

The energetic relationship between ports and cities; how the role of shared values is under pressure

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ABSTRACT

Worldwide, ports are subject to the same trends such as globalization, increase in scale of the modus operandi and the process of containerization. These are general dynamics that are responsible for a changing relationship between the port and the city where it is located. This paper aims to describe and explain the developments that three port regions in Europe have experienced over the last decades, i.e., Hamburg, Antwerp and Rotterdam. Special attention is paid to the relationships between the most important actors within the three port-city clusters. The complex relationships are operationalized by a set of newly developed sensitizing concepts. It is concluded that all three cases have unique shared values play that play a crucial role in the changing relationships between ports and cities. The nature and intensity of these shared values are responsible for the impact of the trends on the relationship between a certain port and its city. E.g., the bond between the port and the city is the strongest in Hamburg and based on a strong culture that strengthen the integration of between port and city in many domains of society. For Antwerp, the political constellation is responsible for a continuing presence in the development of the city and the port, but also of the surrounding smaller municipalities. In Rotterdam, a more business-oriented culture was introduced that replaced a culture of common interests. It is concluded that the three cases have in common that variations in shared values plays a crucial role in the changing relationships between port and city.

1. Introduction

For long, cities and their ports were like a married couple, more or less singing the same song. This relationship is usually studied on an operational level: the outcomes in terms of profit, spatial developments, employment, etc. The “married couple” consisted of different actors in this port/city community, like entrepreneurs, politicians, citizens, etc. The relationship between these actors, belonging to port or city, was strong. As an example, the important entrepreneurs of the port community were also respected actors in the city’s community.¹ This paper sheds light on these relationships, not on an operational level, but on the more intangible, invisible *meta*-level, whereby the port-city is studied as an eco-system with intertwined relationships with unique characteristics.

The prosperity and the well-being of the city interacted with the prosperity of the port and vice versa. as the port was a driver for

economic activities as related industries, trade and finance (Van Hooydonk and Verhoeven 2007; Munro, 1966), but also because leading industrialists, merchants and shippers played a role in person in the development of the city (Puttevils, 2016; Harreld, 2003; Harreld, 2004). This has changed over the years. Due to the increase in scale, rationalization, and globalization as well as regionalization the port’s activities separated spatially and mentally from the city (Vroomans et al., 2017). One of the most striking examples in the West-European setting is Rotterdam, where the containerhandling nowadays takes place about 40 km from the city’s center. But also in Antwerp the port’s activities are localized elsewhere. This is a phenomenon well known and often described (Bird, 1971; Hayuth and Hilling, 1992; Hoyle and Pinder, 1992). The movements of activities down stream and up stream and the effect on the city, were integrated in the “butterfly model” (Vroomans et al., 2017) (Fig. 1).

This separation not only manifested itself spatially, also mentally this

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¹ In Amsterdam and London, it was very common in the 17th century that for instance a banker became the mayor of the city.

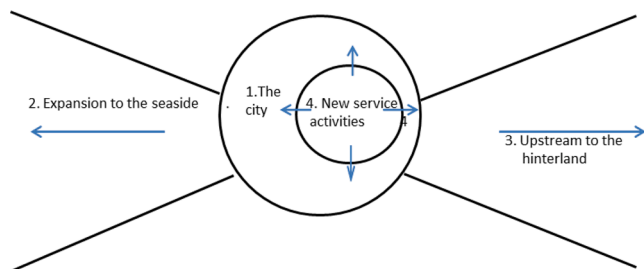


Fig. 1. Opposite dynamics leading to new functions for the port city's center ().

Source: Vroomans et al., 2017, p. 17

separation took place. Increase in scale and the upcoming containerization were also responsible for the spatial separation. This process had a direct effect on the ownership and type of governance that was employed in the ports. Stimulated by the port decentralisation, the port governance drifted away as well from the primary interests of the city as the port authority was confronted with its own needs and responsibilities. The extent how this happened was partly determined by the autonomy granted by the city. And this increasing autonomy might have an impact on the formal position of the port authorities as well. It was remarked that there occurred a general trend towards the privatization of the port authorities (Van der Lugt, 2015, p. 146). Looking to the three largest ports in the Le Havre Gdansk Range (LHGR), Rotterdam, Antwerp and Hamburg, one can see differences in how the separation of the port from the city took place and affected the well-being of the city. This has resulted in the research question that is central in this article: *How can we understand the relationship between port and port city in response to international port business-related developments?*

The three port-cities that are studied differ strongly in composition and welfare. The paper discusses these compositions and welfare and explains that the relationship between the ports and their cities has changed as a result of the dynamics mentioned above (increase in scale, globalization, and containerization). It researched to what extent the separation of ports and cities affected the well-being of the citizens and how this is absorbed in different ways.

To study the port-port city relationships, an operationalization is needed. For this, the port and city are regarded as one cluster (De Langen, 2003). The nature of the relations within the cluster is under influence of rules that govern the social fabric of the cluster. In social science, these rules are known as institutional arrangements.² They determine the nature of governance that exists on the level of firms, port authorities and port cities.

So, for studying the development of port/port city relationships, these three above mentioned perspectives, clusters, governance and institutional arrangements, have been used to describe and understand in what way these three port city clusters have walked different "paths" as a response to the dynamics. These different paths have led to a change in social fabrics, based on a change in what is called: the shared values. Having said this, this contribution is not about operational practices or actual developments ports are confronted with. The study is an analysis on a meta level and a timescale that goes beyond 200 years.

2. Clusters, governance and institutional arrangements

The meta analysis starts with the introduction of clusters that give profile to ports and cities. The concept of the cluster can be used as a framework to describe port/port city relationships. Porter introduced the cluster-analysis in regional-economic policy making (Porter, 1990).

² Manmade rules based on norms and values that govern behavior (Keizer, 2008, p.2).

In his view, a cluster is characterized by its relationships between the actors in the cluster. De Langen, researching the economic performance of seaport clusters also emphasizes the relations within a geographically defined area and introduces the port city relationship (De Langen, 2003). For Porter, the nature of these relationships are crucial for the strength of the cluster (Porter, 1990). These relationships should not only be studied on the level of the firm, but also on the level of institutional and individual actors that govern and influence these firms and the cluster's performance. These spatial concentrations are embedded in an economic, social-cultural and political context as well (Alberti, 2001). This view acknowledges a homogeneous system of values and views and a related common culture. This is where governance, a factor also acknowledged by Porter, comes into the equation. This is not only the governance from a public governance perspective, but also from the firm's perspective. Governance in itself is shaped by the culture of the society in which it is employed. And that means that understanding culture, can also shed light on how the cluster is governed and how the relations between the actors can be understood. But as said, as governance is shaped by culture, culture itself must be studied to understand how these relations are manifested. These relationships shape a dynamic character of the cluster. The necessity to study governance and institutional arrangements is depicted in Fig. 2, in which Porter structures the factors that help analyze the economic success of a nation. Although Porter's study is focussed on the competitive advantage of nations, this model also helps to understand the interrelationships within a cluster. It is the level of interactions that help to explain the success of the firms concerned (De Langen, 2003). The model shows the rationale to include governance and institutional arrangements and as such it can also be helpful in understanding the port/port city cluster.

