopoly to one of fierce competition in many parts of the world. Ports, especially those in the same region, became more substitutable, which has intensified competition between them for greater market share. On the other hand, while port competition is fierce, ports are not perfect substitutes, i.e. they are not perfectly interchangeable or at least not without a cost (OECD, 2008). Gateways still have a strong position in at least some of their service area as hinterlands never overlap completely. De Langen (2007) confirms this notion by exemplifying that Southern European ports clearly have a distance advantage for cargo from Asia, however, the majority of cargo is still routed via the Northern European ports. Notteboom (1997, 2010) reports similar findings.

In times when shipping lines are becoming large logistics conglomerates, amassing logistics assets both vertically and horizontally and thus controlling supply chains door to door, cooperation between ports is imminent. The global top ten shipping lines now control over 75% of the global container market share and thus have strong leverage in negotiations with ports and terminals on terms and conditions. Furthermore, shipping lines deploy ever-larger ships to increase container-per-vessel utilization and thus reduce overall costs per unit carried. A weekly call of a 20.000 TEU vessel translates into about 300.000 TEU per year (Notteboom, 2010), hence winning or losing a weekly call service can have a considerable influence on port's yearly throughput. This shows the impact of shipping lines on ports.

Considering the above described trends, there is a general consensus in the literature that port cooperation is a potentially beneficial strategy for ports. Cooperation between ports in adjacent areas can be instrumental both to attract shipping lines and to consolidate the bargaining power of ports vis-à-vis shipping lines. Notwithstanding all these potential benefits, we nevertheless observe only a few examples in the world where cooperation actually does take place. Moreover, what can also be observed is that these cases normally happen within the same country and rarely across borders. A theoretical framework of port cooperation strategies should therefore attempt to encompass the observed varying levels of the port cooperation strategies among adjacent ports. In the next section, we explore the existing conceptualizations of port cooperation frameworks.

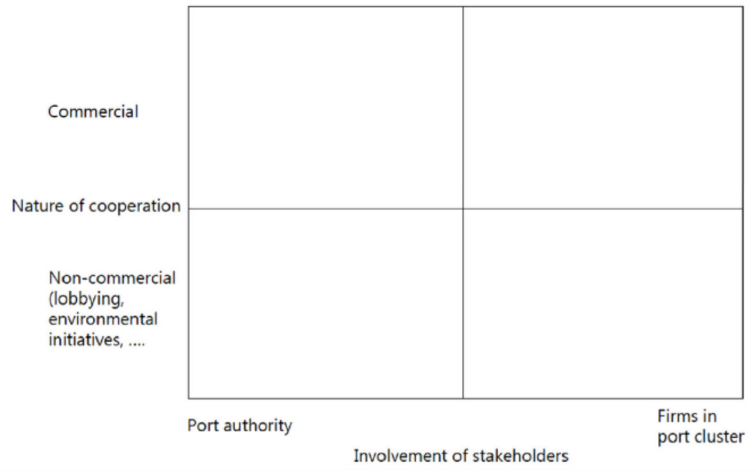
2.2 Current conceptualizations of the port cooperation framework

De Langen and Nijdam (2009) propose three levels of cooperation, namely port authorities that have developed strategic cooperation with other port authorities in their vicinity in forms of joint holdings, investments and acquisitions, port authorities that do have some form of cooperation but not at a strategic level, and port authorities that do not have any form of cooperation with ports in their vicinity, beyond being members of port associations or networks (e.g. ESPO, Ecoports). Freemont and Lavaud-Letilleul (2009) provide a more detailed classification of cooperation by registering different types of ports. They posit that the type of cooperation depends on the port profiles in the sense that the strategy of cooperation is not universal for all ports in proximity. This is a sensible conclusion, since ports which specialize in RO-RO[5] cargo are not in competition with ports that specialize in container traffic. By analogy, then adjacent ports which both specialize in container traffic are in competition. The authors therefore distinguish between ports linked in a strait or an island, ports with different profiles and ports with similar profiles. They go further in their proposal of the framework by claiming that ports may even change their profiles in cases when adjacent ports would consider building a complementary relationship. Authors also provide good examples of mutually beneficial cooperation strategies, for example where one port has better nautical accessibility due

5 Roll-On, Roll-Off (RO-RO): self-propelled vehicles which are loaded on and off vessels using their own wheels or a purpose-built tow vehicle.

