Research methodology and data analysis

7.1 INTRODUCTION

Before the structure of the research process developed to sample and analyze the research data is addressed, the next section elaborates on the theoretical base used to design the analysis process and to arrive at explanations. For that, a framework was applied to make a connection between the outcomes of the theoretical part and the fieldwork, which consisted of three cases by conducting interviews with port and port city representatives of the ports of Rotterdam, Antwerp, and Hamburg and an analysis of the annual reports of the port authorities of these three ports for the years 2011–2016. This framework was based on the grounded theory approach as developed by Glaser and Strauss (1967). The use of this method has been and still is under discussion (Kendall, 1999). The use of literature in relationship to the process of gathering data and the analysis itself has been subject of controversy (Dunne, 2011). So although literature was reviewed needed for the creation of sensitizing concepts, this can still be seen as an application of Grounded Theory to be able to analyze the data of the empirical research inductively. As Swanborn emphasizes, it is a method to reach a new level of abstraction by combining various bodies of knowledge and to design bottom up a more formal theory if possible (Swanborn, 2013, p. 197).

7.2 CONSTRUCTING THE THEORY IN THE GROUNDED THEORY APPROACH

Grounded theory is one of the most used methods in research dealing with between 5 and 50 open or semi-structured interviews (Swanborn, 2013). The grounded theory approach is a variety of the comparative method of analysis (Glaser & Strauss, 1967). Glaser and Strauss (1967, p. 5) took the position that the adequacy of a theory cannot be divorced from the process of creating it. The method consists of having the results of the research 'speak for themselves'. The elements of theory generated from comparative analysis are first conceptual categories and their properties and second hypotheses or generalized relations among the categories and their properties. "The constant comparing of many groups draws the sociologist's attention to their many similarities and differences. Considering these leads him to generate abstract categories and their properties, which, since they emerge from the data, will clearly be important to a theory explaining the kind of behavior under observation" (Glaser & Strauss, 1967, p. 36). It is better to let the categories emerge than to come to the study with pre-set categories based on existing theories. The grounded theory approach is characterized by the following steps (De Boer, 2011, p. 1):

- Sampling the data, analyzing the data, and reflecting on them to decide what kind of additional data are needed to take the next step in collecting new data;
- The sampling is aimed at developing categories or concepts;
- The method of constant comparison is applied to get more detailed categories by comparing texts with one another, the concepts with one another, and the relationship between the concepts;
- The sampling of data and the analysis are aimed at the development of a substantive theory.

Swanborn (2013) adds that thinking in terms of variables is rejected and a more holistic approach is preferred. The term theory is used for the result of the analysis where relationships are made between concepts (Swanborn, 2013, p. 196). In Figure 7.1, this loop is illustrated where the process from induction (from data) to theory is achieved by the upcoming (emerging) questions (and one could also say ideas) and patterns that are more or less verified by the available data.

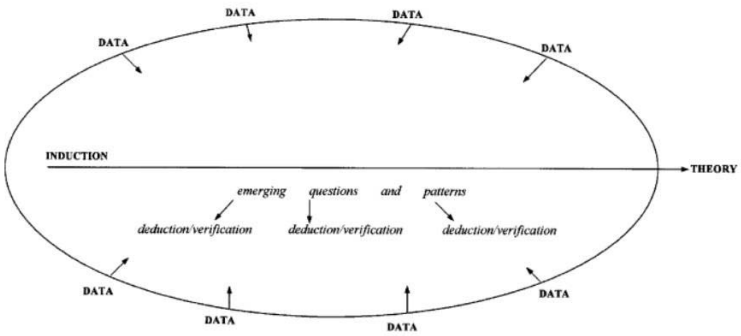

Figure 7.1 A model of the place of induction, deduction, and verification in grounded theory analysis (Source: Heath & Cowley, 2004)

