Erasmus University Rotterdam

Erasmus School of Economics

Economics and business economics

Bachelor thesis

Urban, Port and Transport Economics

The merger effect on the competitiveness of Antwerp-Bruges

A case study analysis with the North Sea port and the Haropa ports

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Date final version: 06-08-2021

Abstract

This paper tries to achieve a good approximation of the change in competitiveness through the Antwerp-Bruges merger relative to the Hamburg-Le Havre range. Thereby, this paper provides insight into different reasons for ports to compete or collaborate. To examine the effect of the merger, this paper uses different performance indicators, a case study analysis with two other port mergers, and stakeholder interviews. This paper focuses mainly on the transport node function through investigating throughput and profits from multiple ports. The results highlight that a merger could indirectly have benefits in the long run. However, further research is needed because this paper cannot distinguish the merger effect from other explaining factors.

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Introduction

The world of ports is a continuously developing world with minor and major developments. On the one hand, some improved processes may be of minor influence, like improving the crane efficiency at a port terminal. This development enhances the competitiveness of that port through better performance and efficiency (Tongzon, 1995). On the other hand, some developments have a more significant impact, like the container development. This development led to different waves of containerisation and the need for drastic changes in global supply chains, maritime economic networks, and logistic systems (Guerrero & Rodrigue, 2014). In this paper, there will be research on a port merger process that potentially has a significant impact on the competitive position of both ports. Furthermore, this research will analyse whether this merger process is of minor or major impact.

The central standing aspect in this paper will be the port merger development between the ports of Antwerp and Zeebrugge. Early discussions initiated in 2018 led to a merger agreement at the beginning of 2021. Ultimately, this merger would continue under the merger name called *the port of Antwerp-Bruges*. With this merging project, the ports of Antwerp and Zeebrugge will try to improve their competitive position (Notteboom, 2021; Port of Antwerp, 2021). According to both port's representatives, this merger development will significantly influence a wide scale of factors, like total throughput, sustainability developments, digitalisation processes, and regional and international competitiveness.

This paper will try to achieve a good approximation of the change in competitiveness through the merger between the ports of Antwerp and Zeebrugge. With the focus on throughput and profit developments, this research will investigate the effect by analysing different port performance indicators (PPI). The port of Antwerp-Bruges is a recent ongoing port merger. Therefore, two other port fusions are also analysed in a case study to provide a comparative analysis regarding Antwerp-Bruges. The first port merger is the fusion between the ports of Le Havre, Rouen, and Paris. This merger took place in 2012 and resulted in the merger name Haropa ports. The second port fusion concerns the collaboration between the ports of Terneuzen, Vlissingen and Ghent. This fusion is a merger in 2018 between the Zeeland Seaports and the port of Ghent, resulting in the North Sea Port. This comparative analysis aims to assess the potential change in the competitive position of Antwerp-Bruges through investigating specific PPI's on the other port mergers. Thereby, this analysis examines the effect on competitiveness relative to the Hamburg-Le Havre (HLH) range. All aspects combined led to a research approximation about the competitive position of Antwerp-Bruges relative to the HLH range. Altogether, this results in the following research question:

"What is the effect of the merger Antwerp-Bruges on their competitive position within the Hamburg-Le Havre range?"

As mentioned, this paper will investigate the effect through specific PPI's. Many studies researched specific PPI's. Talley (1994) already discussed a traditional performance indicator from an engineering perspective, which compares actual throughput towards an optimum number over time. PPIs regarding throughput and profits are used in this paper and applied on a particular period around the merger. This paper tries to satisfy simultaneously two gaps in the existing literature and provide some additional research ideas. Firstly, where most PPI's are measured or studied at a specific point of time, this paper investigates the development over time and its possible causes, possibly the collaboration between ports. Thereby, it applies and measures specific port performance indicators primarily on port mergers instead of single ports. Secondly, since the merger between the port of Antwerp and Zeebrugge is quite recent, there is relatively little available literature or conducted studies on this topic. Thereby, this research tries to support the arguments of Talley (2012), who discussed the case of the merger between Copenhagen and Malmö ports. He suggested that the merger could benefit both port's competitiveness and its influence on regional development. This paper will also provide insight into different reasons for port collaboration on multiple levels and the current ongoing cooperation processes between ports, as highlighted by Hwang & Chiang (2010).

This paper will use and discuss existing literature to move from a theoretical approach on different port concepts towards a more practical analysis. Firstly, the first chapter will discuss the idea of a port. Secondly, chapter two will address different levels of port competition and collaboration. After that, chapter three will discuss the concept of competitive position and performance indicators. These chapters will provide the theoretical foundation which will lead to a set of hypotheses. In the following case study, the analysis will investigate specifically selected performance indicators regarding the premises to identify the effect of a merger. After that, the paper will discuss results from the analysis methods and the outcomes of different stakeholder interviews. These results lead to the interpretation and limitation of the theory, the results, and their possible causes. The paper finishes with a conclusion with all important results and the answer to the main question.

1 Port

This paper investigates the collaborative development between the ports of Antwerp and Zeebrugge. The first step in exploring this development is understanding the term ‘port’. Therefore, it is essential to fully clarify what the concept of port withholds from an economic perspective. The complexity of a port combined with the views towards the idea of a port could cause some descriptions to seem to contradict each other or lack essential aspects easily. Furthermore, how a port is defined determines the perspective to look at its functioning within the world. Thereby, different parties and stakeholders are actively involved in a port, which requires port governance. All in all, it is crucial first to discuss the concept of a port in detail.

1.1 Geographical and maritime aspect

Stopford (2009) defines a port as a location where ships can berth, load or unload cargo. This description places the most stress on the geographical and maritime aspects of the overall concept. However, this aspect is a crucial element of the port concept because it significantly influences the kind of port and its strategic importance. Traditionally, ports are strategic military assets (Robinson, 2002). Therefore, a port could be seen and functioning as a navy port or military asset. However, a small port located in the centre of a city is probably more a heritage, marina, or metropolitan port. A big port at intersection points between sea, rivers, and mainland is perhaps more of a transhipment port. Therefore, this aspect influences the kind of a port and its strategic importance. Thereby, a port could have different geographic transport settings, like a sheltered port like Liverpool, a river port like Duisburg or a delta port like Rotterdam.

The description of Stopford (2009) implicitly means that a port needs to have the proximity of water. This proximity seems logical, but history has shown that this maritime aspect contributes to the increasing importance of ports. Especially a couple of centuries ago, but still nowadays, it is more efficient to transport cargo by sea (Stopford, 2009; Klemann, 2018). With transport between continents, the usage of a ship or a plane are the only two possible options. It is general knowledge that most ships can transport more cargo than planes. Notteboom et al. (2020) highlight that 90% of world trade volume and 70% of world trade value is related to seaborne trade. Ports play a massive role in the facilitation of this seaborne trade.

Maritime transport is the transport of cargo or passengers by a vessel overseas. These vessels need to load and unload at specific places where both locations directly connect to the mainland. Ports function as a node for switching between land and sea transport. This maritime aspect provides a clear distinction between different kinds of ports. In general, an airport and a seaport are both ports. However, this maritime aspect distinguishes a port for inland or sea shipping instead of, for example, air transport. Zuidwijk (217) stresses this aspect by arguing that a port is an interaction node with a diversity of activities with a strong maritime character. From this point onwards, it should be clear that using the concept of a port involves a relation with maritime transportation.

1.2 Network and supply chain aspect

Adam Smith stresses that a successful division of labour depends on the provision of transport, which is where shipping and ports play a crucial role because they provide extensive market access (Stopford, 2009). Here, the network aspect of a port comes forward. Robinson (2002) argued that due to a changing environment, there is a need to define a port as an element of value-driven systems. The changing environment is due to the emerging global value chains caused by lower transport, coordination, landing and production costs. Notteboom & Winkelmans (2001) also address this aspect

by describing the port as a part of a global functioning transport system. De Langen (2020) adds an essential point by arguing that a port is a critical node in the global supply chain. So, not primarily seeing a port as a geographical location but as an essential element of a supply chain network. Zuidwijk (2017) combines these two aspects. He argues that a port is an important node in the global supply chain because it connects various networks like organisational, logistic and information networks to direct the flow of goods and services.

Both seaports and inland ports facilitate the flow of goods and services. Between these two types of ports, there is often a strong relation. Seaports are directly connected to seawaters and are, in general, the bigger kind of ports. An example is the port of Rotterdam, which has a direct connection to the sea and allows for further inland transportation. A corresponding example of an inland port is the port of Nijmegen, which functions as a multifunctional inland port (Streng & Kuipers, 2019). Distance from a seaport and the possibility to allow for multimodal transport are essential factors for the link between a seaport and an inland port (Wiegmans et al., 2015). This connection provides the possibility for inland ports to function as extended gates for seaports. Another name for the relationship between seaports and the inland terminals is the dry port concept (Roso et al., 2009).

The function of a port between foreland and hinterland transportation is an essential factor related to the network and supply chain aspect. With this perspective, a port functions as a transport node. It has its specific location but allows for transportation of different types of cargo between the sea and the hinterland. A port's functioning as a transport node is critical because it affects the general maritime transport costs (Sanchez et al., 2003). Besides the transport node function, three other port functions are also essential to discuss briefly.

1.3 Port functions

Ports can function as a transport node, industrial cluster, a location for logistics and distribution, or as a trade and service location. In general, ports often fulfil different functions. However, the transport node function stands central in this research, leading to a more detailed discussion. Therefore, this section will only briefly address the other three functions.

The transport node function is directly related to the earlier discussed network and supply chain aspect. It acts as a node in a global transport chain with often throughput volumes as a measurement. Maritime accessibility, hinterland characteristics, and geographical location are important factors regarding this function (Notteboom et al., 2020). Accessibility measures the capacity of a particular place to be reached by or to be reached from different areas (Rodrigue, 2020). Cargo handling and the number of commodities going through the port, which has increased rapidly in ports, are essential factors of this function, especially in containers, where the growth of container traffic creates huge container hubs (Vernimmen et al., 2007). The transport node function is vital due to three

reasons. Firstly, it provides a connection between different modes of transport. Secondly, the demand for transport is spatially diverse. Maritime transport is like any other transport a derived demand and follows demand for shipping and economic developments worldwide (McCann, 2013; Rodrigue, 2006). The third reason is the need for storage in the supply chain, which is somewhat related to the second reason.

The second and third functions concern its location for industries or logistics, which is not primarily the presence of industrial or logistic port-related activities but the port's attractiveness as a location for these activities. Ports are attractive for industries due to maritime accessibility, low transport costs, and the proximity of other industrial actors or additional utility providers (Notteboom et al., 2020). In line with the description of ports by Zuidwijk (2017), the logistic and distributional activities deal with the overall strategy of optimizing the inwards and outward flow of commodities from departure to destination (Pettit & Beresford, 2009). The fourth and last function is the location for trade and service activities. This function is related to the provision of maritime-related business services.