to deep berth, while another has better terrestrial accessibility. Instead of each making individual investments to overcome these hindrances, ports could coordinate resources in a way to complement each other in their respective hindrances, thereby reducing the necessary investments. The ports that we analyse later in this paper fit perfectly to such example, for example, Venice port has shallow berthing while Trieste has natural deep-water access. Mclaughlin and Fearon (2013) provide a comprehensive framework for assessing the extent of cooperation among ports by postulating a cooperation-competition matrix, which discriminates between the level of cooperation on one axis and the degree of competition on another axis. This framework enables the assessment of how different forms of cooperation reduce competition. Authors argue that ports should move towards the lower right-hand side of the matrix with a higher degree of cooperation, higher private sector drivers and low competitive rivalry. This conceptual framework is useful for analysing ports with similar profiles (as per Freemont & Lavaud-Letilleul, 2009) sharing common hinterland, as it considers cooperation not only from a public but also commercial perspective. More recently, Stamatović et al. (2018) developed a cooperation matrix for classifying cases of port cooperation (Figure 2), which distinguishes between the depth of cooperation (commercial vs. non-commercial) and the level of involvement of stakeholders (port authority vs. firms in port cluster). The direction in which ports should consider moving is towards the upper-right quadrant, in which private firms in port cluster engage in commercial type of collaboration with joint collective action. All other quadrants are less attractive, due to the limited influence of port authorities on commercial decision, and on the other hand, due to the limited incentives for private firms to engage in a non-commercial type of initiatives, such as lobbying or environmental initiatives. However, authors also draw another important conclusion not mentioned in the literature before, namely for port cooperation to be effective, ports must first be complementary. As authors postulate, ports can be considered complementary when port A benefits from the improved competitive position of port B and vice versa. Complementarity thus becomes a necessary condition prior to evaluating port cooperation level among ports in vicinity. In other words, for the evaluation of their potential cooperation strategies to be sensible, ports must first be classified as complementary.

Figure 2: *Cooperation matrix for classifying cases of port cooperation (source: Stamatović et al., 2018)*



2.3 Examples of national and cross-border cooperation strategies

The following recapitulation of some examples of national and cross-border port cooperation aids in better understanding of the triggers and drivers behind cooperation strategies. One well documented example is that of the Copenhagen-Malmö port, which resulted from a merger of two ports, Copenhagen and Malmö, in 2001. Admittedly, the merger happened as a survival strategy due to the opening of the Öresund bridge connecting Denmark and Sweden, which in turn meant loss in passenger traffic, putting both ports to existential jeopardy. Nonetheless, the merger was completed and many new opportunities in logistics opened up for the merged port. As De Langen and Nijdam (2009) document, success factors that led to the successful merger were a mix of commercial (leadership by port's CEOs, momentum due to the opening of the Öresund bridge, focus on cost reduction, better utilization of sources) and institutional (political and societal support, cultural commonalities) factors. Another example of a successful cross-border merger is a more recent one, between Ghent in Belgium and the Zeeland ports in the Netherlands, which happened at the end of 2017 and is now called the North Sea Port. The idea behind merger was very simple–efficiency, better economies of scale and removing overlapping activities with an increased possibility of optimizing cargo flows within the ports. Also, in Belgium, the ports of Antwerp and Zeebrugge established a commercial type of cooperation, whereby both ports offer the option of using Zeebrugge as the import and Antwerp as the export point. In addition, in times of congestion in Antwerp, vessels could be diverted to Zeebrugge. Finally, they also cooperate on joint commercial activities like fairs, visits etc. (Hope, 2015), however, a merger, as the ultimate form of cooperation, has been ruled out so far (Pieffers, 2019). Another example is the Ningbo-Zhoushan port merger which happened in 2015, whereby two competing ports merged into the world's

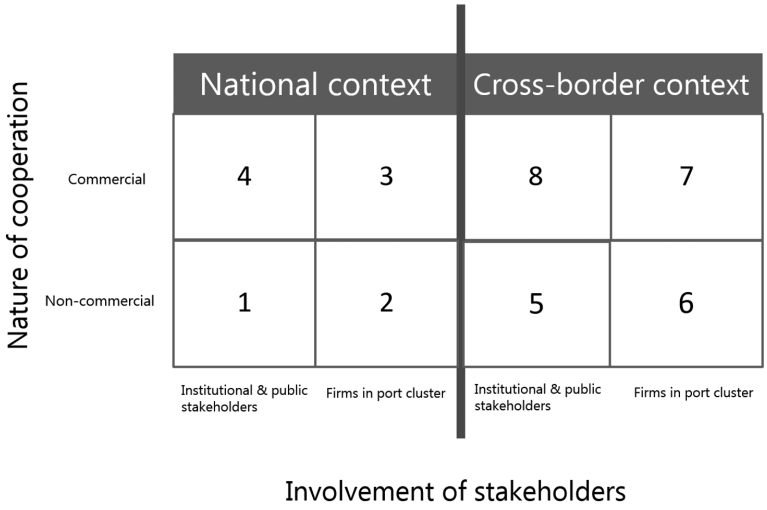
busiest port by tonnage handled. The Ningbo port specialized in container cargo, while the Zhoushan port specialized more in the general and bulk cargo. By combing their port specialization portfolios, they are today able to provide a competitive offer, serving the same clients without competing against each other. In general, the Chinese national and provincial governments are able to facilitate mergers among ports where it appears to make sense, arguably with lesser difficulty, due to the centrally, state-planned economy (for a comprehensive list of port cooperation examples in China see Huo et al., 2018). A slightly different type of cooperation is that of Seattle and Tacoma in the US, now joined in the Northwest Seaport Alliance, where the governing party is a port development authority led by two ports respectively as equal members. Reasons for this strategic cooperation are broadly identical to the previous examples given – efficiency, economies of scale, better profitability and utilization of resources (see Yoshitani, 2018). On the other hand, there is also a handful of failed port cooperation attempts, e.g. Los Angeles-Long Beach (see Knatz, 2018) or Houston-Galveston (see Galvao et al., 2018).

