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Benchmarking Analysis of Factors Influencing Container Traffic in the Port of Rijeka

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ABSTRACT

Traditionally, ports have been regarded as hubs responsible for the reception of ships and passengers, but nowadays they have a much wider economic function, being clusters of various activities directly or indirectly linked to maritime transportation and seaborne trade, among which container traffic is the most important segment. The Port of Rijeka as the largest Croatian cargo port, positioned in the North Adriatic Sea, has exceptional but not fully exploited opportunities for further economic development of importance not just for the port and the city but for the Republic of Croatia as well. In addition, its geostrategic position makes it an important international port for Central and South Eastern European countries. The aim of this paper is to investigate and identify the current position of the Port of Rijeka (hereinafter Rijeka) in relation to the container business and, using Benchmarking as the research method, to analyse the established five main factors that have to be taken into consideration where its efficiency is compared to the statistically proven "best container port" in the region – the Port of Koper (hereinafter Koper). The results show significant competitive advantages of the Port of Koper almost in any of the analysed factors. Therefore, recommendations are given for further actions and improvement according to the natural advantages that Rijeka has to utilize in order to enhance its competitiveness and overall performance.

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1 Introduction

Seaports have been traditionally regarded as hubs through which passenger and cargo transfers between ships and coasts take place. However, they "have evolved from the classic role of being predominantly responsible for the reception of ships (loading and unloading, storage and transport of goods) to a more comprehensive entity of functional and spatial clusters of activities which are directly or indirectly linked to maritime transportation" (de Langen et al., 2018, p. 2). As in Notteboom & Rodrigue (2007), the port-hinterland relationship represents the most important link from maritime transport to any destination in the hinterland. Nonetheless, the main economic function of the port is to provide benefits not only to port authorities and terminal operators, but also to various external users – shipping companies, tenants, shippers, shipping agents, various service providers (such as pilotage and towing services), trucking companies, logistic companies, etc. Therefore, certain basic elements are essential for all ports: sea access (suitable coastal location and access as well as a sufficient draft), good port infrastructure, equipment, and superstructure as well as highly developed rail and road networks necessary for connections with the hinterland.

Hence, ports are complex and very heterogeneous entities and thus a detailed analysis of each port function and activity is of paramount importance. According to the United Nations (2015), ports face different economic, ecological and social challenges they need to eliminate or reduce because of the impact their performance has on a country's trade competitiveness. Nonetheless, ports as economic units have evolved significantly. They have become heterogeneous structures, clusters of numerous activities, each of them contributing at their respective different level to port performance while at the same time, directly or indirectly, affecting changes in the strategic po-

sition of individual ports and numerous external elements outside the port area. Therefore, early detection of potential "bottlenecks" is of extreme importance. They may not be immediately visible but can ultimately produce serious consequences and may compromise the position of a particular port.

Considering that the growth of the world trade directly affects the growth of the world's maritime trade, that the seaborne trade accounts for over 80 per cent of the world merchandise trade by volume and for more than 70 per cent of its value (United Nations, 2017) and that the global seaborne container trade is believed to account for approximately 60 per cent of the world's seaborne trade (Statista, 2018), it is of great importance for ports to be constantly improving their performance and adapting themselves to market demands in order to maintain and strengthen their positions. Therefore, ports need to accept the adoption of various operational and strategic instruments that will provide information for accurate and timely decision-making as well as to identify reasons and ways to improve their implemented business processes, products and services in order to capture the highest competitive market position. Numerous instruments have evolved over the years to this purpose and one of them is Benchmarking.

Our benchmark analysis presented in this paper addresses the case of Rijeka as the largest port in the Republic of Croatia with significant strategic and economic importance for this country and its hinterland. The aim is to investigate the current position of container business of the port and, applying Benchmarking as the research method, to establish the factors that have to be improved with respect to the statistically proven best container port in the region – Koper.

The paper is structured in six chapters. Following the introduction, the second chapter presents the literature review on the significant role of maritime ports, with the emphasis on container traffic. The third chapter provides the methodological and data framework. Chapter four presents the results of the conducted benchmark analysis, while chapter five brings suggestions for further improvements. Finally, chapter sixth contains the conclusion.