All aspects and functions combined, ports are a logistical and industrial node in the global supply chain with a strong maritime character, a specific land area with hinterland access, and a spatial and functional concentration of different activities. A lot of various parties are active in a port. This concentration and variety of activities by other actors require port governance. Combining different port products from the three port ecosystems as a transport hub, value-added logistic hub, and industrial complex strengthens the overall port complex (De Langen & Van der Lugt, 2017). It is therefore important to briefly discuss the aspect of port governance.

1.4 Governance

Due to the interaction complexity of activities, assets, and actors, ports need managing. Ports are, in general, governed by port authorities. Traditionally port these authorities were categorised as a public or governmental domain. However, due to a port's complexity, value-creating activities, land providing function for companies, and increasing private involvement, the role of port authorities has shifted more towards a port development company (De Langen & Van der Lugt, 2017). This development company is an institution that acts as a land manager and developer, with the task to organise port activities and transactions in such a manner that it creates synergies, it results in a fair market playground and competitive development of the port. Through focussing on both challenges - a higher quality port cluster and a higher quality integration of the port in chains - their business model generates income through land rents and port dues (Van der Lugt, 2013). Thus, port governance is about coordinating, optimising, and integrating different actors and their activities to create a competitive port development.

1.5 The port concept

This first chapter described the concept of a port in detail to fully clarify its meaning. A port is a specific land area with a maritime character and hinterland access. It functions within a global transport network and acts as a node in the worldwide supply chains. Due to the high diversity of activities, assets and actors, a port needs governance to coordinate and improve the port's competitiveness. As mentioned, ports could fulfil different functions, implying that geographically closely located ports do not necessarily compete because they perform other functions. However, they often have a similar role that causes different port competition and collaboration forms, which the next chapter will discuss.

2 Competition and collaboration

2.1 Port competition

After the port concept is clearly defined, the second step in understanding and investigating the effect of a port collaboration development is to understand different levels of interaction between ports. Port authorities govern ports and try to increase the competitiveness of their port. The private and public involvement and different port functions, geographic locations, types of commodities, and hinterlands cause different port competition and collaboration levels. This chapter will provide insight into the different interaction levels of port competition and port collaboration, starting from an intra-port level towards an inter-port level.

2.1.1 Intra-port competition

A clustering of various firms related to the arrival and departure of ships and cargo creates an economic port cluster (Talley, 2012). Intra-port competition is a competition level within this port cluster, roughly divided into two levels. The first one is intra-terminal competition, where for example, two service providers compete for providing maritime services for a specific terminal. The second level concerns the general intra-port competition between two terminal operators for attracting cargo. The performance of the port cluster is heavily dependent on appropriate port governance (De Langen, 2020). Therefore, port authorities have an essential task in adapting a governance model that lowers entry barriers with optimal levels of intra-port competition as a consequence (Talley, 2012; De Langen & Pallis, 2007). According to De Langen & Pallis (2006), an appropriate level of this intra-port competition leads to beneficial economic results. This competition can prevent market failures, stimulates specialisation and innovation, and increases the port's efficiency. Overall, all parties benefit from this kind of competition, making it an essential level of competition. Besides intra-port competition, there is another fundamental level of competition beyond the boundaries of a port, namely inter-port competition.

2.1.2 Inter-port competition

In contrast to the intra-port competition, inter-port competition is competition between different ports as a whole or between port operators from different ports. On the one hand, the geographical position plays a vital role in determining inter-port competition. On the other hand, nearby ports are not necessarily involved in the inter-port competition between themselves due to differences in port functions (Stopford, 2009). Ports can therefore compete by fulfilling certain functions. In many cases, inter-port competition is between port authorities of two ports, who share the same hinterland. Within this competition, ports try to achieve a competitive advantage over the other port by increasing their port attractiveness and efficiency.

On the one hand, according to Tongzon and Heng (2005), two aspects can improve efficiency. Firstly, this improvement can be achieved by reaching an optimal level of privatisation and mainly focusing on service handling. Over recent years, an increasing privatisation trend is visible in the most prominent ports without crowding out the role of the public sector (Baird, 2002). However, Cullinane et al. (2005) show that more private sector involvement leads not irrevocably to higher efficiency, supporting the idea of an optimal level of privatisation. Secondly, the other way to improve efficiency is through the specialisation of the whole port. Along with its size, the specialisation of the ports has a significant influence on its efficiency (Pérez et al., 2020).

On the other hand, improving their attractiveness could be achieved by studying essential factors that influence different actors' port choices (Wiegmans et al., 2008). When ports focus on improving these factors, they could improve their attractiveness in terms of port choice. Maximising the efficiency and attractiveness could cause a competitive advantage for a specific port, creating a captive hinterland. This situation is a hinterland where multiple ports compete, but one port has a clear competitive advantage that handles most cargo in this region (De Langen, 2020; Talley, 2012). Competition with captive hinterlands often happens within the geographical borders of a country. The next level of inter-port competition exceeds these boundaries by competition between ports located in a multi-port gateway region called a port range.

2.1.3 Inter-range competition

A well-known example of a port range in the existing literature is the Hamburg-Le Havre (HLH) range. The HLH-range is a central element in this paper. Therefore, this paper describes the HLH-range in more detail as an illustrating example of inter-range competition. The HLH-range concerns the northern part of Europe, where there is fierce competition for attracting cargo and serving the European hinterland. This region contains major and influential ports like Antwerp, Rotterdam, Gdansk, Hamburg, and Le Havre. Some of the biggest freight ports in Europe, according to Eurostat (2020). Throughout history, certain factors have contributed to the development of the current big ports. Firstly, the location along important trade routes, which gives a cost advantage for more

practical transportation. Secondly and thirdly, the development of a connected inland rail network and additional canals. These networks make these ports a vital transportation node to serve the hinterland (Klemann, 2017). During history, smaller ports have logically also gained these factors, creating a network of ports to serve the European hinterland. De Langen (2017) highlights this network, where multiple ports within the HLH-range serve Austrian import and export. Multiple ports serve the same hinterland in the HLH-range causes a large contestable hinterland, which means that no port has a clear competitive advantage due to lower generalised transport costs. Besides competition within this port range, there can also be competition between different port ranges, such as the HLH-range and the port range of Mediterranean Seaports. However, the focus in this paper will remain on competition within a port range.

All in all, there are different levels of port competition. Firstly, there is the intra-port competition which is competition within a port on two levels. Secondly, there is inter-port competition between ports, which can occur on a national level and at an international level within a port range like the HLH-range. However, port competition is not the only kind of interaction between ports. Other forms of interaction concern collaboration between ports, leading to the second section of this chapter.

2.2 Port collaboration

After discussing some interaction levels of port competition, other interaction levels between ports will highlight different kinds of port collaboration. This collaboration implies mainly cooperation between port authorities of the ports. According to De Jong et al. (2019), it is possible to categorize the concept of port collaboration into four different dimensions. Firstly, the motive for the collaboration can be to achieve an advantage or counteract a threat. Secondly, collaboration could be distinguished in an administrative form, changing from structural to a looser collaboration. Thirdly, a commercial or non-commercial distinction is possible. The fourth dimension is the geographical level of collaboration, which could differ from intra-port levels towards inter-range levels. This paper investigates port collaboration in the inter-range category. Antwerp and Zeebrugge, Haropa ports and the North Sea port are port collaboration projects within the Hamburg-Le Havre range. In line with the structure of port competition, the discussion of port collaboration will start at an intra-port level and gradually shift to a more international level.

2.2.1 Intra-port collaboration

Intra-port collaboration is a cooperation between parties within a port. According to Ryoo (2011), intra-port cooperation can create a more efficient environment for port authorities and port operators. De Langen & Pallis (2006) already highlight the benefits of intra-port competition. Because this level of competition is beneficial for all parties, it is also possible to see it as an indirect process of

intra-port cooperation. They cooperate to increase the port competitiveness and defeat competition from other ports (Kavirathna et al., 2019). Intra-port collaboration can also happen through horizontal integration. As a result, port actors could increase their profitability, service quality, innovation and specialisation, and benefit from scale economies (Hwang & Chiang, 2010; Talley, 2012; Song et al., 2015).

Often port authorities coordinate collaboration processes within a port. It is their task to manage the port, which they can only do through collaboration with almost all parties within a port. Otherwise, they cannot optimise, for example, port planning, information exchange, and the direction of innovation transitions within a port (Van der Lugt et al., 2013). According to Haezendonck (2001), this collaboration creates a port cluster as an inter-organisational network among actors from different sectors but involved in similar crucial port-related activities. This kind of cooperation seems logical but is very important for a port to function as a competitive cluster. Besides intra-port collaboration, port authorities also play a significant role in inter-port cooperation processes.

2.2.2 Inter-port collaboration

Inter-port collaboration is relative to intra-port collaboration, often more challenging to achieve. Moreover, this level of collaboration has only a chance of success if both ports have a clear picture of their possible and achievable individual and mutual benefits (Talley, 2012). Nevertheless, there are examples of cooperation between ports. One example is the cooperation between the four main ports in the Flanders port area: Antwerp, Zeebrugge, Ghent and Ostend. This cooperation tries to increase resource sharing for further asset development and lower their environmental impact (Talley, 2012).

Another example is visible in Japan, where the ports of Tokyo and Osaka Bays increase their collaboration activities. Factors influencing this collaboration decision are the fierce competition in the Asian multi-port gateway region, the increasing importance of Chinese ports and increasing port facilities in Korea (Hoshino, 2010). These factors cause the need to further collaborate instead of individually competing amongst each other. Advanced collaboration and managed by one port authority could strengthen both port's overall competitiveness.

There are also other less visible examples of inter-port collaboration. For example, port authorities could collaborate with other supply chain members outside their port region to increase the overall performance and cost-effectiveness of the whole supply chain (Talley, 2012). Port authorities could also collaborate with inland or dry ports to create an intermodal network for better hinterland transportation (De Langen, 2020; Talley, 2012). The challenge imposed by these processes is that individual parties are more likely to try and achieve an individual competitive advantage, while collaboration can be more beneficial for both parties (De Langen, 2020).

To deal with the ever-increasing competitive environment, cooperation between ports seems to be a recent ongoing development (Hwang & Chiang, 2010). McLaughin & Fearon (2013) identify three essential elements in which ports have developed from a direct competition position to an increasing collaboration position. Firstly, inter-port rivalry and direct competition are not sufficient strategic responses to continuously shifting competitive pressure. Secondly, various ports are complementary, relatively small or medium-sized, and do not have a strong value proposition. Therefore, they will eventually disappear unless they create regional collaboration and synergies to improve their competitiveness. Thirdly, opportunity-driven collaborations could positively influence the development of both ports in both the short and long run. When ports further intensify their collaboration activities, this could lead to collaboration agreements or even a merger of different ports.