3 METHODOLOGY

3.1 Revisiting the matrix for analysing cases of port cooperation

The non-exhaustive brief review of the actual examples of port cooperation discussed in the previous section indicates that there are both 'domestic' and cross-border cases. Intuitively, overcoming certain obstacles in both commercial and institutional sense is easier with a common political and legal framework. This is in line with Mclaughlin and Fearon (2013) who posit that mergers, as the ultimate form of cooperation, are more likely when they are a part of national economic agendas. The existing frameworks assume, ceteris paribus, that the national political agendas and legal frameworks do not influence the likelihood and depth of cooperation, particularly at the institutional level. We believe however that the distinction between the national and cross-border contexts is pivotal in understanding the complex dynamics of port cooperation between adjacent ports, hence we propose an upgraded version of the matrix originally postulated by us (Stamatović et al., 2018). This version of the matrix clearly distinguishes between national and cross-border contexts (see Figure 3). We apply this matrix in our analysis of the NAPA ports in the later section.

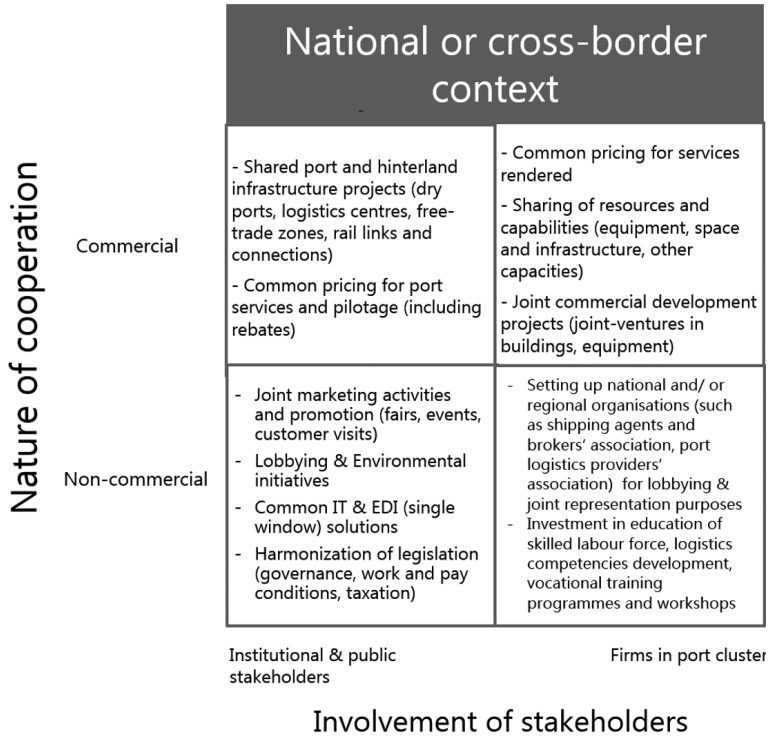
Figure 3: *An upgraded cooperation matrix for classifying cases of port cooperation*



Furthermore, we expand the original explanation of the types of activities that can be classified in each quadrant of the matrix. This improves the value of the framework as a decision-making tool. Figure 4 suggests certain examples of what could pertain to each quadrant. The list is by no means exhaustive, but instead provides some specific examples of such strategies. In this context, quadrants 1-4 are equal to 5-8 in terms of port cooperation strategies and initiatives. As a general guidance in terms of classifying cooperation strategies, we propose considering the following. Non-commercial quadrants represent the types of cooperation where benefits do not directly translate into monetary terms. From the perspective of firms in port cluster, this would mean for example better work conditions, improvements in legislation, and general representation initiatives which stand for the cooperating ports and which lobby for improvements towards relevant institutions where benefits are spread towards all stakeholders. From the perspective of institutional stakeholders, non-commercial initiatives mean common marketing campaigns which promote an entire region and not only a particular port, joint lobbying activities with relevant national and supra-national legislative bodies, and various environmental initiatives where there are benefits also for the ''public good". In general, the effects of the non-commercial activities do not have a directly measurable monetary value, but instead have an overall positive effect on improving the general position of the stakeholders in question. On the other hand, commercial quadrants represent the types of cooperation which have direct monetary impacts that will have value directly (and only) for the stakeholders involved in a certain initiative. From the perspective of firms in port cluster, the commercial type of cooperation means sharing certain resources or making joint investments (e.g. shared warehousing capacities, shared development of IT solutions) or

even common pricing strategies or guidelines on services rendered[6] (e.g. freight forwarding services, terminal handling services, etc.). However, from the perspective of institutional stakeholders, the commercial activities mean developing infrastructure projects that benefit more ports, a common pricing strategy on port and pilotage services, and even, as Stamatović et al. (2018) suggest, introducing quantum rebates on terminal handling costs to attract more shipping lines to a certain region. In conclusion, joint commercial efforts have a direct (positive) monetary impact for the stakeholders (institutional/public or commercial) involved in such common strategies.