2.1. Clusters

Port and city can be seen as a cluster with commonalities and complementarities (Porter, 2002). The characteristics of the relationships in the cluster determines the strength of the cluster as well. Too much commonalities, a lack of complementarities and a too specialized nature for instance, might endanger the needed heterogeneity of the cluster (Chapman, 2005; Van Oort, et al., 2015). So the vitality of the cluster, being the port and the city, can be measured by the heterogeneity of the economic activities as Chapman (2005) showed in his analysis of the Teesside industrial complex: "Teesside's exposure to the negative effects of the restructuring crisis in the European petrochemical industry might have been reduced if greater progress had been made in the diversification of the economy" (Chapman, 2005). And although Chapman limited his study to the Teesside industrial cluster, the same conclusion can be stated for port activities and city activities, related to each other as expressed by variations in Marine Advanced Producer Services. This means that heterogeneity does help to cope for the decline of former blooming activities that, being at the end of their life cycle, generate unemployment and economic decline. In more general terms: having an eye for the life cycle of main activities in the cluster (port and city) does help to guard and protect the vitality of it (Boschma and Fornahl, 2011).

There are three dominant trends that influenced the port city development over the last decades. These trends are 'increase in scale', 'containerization', 'globalization and regionalization'. They led to the situation as depicted by the "Butterfly model" (Fig. 1) that shows that many economic activities moved out of the city or disappeared completely. The negative effects of these trends can be mitigated or even reversed if the cluster is able to develop new activities. It is this characteristic, the degree of heterogeneity or the ability to diversify of the cluster, that determines its success (Chapman, 2005). The waterfront activities as an outcome of a redevelopment of the port's abandoned quays in the city, are an example of this and can be observed in many port cities all over the world (from Shanghai to Liverpool and Baltimore and many more).

If industries, less vulnerable for relocating (more capital and

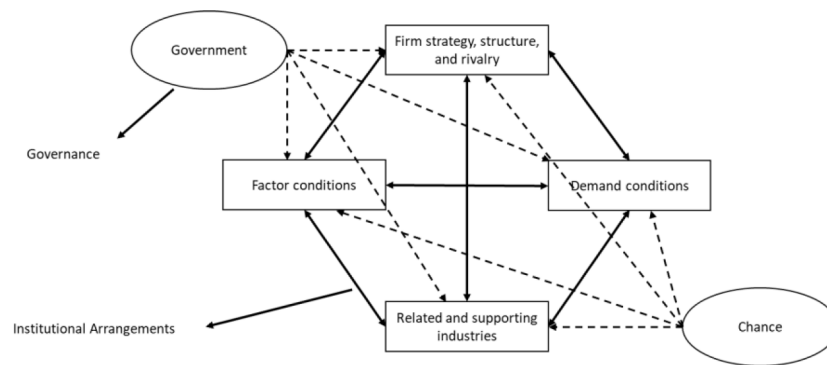


Fig. 2. Studying clusters, governance and institutional arrangements (). adapted from Porter(1990)

knowledge intensive port activities), already existed in the city cluster, the better the cluster can withstand these changes.

So heterogeneity and life cycle are important factors to pay attention to, to get insight in the wellbeing of the cluster, i.e. the welfare of the port and port city. For this, there are interesting differences between Rotterdam, Antwerp and Hamburg, which will be dealt with in Section 4.

2.2. Governance

Shared values are also a precondition to become a vital cluster (Porter and Kramer, 2011). It can be viewed as some sort of an overarching structure, a “glue” that holds together the various interests of the actors within the cluster (Vroomans et al., 2018). To fulfil the interests of these actors involved governance is needed that guides this process. The basic concept of governance is “the process by which we collectively solve our problems and meet our society’s needs” (Osborne, 1993, p24). But governance should not only be perceived as public policy governance, but also as governance within firms or executed by non-governmental organizations (Klijn and Koppenjan, 2016). The relationships between the actors, as characterized as business relations, should be based on ‘trust’ if the cluster really wants to benefit from its interdependences. The nature and the degree of this trust in maritime port city clusters can be based on personal relationships (e.g. personal friendships, family relations, (called real trust) or it can be based on a more rationally mutual understanding (e.g. shared business interests, etc.) (Nootboom, 2002) (Arnott et al., 2007). Trust based on personal relationships as a system can be strong and resilient as is shown by the membership of family, community, culture, religion (Nootboom, 2002). This reflects a situation the cluster might benefit from as it creates a system “in which firms (and public entities) are competing but also cooperating to produce a system to be of service to mutual customers”. Foreign ownership has influenced the way that actors interact with each other. This can be observed not only within firms, but also between firms. The last issue that might shed light on how governance is performed in the cluster, are the responsibilities the actors, especially companies (including port authorities) feel for the society they are embedded in. In history, the business leaders in ports also played a large role in the governance of the city. They felt responsible for the wellbeing of the city and (also for their own firms’ sake) the wellbeing of the citizens (Vroomans 2018). So, researching governance should include the manifestation of business relations, the nature of trust and the degree of foreign ownership and company’s investment in society, which will be dealt with in Section 4.

2.3. Institutional arrangements

When studying governance in the manner as described above, one is not only studying the measurable outcomes (the appearance of foreign

ownership etc.) but also behavioral aspects of actors. By doing so, the rules that influence this behavior -based on norms and values- should be considered as well. That means that culture plays a role as well, as it is articulated in institutional arrangements. As such, culture can be considered as a “system of meaning, ideas and patterns” that “goes without saying” (Van Maanen and Laurent, 1993, p. 3 & 275). The indices that are relevant to measure culture should be action related and about behavior. The relationship between these concepts, culture, institutions and behavior is illustrated in Fig. 3.

What we can experience in reality as an outcome of processes of economic activities and governance within clusters, is a result of behavior defined by institutions, which in turn are influenced by culture. That is why, for understanding the relationship between the port and port city, institutional arrangements should be studied. They play a role in understanding the changes in the role of the city as a response to international port business-related developments.