2.2.3 Merger

Extreme levels of coordination between ports could lead to collaboration agreements or even a merger. An example is visible in northeast China, where medium-sized ports take over other small ports or negotiate further merger agreements. They try to gain a competitive advantage in competing with larger ports (Feng & Notteboom, 2013). The merger process could be a solution to still improve both ports' efficiency and performance by combining both port's specialisations (Qingmei & Hong, 2020). Talley (2012) support this by studying the cross-border merger of the Copenhagen Malmö Port (CMP). Since the merger, the performance and competitiveness have consistently improved relative to other Danish and Swedish ports. The case of CMP suggests that a merger between two ports with one unified governance could contribute to better performance of both the port development company as the entire port complex with its actors (Talley, 2012). A merger between ports can therefore be the ultimate level of collaboration to improve performance. Further analysis on this ultimate level of collaboration will be presented later during this paper.

2.3 Trade-off

The second chapter describes different levels of interaction between ports. On the one hand, intra-port competition brings beneficial outcomes. On the other hand, intra-port collaboration also brings benefits for both parties. The process of inter-port competition creates the possibility of achieving a competitive advantage, higher efficiency, specialisations, or better performances. Simultaneously, different levels of inter-port collaboration could also improve performance and competitiveness. These interaction possibilities raise tension between competition and cooperation about the optimal level of competition or cooperation to maximise a port's competitiveness. Therefore, there is a need for a balance between competition and cooperation to achieve the best possible competitive position (Castelein et al., 2019). The concept of co-opetition describes this new level of interaction between ports. The concept of co-opetition allows overcoming the trade-off

between port competition and cooperation. When port authorities support co-opetition, port operators benefit from both competition and collaboration levels (Kavirathna et al., 2019; Song, 2010). This co-opetition could be the next step to adapt to the changing competitive environment (Ryoo, 2011). However, the size difference between ports, factors of trust, shared values, and a sense of community have a significant impact on the choice of co-opetition and its success (Song et al., 2015; Castelein et al., 2019).

During the rest of this research, the interaction level of co-opetition will remain somewhat in the background. Therefore, the rest of this paper will mainly focus on the ultimate level of collaboration, namely the merger between ports. After discussing different levels of port interaction, it is now time to investigate further the effect of a merger development on the competitive position of both ports. Therefore, the next part will start with an overview of the concept of competitive position. After that, a discussion about some port performance indicators provides tools for analysing a port's competitive position during merging developments.

3 Competitive position and performance indicators

3.1 Competitive position

The concept of competitive position is implicitly already mentioned. The central target of competition or collaboration is to increase a port's competitiveness. Another term to describe where a port stands relative to competitors is a competitive position which is a volatile position (Haezendonck & Notteboom, 2002; Talley, 2012). For example, suppose that a competitor of a specific port heavily invests in adapting new cargo handling technology. This development can create a competitive advantage and worsen the port's competitive position. The competitive position of a port is related to a variety of port factors. It is related to the four port aspects. First, the location geographics of a port geographically located and its maritime setting can affect its influence and performance relative to other ports (Stopford, 2009). Thereby, its position within a global supply chain and in a network of ports can also influence how a port is positioned (De Langen, 2020). Secondly, some influencing factors are its scale, efficiency, variety of cargo handling, and service quality (Talley, 2012; De Langen, 2020; Tongzon, 1995).

Altogether, many factors contribute to the competitive position, which makes it a complex concept to measure. Most importantly, it represents not only their performance but their performance relative to their competitors. For example, when port X increases its performance, but competitor Y increases its performance more, port X's competitive position still worsened. Measuring this competitive position using port performance indicators (PPI) provides the opportunity to investigate if a port's competitive position has improved at specific performance areas relative to other ports.

Therefore, the next step in investigating the effect of a merger development on the competitive position will be discussing and presenting different PPIs.

3.2 Performance indicators

Port authorities and policymakers want insight into the performance of a specific port, which is where port performance indicators play a crucial role. These indicators are choice variables for maximising or minimising operating objectives (Talley, 1994; De Langen, 2007). There are two ways of selecting indicators in traditional transit literature, the criteria specification methodology and the operating objective methodology (Talley, 1986).

The criteria specification methodology specifies criteria that an appropriate performance indicator must satisfy. Selection criteria rising from the literature are consistency with specified objectives and goals, conciseness, measurability and minimising the effect of uncontrolled factors (Heaton, 1980; Tyson, 1977). Most of these criteria are reasonable, but the criterion conciseness could cause some difficulty. The criterion conciseness requires that specific indicators must be selected to limit overlap among others. As this number of indicators increases, its difficulty in interpreting specific also increases. For example, suppose that certain performance indicators improve over time, but some specific indicators deteriorate. There is a need for some weight or priority to specific indicators. Otherwise, it could be difficult to conclude whether performance has improved or worsened.

The operating objective methodology tackles this problem by selecting fewer specific indicators related to the aimed objective. Using the second methodology solves the conciseness problem and selecting proper PPI's (Talley, 1994). Comparing these values with their usual standards, development direction over time provides insight into the overall performance (Talley, 2006). Therefore, this paper will use the objective methodology to select a couple of specific PPI's for evaluating performance and competitive position regarding throughput and profit developments.

The first area of performance evaluation is related to a port's total throughput volumes. This volume is the traditional and widely used way of comparing performance between ports (De Langen et al., 2007). Growth in throughput volumes or related market shares in throughput per commodity is a widespread measurement for the performance of a port. Talley (1994) introduces another throughput performance indicator. This indicator measures the port's throughput per profit dollar, based on a port's zero profit constraint. The port performance will improve if the throughput per profit dollar increases or worsen otherwise. Increasing throughput without decreasing profit is closely related to the concept of efficiency. Being more efficient as a port gives the possibility to increase throughput without relatively decreasing profits. With this argument from Talley (1994), there is a slight connection between throughput volumes and efficiency.

However, De Langen et al. (2007) argue that there are limitations with comparing throughput volumes. Firstly, throughput limits the comparison between ports because one ton of fruits is very different from one ton of crude oil. Secondly, international trade developments and not performance mainly explain throughput volumes. This paper will counteract these first two limitations by investigating total throughput and throughput per commodity relative to other selected ports in the Hamburg-Le Havre range. Chapter four will investigate this combined with the discussed economic theory about ports, port competition, port collaboration, and PPI's. This analysis investigates the PPI's on the port of Antwerp and Zeebrugge. Since this is a currently ongoing merger process, the analysis will also use two other mergers as a case study to investigate the effect of a merger on the competitive position.

Altogether, this provides four PPI's for evaluating the performance of a port and its position towards other ports. These are total throughput, growth in throughput, market share per commodity, and throughput per profit dollar. Combining these indicators with the discussed theories about ports and their interaction causes development expectations of these PPI's. As earlier mentioned, Pérez et al. (2020) argue that a port's size and the specialisation provides opportunities for better efficiency. Thereby, collaboration could create synergies and stimulate performance and efficiency at specific cargo handling processes (Mclaughlin & Fearon, 2013; Qingmei & Hong, 2020). Furthermore, ports could achieve a competitive advantage through a merger, according to Feng & Notteboom (2013).

Additionally, Talley (2012) highlights the Copenhagen Malmö port merger case, which consistently increased performance, competitiveness, and throughput market shares. Altogether, a merger between ports, the ultimate level of collaboration, and operating under one port authority seem to contribute to multiple areas of performance positively. Based on the presented PPI's regarding throughput and profit, this leads toward the three hypothesises regarding the expected PPI development before and after the merger. These three hypotheses are shown below.

H1: The merger of ports has a positive influence on the throughput per profit indicator

H2: The merger of ports positively affects total throughput development as a market share within the HLH-range

H3: The merger of ports causes a positive effect on the market share of at least one category of throughput within the HLH-range

4 Case study

This section of the paper will focus on applying the discussed theory in combination with further in-depth analysis. The analysis section aims to estimate the potential effect of the merger of Antwerp-Bruges on their competitive position. This case study investigates the merger effect of Antwerp-Bruges relative to the Hamburg-Le Havre (HLH) range and two other port mergers. These two aspects, the HLH-range and the specific port mergers, need additional discussion before going further into the analysis. Therefore, the first part will address these two aspects.

4.1 HLH-range and port mergers

4.1.1 Selection of ports

To understand a port's position within the HLH-range, this case study chooses a specific selection of ports to represent the HLH-range for comparisons. The inclusion of all northern European ports would be ideal in this analysis. However, this case study chooses a specific selection due to a lack of comparable data for certain ports. The annual published facts and numbers from the port of Rotterdam (Port of Rotterdam, 2021) provide the basis for this selection. Table A.1 in appendix A shows the resulting selection of ports. The advantage of this relatively small selection is that these ports are all prominent and influential and relatively closely located near each other within the HLH-range. These aspects provide the opportunity for better comparisons. After discussing the first aspect, it is time to address the second aspect in this case study analysis. This second aspect is related to the three port mergers that this analysis will use for comparisons. The three port mergers are the port of Antwerp-Bruges, the North Sea port and the Haropa port. The following three parts will discuss these mergers in more detail, respectively.

4.1.2 Antwerp-Bruges

To investigate possible collaboration opportunities, the cities of Antwerp and Bruges initiated discussions in 2018. Along with corresponding studies and negotiations, this resulted in the merger agreement at the beginning of 2021 to start a one-year ongoing integration process between Antwerp and Zeebrugge. An agreement between governments of both cities and port authorities of both ports led to this ultimate form of port cooperation. Regarding the market share division, 80,2% and 19,8% of the shares of Antwerp-Bruges are for the government of Antwerp and Bruges, respectively. A board of directors consisting of representatives from both port authorities, city governments and some independent representatives will direct the port. This cooperation will lead to one operating port authority regarding port governance under the name *Port of Antwerp-Bruges* (Port of Antwerp, 2021).

The port of Antwerp is the biggest in Belgium and is present in the international top twenty-five list when measured in total cargo throughput. In terms of the largest container ports, the port of Antwerp is present in the top fifteen worldwide (De Langen, 2020). Relative to Antwerp, the port of

Zeebrugge is a relatively smaller port. However, the port of Zeebrugge experienced a higher growth rate in terms of throughput relative to other Flemish ports. Since 2003, its steady growth has caused the port to become the second biggest port in Belgium (Mathys, 2009). Figure A.2 in appendix A shows the prominent position of both Antwerp and Zeebrugge towards other Flemish ports. Their combined number circulates about 90% and 83% of the total throughput of all Flemish ports and all Belgian ports, respectively (Rubbrecht, 2020). Roll-on roll-off traffic (RoRo) is of great importance on the total throughput at Zeebrugge. RoRo refers to the horizontal handling of goods using wheeled equipment. For example, cars that belong to this category can be loaded or unloaded horizontally. Due to rapid and continued growth in RoRo cargo, the port of Zeebrugge is becoming one of the world largest and prominent car handling ports (Gueli et al., 2019).