Figure 4: *Examples of the cooperation strategies among stakeholders involved for each quadrant.*



3.2 Research design

We conduct in-depth, semi-structured expert interviews to assess the level of cooperation, and in particular to position the NAPA ports within the matrix proposed in the previous

6 Without suggesting any cartel-like agreements on pricing, but more as a general guidance type of initiatives, e.g. a minimum rate for rendering a certain service in the logistics industry. This is common e.g. in the IT or legal industry, where official representative bodies publish guidance on minimum hourly rates for lawyers, IT specialists, etc.

section. For our research project, we conducted a total of 15 interviews, part of which were executed in person and the other part by phone. Expert respondents were selected based on their position in their organization and their length of tenure. We thus gathered views from country managers or commercial managers of five major shipping lines for the NAPA region, four port authority representatives, C-level managers of two rail operators and of four forwarders from Italy, Slovenia and Croatia. The questions that were prepared in advance were personalized for four categories, namely carriers, forwarders, intermodal operators and port authorities.[7] All respondents were asked to assess the current level of cooperation among stakeholders in order to point out the benefits of cooperation and most importantly, to highlight the hurdles preventing higher levels of cooperation. Finally, we challenged the respondents to provide potential solutions in overcoming these pitfalls, by asking them to consider several hypothetical NAPA port situations, such as "*Would your answer differ, if all NAPA ports were located within the same country?*". The respondents' answers were marked, after which an oral summary of their replies was provided to confirm that our understanding of their answers is correct. In addition, respondents were kept anonymous, since if they were cited formally, they would have to obtain approvals from their organizations, which could have limited our findings. The interviews usually lasted 1-2 hours and took place between May and July in 2017.

There are a few clarifications that need to be made to our analysis. First, our research (both its preparation and execution) was done during the first half of 2017, during which the Ravenna port was not yet (again) a member of the NAPA organisation. Since it rejoined the organization in the late 2017, it was consequently not part of our analysis. We nevertheless acknowledge that future research on this topic could provide insightful results, if Ravenna, as the third Italian port in the NAPA organization, was included. Second, our focus is entirely on container traffic and throughput. Not only is the container traffic growing globally as a transport unit segment, but it is also the most important market segment for the NAPA ports, in terms of both profitability and future development and expansion plans. Finally, the interview transcripts and notes that were used as research material in this paper were part of a larger research project conducted by the authors of this paper (for the other publication of this research project see Stamatović et al., 2018).

4 EVALUATING THE PORT COOPERATION STRATEGIES IN NAPA

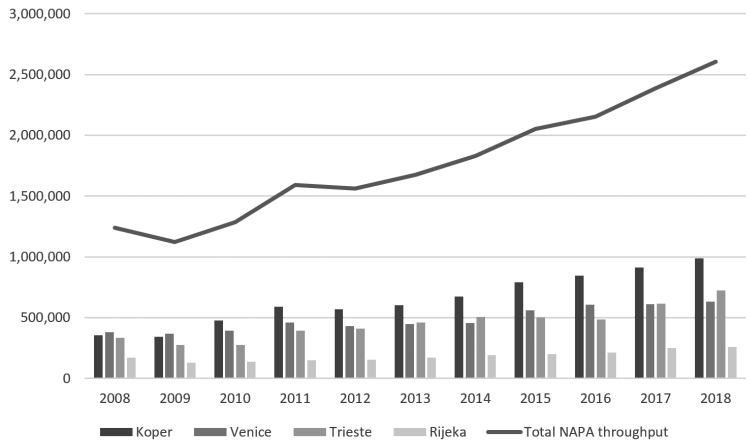
4.1 NAPA ports: brief introduction

The NAPA region consists of five ports, namely Ravenna, Venice, Trieste, Koper and Rijeka. However, since Ravenna rejoined the NAPA organisation only in late 2017, as explained in the previous section, we consider only Venice, Trieste, Koper and Rijeka for the purposes of our analysis. The NAPA ports aspire to become a regional gateway for the Central with Eastern and South Eastern European region, however, arguably Venice mainly serves the Veneto region in Italy, while the other three ports do indeed serve several markets,

7 See the full set of relevant questions per group category in Appendix 1.

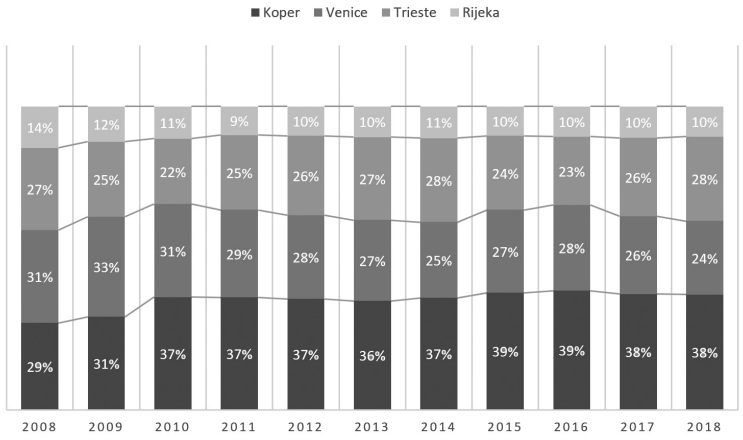
with some degree of overlap. In total, the NAPA region has more than doubled its total container throughput in the last decade, exceeding 2.5 million TEU (see Figure 5).