For understanding the institutional arrangements based on culture, the concept of tacit knowledge (Polanyi, 1966) is quite useful. Tacit knowledge refers to non-codified knowledge that everybody knows off, but of which no one speaks. To make this possible, an acknowledgement of the so called economy of touch (Geerlings, 1997) is needed: the physical proximity of actors that can foster personal relationships and as such the wellbeing of the cluster. That means it is about the social network (Boschma, 2005). Social networks have a degree of proximity and tacit knowledge, and these are regarded as valuable resources (Barney, 2007; Kapas, 2006).

2.4. The embeddedness: Shared values as integrative driving force

For Porter, a cluster is also characterized by its common interest as shaped by a shared value (Porter and Kramer, 2011). According to Porter, shared values contribute to the strength of the cluster. It “holds”

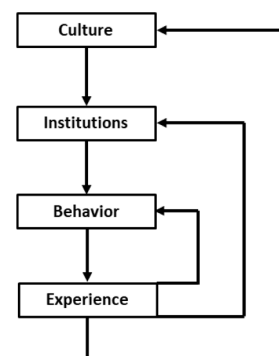


Fig. 3. Cultural and institutional change (). Source: Keizer 2008

it together and reinforces the performances of its members. It is interesting to research the degree that such shared values are created. A perhaps even more relevant question relates to the values that determine the behaviour of the actors within the cluster: are they in line with each other? If aligned, they can be expected to enhance the performance of the cluster. As such, shared values can be seen as a characteristic of the cluster but in the same time as a manifestation of this, as dealt with in the next sections.

3. Methodology

From the sections above, Fig. 4 summarizes these concepts that are used as characteristics describing the clusters and the sensitizing concepts for conducting the research regarding governance and institutional arrangements. Using sensitizing concepts is an approach whereby factors are selected to understand former invisible, intangible processes. As such they should not be interpreted as independent (or dependent) variables, but as phenomena that can identify and explain processes in reality (Vroomans, 2020, p. 135).

The characterization of the cluster is done by using data to illustrate the heterogeneity (commonalities and complementarities) and the life cycles of the ports and cities. The concept of shared values, in fact a characteristic of the cluster, was approached by reflecting on the concepts of governance and institutional arrangements as they are very much related to each other.

The empirical research was done by analyzing the annual reports of the port authorities of Rotterdam, Antwerp and Hamburg for the years 2011 to 2016. In addition, 36 interviews were conducted with representative respondents from different backgrounds of each of the three port cities researched (see appendix II). These consisted of (former) CEO's or chairmen of the three port authorities, (former) alderman of the port cities, CEO's and staff of port companies, consultancy agencies, and scholars of the Erasmus University, the University of Antwerp and the Kühne Logistics University. Each interview lasted between 1 and 1.5 h in which topics were discussed that can be traced back to the sensitizing concepts. There was not a formal questionnaire in terms of defined questions. There was a script consisting of topics, based on the concepts depicted Fig. 4, that needed to be discussed which was sometimes elaborated with new topics, based on former information that needed clarification. They laid to the creation of the sensitizing concepts. These concepts in fact were the group codes consisting of the codes attributed in the axial coding process. The codes from the initial coding process (stemming from the interviews) were the basis for this.

The data were analyzed with the help of Atlas TI (qualitative data analysis and research software), but besides this helpful instrument to classify and structure the coding of the texts (interviews and annual reports), also observations and explanations were added when reading the primary information (the reports and the verbatim transcribed interviews). To give a weight to the presence of a concept in a specific port-city cluster, an ordinal scale has been used. The scales are based on these outputs. Determining + or – is of course a limitation of the method used because that partly becomes arbitrary, but it is backed by the quotes of the interviews that nuances certain findings. The quotes were ranked per port city researched and grouped together.³

4. Findings

Section 4.1 describes the analysis of secondary data to picture the economic position of the port city itself. This is done by comparisons of personal income to illustrate the wealth of the city in section 4.1.1. Section 4.1.2 pictures the composition of the cluster in terms of the

nature of the goods handled in the ports, in terms of tonnage and added value. The heterogeneity of the port city cluster is explained by illustrating the composition of the added value of the port city. Section 4.2 and 4.3 analyze the results of the interviews and annual reports using the sensitizing concepts to describe the differences in governance and institutional arrangements that influence the port cluster developments.

4.1. About clusters

This section discusses the personal wealth of the citizens of the three port cities and relates them on the nature of economic activities. The indicator added value is chosen as a representative of the contribution of the economic activity of the port and to the wellbeing of the city.

4.1.1. Economic position of the citizens of the three port cities

The economic position of the three port cities varies significantly. Although having the biggest port, the city of Rotterdam did not really benefit from this position as one might expect. Within the Dutch ranking of the largest cities, Rotterdam is the poorest one (Table 1), whereas Antwerp leads the ranking (Table 2) and Hamburg performs in the middle range (Table 3). Comparisons were made within the country because figures between countries are hard to compare. The base of these kind of rankings differs per country so a common figure that can compare the three cities exactly could not be done. But that is overcome by describing their position within their respective country. The point to be made is how wealthy the city can be considered within their own country. And since the economic position of the three countries can be considered as equal, this comparison is a sound one.

The picture that emerges when we compare the three port-city clusters Rotterdam, Antwerp and Hamburg, is clear. Economically, the citizens of Rotterdam are worse off, not only on the national level, but also compared to the other two port cities. And the three cities all cope with the problems of socio-economic nature regarding the influx of immigrants. For Rotterdam this is 52.3 %⁴ (which is lower than Amsterdam and The Hague which both score higher in income). For Antwerp this is 50.1 %⁵ (for Brussels this is 29.8 % and for Liege and Charleroi 31.5 % and 25.8 % respectively). For Hamburg this is 36.1 %.⁶ So, when looking at the situation in The Netherlands and Belgium, immigration is a factor that is not discriminating at forehand. The factor personal income is not only influenced by the port. But that is exactly the point to be taken. Although there is an important port in each of the three cities, a motor of economic prosperity, the presence of the port itself apparently does not influence the wealth of the citizen on average, as one might expect for such an economic driver and former core activity in the city.