Glaser remained faithful to his first ideas (Glaser & Strauss, 1967), whereas Corbin and Strauss (1990) reformulated the classical mode. Glaser still considered that the data alone should speak for themselves without any pre-notion or theoretical model. The concepts should emerge purely by induction, and then from that deduction/verification should take place. Because this might generate new questions or patterns, the researcher should constantly go back to the data. Induction is the key process in the journey from data to theory. Methodologically speaking, Strauss took another turn, by stating that there is always a framework of knowledge and notions present with the researcher. Although Glaser also acknowledges that, the difference especially appears with the role of literature. For Glaser, literature is additional after the emergent theory has been developed; it is to be used as additional data. This lit-

erature will then be read in a more focused way because it can then allow for more interpretations. For Strauss, it is the source of stimulating theoretical sensitivity. It forms the foundation of a paradigm model that will evolve into a theory.
This does not mean that Glaser denies the fact that each researcher cannot conduct his/her research free from any precognition or ideas, but the role of literature is seen differently by these two founders of the grounded theory approach (Heath & Cowley, 2004, p. 143). Strauss asserts that literature can be used to create concepts that steer the research. These concepts are called sensitizing concepts because they 'hint' at phenomena that might be able to explain processes in reality. These concepts are summarized in Chapter 6 of this thesis. Figure 7.2 shows the place of data in Strauss' approach, where it is used to verify them after deduction of former data. In this way, a constant interplay between new data and explanations (deductions) is created. The trouble with this is the use of verification. Verification as a concept could generate the idea that results in an explanation that is objective, ever repeating in the same circumstances and the same in appearance; thus, it will be the evaluation for everyone examining the phenomenon. Therefore, this term does not do full justice to the underlying philosophy of this research method. The basis of the method can be traced back to the philosophical approach that not only can empirical, objective realities be experienced, but also that phenomena, 'that which it is in itself', can be known. This is based on Kant's ontological approach, which argues that a distinction must be made between the things that are as they are (*Ding an Sich*) and the knowledge of them that is experienced. This was taken further by Brentano, who states that the object to be known is intentionalized by the observer (Bakker, 1977). That is why, for phenomenology, there "can be no world without a subject and no subject without the world" (Bakker, 1977, p. 70). Husserl, a student of Brentano, elaborated on this with his reductionism, which argues that withdrawal of all precognitions offers the opportunity to know things (*Wesenanschauung*) (Bakker, 1977, p. 80). The question is whether this type of phenomenological thinking really is the basis of the controversy between Glaser and Strauss. Husserl's pure reductional approach is not to be found in the original grounded theory approach as later continued by Glaser. In the process of deduction/verification, ideas are created that are used to select or evaluate (what Glaser and Straus called "verificate") new data. So, then precognition is present. Strauss' deviation from the original idea is in that sense more honest because he states that upfront in the process there is a model based on theory or ideas.

The methodology used in this thesis takes the Strauss deviation by formulating ideas and developing a framework on which the field research is designed and based. However, in contrast to the model as shown in Figure 7.2, I do not agree that the

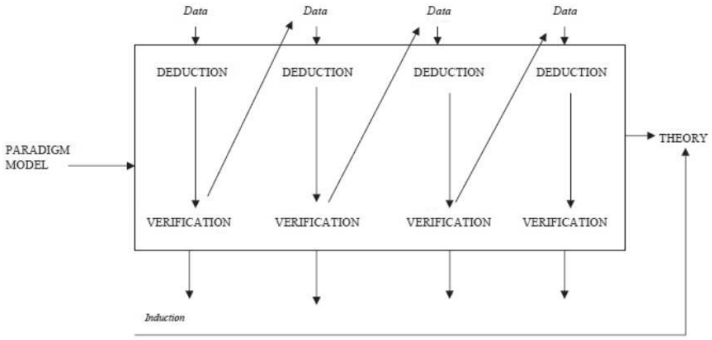

Figure 7.2 Place of induction, deduction, and verification in grounded theory analysis (Source: Heath & Cowley, 2004)