Figure 5: *NAPA container throughput during the 2008-2018 period in TEU (source: Port of Koper, 2019a; Port of Rijeka, 2019; Port of Venice, 2019; Port of Trieste, 2019).*



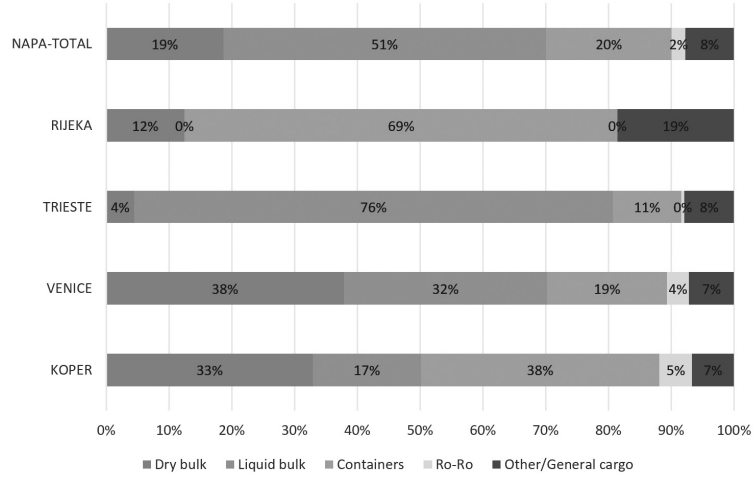
Among them, Koper maintains the largest market share (40%), Rijeka the smallest one (10%), while Venice and Trieste share the remaining half in about equal shares (see Figure 6).

Figure 6: *NAPA ports container throughput market share during the 2008-2018 period in % (source: authors' own elaboration).*



In terms of cargo type handled by weight[8] by the NAPA ports, we observe that liquid cargo is predominant in Trieste and containers in Rijeka, while Venice and Koper have a more evenly spread distribution between dry, liquid and container cargo (see Figure 7).

Figure 7: *Cargo type throughput split in percentages of total tonnage throughput in a single port and the NAPA as an entire region in 2017 (source: Eurostat, 2019).*



All the studied ports are multi-purpose ports with general emphasis on container handling. It has been posited by Stamatović et al. (2018) that firstly, NAPA serves as a turnaround region for the shipping lines' service loops, i.e. NAPA ports are the last and first calls in a service loop connecting two regions, and secondly, that the NAPA ports are broadly complementary. The growth in the NAPA ports' throughput in the last decade has been attributed to attracting cargo that has previously been routed via Hamburg-Le Havre range ports (Notteboom, 2010), as a consequence of its shorter nautical route from the Far East via Suez Canal which in turn gave rise to the introduction of the direct deep-sea service loops with the Far East. All major alliances are calling the NAPA ports, whereby the Mediterranean Shipping Company (MSC) also owns the majority share in Trieste's main container terminal. A sizable amount of infrastructure projects co-funded by the EU institutions have taken place particularly in developing the hinterland railroad network, expanding and enlarging container handling capabilities and coastal dredging, necessary

8 However, the cargo split per weight basis is partly biased in favour of heavy cargo–liquid and dry bulk–since containers are limited in terms of weight they can carry, while RO-RO cargo is by definition the per unit basis and is limited in weight as well. In other words, such comparison indicates port specialization, but cannot be entirely conclusive

to accommodate the largest vessels. Despite all the developments, the scale gap with the Northern European ports is still significant[9] (Noteboom & De Langen, 2015).

The NAPA ports have a shared exposure to risks brought about by the promotion of new routes serving the same hinterland, i.e. the railroad to CEE from Piraeus, railroad from Mainland China to CEE, etc. This implies that all stakeholders in the region would benefit from a joint market approach.

4.2 Positioning of the NAPA ports in the upgraded port cooperation matrix

Observing the cooperation efforts in the NAPA region in the past two decades, we see the emergence of various cooperative initiatives and projects. The biggest cooperative achievement represents the North Adriatic Port Association (NAPA) established in 2010. All five ports, i.e. Ravenna, Venice, Trieste, Koper and Rijeka, are now active members of it, with the Ravenna port's brief departure for a certain period[10] and the Rijeka port joining a few years after the association was established. Prior to the association's existence, there were some cross-investment and concessionary attempts between Koper and Trieste (see Port of Koper, 2019c and OECD, 2011, p.125), however, without significant results. Theoretically, on paper, the purpose of the association is to coordinate joint marketing activities in promoting the NAPA ports, obtaining EU funding and partaking in various environmental and IT projects (e.g. single window, MOS4MOS, Fresh Food Corridor NAPA4CORE). The association is also tasked with coordinating the development of a common infrastructure, nevertheless, this part has not had fruitful results. One such initiative was to connect Trieste and Koper by rail, as an alternative to Slovenia building itself a second rail track between Divača and Koper, otherwise the main bottleneck area in the Slovenian railway network. The possibility of building a second rail track from Divača to Koper has received lots of public attention and been politically debated, as it is a relatively large infrastructure project development for the Slovenian economy, assessed to be worth over 1 billion € in investment. As a potentially cheaper alternative, a rail connection between Koper and Trieste was put forward, where Koper would then also be linked to the Italian rail network. This proposal never obtained sufficient political momentum, particularly from the Slovenian side. There are more indications that the activities of the NAPA ports are still rather individual than joint efforts. For example, the Italian government is investing heavily in the railway network development towards Austria, and consequently also Germany. Slovenia aimed for building the second rail track mentioned before, partly with a loan from Hungary, until the newly elected government discontinued these efforts not long ago. The Rijeka port aims to serve the Hungarian hinterland, as being the closest to it. However, so far it has been unsuccessful[11] due to underdeveloped railway capacity. More recently, with the Belt and Road Initiative (BRI),