4.1.2. Cluster composition: Complementarities and commonalities

Cluster composition can be used as an indicator for cluster heterogeneity and as such for the vitality and the capability of prolonging or life cycles or anticipating declining life cycle by developing new ones. Firms in a cluster composed of the same industry do grow more rapidly than non-clustered firms, but in the longer run non-clustered companies survive better in terms of number and size (Menzel and Fornahl, 2009). So, heterogeneity is vital for the port city cluster (Chapman, 2005); (Van Oort et al., 2015). As the research has been done in three port/port cities, to compare the size of each the first impression of how these three regions perform when compared to each other is done by offering the metrics as shown in Table 4. Often comparisons between the

⁴ <https://www.cbs.nl/nl-nl/dossier/dossier-asiel-migratie-en-integratie/hoeveel-mensen-met-een-migratieachtergrond-wonen-in-nederland>.

⁵ <https://www.brusselstimes.com/news/belgium-all-news/54037/latest-figures-show-an-increasingly-international-antwerp/>.

⁶ <https://de.statista.com/statistik/daten/studie/1182512/umfrage/bevoelkerung-mit-migrationshintergrund-hamburg-bezirke/>.

³ For sake of anonymity the outputs cannot be exhibited in this paper. Only certain quotes are presented without the possibility to attribute that to a specific respondent.

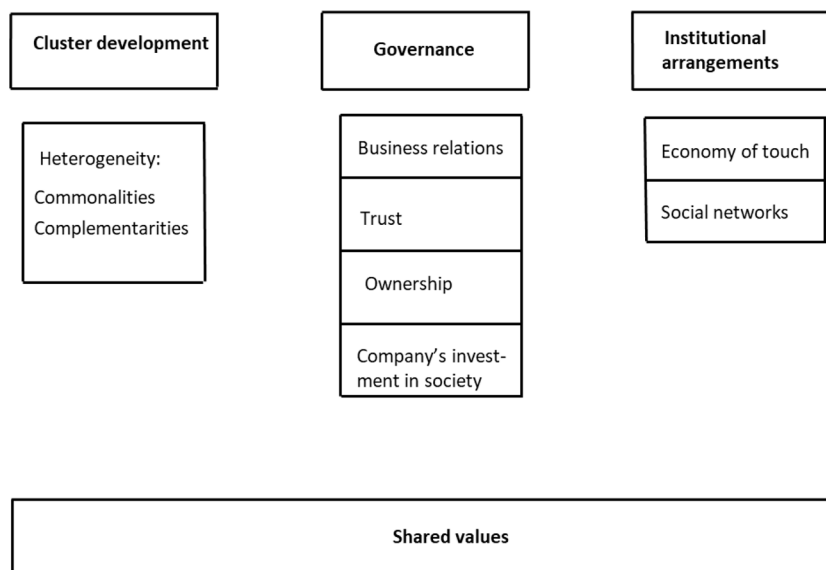


Fig. 4. Describing and explaining port-port city relationships.

Table 1
Comparison in income for the top 4 cities in The Netherlands 2016.

	Average personal income per citizen (x € 1000)	40 % households with lowest disposable income	20 % households with highest disposable income
Rotterdam	€22,800	54.2 %	13.1 %
Amsterdam	€27,600	52.6 %	16.4 %
's-Gravenhage	€24,900	49.1 %	16.8 %
Utrecht	€26,300	49.0 %	19.8 %
The Netherlands	€24,700	40.0 %	20.0 %

Source: <https://www.cbs.nl/nl-nl/maatwerk/2019/02/inkomen-per-gemeente-en-wijk-2016>. Retrieved: 8 October 2019.

Table 2
Comparison incomes for the top 4 cities in Belgium 2016.

	Average income per tax return	Median income per tax return	Average income per citizen
Antwerp	€ 28,209	€ 21,688	€ 15,718
Liege	€ 25,149	€ 18,792	€ 14,503
Brussels	€ 25,260	€ 17,802	€ 12,475
Charleroi	€ 23,518	€ 18,694	€ 13,020
Belgium	€ 31,938	€ 23,773	€ 17,824

Source: <https://statbel.fgov.be/nl/themas/huishoudens/fiscale-inkomens#panel-13>. Retrieved: 9 October 2019.

Table 3
Comparison incomes for the top 7 cities in Germany 2016.

City	Disposable Income
Hamburg	€ 24,421
Munich	€ 29,685
Stuttgart	€ 25,012
Düsseldorf	€ 24,882
Frankfurt	€ 21,690
Bremen	€ 21,327
Berlin	€ 19,719

Source: <https://de.statista.com/statistik/daten/studie/998971/umfrage/verfuegbares-einkommen-in-den-groessten-staedten-in-deutschland/>. Retrieved: 9 October 2019.

performance of ports is measured in tons. That this is not a good indicator to measure the economic driver to foster wealth, is illustrated by the next tables. **Table 4** presents the direct added value per metric ton,

Table 4
Direct added value per metric ton in 2017.

	Rotterdam	Antwerp	Hamburg
VA (€bln)	18.0	11.5	12.61
Tonnes	467.4	214.2	136.5
VA/tonnes	0.04	0.05	0.09

Source: (Kuipers, 2018a); <https://www.mobiliteitsraad.be/mora/thema/kerncijfers/vlaamse-havens/toegevoegde-waarde>; Hamburg Port Authority AöR, 2017;

¹For Hamburg only the VA for 2014 could be retrieved. It is remarkable how difficult it is to find the right updated numbers for the port of Hamburg, compared with the other two ports. The metrics for Rotterdam and Hamburg are dating back to 2017.

which, in terms of tons show the dominant position of Rotterdam.

Table 5 operationalizes heterogeneity in a simple division between maritime and non-maritime business. It shows the strong presence of the maritime sector in Rotterdam. A closer look would reveal that the strongly diversified sector of wholesale and services (including finance and insurance) contributes for 11 % in Rotterdam and 32 % in Hamburg. And for that, one could say that the Hamburg cluster is less dependent on

Table 5
Cluster composition in % direct added value.

Sector	Rotterdam	Antwerp	Hamburg
maritime	49.3	31.5	31.9
non-maritime	50.7	68.5	68.1

Source: Van der Lugt et al., 2018; Gueli et al., 2019; Statistisches Amt für Hamburg und Schleswig-Holstein, 2019.

the maritime activities.

So, the wealth of the cluster in terms of income is reflected in the composition of activities. For Rotterdam the non-maritime is based on finance and culture whereas Hamburg has the best hand in terms of diversity with a strong position in healthcare, life sciences, media, and aviation. If the top 10 companies of the three clusters are compared, it can be noticed that for Rotterdam it is about oil, logistics, energy, and construction. For Antwerp it is about chemicals, logistics and oil. For Hamburg it is about healthcare, aviation, transport, retail and banking, sectors where a significant higher income can be obtained (see appendix I for information about the top 10 companies in terms of employment). Not precisely the most obvious ones if one speaks about the port city of Hamburg. But it does show off in its diversity and the presence of (high value) non-maritime activities.