Combining these two ports through a merger agreement will result in becoming an even more outstanding major player worldwide. Through the merger of the port of Antwerp and Zeebrugge, the port of Antwerp-Bruges will roughly approach a port size like Rotterdam in terms of throughput. The port authorities have ambitious goals by combining the relative specialities of Zeebrugge's cargo handling and Antwerp's competitive throughput position. One central ambition is to become the world's first port that reconciles economy, people, and climate. Some other goals are: becoming the most important container port in Europe, growing towards one of the largest breakbulk ports and being the largest in terms of vehicles throughput. In line with three strategic priorities - sustainable growth, resilience, and leadership in the energy and digital transition – this will create the world port of the future (Port of Antwerp, 2021). Furthermore, by this merging project, the ports of Antwerp and Zeebrugge will try to improve their position within the chain of global logistics (Notteboom, 2021; Port of Antwerp, 2021).

4.1.3 North Sea Port

After discussing some details about the ports of Antwerp and Zeebrugge, this section discusses some details about the second merger. This merger concerns the collaboration between Zeeland Seaports and the port of Ghent. Zeeland Seaports resulted from a cooperation agreement between the ports of Terneuzen and Vlissingen in 1998 to operate under one name, whereas since 2011, it functions under one port authority. In 2018 the port of Ghent and Zeeland Seaports merged and continued under the name North Sea Port. This cooperation created a sixty-kilometre international border crossing port area, beginning at the North Sea near the port of Vlissingen up to the port of Ghent thirty-two kilometres inland (North Sea Port, 2021a). The North Sea port has eight public shareholders. On the Dutch side, these are the province of Zeeland, the municipalities of Borsele, Terneuzen and Vlissingen, with respectively 25% and 8.33% for each municipality. On the Flemish side, these are the city of Ghent, the municipality of Evergem and Zelzate, and the province East Flanders with respectively 48.52%, 0.03%, 0.01% and 1.44%. The North Sea port operates under one central

supervisory body with four representatives from both the Dutch and Flemish shareholders (North Sea port, 2021b).

The North Sea port tries to function as a central multimodal logistical node in the European supply chain. They have a strong focus on a sustainable economy and inland shipping. With the handling of 12% of all Dutch maritime transport, the North Sea port belongs to the top ten of European ports regarding freight traffic in the Hamburg-Le Havre range (North Sea Port, 2021a). The North Sea port also plays a vital role in the process of future-oriented innovations. According to De Langen (2020), the North Sea port provides an innovation-oriented culture. The fact that they are currently developing one of the largest sustainable and green hydrogen plants is an excellent example of this innovative focus (North Sea Port, 2021c). While the North Sea Port is an international port merger, the subsequent port merger is more at a national level. This port merger concerns the collaboration between three relatively close located French ports.

4.1.4 Haropa

The third port merger in this research is the port of Haropa. Since 2012, this merger name is the consequence of the collaboration between the ports of Le Havre, Rouen, and Paris. The central target is to create an efficient end-to-end logistic system in the Seine region (Inoue, 2018). The collaboration of Antwerp-Bruges is somewhat similar to the Haropa ports collaboration. They are not necessarily in competition with each other because they have different functions and specialities. The port of Le Havre functions as a modern gateway for the whole region by being France's main northern port in container handling (Stopford, 2009). The port of Rouen has a more logistic function with its well-developed logistic system. The port of Paris functions as a river/inland port and is France global centre of advanced maritime services (Merk et al., 2011). The Haropa port functions overall primarily as a transport node but has its own functions for the specific ports. As the fifth largest port in northern Europe and handling 35% of French maritime transport, the port of Haropa focuses on becoming a future green and smart port. Protection of the environment, state of the art security and safety procedures, and sustainable growth of service quality are central goals for the port authorities (Haropa Ports, 2021).

4.1.5 Comparisons

By providing some background information on the different port mergers, it is possible to distinguish some similarities and differences. The port of Antwerp-Bruges aims to be a competitive international port. They aim to compete with international ports like Rotterdam and become frontrunners on multiple levels of interest. The Haropa ports and the North Sea port are relatively smaller mergers in terms of international competitiveness. The North Sea ports and the Haropa ports aim more for a stable competitive position within the HLH-range and a strong position towards other national ports. In terms of freight, they are considerably smaller when measured in throughput

volumes. Figure A.3 in appendix A highlight this difference. The competitive position before the merger is a bit different for the port belonging to Haropa ports and the North Sea port relative to the port of Antwerp-Bruges. This change in competitive position before the merger may also influence the effect of the ultimate collaboration on their position after the fusion.

However, they are also comparable in certain aspects. Firstly, they all create relatively large and geographically similar port areas covering relatively large parts of their hinterland. Where both Antwerp-Bruges and Haropa ports create this at a national level, the North Sea port creates this at an international crossing border level. Secondly, one evident element that they all have is the functioning under one governing port authority. This element is essential because otherwise, there could be simultaneously cooperation and some competition between those authorities, creating possible co-opetition but without the efficient outcomes compared to one governing port authority. A port authority wants to maximize the performance of the whole port. All ports operating under one port authority gives the chance to maximize both port's performances through, for example, efficiency improving synergies. Thirdly, they all compete within the same port range. If specific ports in this range decide to merge, then the effect of this merger on their competitive position is theoretically expected to be roughly like other ports that merge in the same port range, on the condition that these are very comparable ports between the two mergers with comparable port functions. There is a resemblance between the port mergers regarding port functions because all concerning ports are, in essence, primarily transhipment hubs with the transport node function. There are some small differences in functions. For example, the ports of Rouen and Paris also have a more logistic or service function than a transport node function. However, this is also the case with the port of Antwerp, which has an important second and third function for logistics and industries, respectively. However, this research focuses mainly on the transport node function wherein the mergers are roughly comparable.

All in all, there are differences to identify regarding their international competition level, ambitions, and initial competitive position. These factors could cause a subtle difference in the merger effect on their competitive position. Nevertheless, there are also similarities regarding geographics, governance, competition within the same port range and port functions. According to expectations, these factors will outweigh the differences when investigating the effect of the merger due to the comparability in port functions. Therefore, without disregarding the differences, the effect of the merger is expected to be roughly estimated the same.

4.2 Analysis

This second section of the analysis will address the three hypotheses. Firstly, it explains the sources and collecting of the data. Secondly, it discusses the applied methods regarding the hypotheses. Fourth, the results from the different methods will be published and analysed. The

discussions about the data, methods and results are in different sections, but all in the same order from the first towards the third hypothesis. One critical remark is essential to remember during the analysis. Due to a lack of data, it is not entirely possible to investigate the three hypotheses completely on all three port mergers separately. Nevertheless, this paper tries to analyse as much as possible with the available published data.

4.2.1 Data

The first hypothesis uses the throughput per profit performance indicator of Talley (1994); and argues that the merger positively affects this performance indicator. Therefore, this paper collects throughput and profit data from different port authorities. The Orbis database from the Erasmus University Rotterdam, a detailed database for providing financial data about companies, is used. This database provides overviews of annually financial income statement results. These results allow collecting the net income of the specific ports and port mergers. These results are compared or adjusted with published reports from individual ports. It is essential to keep in mind that the reported income from the port authority reports and Orbis relate to the income of the governance company of the port. Due to a port's complexity, it is not easy to approach the net income or operating profit of the port as a whole. Therefore, this paper chooses the net income of the port authority company to represent a port's profit. The Haropa ports merged around 2012, which caused the fact that there is, unfortunately, no public data about profits from multiple years available around their merger. Nevertheless, the complete data of the period 2016-2019 is used for the North Sea port and as a comparison the theoretical port of Antwerp-Bruges.

Regarding total throughput, annually published reports from port authorities of the selected ports are used and compared to collect throughput data. Additionally, Eurostat is used as an additional database to collect the total throughput volumes for specific individual countries. Eurostat publishes these volumes as a total of all ports in a country. In addition, this paper uses throughput data from published reports and working papers of the National Bank of Belgium to control values or fill in certain blanks for specific years. The annual facts and numbers publication from the port of Rotterdam provides the baseline in this throughput collecting process. The second hypothesis states that a merger positively affects the port's market share of total throughput in the HLH-range. This paper already collected this data is for the first hypothesis. However, this paper also uses statistics from the national bank of Belgium and the central bureau of statistics. These various sources make it possible to gather throughput volumes for specific ports for a larger time frame and, therefore, also for the combined throughput volume of the selected ports. This more extensive time frame allows for better options regarding long term throughput development.

Where the first and second hypotheses are related to total throughput, the third hypothesis is all about specific categories of throughput. This paper divides total throughput into four categories:

dry bulk, liquid bulk, containers, and breakbulk. The category breakbulk includes non-containerised general cargo and roll-on roll-off traffic. The third hypothesis states that a merger positively influences the combined market share in at least one of the four cargo categories. The Rotterdam port authorities' annually published fact and figures reports provide the guideline foundation for the throughput category data regarding this third hypothesis. In this way, this research collects data of the selected ports from 2016-2019 of the different throughput categories. Like earlier, this paper uses individual port authority reports to control or adjust these values. Due to a lack of complete data about throughput categories, it is impossible to gather data for earlier years.

Consequently, this means that it is not possible to investigate the merger of the Haropa port around their merger year in 2012. So, this paper can only investigate the North Sea port regarding the third hypothesis. The reason for excluding the year 2020 is that this year is considered a disturbing year regarding the Covid-19 pandemic and the maritime transport sector. Therefore, this year's inclusion would increase the risk of the wrong estimation of the merger effect.

4.2.2 Methods

The first hypothesis states that the merger has a positive effect on the throughput per profit indicator. To analyse the North Sea port, before 2018, the year of the merger, the total throughput and profit is a summation of Zeeland Seaports and the port of Ghent. Similar, this paper calculates the throughput volumes and profits of Antwerp-Bruges as a summation of the ports of Antwerp and Zeebrugge.

Throughputs and profits are not comparable on an absolute level. This paper gathers throughput in millions of tons, where it collects profits in thousands of euros. Therefore, this paper uses an index base year to allow for applying relative comparisons. The year 2016 is selected as a baseline because that is exactly two years before the merger of North Sea Port in 2018. Automatically, the throughput per profit dollar will result in 2016 then also in a value of one. Concerning the following years, the formula below shows how to calculate the indexes of the specific year t. The formulas (1), (2) and (3) are respectively for the throughput index, the profit index, and the indicator value. The letter *t* represents the specific year. The results are collected in excel to create a line diagram. This diagram creates the possibility to investigate the trend in throughput, profits, and value of the indicator.

$$(1)\ Throughput_{index,t} = \frac{Throughput_t}{Throughpu_{2016}} \qquad (2)\ Profit_{index,t} = \frac{Profit_t}{Profit_{2016}}$$

$$(3)\ Throughput\ per\ profit_t = {Throughput_{index,t}}\Big/{Profit_{index,t}}$$

The second hypothesis argues that a merger positively affects the port's market share of total throughput in the HLH-range. The first important step is to add up all volumes of the selection of ports. This total volume is used as a denominator to calculate throughput market shares. This paper divides

their throughput volume by this denominator to calculate all individual market shares. This share is collected in excel to present a bar graph for visual presentation. This paper also applies this method for the three specific port mergers. The method divides the total throughput volumes of Antwerp-Bruges, the North Sea port and the Haropa ports by the total volume of all individual ports. This addition allows for a similar visual presentation as earlier but now with the market shares of the mergers. This visualisation could overcome the challenge of size difference in total throughput between the three mergers because the comparisons of market shares are more on a relative level.