9 3 million TEU (NAPA) vs. 34 million TEU (Rotterdam, Amsterdam, Hamburg) (Port of Koper, 2019b).

10 Ravenna left NAPA due to the disputes over funding the Venice port's offshore terminal (Ship2Shore, 2017).

11 The current market share of Koper in the Hungarian container throughput is estimated to be at 60-70% (Port of Koper, 2018b, slide 5).

Trieste has been singled out as the beacon of the Silk Road into the CEE region directly by the Chinese government and with, so it appears, the support of the Italian regional and national governments (Scimia, 2018). Koper has, meanwhile, signed a Memorandum of understanding (MoU) with the Ningbo port (Port of Koper, 2018a), while the other two ports do not seem to have gotten involved with the BRI at all.

This variety of initiatives, ranging from infrastructural development to general sales and marketing activities, could have been done jointly and more coordinated. If it had been done differently, it could have brought benefits to the entire NAPA region, especially since NAPA is a turnaround region for carriers, meaning that carriers decide to make the call due to the potential of the region as a whole and not due to the individual port (Stamatović et al., 2018). Finally, there is also the issue of different port governance models in the ports concerned, namely Italy uses the landlord model, while Slovenia and Rijeka operate under the service port model. This prevents effective communication between various stakeholders due to the different legislature and decision-making authorities, including the responsibilities among the communicating parties.

The executed expert interviews confirm the absence of any deep joint strategic type of cooperation between the NAPA ports. From the perspective of port authorities, we gather that some pre-competitive levels of cooperation indeed exist. These are mostly due to and on behalf of the North Adriatic Ports Association. Port authorities acknowledge that since the introduction of the Association, cooperation has improved and many successful projects were materialized, but at the same time they explain that the Association is underfinanced and not autonomous. Namely, the presiding party rotates every 6 months between presidents of each member's port authority. In this way, it is hard to assure autonomous and independent running of the organization and our respondents claim that they are considering changing the governance structure and framework in the future. In terms of successful projects, they list obtaining EU funding for various projects in the fields of environmental and IT initiatives, common marketing activities such as participation in logistics industry themed fairs (Munich, Shanghai), exchanging and monitoring statistics, market analysis and R&D projects. The representatives of the Italian ports admit that cooperation between them is now much better and more coordinated as a result of the initiatives made by the central government in Rome. They advise that infrastructural projects are now considered for the benefit of all ports involved. They do admit however that provincial governments still cater more for the benefit of province (Friuli-Venezia Giulia and Veneto respectively) and not necessarily for the national benefit. On the other hand, cross-border cooperation on infrastructural questions is non-existent. Another area for potential cross-border cooperation could be some level of port specialization, which is potentially attractive due to the already existing complementarities in cargo handling types among the NAPA ports (as already depicted in Figure 7). Nevertheless, this would necessarily mean, as explained by our respondents, that some ports would have to forgo the most profitable categories – containers and RO-RO cargo – which is unlikely to go forward, not on national level and even less on cross-border level. They conclude that more cooperation, particularly on the level achieved by the Copenhagen-Malmö port,

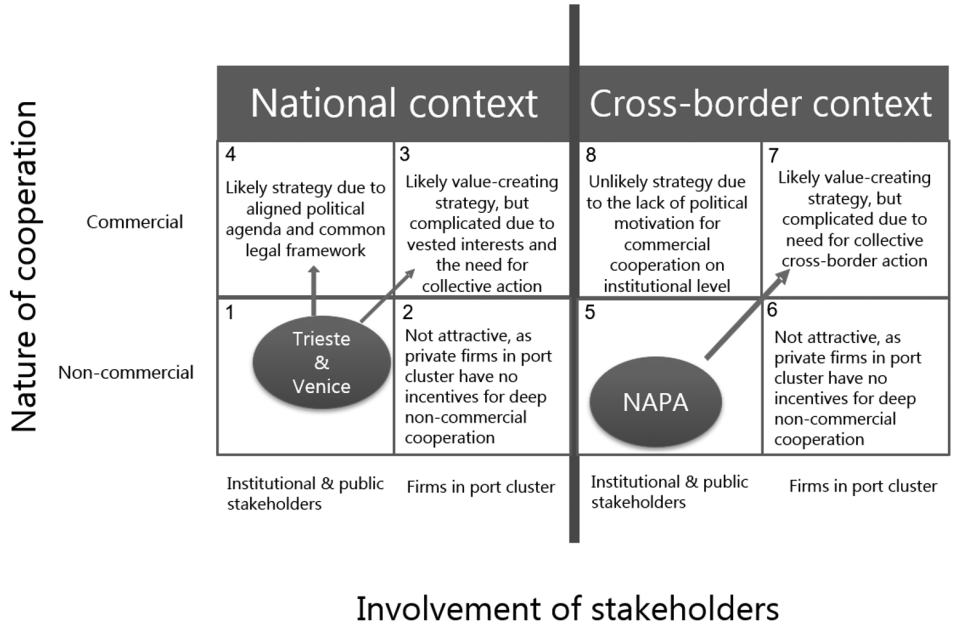
would only be possible with radical political and strategic changes, which none of them consider realistic in the foreseeable future. The major obstacle is that national, and even provincial in this case, governments pursue national political and economic agendas which, due to the short-sightedness and even the frequent-changing nature of political leaderships in the respective countries, makes any kind of supra-national coordination and cooperation on deep strategic level virtually impossible. This is partly understandable, but at the same time also problematic since the main point of the EU is cross-border, supra-national economic cooperation. Concerning the latter, port authority representatives also raise concerns regarding unequal legislative frameworks, work and pay conditions, thereby causing uneven costs in running the ports, pilotage and nautical services in each respective country.