In this, it is clear that history matters as there is path dependency into play. The present situation is the result of developments and decisions in the past. The position of Rotterdam in Western Europe as a gateway to the Ruhr area, made it a perfect port for handling raw materials and energy. But not only geography determined the nature of activities. In the 60 s, thanks to the reconstruction of The Netherlands in the aftermath of the war, the availability of employees was low. So, the choice of which company may establish itself in the port, was also determined by the nature of its employment, which needed to be as labor extensive as possible because of a lack of labor capacity (Posthuma, 1972, p 54). Antwerp had a long history of logistic companies and a strong position in the chemical industry, hence the score of high adding value of these industries (Van Hooydonk and Verhoeven, 2007). The Hansa history of Hamburg made a strong imprint on the economic composition of Hamburg. It made it a wealthy city in the past with strong merchant structures that as a spin off attracted other high value activities (Lindberg, 2008; Smith, 2012). The next section will shed a light on these factors as governance and institutional arrangements of the three port city clusters are discussed.

4.2. Governance as a discriminatory factor in port-port city relationships

As introduced in section 3, the sensitizing concepts used to conduct the interviews to discuss the issue of port and city governance, were business relations, trust, ownership, and company's investment in society. This section briefly discusses the results for the three ports. The annual reports and the interviews lay the empirical foundation for the remarks made below.

4.2.1. Business relations

For Rotterdam, business relations in the past used to be tight. Thanks to the need of reconstructing the port after the Second World War, the relationships between firms and between the port community and the city, were strong. This cooperation came under strain due to the propagation of competition in the port and globalization, whereby foreign firms entered the port community: *"These companies are more interested that you are having bad times, than that they prosper themselves!"*^{7, 8} And as a result, the way of doing business and the bond with the city became weaker. Business relations became more business oriented and competitive: *"Big companies are taken over and their management is located elsewhere and that influences behavior regarding community activities of such a company"*. The internationally oriented company centered attitudes of managers (instead of company owners) replaced the old structure of realizing activities as a part of a network.

In Antwerp, the same development can be observed, but this was influenced by a more politically motivated port authority due to the fact that the business structure of Antwerp is more formalized and subject to legalization (Chabert's law; Major's Law). The relationship between the

actors in Antwerp is characterized by the pursuit of their own interests that do not always align with the common interests, due particularism. But on the other hand, when necessary, the port authority managed to align the various sectors around the task how to overcome the effects of the financial crisis 2008/9: *"and then they said: we can reinforce each other... OK, these three industries overhere, logistics, industry and stevedoring, we have an important role starting to reinforce eachother in the port"*.⁹ This has been an approach that was stimulated by the port authority of Antwerp itself: *"What makes the port of Antwerp unique is its combination of industry, freight handling and value-added activities"*. (Antwerp Port Authority, 2016, p. 31). From this basic point of view, expressed in many annual reports, the actions taken in 2008 and 2009 were obvious for the leading actors of the port.

Business relations in Hamburg are very much the result of old (trade) structures in dominant networks. There is a strong relationship between business and politics where e.g. politicians become manager of a port company. All stakeholders interviewed, stressed the importance of a strong network of company owners and influential politicians with its roots in the past, but still very much alive: *"...but still, there is a very dynamic community in Hamburg, that still contributes to the cluster"*¹⁰.

4.2.2. Trust

For Rotterdam, the concept of trust manifests itself as reliance. Derived from business relations, the person-oriented attitude has changed into a more rational and business-oriented behavior. Or must it be said, the business relationship has changed due to the changed trust within the cluster? Of course, this is an interchangeable phenomenon. But undoubtedly, the diminishing old network structure as stated in section 4.2.1 is responsible for the observations made by the respondents in the port city. That does not mean that there is distrust. The nature of trust has changed. During the last three decades the concept of trust has been under strain due to the changing ownership of important port actors like the container terminal operators, and with that the nature of governance within the cluster.

Like Rotterdam, in Antwerp in the past, trust was a personal one but this has changed: *"This has become less and to my opinion this has several causes: first the globalisation, the large companies that want to do everything with a contract, and secondly the legalization of our community in the western world."* Besides these arguments, there certainly is an absence of trust. It is *"a central theme in the relationship between the right bank of the Scheldt where the city is located and the Left Bank where the largest part of the port is situated. This is also grounded in the fact that these are also culture-wise two worlds: Antwerp versus East Flanders: in fact, an urban versus a rural community"*.

For Hamburg one can say that the element of personal trust is still very prominent. This has to do with the fact that the old business structures based of family ties (and between families!) still exist: *"...and that is something that is usually completely overlooked. Because it has something to do with business ethics.it means that you can trust if you sit and talk, yes, that is agreed. No piece of paper. No signature, we can rely on it"*.¹¹ Besides this personal trust, reliance is also strongly present. But this, besides the fact that it is an imperative for doing business, is also enhanced by the presence of personal trust (Arnott et al., 2007).

4.2.3. Ownership

The best example to illustrate the degree of foreign ownership perhaps is the ownership of the most important container terminal operators. For Rotterdam and Antwerp, these companies are all foreign owned. This elicited from one of the Rotterdam respondents the phrase: *"These are all passing travelers. Hired men"*. Smaller companies find it harder to do business with these large multinationals as the live-and-let-

⁷ Quotes taken from the interviews are in *italic*.

⁸ Respondent port of Rotterdam.

⁹ Respondent port of Antwerp.

¹⁰ Respondent port of Hamburg.

¹¹ Respondent port of Hamburg.

live concept is less practiced: “I think that there is less attention for the cost structure of the subcontractors. ... Every-one wants to score at his headquarters in “Far away country” and be able to say: “look at me how I cut cost for 50 %!”¹²”. These companies are operational managed companies that are hardly able to make decisions that go beyond their own operations.¹³ Nijdam concluded that foreign owned companies exhibit less leader firm behavior (Nijdam, 2010, p. 218), a type of behavior that is very much similar to Porter’s shared values.

Hamburg makes the striking difference in this as the terminals are mainly Hamburg based (with the exception of Steinweg). The attitude of the city of Hamburg is completely different anyway. The Hamburg respondents very much stressed the fact that it is important to have the headquarters of a company in the city. If a company is estranged, very soon the headquarters would leave as well. So, there is much opposition against the selling out of companies: “We make partnerships for sub daughters and so, but the main company is a family company”.¹⁴ That means that an opposition against foreign ownership is not only present from the perspective of the unions, but from the Hamburg business circle and municipal government as well.