Additionally, this paper uses a second method. With Stata, this method uses a multiple regression method to estimate the effect of the merger and other independent variables on the dependent variable market share This method uses only the North Sea port and the Haropa ports because here, the theoretical treatment variable merger will change over time. The port of Antwerp-Bruges is not yet merged and therefore not used in this case. The advantage of this selection is that it is hopefully easier to distinguish differences in developments around the merger. The disadvantage is that there is no control group and only two observations over time which weakens the results and validity of the method. In formula (4), *Yi,t* represents the market share of port merger *i* in year *t.* This share is calculated in the same way as the first method but now presented in the data as an absolute number of percentage points. The αi coefficient represents the constant term. The term *X1,i,t* is the merger dummy variable with value one if port *i* is merged in year *t* and zero otherwise. For example, in the case of the North Sea port, before the year of the merger in 2018, this dummy variable has a value of zero and a value of one afterwards. The term *X2,i,t* is the growth in throughput op port merger *i* at year *t* relative to the previous year *t-1* in percentage. The term *X3,i,t* represents the growth in total throughput of the HLH-range in year *t* relative to the previous year *t-1* in percentage. The term *X4,i,t* is the growth in market share of port merger *i* in year *t* relative to the previous year *t-1.* In other words, this term represents the difference between *Yi,t* and *Yi,t-1.* Although this is dependent on Y and therefore not an independent variable, this paper still uses this variable because other ports' market shares developments could influence *Yi,t* through *X4,i,t* indirectly. This paper chooses these variables because they could all probably influence the decision to merge and ultimately also the market shares, based on the current year or previous year

$$(4)\ Y_{i,t} = \alpha_i + \beta_1 X_{1,i,t} + \beta_2 X_{2,i,t} + \beta_2 X_{3,t} + \beta_3 X_{4,i,t} + \varepsilon_{i,t}$$

Where the first and second hypotheses are related to total throughput, the third hypothesis investigates specific categories of throughput. The third hypothesis states that a merger positively influences the combined market share in at least one of the four cargo categories. This paper calculates market shares for the four specific categories at the North Sea port through the data collection process as described. The paper calculates this share by dividing the throughput of the North Sea port in a specific category by the total throughput of all selected ports in that category. A comparable

calculation as the total throughput market shares. The paper collects these results in excel to allow for visual presentation in a line diagram.

4.2.3 Results

The figures below show the throughput per profit indicator results of the North Sea port and the theoretical port of Antwerp-Bruges in respectively figures 4.1 and 4.2 below.

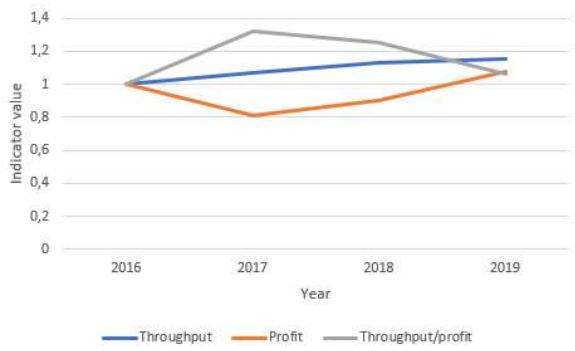

Figure 4.1 Throughput per profit indicator of the North Sea Port

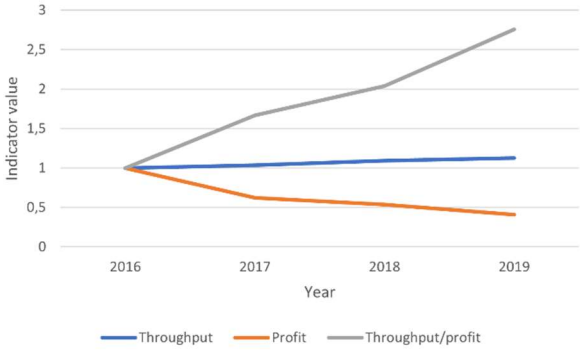

Figure 4.2 Throughput per profit indicator of the port of Antwerp-Bruges

The first clear aspect from the results is that this performance indicator is very volatile despite using a base year as an index. Profit and throughput per profit move in opposite directions. This movement is logical because it points out precisely a significant disadvantage of this performance indicator. Ceteris paribus, if profits decrease, throughput per profit automatically increases due to how this indicator is measured. However, it is essential to notice that by rough approximation, the value of this indicator is slightly higher after the merger in 2019 than before the merger in 2016. Figure 4.3 below shows these results where total throughput is higher due to the steady growth trend, but profits are also higher than in 2016. So, there is a higher volume of total throughput but also higher profits.

These fluctuations could probably be caused by significant changes in profit over the years 2016-2019 due to, for example, changes in investments during this period. The volatility of the profits at the North Sea port has multiple causes. Firstly, it is crucial to keep in mind that the profits before the year 2018 are a summation of profits from Zeeland Seaports and the port of Ghent. Therefore, it is more volatile than the profits of an individual port. Secondly, there are some magnitude differences in investments. For example, in the year 2017, the profits of Ghent increased, but the profits of Zeeland Seaports decreased. This change is due to relatively big investments in 2017. Some examples are the improvement of canal depth around Vlissingen, the ground expansion for food producers at Vlissingen, and the start of the construction of a new biogas plant at the Axel area (Zeeland Seaport, 2018). Altogether, this causes that logically the years after 2017, the profits steadily increase with relative smaller investments, ceteris paribus. Besides investments, there could also be other factors. Like a positive or negative change in tax regulations, changes in personnel staff payments, and accidents in the port with the corresponding reparations and safety procedure costs, all could influence profits.

These results from figure 4.1 suggest that the merger could positively influence the total throughput per profit indicator in the long run. However, there is substantial volatility of this indicator and the strong influence of other factors like investments. The presence of other factors makes it impossible to conclude that the long-term improvement in profits, and therefore the indicator value, is only caused by the merger. So, the increase in throughput, profits and indicator value is caused by a combination of factors.

Regarding the second hypothesis, results are shown below for the total throughput market shares. Firstly, figures 4.3 and 4.4 show the results from the first method. Secondly, table 4.5 shows the results of the second method.

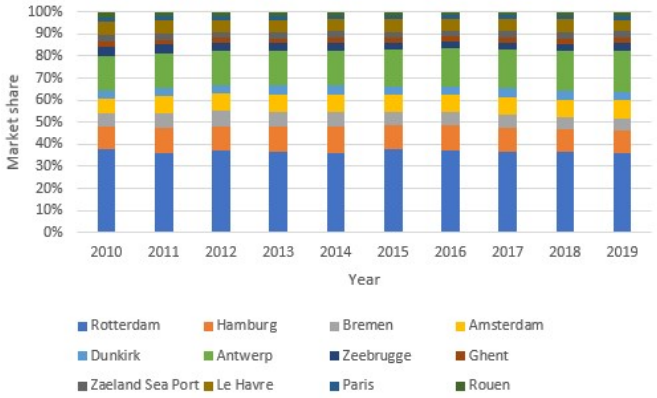

Figure 4.3 Throughput market shares of all individual ports

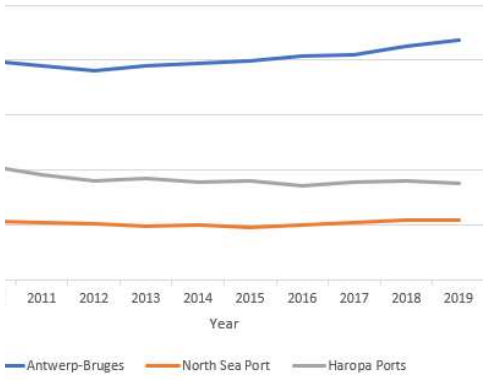

Figure 4.4 Throughput market shares of the three port mergers

Table 4.5 Regression results of the relation between merging and a port's throughput market share

Variable	**Throughput market share**
Merge	0.438*
	(0.118)
Grow throughput	0.024
	(0.031)
Grow HLH throughput	-0.002
	(0.028)
Grow market share	-0.138
	(0.489)
Constant	5.08*
	(0.092)
Observations	2
R^2	0.567

Notes: Standard errors between parentheses; the dependent variable is throughput market share; * $p < 0.01$.

Figures 4.3 and 4.4 show a considerable difference in throughput market share between the three mergers and their individual ports. Figure 4.3 shows the total throughput market share of all twelve individual ports. However, from the chosen port selection, three ports are missing. The port mergers are not directly shown in figure 4.3, although they are indirectly present by adding the corresponding ports shares. The market shares of these three mergers are presented separately in figure 4.4.

From figure 4.4, it seems like the market share of the North Sea port in 2018-2019 is relatively higher than before the merger in 2018. An increase in the market share of the Zeeland Seaports causes most of this increase. Surprisingly for Haropa ports, an increase in market share is not the case. Figure 4.4 shows that the market share of Haropa ports strongly decreased until the merger in 2012, whereafter it slightly decreased. The financial debt crisis in Europe could cause a decrease in share for Antwerp-Bruges and Haropa ports in 2012. For some ports, it may affect their overall performance or throughput, in this case, more than others. However, the case of Haropa ports in figure 4.4 shows a continued decrease after 2012. The fact that all three ports belonging to Haropa ports handled a roughly constant number of total throughputs over time could explain this decrease. When this number is not steadily increasing, their market share will decrease since other port's handle probably more throughput year by year. This development is exactly what chapter three describes regarding the competitive position. The competitive position is dependent on the performance of a port relative to its competitors.

Table 4.5 shows the results of the multiple regression. With the case of Haropa ports and the North Sea port, the results show a positive merge coefficient which is significant at one per cent level. Since there may be many other factors, which are now included in the error term but may influence market shares, the conditional independence assumption cannot hold in this case. An example is the ambitions or focus of a port on multiple interests. Suppose that they are trying to improve safety in the port. This improvement may come at the cost of a relative decrease in total throughput because it takes more time to do it with the new safety regulations. Besides ambitions or focus, other factors could influence market shares. Some examples are the level of intra-port competition and collaboration, the number of public and private investments in new or improved port assets, facilities, or equipment, and the level of human capital. These three factors could all influence the performance of individual port actors or the collective performance of the port as a whole. In addition, these factors will indirectly affect total throughput through, for example, levels of efficiency or integration and alignment in the port's supply chain network. Besides influencing the dependent variable market share, these factors could also influence the decision to merge the theoretical treatment variable. Consequently, this creates omitted variable bias.

Thereby, the linearity assumption may technically hold partially because the theoretical treatment variable is represented by the merger dummy variable. The relationship with a dummy variable is always linear. However, this assumption also states that there cannot be substantial differences in characteristics across the treatment and control groups. On the one hand, since there is no control group, in this case, this assumption cannot hold. On the other hand, even if this paper uses the other ports from the port selection as a control group, they would substantially differ in characteristics.