From the perspective of commercial stakeholders (carriers, forwarders, rail operators), we gather that they are purely profit led and that they are willing to partake in initiatives which are expected to generate commercial benefits. Forwarders in all three countries have representative bodies, which have general lobbying and representation functions, but these bodies do not cooperate cross-border. Carriers, on the other hand, follow regional guidelines issued by their respective headquarters, which do not discriminate between nor have preference for different countries but instead consider market requirements and potential only. Those carriers, notably MSC, who have a vested interest in Trieste, have a natural preference for Trieste in terms of calling patterns and since MSC and Maersk are part of the 2M alliance, the same applies for Maersk. Therefore, it is not surprising that for the service loop from Far East to NAPA and vice versa, the first and last call of the loop is Trieste. Similarly, for forwarders that act in both or all three countries will follow strategies which bring them the biggest profits, regardless of via which port in particular their controlled cargo is routed. Rail operators inform that they simply follow cargo demand, as routed by the carriers and from this perspective, they have no deciding power over creating favourable conditions for all ports concerned. In summary, the firms in the ports cluster do not follow non-commercial strategies, neither on the national nor the cross-border level. On the other hand, commercial initiatives can and do take place when profit interests are aligned. In this case, there is no difference between the national or cross-border context, because firms do not orient themselves by the national borders, but purely by economic motivation.

Positioning of the NAPA ports within the newly proposed matrix for classifying cases of port cooperation is therefore summarized in Figure 8. From the national context, we position Trieste and Venice in quadrant 1, but slightly higher towards quadrants 3 and 4, given that our findings suggest better and higher likelihood of cooperation among institutional and commercial stakeholders, as compared to the NAPA as a whole. For that reason, we position NAPA lower in the quadrant 1, since there are only limited, pre-competitive cooperation strategies and initiatives from both institutional and commercial stakeholders taking place. With respect to the potential directions within the matrix, Venice and Trieste can consider moving towards quadrants 3 and 4, due to the, on the one hand, aligned national legislation framework and political agenda, and on the other hand,

higher likelihood of aligned vested commercial interests of the firms in the port cluster. The latter is also valid for NAPA, since commercial stakeholders do not limit themselves by the national borders, as instead their interests are purely profit led.

Figure 8: *Position of Trieste & Venice and the NAPA ports in the upgraded matrix for classifying cases of port cooperation.*



5 CONCLUSIONS AND FURTHER RESEARCH SUGGESTIONS

There is a growing academic literature supporting the notion that adjacent ports, provided they are complimentary, should develop common cooperation strategies. For our case study, we chose the Northern Adriatic ports (NAPA), which appear to be a clear case where cross-border cooperation would benefit all ports involved. This is supported not only by their complementarity, but also since the NAPA region is a turnaround region for ocean carriers, meaning shipping lines will consider the justification of a NAPA port call due to the economic potential of the whole region and not due to the individual port. Furthermore, the NAPA ports face inter- and intra-range competition, spurred by a variety of initiatives competing for the same catchment area.

In this paper, we first evaluate the existing models and frameworks for assessing port cooperation strategies. We note that while the existing models enable classification and evaluation of cooperation strategies, there is a gap in discriminating between national

or cross-border contexts. Second, we observe several actual worldwide examples of port cooperation strategies in order to derive new theoretical conclusions. This leads us to propose an upgraded version of the matrix for classifying cases of port cooperation originally postulated by Stamatović et al. (2018). The new matrix distinguishes between cases of national and cross-border port cooperation strategies. Furthermore, we provide general guidance for different quadrants of the matrix, by supplying examples of strategies that pertain to each quadrant. Third, we explain our research method for obtaining relevant information, which enables us to position and evaluate the cooperation level among the NAPA ports. Another case in point in favour of the NAPA ports is that it allows us to evaluate national and cross-border strategies simultaneously. We use in-depth, semi-structured expert interviews with relevant stakeholders (port authorities, ocean carriers, freight forwarders and rail operators) to gather insight and understanding on port cooperation strategies. Fourth, we introduce the NAPA ports and proceed to analyse the insight gained from the expert interviews. We find that on the cross-border level, the NAPA ports are still at a very basic, arms-length type of cooperation, while on the national level (that is between Venice and Trieste) we observe a slightly more coordinated and deeper level of cooperation, though still in the very early stages of development. In evaluating the potential future movements within the matrix for both Trieste and Venice and NAPA as a whole, we find that Trieste and Venice have the potential to move towards a commercial level of cooperation for both port authorities and firms in the port cluster, while NAPA only in the direction of the commercial level for firms in the port cluster.