4.2.4. Company’s investment in society

The strength of the port city cluster can also be expressed in the way that companies feel responsible for the wellbeing and development of the city. Not only for its own interest (license to operate!), but also for the citizens themselves. In the past, in Rotterdam this was remarkably manifested in public/private investments. Directors of companies were member of several committees concerning city government. Museum, leisure centers (swimming pool) and e.g., the famous stadium of football club Feyenoord are the witnesses of private investments as well. Rotterdam benefited from that. This has changed, although there still is the foundation “Verre Bergen”, investing in social activities for their own sake. But many other activities “enhancing the welfare of the city’s population are more directed to the wellbeing of the port’s economy”. The texts in the annual reports of the Port Authority are also strongly influenced by the need to a “license to operate” or an attention for the education of people from the perspective of port employment.

In Antwerp, when observing activities for fostering welfare in the economic and cultural sphere, there is a strong tendency to focus on the need for education in the city. Aiming at getting highly educated people interested in port business and less educated to get a job in the port as well. Especially the chemical sector is involved in traineeships. Personal investments in the city of Antwerp are done by the Phoebus Foundation of the CEO of Katoen Natie. But this investment is focused on restoring and buying expensive works of Art, and as such does not benefit a large share of the population of Antwerp.

For Hamburg again the large families contribute on a business and a personal level, Universities (e.g., Kühne Logistics University; what’s in a name!), festivals and preservation of the Elbe Bank, are examples of investments to better the life of the Hamburg citizen. Of course, there is also the link with the motive of “license to operate” but there also is a genuine motivation of giving back to the city, knowing that there is a close relationship between government and Hamburg business.

4.3. Institutional arrangements

Elements of culture, organized by institutional arrangements, determine in part the way governance is expressed. The next sensitizing concepts represent institutional arrangements and their influence on the port/port city cluster.

¹² Respondent port of Rotterdam.

¹³ It is not the aim of this paper to explore the phenomenon of institutional distance as an aspect of foreign investments. Here, ownership is derived from the concept of governance.

¹⁴ Respondent port of Hamburg.

4.3.1. Economy of touch

In Rotterdam, where in the past close personal relationships were the usual way of doing business, this has decreased a lot. Many respondents mentioned the concern that “agreements that reflected a too close relationship might be food for legal actions”. There is a lot of cooperation in the port, but this is done in a formalized way, e.g., via industry organization Deltalinqs. There is less need for an economy of touch that “paves the way for a communal approach to cluster development”.

In Antwerp, there is the same concern for too many informal relationships as careful as they are not to be accused of a distortion of competition by the anti-trust agency. On the other hand, there still is a group (‘naties’ based¹⁵) that forms a biotope as one respondent recalled it. There are still quarterly stakeholder meetings for maritime, logistics and industry representatives to discuss relevant topics, chaired by the port authority.

Hamburg, again, is the most prominent when it comes to personal relationships based on an economy of touch. “Hamburg is a village. And of course, they all know each other”.¹⁶ This “knowing each other” goes back into history. The relevant businessmen have personal bonds e.g., based on their common education (often London-based business studies they joined together): “... it is a pedigree. These owners, they know each other in Hamburg, because we are not as New York or as London...”¹⁷.

4.3.2. Social networks

These sensitizing concepts appeared not to be distinguished apart but as an underlying phenomenon that shaped the concepts economy of touch and trust. But it also created a concept especially applicable for the situation in Hamburg: being a closed community. Once the interviews touched upon social networks, the concept of tacit knowledge quickly transformed the response in Hamburg to the fact that Hamburg is very much a closed community. Antwerp, nor Rotterdam have indications of such a prominent appearance of a closed community. The business language in Hamburg is German. Their common educational background strengthens existing inter-family ties. They even find themselves special within the German Umfeld, being a protestant enclave in Catholic surroundings. Their acting regarding foreign ownership reflects their closed community in optima forma. In Rotterdam, as several respondents remarked, because of the diminishing social contacts that are replaced for more formal business contacts, and less enduring bonds and common pasts, tacit knowledge has eroded and by that the nature of the social network as well.

4.4. Summarizing

Table 6 evaluates the concepts discussed of the three perspectives cluster, governance and institutional arrangements. The concept of commonalities and complementarities show remarkable differences between the ports and port cities. Governance as an influencing factor, steering processes of Porter’s structure of cluster forces does play a role, especially an omnipresent one in the Antwerp case. Complementarities lead to diversity, which is extraordinarily strong in the city of Hamburg, and as such Hamburg can be seen “as a city that is not locked in as Chapman (2005) described...” (see Tables appendix I). The remarks made in Table 6 are based on an evaluation of the interviews and annual reports.

The analysis of the economic position of the port city clusters shows the differences between Rotterdam, Antwerp and Hamburg. Rotterdam is a rather poor city in terms of the economic position of its citizens. Decisions in the past play a role in this: a rather extensive industry where less high-income jobs were created compared to the more value-added activities in Antwerp and Hamburg. Especially the economic diversity

¹⁵ A natie is a labor organization dating back to the 19th century.

¹⁶ Respondent port of Hamburg.

¹⁷ Respondent port of Hamburg.

Table 6
Evaluation of the manifestation of the sensitizing concepts in port city clusters.

Concept	Rotterdam	Antwerp	Hamburg
Commonalities and complementarities (section 4.1.2)	Aligned. No active policy to enhance the cluster by integrating the entities through a main-port policy. A very diversified port. Strong maritime-based industry, especially transshipment and fuel based. Logistical value-adding activities also more related to inland ports near Rotterdam.	Integrated and therefore an enhancement of the entities within the cluster. A less diversified marine-based industry. Logistics adding value within the port of Antwerp. Chemicals as a prominent sector.	Between the marine-based activities and the strongly present maritime advanced producer services in the city. Port as the gateway for importing resources and exporting products. Strong marine and non-marine based. Marine industry is only one of the industries. High-tech, high-value-adding activities: chemistry, Airbus, education.
Business relations (section 4.2.1)	Business based and competitive. Internationally oriented, entrepreneurial attitudes. Considered as a national asset.	Institutionalized and politically influenced. More formalized and subject to legalization and particularism.	Locally based. Old trade structures dominant in networks. Close relationship between business and politics.
Trust (section 4.2.2)	Strongly based on reliability.	Institutionalized trust and reliability.	Personalized trust and reliability.
Foreign ownership (section 4.2.3)	Is viewed as a natural outcome of economics. Like in Antwerp, it is slowly becoming an issue.	Seen as a 'natural' result of lack of finance to develop modern infrastructure. Is viewed as being problematic.	Strong aversion, therefore a protectionist environment. Hardly any opportunity for outsiders to acquire full control in Hamburg companies.
Investment in society (section 4.2.4)	Recognition of an attractive city where investments need to be made from an economic point of view. Hardly any individual contributions (except Verre Bergen).	Under direction of port authority. License to operate is a motive. Individual entrepreneurs play a modest role.	Companies invest from a license to operate perspective. Besides this, individual businessmen and their companies contribute significantly to the city.
Economy of touch (Section 4.3.1)	Less present.	Especially present between the naties.	Highly omnipresent but invisible.
Closed community (section 4.3.2)	N.A.	N.A.	Very closed community.