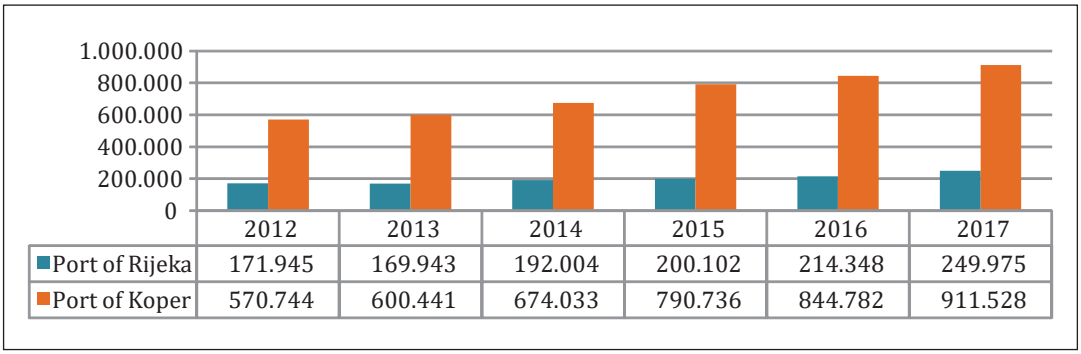
2 Literature review

There are many researches that highlight the significant role of maritime ports. Hence, many researchers investigate the importance of port's supply chain integration (Bartholdi et al., 2016; Gumzej & Čišić, 2018; Host et al., 2018; Onwuegbuchunam et al., 2018; Trupac & Twrdy, 2010), their importance for the port-city relationship (Hesse, 2018; Monios et al., 2018; Schiozzi et al., 2018), and hinterland connections (Bergqvist, 2015; Notteboom & Rodrigue, 2007; Van Der Horst & De Langen, 2008). Other emphasize the importance and quality of container shipping liners (El Kalla et al., 2017; Hirata, 2017; Kos et al., 2010) and the importance of working timetable harmonization between seaport clusters (Karmelić & Tijan, 2018). In addition, Carruthers (2013) made a benchmark analysis to highlight the importance of transport infrastructure and its impact on the overall country growth. Kevin et al. (2004) considered port equipment as an important input factor for measuring the container port production efficiency through the frequently used data envelopment analysis (Bichou, 2013; Hung et al., 2010; Sharma & Jin, 2009), while Bartholdi et al. (2016) suggested a new measure of importance with which to compare container ports, the so-called Container Port Connectivity Index. All this, together with additional factors, has a significant influence on port performance. It is therefore important to analyse them as a whole and to find a constant way for their improvement.

As stated by Host et al. (2018, p. 42), "during the last two decades ports have transformed their role from the traditional regional gateways to the place where essential value adding and logistics activities are taking place." Rijeka has always been important for the maritime traffic of Central and East European countries, but with Croatia's integration in the European Union in 2013 the market position of the port and the Rijeka Gateway was put on a par with other competitive ports and gateways (Hadžić et al., 2016). It is therefore of great importance for Rijeka to be continuously improving its position through the improvement of all business areas and processes along with today's trends. To accomplish that, frequent detailed analyses of crucial business performance factors are required. Thus, a benchmarking analysis of Rijeka has been conducted based on five selected areas of container business: terminal equipment, liner services, transport networks and tariffs, infrastructure investments and the quality management system. Based on findings, suggestions have been given for further actions and improvements.

3 Methodology and data

In order to analyse the current position of the Port of Rijeka container business and to establish the factors that have to be taken into consideration in future improvement actions, we used Benchmarking as the research method. Benchmarking is the "process of identifying the highest standards of excellence for products, services, or processes, and then making the improvements necessary to reach those standards, commonly called 'best practices'" (Elmuti and Kathawala 1997, p. 229). In other words, it helps companies to achieve a world-class reputation and to become the best in the business (Smith et al., 1993). Its purpose is reflected through two goals – gathering information for the purpose of improving business results and consistently learning (Jetmarová, 2011). Although benchmarking is not a problem-solving tool, it helps spotting the areas that require special attention and improvement. Port Regulators of South Africa (2014, p. 1) define it as a "tool that assists in measuring comparative operat-



	2012	2013	2014	2015	2016	2017
Port of Rijeka	171.945	169.943	192.004	200.102	214.348	249.975
Port of Koper	570.744	600.441	674.033	790.736	844.782	911.528

Graph 1 Total container throughput of the Port of Rijeka and Port of Koper 2012-2017 (in TEU)

Source: Made by the authors based on data taken from website of the Port of Rijeka and the Port of Koper (2018)

ing performance and identifies best practices that can be adopted in improving terminal service levels". Because of its relative simplicity, it is an often used method at various sectors. Although, as stated by Rao et al. (2017), existing studies on benchmarking in the port sector have started recently and are limited in number. Hence, Wilmsmeier et al. (2014) used it to analyse energy consumption in Latin American container terminals. Antão et al. (2006) use it to benchmark twenty-five small and medium European ports for efficiency improvement by primary data collection and questionnaire analysis. Cuadrado et al. (2004) adapt the benchmarking technique to analyse the competitive position of the Port of Valencia by ports report analysis, personal interviews, and administration of questionnaires. Jeevan et al. (2017) aimed to enhance the Malaysian dry port performance by adapting a process benchmarking strategy and came to the conclusion that all analysed ports need to improve their transportation infrastructure and operation facilities in order to increase the container seaport system efficiency and effectiveness. Similar studies were also conducted upon the application of advance benchmarking techniques like Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA) (Haralambides et al., 2010; Rao et al., 2017), but this paper was undertaken by obtaining data through existing literature and publicly available data of the ports.