All in all, it is impossible to conclude or highlight a causal relationship. The only possible outcome of the results is that they suggest a positive association between market share and both throughput growth and merging. However, since other factors almost certainly influence market share development, a change in market share cannot be caused by the merger only. It is at least a combination of factors leading to the outcome.

The four figures below show the results regarding the third hypothesis about throughput categories and the corresponding method. Figures 4.6, 4.7, 4.8 and 4.9 show the results for the dry bulk, liquid bulk, container, and breakbulk categories, respectively.

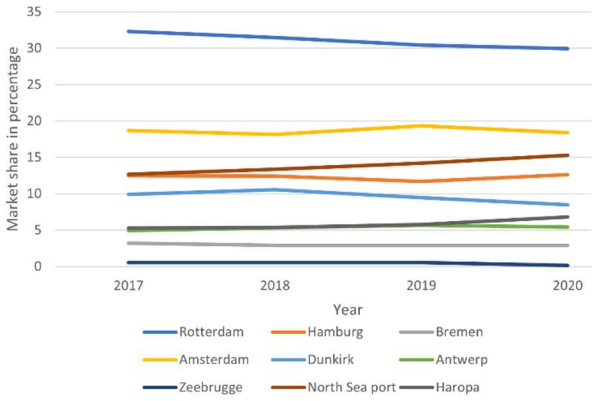

Figure 4.6 Dry bulk throughput market shares

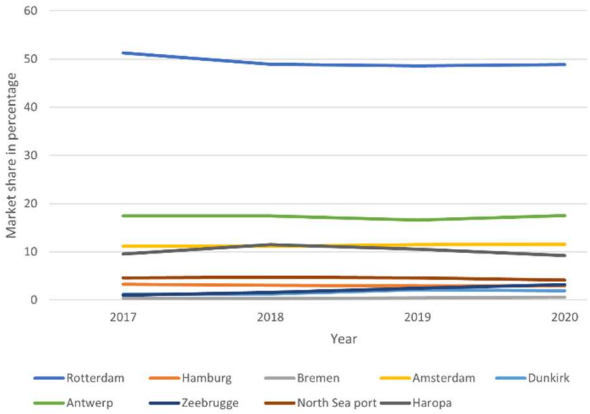

Figure 4.7 Liquid bulk throughput market shares

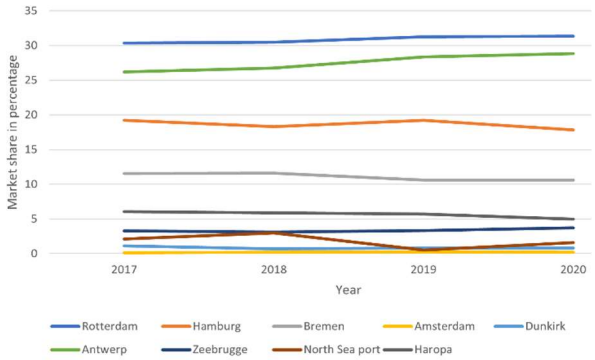

Figure 4.8 Container throughput market shares

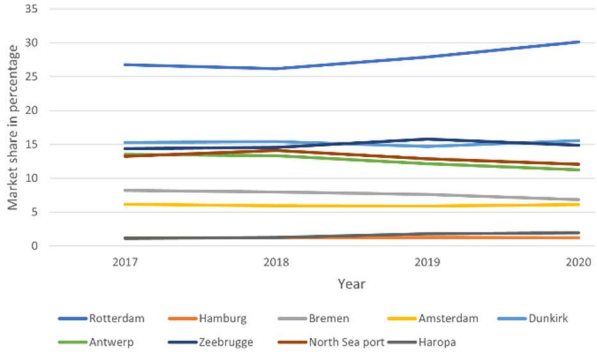

Figure 4.9 Breakbulk throughput market shares

Figure 4.6 shows that the dry bulk market share of the North Sea port is increasing over time. The surprising element behind this result is that their market share seems to increase more progressively after the merger in 2018. It increased for 2018, 2019 and 2020 with respectively 0.62,

0.85 and 1.12 percentage points. This increase suggests that the merger could contribute to their market share development. The growing trend in dry bulk is not entirely unexpected since they see it as their speciality because half of their throughput belongs to the dry bulk category, which creates synergies (North Sea port, 2021d). The merger could strengthen this synergy effect. However, it could also be that other ports specialize in other segments and decrease their dry bulk throughput for other categories, which causes a logical increase in market share. Another important factor that this paper cannot neglect is the facilities needed by, for example, dry bulk. Suppose the port of Ghent increased its dry bulk terminals qua performance or capacity. Then the increase in market share in figure 4.6 is a distorted picture of the merger effect. However, the merger is indirectly connected to this factor because it connects these facilities or terminals belonging to the same port. Another factor that is also important is the fact that in the port of Ghent in the year 2019, there were multiple short strikes and one twenty-four-hour strike (Van de Voorde, 2019). These strikes cause uncertainty and delays, which could explain a part of why every category share changed from 2018 to 2019. Some more drastically than others, but no category remained unchanged that year. A factor like strikes could cause a wrong interpretation of the overall merger effect on the specific market shares since the strikes may influence certain categories harder than others. Such factors would be hard to quantify in this analysis because the long-run effect is often difficult to approximate in numbers.

Overall, the merger could strengthen the presence of synergies on performance. However, the overall change in market share is not only caused by the merger but through a combination of factors. As is the case with the profits, total throughput market share and throughput category market share, they are not only affected by the merger but by a combination of factors. Therefore, the next chapter provides more insights into how the merger may directly or indirectly influence profits, total throughput, and categories of throughput.

5 Interviews

This chapter provides the summarised insights about the merger Antwerp-Bruges through interviews. These interviews will provide additional insights from port actors regarding the overall port merger and developments of throughput, profit, merger challenges, and competitiveness. The previous chapter examined these developments through a comparative analysis with two other mergers. This chapter will address the effect of the merger on these developments by collecting insights from interviews conducted with different port actors who are actively involved in the ports of Antwerp or Zeebrugge. Appendix B shows the more detailed transcript of the interviews.

The interviews results highlight some aspects that are important to emphasise first. Firstly, this merger could some people already expect this merger as the merger of the North Sea port has provided some incentives regarding competitiveness and efficiency advantages. Secondly, the merger of

Antwerp-Bruges is a merger between the relatively big port of Antwerp and the relatively smaller port of Zeebrugge. Due to the size difference, the port of Antwerp will take the lead in this merger development to fully integrate and beyond. The port of Zeebrugge can only follow during this process. Thirdly, the overall merger process faces some challenges. The first and maybe biggest challenge could be the significant cultural difference between the regions of both ports. The second challenge could be the distance between both ports. This distance will create challenges for collaboration but also for individual port actors. The third challenge is that there will probably be a level of co-opetition in the short run. Through the merger, they collaborate intensively with each other. However, in the short run, instead of total collaboration, both ports are likely to compete with each other and focus too much on their own performance and competitiveness. These challenges and the leading role of Antwerp need proper management from the overall port authorities if they want to succeed in this merging project fully.

The interview results require a slight distinction between the short and long effects regarding total throughput and profit developments. The total throughput is simply a summation of both port's throughput as a new total volume in the short term. So, no increase in total throughput market shares relative to the initial situation of both ports before the merger. This summation will be the case for the next five years after the establishment of the merger. After these five years, in the long run, possibilities arise to create and exploit synergies. So, there is no increase in total throughput in the short run and, therefore, not their throughput market shares. However, opportunities will present themselves for more than proportional increases of throughput through synergies in the long run.

This distinction is similar regarding the profit developments. In the short run, it will only be a steady summation of both port's profits. However, due to the considerable difference in staff, cost-savings are possible by combining personnel from both ports. These cost-savings can be done through, for example, the process of dividing specific special staff across both ports or placing the right people in the appropriate places at both ports, causing possible efficiency improvement opportunities. Consequently, a higher efficiency results in higher net results. Altogether, these developments mean that the merger has no direct positive influence on the throughput per profit indicator since both developments are likely to remain unchanged in the short run and relatively similar developing in the long run. However, the merger could indirectly positively affect profit and total throughput developments by providing synergies or higher efficiency opportunities. So, the merger could indirectly affect the throughput per profit indicator in the long run.

However, this is different for the specific throughput categories. The merger could create improvements in specific category market shares or specialisations in the short and long run. The competitive positions of Antwerp in liquid bulk and containers and the position of Zeebrugge in breakbulk, especially the roll-on roll-off traffic, will cause a more than proportional increase in market

shares. The clustering and combination of specific activities that belong to the specific categories will create the possibility of optimising a broad spectrum of category-related activities by using each other specialities. So, the merger would positively contribute to market shares in specific categories of throughput. With the merger of Antwerp-Bruges, this increase will be most visible for the breakbulk category by further improving Zeebrugge's already prominent roll-on roll-off position to one of the biggest roll-on roll-off ports when combined with Antwerp. So, the merger positively influences the market share of specific throughput categories.

All in all, the interview results provide some additional insight concerning the merger of Antwerp-Bruges and the central standing hypotheses. Firstly, total throughput developments will steadily develop, unchanged by the merger, as a summation of both ports' total throughput for the coming five years. Hereafter, synergies or efficiency opportunities will provide the opportunity for further throughput growth in the long run. Secondly, profit developments remain unchanged as a summation of both ports' profits in the short run. However, due to a significant difference in staff size, there is an opportunity for cost-savings that could benefit the efficiency and the following net results. Thirdly, the merger positively affects specific throughput categories through the clustering and combination of category related activities causing specialisation and synergies. In the case of Antwerp-Bruges, this will be most visible for the breakbulk and liquid bulk categories. Finally, the Antwerp-Bruges merger has some challenges for the establishment of the merger and afterwards. These challenges need appropriate attention through an appropriate management approximation.

6 Interpretation and limitations

The fourth chapter analysed the effect of the merger regarding the three hypotheses through conducting a case study analysis. The fifth chapter examines this effect by collecting additional insights through conducting interviews. Finally, this chapter combines the results from the previous two chapters concerning the three hypotheses by discussing whether the results support or contradict the hypotheses. Hereafter, the second section discusses the limitations of the analyses.

6.1 Interpretation

The first hypothesis argued that the merger positively influences the throughput per profit indicator. The case study results show a volatile indicator with a probably substantial interference by other omitted factors. Factors like investments, changes in tax regulations or staff payments could cause fluctuations in profits. This interference makes it impossible to conclude that the merger only causes an improvement in profits or the indicator value. Therefore, a combination of multiple factors causes a change in this indicator. The interview results provide additional insight into some of these factors. They show that the merger has no direct influence on the development of profits or total throughput in the short run. Both throughput and profit will be a summation in the short run. However,

in the long run, possibilities arise for synergies and cost-saving opportunities. By creating these opportunities, the merger could indirectly influence the long-term development of profits and total throughput. Aside from these arising opportunities, there are probably other factors that influence both throughput and profit developments. Thus, an increase in throughput or profits is not only caused by the merger but by a combination of factors. However, indirectly, the merger could contribute beneficially to both developments. Nevertheless, it is nearly impossible to conclude that the merger positively affects the throughput per profit indicator regarding the first hypothesis. The merger could indirectly stimulate both developments, but it is unknown how strong this stimulation will be for both developments. For example, profits may grow faster than throughput volumes which causes a decrease in the throughput per profit indicator. This example illustrates that these results are not sufficient to support the first hypothesis.