in Hamburg enhanced its economic position. The general dynamics described in the introduction were not helpful to overcome the economic position of the Rotterdam citizens. In its drive for developing a new economy, Rotterdam is aiming at economic activities that are not directly favoring the welfare of the Rotterdam people themselves. These activities rather create an influx of new inhabitants that follow this new employment which often is of a highly educated level that does not match the employment needs of the existing citizens. This is different in Antwerp and Hamburg where existing port activities do provide enough well-paid jobs, e.g., the chemical sector in Antwerp. Besides this, and especially in Hamburg, there are activities that provide employment in non-maritime sectors that are very well paid and because of their nature are not sensitive for the international maritime dynamics.

But as said, this cluster is influenced by governance and embedded in an environment determined by institutional arrangements. For the concepts describing institutional arrangements, it is clearly that the relations between the actors within the port community, but also between the actors of the port and the city, are the strongest in Hamburg, based on personal, often long term, bonds. A situation that has been present in Rotterdam and Antwerp in the past but changed, especially due to globalization. This change from the personal to the more rational, businesswise attitude, has been most prominent in Rotterdam. Using an ordinal scale to summarize the results, Table 7 compares the outcomes of an evaluation of the degree of intensiveness of the sensitizing concept in the port city cluster.

Table 7 shows that the framework of relationships within the cluster is strong in Hamburg, followed by Antwerp. For that, the international

Table 7
The presence of the sensitizing concepts in the three port city clusters.

	Rotterdam	Antwerp	Hamburg
Foreign ownership	++	++	-
Investment in society	+/-	+/-	++
Economy of touch	-	++	++
Closed community	-	-	++
Trust as reliability	++	+	++
Trust as personal trust	-	+/-	++
Shared values cultural	-	+/-	++
Shared values economic	+/-	+	+

dynamics were able to have the strongest effect in Rotterdam. It is hard to say that because of that, the economic development of the city of Rotterdam was lacking behind. Path dependency has had an effect as can be seen discussing the nature of employment and the economic structure. But certainly, the less prominent social structure of Rotterdam did not help to overcome the effect of the dynamics – e.g., the effect of foreign ownership contributed to a less tight structure of business relations, as it also influenced economy of touch. These sensitizing concepts do show strong differences between the three port cities. The concept of shared values, divided in economic and cultural, summarizes this convincingly.

5. Conclusion

Cluster theory provides a powerful perspective to evaluate the relationships between port and port city, however it is an analysis that is focusing on the *meta*-level of the relationship between a port and a city. Therefore, it is a framework that does not deal with the daily practices in a port, but it is a tool to assess generic characteristics and provides a base to relate elements of governance as expressed in the sensitizing concepts chosen. Besides this, the embeddedness in which the interaction within the framework takes place, can be approached and linked by using the perspective of 'institutional arrangements'. The sensitizing concepts chosen, appear to enlighten interesting differences between the port cities chosen. The forces that were introduced in the introduction of this paper are all present in the three port clusters. As such, they truly are general dynamics influencing port/port city relationships. But the impact of these dynamics differs strongly when the three ports are compared. They "landed" on different grounds. The picture that emerges from sections 4.2 and 4.3 is one of various attitudes towards the drivers that make up a community. It is the attitude towards the understanding that there should be a common ground within the cluster based on shared values.

5.1. Economic and cultural shared values

"No words, but action" was for a long time the common feeling and attitude of the Rotterdam citizens and businessmen. In the hearts and in the minds. The general feeling among the respondents of Rotterdam is

Table 8
The presence of shared values in the three port city clusters.

Concept	Rotterdam	Antwerp	Hamburg
Shared values	Economic.	Slightly cultural and more strongly economic.	Cultural and economic.

that “the willingness to perform hand in hand, has changed and not for the better”. Because of the interplay of the actors in the cluster, shared values are often seen as vital for enhancing the economic performance of the cluster. But besides this economic spin-off, one can also say that at the basis of this economic shared value, there must be a cultural one as well. This certainly was the case for Rotterdam in the past. The well-known expression with which this subsection started, is an example of this. And this has led to economic shared value. But time and the general dynamics as described in section 1.0 are responsible for a decrease of the cultural shared value as has been described at the hand of the sensitizing concepts as described in sections 4.2 and 4.3. and has put shared values based on economic goals first. This also has been the case in Antwerp, although regarding the presence of cultural shared values, e.g., in 2008 businesspeople were inclined to find each other and cooperated to overcome the aftermath of the financial crisis. And in the “natie” the history of these companies represents common interests within their workers community and within the company as an enterprise. For Hamburg one can say that both expressions of shared values are present. And especially the cultural one is the discriminator when the comparison with Rotterdam is made. The economic shared values are still highly under influence of the cultural shared values as described in the sections discussing the sensitizing concepts of sections 4.2 and 4.3. So, a new row should be added to Table 6, as described in Table 8.

5.2. Epilogue and theoretical relevance

Port/port city relationships have been studied extensively, but mostly on the operational level (see for instance the OECD studies). This kind of research is done by looking at processes that led to different outcomes in terms of spatial and functional configurations (Bird, 1963; Charlier, 1992; Suykens, 1998; Merk, 2014; Hoyle and Pinder, 1992), but less by looking at the underlying (and invisible) forces and structures that influence these processes. There has also been interest in the benefits for the city in terms of the nature of direct and indirect employment and added value (Kuipers, 2018b; Kuipers and Vanelslander, 2015; Jacobs et al., 2011). This paper makes a comparison between the three ports using these outcomes. But for a deeper understanding of how these outcomes (employment, spatial position, etc.) were created, one must look at the meta level. Behind these outcomes there have been invisible forces that might influenced them. This paper contributes by presenting influential forces like economy of touch, closed communities, and trust as sensitizing concepts chosen as an operationalization for these forces. When possible, arguments are illustrated with empirical data. It aims at

Appendix I. Top 10 companies in Rotterdam, Antwerp and Hamburg

Rotterdam

Rotterdam Company	Industry	# employees	Location head office
Shell	Oil	3,355	The Hague/London
Nationale Nederlanden	Insurance	2,485	The Hague
ECT Delta Terminal B.V.	Logistics	1,961	Hongkong
Eneco	Energy	1,611	Tokyo
Bilfinger Industrial Services	Construction	1,305	Mannheim
Stedin	Energy	1,147	Rotterdam
Coolblue B.V.	Retail	1,098	Rotterdam

(continued on next page)

researching the relationship between the port and the city it belongs (belonged?) to.