Over the years there have developed four fundamental types of benchmarking: internal, competitive, functional and generic (Osmanagić Bedenik & Ivezić, 2006). Due to their definitions, and for the purpose of determining fundamental developmental features of Rijeka, we applied an external competitive benchmarking by the chosen benchmarking partner – Koper. Therefore, a desk research has been carried out on the basis of existing literature and online available data from websites of the Port of Rijeka, the Port of Rijeka Authority, Adriatic Gate Container Terminal[1] and the Port of Koper.

[1] Adriatic Gate Container Terminal – brand name for the Rijeka Container Terminal Brajdica

4 Benchmarking analysis – Port of Rijeka and Port of Koper

One of the most frequently used performance indicators for container terminals is the throughput achieved in Twenty-foot Equivalent Units (TEU)[2]. Although Koper and Rijeka have both followed an almost constant increase in the last six years (2012-2017), Koper is still significantly ahead due to the achieved TEU throughput over the years. As in Graph 1, Koper had almost four times more throughput than Rijeka in all the observed years and although Rijeka achieved its best result of the decade in 2017, it is still significantly lagging behind Koper.

Yet another indicator showing the developed level of Koper is the realized throughput in relation to the container terminal's maximal annual available TEU capacity. While Rijeka in 2017 used only 42 % of its maximum annual capacity (600.000 TEU), Koper used 96 % of its current maximum capacity (950.000 TEU) and is planning to increase it to 1.3 million TEU by 2020 (Adriatic Gate Container Terminal, 2018; Port of Koper, 2018). That will ensure its constant twenty-year container throughput increase. The same trend can be noticed in the transported quantity of goods expressed in tons, where Rijeka also significantly deviates from Koper. While the Rijeka container traffic in 2017 amounted to 2.145.898 tons, Koper reached 9.071.413 tons (Port of Koper, 2018; Port of Rijeka, 2018). Nonetheless, twenty years ago the situation between the two ports had been reversed. In the period prior to the Croatian Patriotic War, Rijeka had reached a significant, almost twice as large container throughput as Koper (Port of Rijeka, 2015). However, due to social and political changes during the nineties, Croatia experienced a significant decline in the overall economy and consequently in container traffic as well. This led to significant differences in

[2] TEU represents a standard metal container unit i.e. box that serves for easy cargo transfer between different means of transport such as ships, trains and trucks. The standard TEU is 20 feet long, 8 feet wide and 8 feet 6 inches high, i.e. 6,1 m long, 2,44 m wide and 2,59 m high. The total weight of a single TEU is 2.400 kg (5.140 lb), while the maximum permissible weight is 24.000 kg (52.910 lb), net loads of 21.600 kg (47.770 lb).

Table 1 Basic features of the Port of Rijeka and Port of Koper container terminals

Feature / Container Terminal	Port of Rijeka	Port of Koper
Quayside	628 m	596 m
Sea depth	14,88 m	15 m
Max. allowed draft	14,21 m + tide	14,5 m
Berths	2	4
Railway tracks	1 x 300 m; 4 x 250 m	5 x 700 m; 2 x 270 m; 2 x 300 m
Storage capacity – marine terminal	9.100 TEU	19.130 TEU
Storage capacity – depot for empties	2.400 TEU	9.547 TEU
Reefer electrical outlets	418	432
Total terminal area	168.000 m2	270.000 m2
Stacking area	111.000 m2	180.000 m2
Annual capacity	600.000 TEU	950.000 TEU

Source: Made by the authors based on data taken from website of Adriatic Gate Container Terminal, the Port of Rijeka Authority and the Port of Koper (2018)

future periods between the two ports, in favour of Koper. In addition, Slovenian sooner integration in the European Union (in 2004) led Koper into expansive growth.

It is evident from basic features of each container terminal that Koper has better resources throughout all the mentioned categories. To determine if those features have any significant impact on the performance of the ports, a detailed analysis has been conducted through the five chosen areas.