The results concerning the second hypothesis are slightly different between the two analyses. The case study results suggest a positive association between a merger and throughput market shares. However, this association is without solid evidence combined with other omitted variables that almost certainly influence market shares. In contrast, the interview results show that throughput remains unchanged by the merger itself. As mentioned, the merger could affect positively indirectly throughput. Therefore, combining the results of both analyses does not support the second hypothesis that the merger positively affects total throughput market shares in the short run. However, technically the results support this hypothesis for the long run through the stimulation of other factors. Thus, the merger is not the only causing factor of possible higher throughput volumes but could be at least a contributing factor in the long run. This contributing influence is in line with the theory of Talley (2012), which argues that a merger could contribute to higher throughput market shares in the long run. Thereby, one crucial assumption is needed, which assumes that this growth is higher for the merged ports than for other selected ports. Otherwise, the market shares would not increase.

The positive effect of the merger on the throughput categories is slightly more visible from the results. The case study results show that specific categories of throughput are certainly influenced at the year of the merger. Besides the merger, other factors influence this change in category market shares like the port facilities or other port's specialisations concerning the specific category. The interview results show that the merger could positively affect specific throughput categories in both the short and long term through the clustering and combination of category-related activities, causing specialisation and synergies. These results align with the argument of Mclaughlin & Fearon (2013) and Qingmei & Hong (2020) that further collaboration could create synergies and stimulate performance and efficiency at specific cargo handling processes.

Overall, a merger between ports could possibly indirectly stimulate profits, total throughput, and throughput categories in the long run. Combined with the theory about the competitive position,

these results highlight that a merger could contribute to long-run competitiveness. However, this paper is unable to identify a causal relationship between the merger and these three developments. There are too many omitted variables that also play a role in causing these developments. Therefore, this paper cannot conclude that a merger between ports positively influences profits, total throughput, and throughput categories.

6.2 Limitations

Before concluding, it is important to briefly discuss the most critical limitations of the theories and the analyses. This discussion is vital because it determines how strong and realistic the results are regarding the hypotheses and the main question; and how further research could be improved.

The first limitation is the zero-profit constraint assumption of Talley (1994). This assumption assumes that a port is a non-profit operating entity. However, port authorities who manage the port have changed towards more commercial port development companies due to the changing environment. These authorities aim to make a profit for their stakeholders or further investments. This profit orientation makes the zero-profit constraint less realistic regarding the throughput per profit indicator. This difference may explain why this indicator could work as a theory measurement indicator but not in practice during this research. The second limitation concerns the reliability and availability of public data on throughput and profits. Although this paper uses multiple sources to control for the correct volumes of throughput or number of profits, the report of an individual port is likely to overestimate its own operating results. Not for every port, a check of these numbers with a report from other ports or entities was possible, which slightly limits the reliability of the available public data of specific ports.

The third limitation concerns the limited number of interviews and comparable port mergers for the two analyses. More interviews create a broader perspective on the effect of the merger from multiple port actors. Thereby, more comparable port mergers could provide a better comparison in the case study analysis. They might differ more in geographics but may also be more similar in size and competitive position. This paper uses only two port mergers for comparisons, which implies two observations over time, limiting the results' validity and strength. The fourth important limitation is that this paper chose a selection of ports to represent the HLH-range for comparisons. Although this may be easier for comparisons, this limits the reality. It neglects the importance of a considerable number of small and dry ports in the hinterland on the competitiveness of the selection of big ports.

The last and maybe most significant limitation is that this research used three relatively recently port fusions. As the results may suggest positive effects on the long, this limitation limits the opportunity to investigate these long term effects. Due to the relatively recent mergers, it is almost

impossible to investigate long term effects yet. So, it is logically hard or impossible to investigate the long term effects precisely when this research is done in a relatively short time after the mergers.

Conclusion

This paper examines the merger's effect between Antwerp and Zeebrugge's ports on their competitiveness relative to the HLH-range. While investigating this effect, the paper places the most stress on the port functioning as a transport node through investigating throughput volumes. The first chapter describes the port concept in detail by explaining the different aspects of a port, the different port functions, and the governance of a port. After that, the second chapter discusses different levels of competition and collaboration between ports. Starting from an intra-port interaction level to a more international inter-port level provides theoretical arguments that both competition and collaboration benefit a ports' performance. After describing different levels of port interaction, the third chapter discusses the concept of competitive position and relevant performance indicators. The concept of competitive position and the relevant four PPIs lead to three hypotheses based on the previous theory discussion. The paper investigates these three hypotheses and the effect of the merger through a comparative case study analysis and additional stakeholder interviews.

The first hypothesis argues that the merger of ports positively influences the throughput per profit indicator. Based on the case study analysis results, it is impossible to conclude that the merger is the only factor causing a change in this volatile indicator. The development of profits and throughput is affected by multiple factors. The interview results provide more insight by indicating that only in the long run, the merger could affect both developments positively. In the short run, total throughput and profits are a simple summation of both ports. Overall, in theory, the merger could positively influence both profits and total throughput but without certainty if this influence is positive. Therefore, this paper cannot conclude that the merger positively affects this indicator. This conclusion is not possible due to how this indicator is measured and the uncertainty about how strong this merger influences both developments. Thereby, most importantly, there are other omitted influencing factors on both profits and total throughput. Therefore, this paper cannot reject the first null hypothesis.

The second hypothesis states that the merger positively affects total throughput as a market share within the HLH-range. The combined results of the case study and the interviews show no causal relationship between the merger and the ports' throughput market shares. The merger could possibly influence throughput developments but not without the interference of other influencing factors. The interview results highlight that the merger does not affect total throughput in the short run. However, the merger could positively affect the throughput development through synergy between both ports in the long run. So technically, in the long run, a merger between ports could possibly contribute to increased throughput growth. Assume that this growth is stronger than other ports, the total

throughput market share increases of the ports belonging to the port merger. Based on the assumption, the merger could possibly positively affect throughput market shares. However, this research cannot conclude that the merger positively influences throughput market shares. Firstly, there is no causal relationship, and there are other omitted influencing variables. Secondly, the results only suggest a positive influence in the long run without conclusive evidence. Combining these two aspects with the limitation that it is impossible to investigate these long-term effects perfectly due to recent mergers, this research cannot reject the second null hypothesis.

The third hypothesis argues that the merger positively influences the market share of at least one throughput category within the HLH-range. The case study results show that specific categories of throughput are certainly influenced at the year of the merger. The interview results show that the merger could play an essential indirect role in this change. The merger could indirectly positively affect specific throughput categories through the clustering and combination of category related activities, causing specialisation and synergies. Nevertheless, due to other omitted influencing factors that can explain changes in market shares, this paper can not reject the third null hypothesis. It could be that a merger stimulates these market share developments indirectly in the long run. However, due to the data, interview and time horizon limitations and the corresponding results, it is impossible to make this conclusion based on this research.

Overall, this paper approximates the effect of the merger of Antwerp-Bruges on their competitive position. The usage of the specific throughput performance indicators and the corresponding results regarding the three hypotheses lead to only one conclusion. The effect of the merger may be unknown or unnoticed in the short run. In theory, the merger could cause an increase in competitive position regarding the transport node function in the long run. The merger could indirectly stimulate efficiency, total throughput developments and throughput category developments through synergies and specialisation opportunities through collaboration processes. However, many other omitted influencing factors could also explain changes in competitiveness regarding efficiencies and total throughput. So, based on this research, it is impossible to determine that the merger contributes to a better competitive position from a critical perspective.

As is the case with all studies, further research could investigate the effect of a merger more accurately. Further research could investigate the effect of the merger with a focus on the other three port functions. Thereby, the effect of the merger needs further investigation after the establishment of the merger of Antwerp-Bruges. After a couple of years, a better approximation of the long-run effects is possible. Also, combining other Chinese port fusions could improve this paper or provide an idea for further research. Ultimately, the years to come will show if and how the competitive position of the ports of Antwerp-Bruges changes in practice. Like the North Sea port, it may be an incentive for other ports to merge or not. Only time will tell.

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Appendix A

Table A.1 Selection of ports within the HLH-range

Port name	Country of port	Port Name	Country of port
Amsterdam[1]	The Netherlands	Hamburg	Germany
Rotterdam	The Netherlands	Bremen	Germany
Zeeland Seaports[2]	The Netherlands	Dunkirk	France
North Sea Port[3]	The Netherlands/Belgium	Le Havre	France
Ghent	Belgium	Rouen	France
Antwerp	Belgium	Paris	France
Zeebrugge	Belgium	Haropa[5]	France
Antwerp-Bruges[4]	Belgium		

Notes: 1) represents the North Sea canal area; 2) port merger between the ports of Terneuzen and Vlissingen since 2011; 3) port merger between the port of Ghent and Zeeland Seaports; 4) fictional theoretical port to represent the merger between the ports of Antwerp and Zeebrugge; 5) port merger between the ports of Le Havre, Rouen, and Paris since 2012