The relevance of having attention for the interrelationships between the actors of the cluster from the perspective of governance and institutional arrangements in a port on the meta level, helps to overcome the comment that differences are a result in path dependency. Of course, as said, there is path dependency: events in the past do have their influence on later developments. But these events are rooted themselves in certain conditions. The path of the cluster is characterized by events and crossings. In this paper these are the general dynamics. These dynamics have an effect. But the feedback on these crossings is influenced by the factors as operationalized by the sensitizing concepts researched in this paper. They can be linked to the existence of different political economic structures that make up the institutional arrangements that together make up for the existence of shared values. These differences, often stemming from the past, could be partly explanatory for differences in the appearance of these sensitizing concepts. For this paper, it is the aim to stress that measurable, and visible phenomena often are the outcomes of invisible and often hidden processes as articulated by the sensitizing concepts as used in this study.

But to be more concrete, this study leads to actions that can be considered. For Rotterdam it means that the perspective of the port should not be limited to port activities itself, but they should be focused on stimulating heterogeneity in cooperation with the city. For Antwerp, a priority should be the mental integration between the different levels of government and (spatially) the Left and Right bank of the Scheldt. For Hamburg the challenge is not only on consolidating the existing activities, but also be open for international trends like globalization whereby shippers and terminal activities are more integrated. And spatially it means that the development of HafenCity should be considered as a mutual interest for the port and the city. Herewith it is shown that a meta-analysis that is based on sensitizing concepts can lead to new insights and practical recommendations.

The limitations of the study are partly defined by the choice of respondents and the way they perceive events. That is always the case but becomes more pregnant when respondents with a specific background are chosen as is the case with some captains of industry. But the fact that an entry was made to these respondents is this risk worthwhile. And checking their views with other respondents make up for too subjective insights.

Future research could be directed to the changes that are to be observed in terms of how politics and society perceive foreign ownership and the effects on shared values, both economic as cultural.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

(continued)

Rotterdam Company	Industry	# employees	Location head office
Deloitte	Finance	1,081	London
ISS Cleaning Services	Facility management	1,069	Utrecht
ABN Amro Bank NV	Finance	1,048	Amsterdam

Antwerp

Company	Industry	# employees	Location head office
CEPA	Union	8,815	Antwerp
BASF	Chemicals	3,200	Ludwigshafen am Rhein
NMBS	Public transport	700	St. Gillis
MSC	Logistics	2600	Geneva
Katoen Natie	Logistics	3000	Antwerp
Total Refineries	Oil	4,900	Paris
Exon Mobil Petrochemicals	Oil and chemicals	2,200	Irving (Texas)
Evonik	Chemicals	1,000	Essen
Electrabel	Energy	418	Paris
Dredging International	Maritime	4,937	Antwerp

Hamburg

Company	Industry	# employees	Location head office
Asklepios Kliniken GmbH	Healthcare	14,500	Hamburg
Airbus	Aviation	12,500	Toulouse
Universitäts Kliniken Eppendorf	Healthcare	11,340	Hamburg
Deutsche Bahn	Transport	9,500	Berlin
Lufthansa	Aviation	8,000	Frankfurt
Deutsche Post	Transport	6,500	Bonn
Elbkinder	Childcare	8,845	Hamburg
Edeka	Retail	5,520	Hamburg
Haspa	Banking	5,000	Hamburg
OTTO Group	Retail	4,900	Hamburg

Appendix I. I: List of interviewees

Date of interview(jjjj-mm-dd)	Function	Company
Rotterdam		
2018-06-29	Chief Public Affairs & Public Relations Officer	ECT
2018-05-24	Senior Commercial Executive	ECT
2018-05-31	Former CEO	ECT
2018-07-06	Former Managing Director	PSA
2018-06-07	Former Alderman	City of Rotterdam
2018-07-05	Former Alderman/ Director; owner	City of Rotterdam/ Matrans Holding
2018-06-28	Former Alderman/Mayor	City of Rotterdam/Zwijndrecht
2019-06-20	Managing director Rotterdam Maritime Board	City of Rotterdam
2018-06-22	Senior Policy Advisor	City of Rotterdam
2018-05-31	Manager Social & Labour Affairs	Port of Rotterdam
2018-07-04	Former CEO	Port of Rotterdam
2019-03-142019-08-20	Director Corporate Strategy	Port of Rotterdam
2020-03-16	CEO	Port of Rotterdam
2018-07-11	Former CEO	Port of Rotterdam
2018-08-13	Chairman	Deltalinqs
Antwerp		
2017-11-22	Alderman, chairman	City of Antwerp/Port of Antwerp
2018-01-12	Chief Corporate Affairs Officer	Port of Antwerp
2018-01-11	Former CEO	Port of Antwerp
2017-12-07	Former managing director	P&O Ports/DP World
2017-11-30	CEO	Katoen Natie
2017-11-16	Regional Port Commissioner	Government of Flanders
2017-11-17	General manager	Maatschappij Linker Scheldeoever
2017-09-18	Associate professor	University of Antwerp (Transport & Logistics)
2018-01-15	Managing director	Alphaports/VOKA Antwerpen
2018-02-09	Mayor	City of Beveren
Hamburg		
2019-07-11	CEO	Port of Hamburg
2019-07-11	Ass. to the CEO	Port of Hamburg
2018-10-25	Head of Port Strategy	Port of Hamburg

(continued on next page)

(continued)

Date of interview(jjjj-mm-dd)	Function	Company
2015-11-12	Officer Process Management Innovation	Port of Hamburg
2018-10-24	Former State Secretary/Executive Director	City of Hamburg/Eurogate
2019-02-27	Chairman faction Green Party	City of Hamburg
2018-12-13	CEO	HafenCity Hamburg
2018-10-25	Former CEO/Managing Director	Port of Hamburg Marketing /IHS Markit
2019-02-28	Consultant	W&P marine
2019-02-28	Professor em./ Consultant Maritime Logistics	Hamburg University of Technology
2019-02-01	Associate professor	Kühne Logistics University

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