4.1 Terminal equipment

In recent years, Rijeka has undergone significant investments in mechanical equipment at the container terminal. Major funds have been invested in the procurement of new trans-shipment machinery by the current concessionaire, on the basis of a concluded concession contract (Kolanović et al., 2015). Table 2 provides a review of the mechanical equipment currently operating at container terminals Rijeka and Koper.

The largest and most significant investment for Rijeka is related to the purchase of two–panamax container cranes[3] with a 50-ton twin lift spreader. Additionally, the two post-panamax cranes[4], acquired in 2013, were specially designed, manufactured and built for trans-shipment operations of containers at the terminal itself. Replacement of existing cranes was necessary for several reasons, but the most important were technical inadequacy, high maintenance costs and difficult accessibility of parts (Kolanović et al., 2015; Port of Rijeka, 2018). Compared with Rijeka, Koper disposes with a large number of assets, proportional to its overall traffic. Precisely, it disposes with three types of container cranes. Four panamax cranes with a lift capacity of 40 tons (40 feet reach), i.e. 45 tons (2 × 20 feet) under spreader, and four post-panamax cranes with a lift capacity of 51 tons (40 feet reach), i.e. 65 tons (2 × 20 feet) under spreader. Additionally, since 2017, it has also disposed with two super-post-panamax cranes with the same lift capacity as the four panamax cranes. Beside the cranes, which represent the most significant and cost-effective investments, Koper also owns a large number of additional equipment essential for the smooth running of terminal operations (Port of Koper, 2018).

By comparing the terminal equipment of the two container terminals, it can be concluded that the container terminal of Koper is significantly ahead owing to the number of available resources that generate more turnover and allow for fast and efficient cargo trans-shipment. Investing in proper reloading capacity with optimal tech-

Table 2 Mechanical equipment of the Port of Rijeka and Port of Koper container terminals

Equipment	Port of Rijeka	Port of Koper
STS panamax cranes	2	3
STS post-panamax cranes	2	4
STS Super post-panamax cranes	-	2
Rubber Tyred Gantries	6	22
Rail Mounted Gantries	2	3
Reach stackers	7	12
ECH – empty container handler	-	8
Terminal/Yard Trucks	9	61
Trailers	17	61
Ro-Ro Trucks	-	1
Ro-Ro Trailers	-	1

Source: Made by the authors based on data taken from website of Adriatic Gate Container Terminal and the Port of Koper (2018)

[3] The cranes have a 38 m reach on the seashore, and a 10 m mainland reach. The lifting speed is 60 m/min at rated load and 120 m/min with an empty spreader.

[4] These cranes had a maximum reach of 50 m on the seaside and 12 m on the landmark. The lifting speed at rated load is 80 m/min, 160 m/min with an empty spreader.

Table 3 Weekly direct services and transit times in eastbound and westbound directions for the Port of Rijeka and Port of Koper container terminals (in days)

Carrier		Port of Rijeka		Port of Koper	
		TT Shanghai – Rijeka	TT Rijeka – Shanghai	TT Shanghai – Koper	TT Koper – Shanghai
CMA CGM / APL	Ocean Alliance	33	36	30	32
COSCO			35		
Evergreen		34		31	33
OOCL		33		32	39
MAERSK LINE	Alliance 2M	32	33	28	36
MSC					

Source: Made by the authors based on data taken from websites of Carrier's – CMA CGM, COSCO, Evergreen Line, Maersk, MSC, OOLC (2018)

nical and technological features with precision-based forecasts of future turnover significantly affects container terminal operations and development and the growth of container traffic in certain seaports (Kolanović et al., 2015, p. 229). Although the Rijeka container terminal has invested and renewed some of its port superstructure, additional efforts have to be made in order to secure support for further growth of its container turnover.

4.2 Liner services

North Adriatic ports have shown to be capable of handling large container vessels including cargo distribution to various users in the hinterland. The best contributing factors include the presence of a number of world's largest container operators, direct liner services with mother vessels and reliable feeder services with Central Mediterranean hub ports.