This paper adds to the existing and growing literature on port cooperation by proposing an additional dimension, which has not been considered before – that is the factor of the national and cross-border context. We believe there is a marked difference between the possibilities and extents of cooperation in these two separate contexts. The premise here is that given the large involvement of governments in the national infrastructure development agendas, drivers for enabling a deeper and far-reaching cooperation among ports is far more likely in national than in cross-border situations. This is confirmed by our analysis of ports and the insight gained with the expert interviews. Due to the dynamic nature of the maritime industry, further fine-tuning of the existing models for assessing port cooperation strategies is recommended. Finally, further research is also needed to explore additional cooperative market approach strategies with a further analysis of the successful and failed cases of port cooperation, in order to increase the understanding of success and failure factors when implementing port cooperation strategies among ports in vicinity.

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APPENDIX 1: INTERVIEW QUESTIONS

A) Questions for the port authorities

1. Do you believe the NAPA ports cooperate well enough? If not, can you advise what is missing?
2. How restricted is the cooperation between the NAPA ports given that ports are located and governed by three different countries and also different types of organizational structures (i.e. service port, landlord port, port authorities, etc.)?
3. If any of the members changed this, do you believe it would be easier to cooperate?
4. If we isolate container cargo only, could you describe how far-reaching is the level of cooperation between NAPA ports?
5. Do you believe the NAPA ports are substitutable or complementary?
6. What are your future plans? Are they aligned with the strategies other ports have?
7. Specific: there is criticism that since for example Venice is battling with the issues of shallow sea, while Trieste has a naturally deep sea, that there could be better alignment of development strategies? Trieste is also very strong in liquid cargo, while Venice is stronger in dry bulk cargo.
8. Could you describe in more detail what exactly NAPA association does?
9. Do you see benefits of NAPA as an association and if so, can you specifically describe them?
10. What could the NAPA organization do more in your opinion?
11. What is in your opinion the key obstacle in increasing the current cooperation level?
12. Do you believe there is more cooperation between for profit stakeholders like forwarders, rail operators etc. than it is on the level of port authorities?
13. Do you believe, if all ports lied in the same country as the Shanghai, Ningbo or Guangzhou ports do, that there would be more cooperation?
14. Trieste has an advantage on liquid cargo. Koper clearly has advantage of RO-RO cargo. For Rijeka, we cannot emphasize any specific advantage. Do you believe ports could agree on which commodity group to specialize in and thus not compete?
15. Academics argue that in the current world, where shipping lines are stronger than ever, cooperation makes more sense than competition, particularly in adjacent ports and particularly in complementary ports. Do you agree with that statement?
16. Would you rather see that major shipping lines divided ports, for example Trieste with MSC, Koper with Maersk, Rijeka with Cosco and Venice with CMA, thereby solving the issue of competition between ports?

17. Actually, growth of container cargo in some ports has not been very significant. To what would you attribute that?
18. Is there anything else you would like to tell us that will help us better understand the level of cooperation in the NAPA region?

B) Questions for the shipping lines

1. Do you see benefits of NAPA as an association and if so, can you specifically describe them?
2. What could the NAPA organization do more in your opinion?
3. Do you agree that the NAPA region is a turnaround region?
4. Is it different compared to other European regions? If so, how?
5. Do you consider the NAPA ports complementary or substitutable?
6. If you had a dedicated terminal (either your own or a preferred partner/alliance), would you consider the NAPA region more important than it is right now? If so, what is the potential of the NAPA region compared to that of the Northern ports?
7. If NAPA ports cooperated by means of assigning one or two strategic ports for container cargo, would you see this as more or less beneficial? Should they do that?
8. What is the main obstacle to more cargo not being routed via NAPA ports? How would NAPA ports convince you to bring larger ships to the region?
9. If NAPA ports assigned one port to handle all region's containers, would this mean any particular changes from your perspective? Would you be able to include this single port in a different type of rotation where it would just be part of another loop, or would it still mean a turnaround point?
10. As a carrier present in all NAPA ports, do you coordinate your commercial activities for each port-market internally? How about within alliance members?
11. Are you part of any local/regional associations which lobby and cater for better conditions, infrastructure, customs procedures, etc.? If yes, how successful is the organization/association in achieving results? What could be improved?
12. What would you suggest to ports to do to protect themselves from the rapidly changing dynamics of supply chains in the region (Piraeus, rail connection with China…)?
13. Is there anything else you would like to tell us that will help us better understand the level of cooperation in the NAPA region?

C) Questions for the rail operators

1. How well are the strategies among rail operators that operate in the NAPA region aligned?