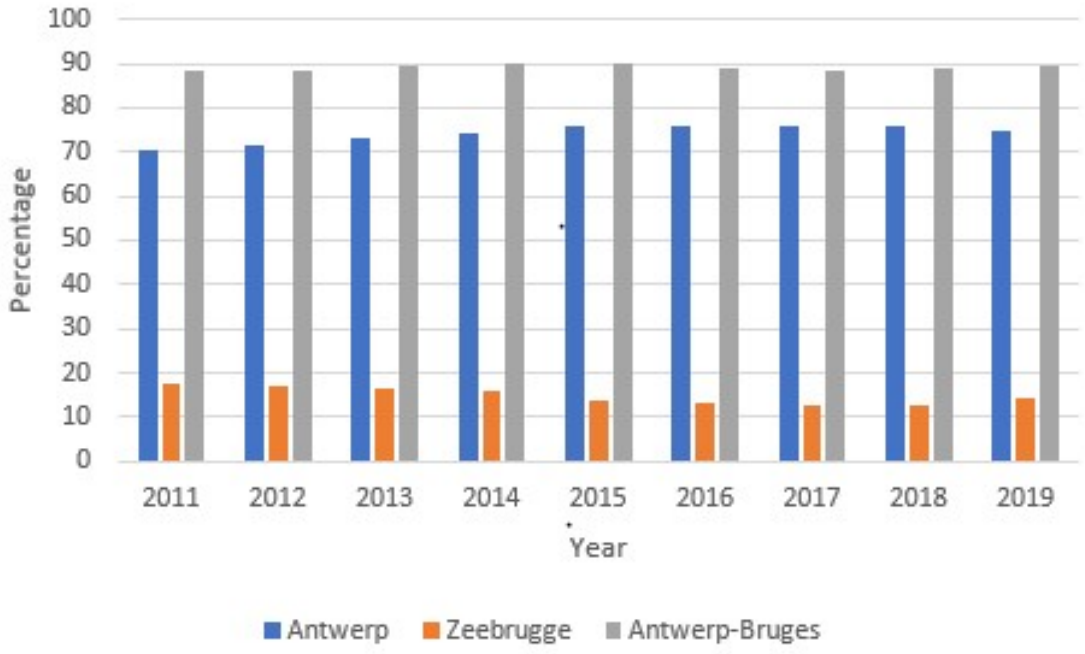

Figure A.2 Total throughput as a percentage of total Flemish throughput

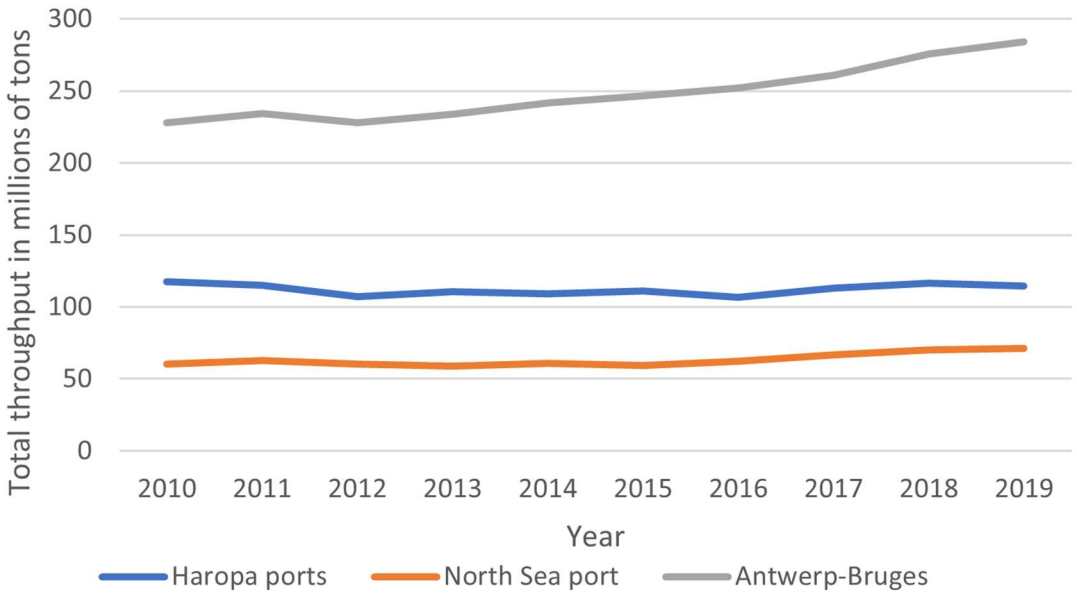

Figure A.3 Throughput developments of the port of Antwerp-Bruges, Haropa ports and the North Sea port

Appendix B

Transcript interview one

General information

Name: Gert Bulte

Short job description: terminal manager/project manager/consultant

Port and company: Involved in multiple ports. Previously active in the port of Antwerp as former business manager at the PSA North Sea terminal and Europa Terminal. After that, two years active in the port of Zeebrugge at APM terminals. After that, active as a bulk terminal manager in the port of Antwerp. Currently, independent consultant/project manager at BLT C Consultancy and currently involved with a terminal expansion project at the port of Tanger.

Questions and answers:

1. What is your overall perspective on the merger between Antwerp and Zeebrugge and their competitiveness relative to the Hamburg-Le Havre range?

In general, Antwerp and Zeebrugge are two relatively complementary ports. The port of Antwerp has its most significant strength in container transport, whereas in Zeebrugge, this is a much smaller number linked to deep-sea transportation. Roll-on Roll-off traffic volumes are in the port of Zeebrugge at extremely high levels due to the transportation of cars, whereas in the port Antwerp this is much lower. In general, in the port of Antwerp, there is more deep-sea transportation where the port of Zeebrugge has a little bit of deep-sea transportation but lots of roll-on roll-off throughput. Additionally, most people expected the merger of Antwerp-Bruges because of the successful effects and results of the previous merger of the North Sea port. This merger provided some incentives and insights for the merger between the two biggest ports in Belgium.

2. What is your expectation regarding total throughput developments when comparing before and after the merger?

Total throughput is not necessarily positively influenced by the merger in the short run. It will just be a summation of the two port's throughput as a new total. This summation will be the case for approximately the next five years. Hereafter, the possibility of synergies increases, which could lead to more than proportional increases, but that will take some time. So, no significant differences in the short run but possible synergy effects in the long run. These effects will only be distinguishable after five years.

3. As ports merge, their throughput is automatically added up as a new total, a proportional increase of throughput. However, the merger could increase throughput more than proportionally. Some

causes may be factors like synergies, combining of resources, facilities, and other assets. What is your expectation regarding this (throughput) development?

The new total will be just a summation of both port's throughput volumes as a new total. No more than proportional increase. See also the answer and explanation at question two.

4. Through the merger of both ports, would you expect that the port becomes more profitable or more efficient? For example, creating an increase in profits or efficiency while still handling growing numbers of total throughput?

Total throughput will develop according to their current trend. Thereby, profits and total income will also be added together as a new total of the port of Antwerp-Bruges. Between the two port authorities, there is a massive difference in the number of workers. This difference will allow them to create or increase cost savings, consequently increasing efficiency and higher net results. So, no direct increase in profits or efficiency but the possibility for improvements in the long run.

5. The port of Antwerp has an important function position within, for example, the categories of liquid bulk and containers. The port of Zeebrugge has an important role in transporting containers and roll-on roll-off traffic like cars. Would you expect that the merger would cause a speciality or dominance in specific cargo categories? (Dry bulk, liquid bulk, breakbulk or containers) Would this affect their throughput market shares in one of the four categories?

The merger would create possibilities to achieve relative specialisations or increase market shares in specific throughput categories. Most importantly, breakbulk (roll-on roll-off) for the port of Zeebrugge, together with the liquid bulk and container for Antwerp, will lead to increased market shares than just a summation of both ports. Furthermore, the clustering and combination of activities belonging to specific categories will create the possibility to optimise a broad spectrum of category related activities for both ports. Especially for roll-on roll-off traffic, this merger creates possibilities because it is currently one of the biggest roll-on roll-off ports.

6. What would you expect to be the main challenges for establishing the merger through a one-year ongoing integration process? What would you expect as future challenges after the establishment of the merger?

The first and maybe biggest challenge will be the differences in culture. Between the ports of Antwerp and Zeebrugge, there is a significant difference in culture. The distance between both ports will impose the second critical challenge. This distance could impose collaboration challenges. The third and long-term challenge will be the individual focus. In the short run, they will focus too much on their own performance and competitiveness. In the first five years, there will still be competition or co-opetition between both ports. After five years, this will eventually gradually decrease.

7. What is your expectation regarding the future challenges and developments regarding throughput, port authorities or other complex developments?

The amount of capital and motivation to establish or improve the overall merger over time is sufficient. It will continue to invest significantly in different kinds of infrastructures, port docks, and currently two new locks at the port of Zeebrugge. However, the port of Antwerp will take its dominant position within future developments and challenges, where the port of Zeebrugge will have to follow this lead. Antwerp will take this prominent role at, for example, the process of efficiency improvements and digitalisation.

Transcript interview two

General information

Name: Roel de Swert

Short job description: Manager Warehousing & VAL Belgium

Port and Company: Actively involved in the port of Antwerp at De Rijke N.V. - Locatie Antwerpen

Questions and answers:

1. What is your overall perspective on the merger between Antwerp and Zeebrugge and their competitiveness relative to the Hamburg-Le Havre range?

In general, both ports are strong in their own way. They both have their strong areas of competitiveness. The port of Zeebrugge has its strength in the transport of cars (RoRo traffic), where the port of Antwerp has its focus on containers, liquid bulk and breakbulk. The further collaboration of both ports will create a new bigger port through the merger. However, it will not cause that, for example, all cars are handled at one place in one of the two ports.

On the one hand, the merger has an important commercial aspect in it. How to distinguish themselves in and to the world as the biggest and most important port. In short, everyone tries to position themselves as the biggest or one of the biggest in the world. In this process, further fusion collaborations are essential for its positioning towards its competitors. On the other hand, there is also a more practical effect. This merger leads to additional challenges for shippers and other logistic companies. The unified port could create misunderstandings between port actors and customers. For example, suppose someone in Japan looks at the newly unified port on a world map and decides to transport the containers to Zeebrugge since this is also the port of Antwerp. This brings the shippers in a difficult position. They need a full day of work to pick up these containers. Three hours of driving to Zeebrugge, unload and load somewhere and three hours to drive back to Antwerp. Consequently, the shipper earns significantly less, and a customer is dissatisfied because only one container per day can be taken care of.

Altogether, the shippers in the port do not expect much of this merger. The port authorities play it out as a commercial story. Important to notice is the fact that both parties know each other points of view on this topic. When looking at the future, hopefully, the throughput volumes and competitive position are positively influenced by the merger. However, this will be very hard to quantify.

2. What is your expectation regarding total throughput developments when comparing before and after the merger?

Hopefully, the merger will benefit throughput volumes nut this is hard to quantify. See also explanation at question one.

3. As ports merge, their throughput is automatically added up as a new total, a proportional increase of throughput. However, the merger could increase throughput more than proportionally. Some causes may be factors like synergies, combining of resources, facilities, and other assets. What is your expectation regarding this (throughput) development?

Hard to quantify an answer about the effect of the merger on transport volumes. See also explanation at question one.

4. Through the merger of both ports, would you expect that the port becomes more profitable or more efficient? For example, creating an increase in profits or efficiency while still handling growing numbers of total throughput?

Hard to quantify into a direct answer. See also answer at question one.

5. The port of Antwerp has an important function position within, for example, the categories of liquid bulk and containers. The port of Zeebrugge has an important role in transporting containers and roll-on roll-off traffic like cars. Would you expect that the merger would cause a speciality or dominance in specific cargo categories? (Dry bulk, liquid bulk, breakbulk or containers) Would this affect their throughput market shares in one of the four categories?

The ports of Antwerp and Zeebrugge have their own strengths. The port of Zeebrugge has an important role in the transport of cars. The port of Antwerp has an essential role in containers, liquid bulk and breakbulk. It is hard to quantify whether the merger will increase competitiveness in one or more areas. See also explanation at question one.

6. What would you expect to be the main challenges for establishing the merger through a one-year ongoing integration process? What would you expect as future challenges after the establishment of the merger?

Shippers will have new challenges to manage to evade misunderstandings between producers, themselves, and consumers regarding the future. See also answer at question one.

7. What is your expectation regarding the future challenges and developments regarding throughput, port authorities or other complex developments?

Hopefully, the merger benefits their competitive position and transport volumes. However, for now, it is hard to quantify whether this may be the case. See also explanation at question one.