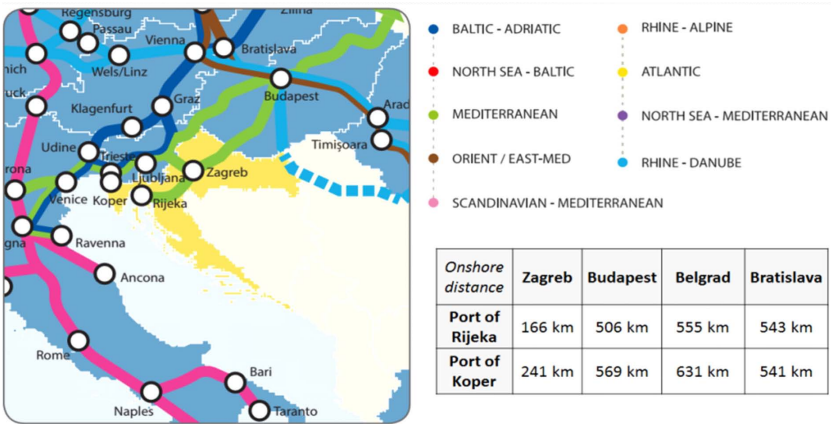
From the analysis of container liner services in both ports it can be concluded that both ports have the same, regular and reliable, direct weekly service to the Far East (operating by two alliances – Ocean Alliance and Alliance 2M)[5] and four feeder services to Mediterranean ports. Unlike Rijeka, Koper has, in addition, seven Intra-Mediterranean services connecting Koper with Mediterranean ports that contribute to its better transport connection. Moreover, differences can be noticed in the number of existing container carriers i.e. operators – Koper 15, Rijeka 12 (Port of Koper, 2018; Port of Rijeka, 2018).

In addition, by comparing the transit time (TT), i.e. the time (in days) required for the goods to arrive at a particular port, it can be concluded that Koper has precedence over Rijeka in the westbound direction. As seen in table 3, goods arrive in general three days earlier to Koper than to Rijeka.

There are a number of factors influencing the TT and one of them is the port call rotation set by container shipping companies. For a long time, Rijeka has had an advantage over Koper owing to the naturally greater draft (originally 11.2 m vs. 10 m of Koper). In the past, ships calling North Adriatic seaports used to be partly unloaded in another port (Rijeka) before being able to call at Koper. The seabed dredging at Koper having been completed at the end of 2015, the draft was increased to 14.5 m, Rijeka lost the position of the first port of call in rotation together with all the advantages pertaining thereto. However, with the recent construction i.e. extension of Berth 2 at the Rijeka container terminal that part of the berth has been provided with a greater draft (14.88 m) (Port of Koper, 2018; Port of Rijeka, 2018). Nevertheless, owing to the greater overall container traffic, Koper has retained its position as the first port of call in the westbound direction. In the future, ports with draft of 18 metres and more will have a higher competitive advantage since new ships with an increased capacity of e.g. 16.000 TEU and more will not be able to berth in North Adriatic ports. The only exception is the Port of Trieste with the present draft of 18 metres (Port of Trieste, 2018).

It should be emphasized that freight forwarders are always looking for best i.e. fastest cargo routes, with the most convenient combination of transport and other accompanying costs, faster transit times and higher flexibility. Thus, for example, a study by Drewry Supply Chain Advisors (2016), specialized in the world maritime transport, has shown that Koper is more competitive in delivering goods to southern Germany than some Northern European ports (e.g. Hamburg). More accurately, a container shipped from China arrives three days earlier to Munich via Koper than through Hamburg. Because of the fact that Rijeka along with Koper shares the same hinterland, activities aimed at increasing the frequency of calls of single liner services, strengthening the development of the entire transport system, and increasing both the speed of cargo handling and its dispatch in the hinterland are of great importance for the increment of competitiveness of single ports.

[5] OCEAN Alliance – joint service of the CMA CGM, COSCO, Evergreen & APL with TEU 6.500 capacity vessels; Alliance 2M – joint service of the MAERSK & MSC with TEU 9.650-TEU 11.300 capacity vessels



Onshore distance	Zagreb	Budapest	Belgrad	Bratislava
Port of Rijeka	166 km	506 km	555 km	543 km
Port of Koper	241 km	569 km	631 km	541 km

Figure 1 Geographical position of the Port of Rijeka and the Port of Koper

Source: Made by the authors based on European Commission (n.d.)

4.3 Transport networks and tariffs

Given the high competitiveness of container ports, good geographic location is an essential factor for reaching the highest portion of market share. When it comes to the ports within the Adriatic Bay, it can be emphasized that all of them have an equally favourable geographic position and therefore their success depends on the same factors, including well-developed road and rail networks towards the hinterland and competitive and flexible port tariffs.

A well developed road and railway network is a crucial factor in the linkage of ports with the hinterland and smooth evacuation of cargoes from the ports. When it comes to port connectivity, Rijeka has to undertake emergency steps and investments, especially in railway infrastructure in order to reach the desired competitive level. Regarding road connectivity, priority must be put on the realization of the construction of state road D-403[6] that will connect the existing one and the New Zagreb Deep Sea Container Terminal with the Croatian motorway network for which funds have been provided by the EU funds and the state budget (Pajić, 2018; Žabec, 2019). Regarding railway connections, Rijeka has only one operator to execute railway transport, mostly to Hungary and Serbia, while Koper has seven contracted operators executing railway transport of containers in and out of the terminal, thus connecting numerous European countries. More precisely, there are more than eighty trains in total running on a weekly basis from Koper to numerous cities in Hungary, Austria, Slovakia, Czech Republic, Poland, Germany, Slovenia, Bulgaria, Romania, Italy, Serbia and even Croatia (Port of Koper, 2018; Port of Rijeka, 2018). In addition, with the European integration the legislative framework of the Republic of Croatia has enabled liberalization of the market for rail freight services and entry of private operators. However, since privatization has not been completed yet, the future concessionaire has been unknown and Rijeka remains a port with a much smaller number of 15 block trains per week.

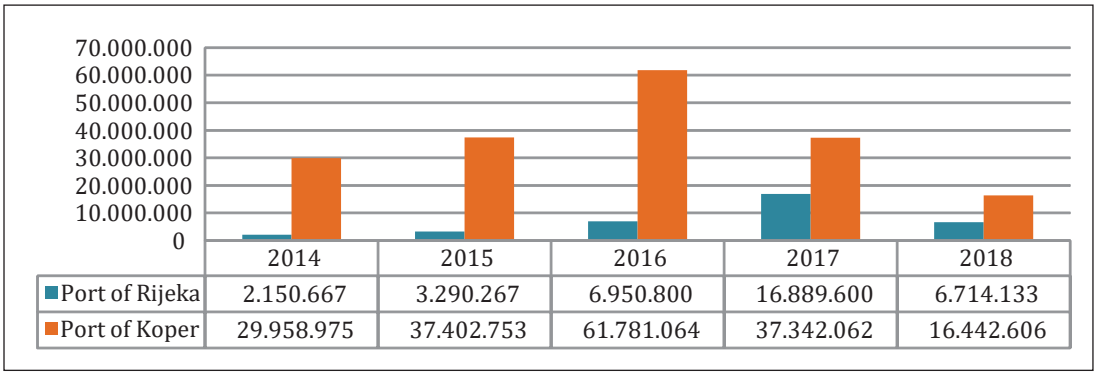
In addition, as part of the Trans–European Network–Transport (TEN-T), Rijeka has a special significance for the hinterland region and its countries (Austria, Hungary, Slovakia, Czech Republic, Serbia and BIH) and enjoys an excellent position for taking advantage of this location with two central corridors passing through it: the Mediterranean Corridor and the Rhine-Danube Corridor (Port of Rijeka, 2015). It can be stated that owing to its position Rijeka represents the most favourable gateway in the region (Port of Rijeka Authority, 2013). Although Koper has still an advantage because of its position on the Baltic-Adriatic corridor, Rijeka has the ambition to become a part of the core network through the railway line Rijeka-Pivka (Hlača, 2017).

Port tariffs are an additional factor by which these two ports differ. By comparing valid tariff lists of both ports it can be concluded that in this segment Rijeka has a competitive advantage due to lower port charges. However, lower prices do not necessarily mean better service and higher cargo traffic. In fact, a market study performed by the Port of Rotterdam shows that increases in port tariffs have rarely made users choose an alternative port (OECD, 2011). Nevertheless, we are of the opinion that Rijeka has insufficiently highlighted and exploited the benefit of lower port charges, taking into consideration that some service users may be governed by lower costs and higher pricing flexibility.

4.4 Port infrastructure investments

As stated in the Valletta Declaration (2017, p.5), "well-connected and modern ports and efficient short sea shipping play a key role to preserve and attract new industries and logistic activities, to link up the different regions within the internal market of the Union and support the greening of transport". This role requires ports to make substantial

[6] Component of the Rijeka Gateway Project. For more information follow the link: https://www.portauthority.hr/en/rijeka-gateway-project/



	2014	2015	2016	2017	2018
Port of Rijeka	2.150.667	3.290.267	6.950.800	16.889.600	6.714.133
Port of Koper	29.958.975	37.402.753	61.781.064	37.342.062	16.442.606

Graph 2 Investments in property, plant, and equipment (in EUR*) in the Port of Rijeka and Port of Koper 2014-2018

* The rate of exchange of 7.5 is used to convert HRK amounts into EUR.

Source: Author's calculation based on website data from the Port of Rijeka and Port of Koper (2018) Consolidated Financial Statements

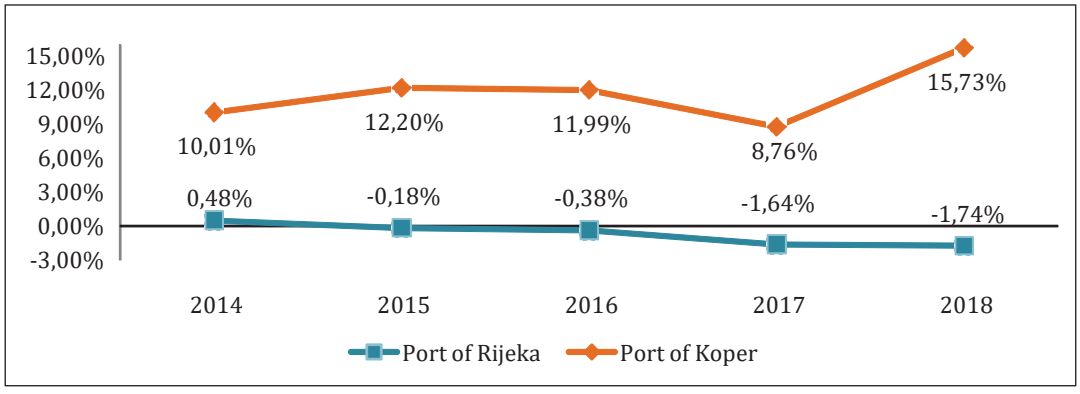
investments, in order to maintain and enhance the existing infrastructure, to create new transport links and to improve the environmental sustainability of port operations.

The Port of Koper, the only Slovenian multipurpose port, is going through a strong port infrastructure investment cycle started back in 2008 and 2009 when major investments were completed (extended container quay, enlarged warehousing area, four new post-panamax cranes and other various new equipment items). Those investments enabled consistent growth in the overall throughput, especially in container traffic. On the other hand, Rijeka is trying to catch up with other Mediterranean ports after having lost its once leading position due to various reasons, the most important among them being insufficient investment in the port infrastructure in the way and within the scope that other Mediterranean ports have followed, especially Koper as the leading port.

Graph 2 shows amounts invested in port infrastructures in the period 2014-2018. While both ports show a positive trend we can notice that investments in Rijeka in the period 2014-2016 were just 9 % of the investments realized by Koper. The decrease in the imbalance between the two ports in the last two analysed years (2017 and 2018) is mainly due to two reasons:

1. significantly increased Rijeka's investments mainly in the Inland Terminal Škrljevo (the overall investment exceeding 30 mil. EUR) and
2. significantly decreased Koper's investments (a 40% decrease in 2017 compared to 2016, and 56% in 2018 compared to 2017) due to untimely provision of approvals and permits required for the implementation of planned investments (mainly the Pier I extension project), issues concerning public procurement procedures and existing constraints in respect of additional spatial capacities.

In addition, the financial performance of companies can be measured using various key performance indicators among which the Return On Net Operating Assets (RONOA) can be distinguished as one of the most important and frequently used (Belova & Mickiene, 2015; Moore Stephens LLP, 2012; PwC, 2014; Skibińska, 2011) in regards to investments. The RONOA is used to meas-



Graph 3 Returns on net operating assets (in %) in the Port of Rijeka and Port of Koper 2014-2018

Source: Author's calculation

ure returns on investments and to assess a company performance compared to others within the same industry. It reveals if a company and its management are deploying assets in an economically valuable way. The higher the RONOA, the better the profit performance, meaning the company is using its assets and working capital efficiently and effectively.

The RONOA for both ports is calculated through the following formula:

$$RONOA = \frac{Earnings\ before\ interest\ and\ taxes(EBIT)}{Net\ operating\ assets} =$$

$$= \frac{EBIT}{Working\ Capital + Net\ Fixed\ Assets}$$

By comparing RONOA of the two ports over the last five-year period a significant difference in numbers can be noticed (graph 3). While Koper has a positive trend with an average RONOA of 11.74%, Rijeka has a negative trend with an average RONOA of -0.69%. This appears to be mainly due to the negative EBIT realized in the past three years. The performed analysis of RONOA shows again that Koper uses its assets and working capital much more efficiently and effectively than Rijeka.

4.5 Quality management system

Unlike Rijeka, Koper can be said to be a company of comprehensive business. In today's socially responsible business there is a growing need for the system-based quality management as a tool for establishing and meeting stakeholders' highest level needs and expectations. In this respect, Koper is also ahead of Rijeka, which is currently certificated for three quality management systems only – the ISO 9001: 2015, ISO 50001:2011 according to the long-term goal of energy efficiency, and more recently for the ISO 140001 (Port of Rijeka, 2018). As the container terminal is a part of the Port of Rijeka Group, the implemented systems have also directly addressed the terminal. Additionally, the container terminal has also implemented the Health, Safety, Security & Environmental (HSSE) management system that provides the structured set of controls for managing health, safety, security, and environmental issues at all business levels (Adriatic Gate Container Terminal, 2018). Koper, as one of the first European ports that has organized its entire business, including the container terminal, in accordance with international quality standards, has until now implemented the following systems that have led to the EFQM system of business excellence: 1) ISO 9001: 2015 – Quality management system; 2) ISO 14001:2015 – Environmental management systems; 3) ISO 22000:2005 – Food safety management systems; 4) BS OHSAS 18001:2007 – Health & safety management system; 5) NON GMO system for separate handling and warehousing of non-genetically modified soya; and 6) GMP+ B3 standard for storage and trans-shipment of feed stuff (Port of Koper, 2018). The success of Koper is reflected in constant activities of adopting new standards and their direct integration into internal processes for the purpose of achieving better business results.

5 Suggestions for improvement

In order to efficiently use available routes and increase its performance, Rijeka needs to ensure many prerequisites and take rapid steps. As the first and foremost, Rijeka needs to improve the existing railway directions towards the hinterland which will permit rapid and smooth cargo flows to and from the container terminal i.e. port, as well as faster delivery of goods to consumers. Although Rijeka is already introducing new connectivity projects, there is much to be done in order to fully integrate itself into the desired supply chain. Future investments in the construction of adequate rail infrastructure are particularly required. There is also an ongoing need for a diverse set of investments in the port infrastructure (deeper draft, more berths) and superstructure (adequate mechanical equipment, sufficient storage capacity) that are driven by various external developments such as the increasing size of vessels and expected trade growth. The availability of liner services and number of companies operating in port should also be expanded since maritime connectivity determines the competitive position of a port (Biermann & Wedemeier, 2016). Besides, the implementation and integration of management systems that ensure quality and safety have become a must for the port industry and those who strive to enhance its efficiency. Therefore, the container terminal of Rijeka and port in general should invest more in the improvement of the existing quality management system as well as apply new standards in various areas in order to meet clients' expectations by providing high-quality services. In addition, more attention should be paid to data visibility and transparency as well as efficiency improvements given that such initiatives help improve the overall supply chain performance and bring benefits to various stakeholders of the Rijeka container port, internally and wider. All this is essential for reaching the so-called "best-practice" position. Furthermore, we emphasize the importance of using benchmarking as an internal method and suggest its implementation through the organizational structure of the container terminal and the Port of Rijeka in general. That will enable a constant identification and improvement of crucial factors essential for achieving competitive advantages and performance improvement over the "best practice" competitor, which is currently Koper.

6 Conclusion

The constant growth of the world trade, seaborne trade and especially the seaborne container trade has a direct impact on the development of ports, their strategic positioning and orientation. The Port of Rijeka as the larg-

est Croatian cargo and container port, positioned in the North Adriatic Sea, has exceptional yet not fully exploited opportunities for further economic development favouring not just the port and city itself, but the Republic of Croatia as well. Consequently, there is an increasing need for the implementation of modern strategic management tools in order to evaluate reached economic positions both internally and externally. Benchmarking is one of them. Therefore, the aim of this paper was to investigate the current position of the Rijeka container terminal applying Benchmarking as a technique and to distinguish areas requiring immediate attention and improvement in comparison with the set benchmarking partner Koper. There were five key factors chosen for benchmarking purposes: container terminal equipment, number of liner services, transport network and port tariffs, infrastructure investments and finally the number of implemented quality management systems.

In accordance with all the benchmarked data and discoveries arising there from, it can be concluded that the Rijeka container terminal has the potential to become the "best practice" one, but much needs yet to be done in order to meet the standards set and reached by Koper. It can be concluded from the conducted research that Rijeka, despite its many competitive advantages especially in regards to its geostrategic position being included in the Mediterranean TEN-T corridor, further substantial immediate investments in the railway network are required since this is one of the main preconditions for the port and terminal to be included into the global supply chain. Additionally, emphasis should be placed on the constant improvement of existing and introduction of additional quality management standards in order for various stakeholders' and organization's expectations and requirements to be met. Besides, further substantial investments are required to maintain and enhance existing infrastructure and superstructure in order to catch up with the rhythm of new technological tendencies and attract new industries and logistic activities. Furthermore, we emphasize the importance of using benchmarking as an internal method, which will enable constant identification and improvement of factors essential for achieving competitive advantages of the container terminal as well as the port. Only by performing constant comparison with the so-called "best practice", currently featured by Koper, Rijeka can efficiently set benchmark standards in order to increase its profitability and improve the performance.

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