steps in the process are based on verification. Whenever new data were collected, the approach to the new data was of course 'biased' by this; and this in fact enriched the collection of new data because a certain theme discussed in the interviews could be taken a step further by already taking this new information into account. Therefore, it is better to speak of plausibility. The data are interpreted by the researcher with his background, his experiences, his precognitions, and his knowledge furthered by the previous data collections. Strauss acknowledges that: "Here, analysis is necessary from the start because it is used to direct the next interview and observations. This is not to say that data collection is not standardized. Each investigator enters the field with some questions or areas for observation, or will soon generate them. Data will be collected on these matters throughout the research endeavor, unless the questions prove, during analysis, to be irrelevant" (Corbin & Strauss, 1990, p. 6). Thus, the outcome in terms of an explanation of described and illustrated phenomena is not something that is a substantive, measurable, objective, verified fact in itself, but a possible phenomenon that, given these backgrounds, creates, including for another researcher, a understanding that he too sees this as a possible outcome of the research. This means that 'possibility' is the proper term to evaluate the outcomes of much of the sociological, human geographical, political, and psychological research. This is also why so often different studies in the same area, studying the same phenomena, come to different conclusions[12]. This is not a problem as long as it is clear on which data the study has been performed and how the researcher has come to his conclusions, or, in terms of grounded theory, his new – or in the case

12 An explanation for this might have its roots in the way that people, researchers as well, look at reality which is a construct based on its own primary and secondary socialization (Berger & Luckmann, 1967): "" social worlds are interpretive nets woven by individuals and groups" (Scott, 2014, p.692).

of existing theories adjusted – theory. How the field research for this thesis was designed is the subject of the next section.

7.3 METHODOLOGY

7.3.1 Basis of analysis

To operationalize the research, sensitizing concepts were formulated that resulted from the literature study (Bowen, 2006; De Boer, 2011). These concepts are interpretations of the elements defined in the research model visualized in Figure 1.7. The concepts are summarized in Chapter 6. They are economy of touch, company's contribution to society, business relations, social networks (during the research defined as closed community), and trust. These were the main sensitizing concepts that formed the basis for the analysis of the multiple case study. The concepts were used for two types of empirical sources:

- The interviews with port and port city representatives of the three ports under study;
- The annual reports for the years 2011 to 2016 of the port authorities of the three ports under study.

Both types of resources resulted in written texts that needed to be analyzed. For this, the concepts were broken down into codes in steps that created more detail in every step taken.

7.3.2 Coding based on constructs from the model: deductive coding

Coding started by using the constructs from the model: economy of touch, company's contribution to society, business relations, and trust. These were the main sensitizing concepts and so the first heading of the groups of codes. Codes, found to be related to them, were attributed technically from the process of open coding, but in fact heuristically derived from the sensitizing concepts, that is, the concept of trust (a code) generated more detailed codes:

1. Trust between companies;
2. Trust between the port and cites in the region;
3. Trust between the port and the port city;
4. Trust between the port authority and port firms;
4. Trust within companies;
5. Institutional trust;
6. Personal trust.

This process also relates to the fact that a constant comparison was made between the concepts and that it appeared that a more detailed code was needed to describe the text fragment in a way that it gave it more credit. Thus, a concept like business relations created the concept of foreign ownership, thanks to the interviews where this issue became a frequently discussed topic.

7.3.3 Coding based on findings: open coding

New codes were found by the process of open coding: not directly related to the sensitizing concepts but appearing in the research material (interviews and annual reports of the port authorities dating from 2011 to 2016) by the researcher constantly moving forward and backward for new codes or renaming them and checking them with their presence in formerly coded interviews and reports. This was done according to the methodology described by Glaser and Strauss (1967). In total, 434 codes were defined, but many of them were used on one or two occasions, so they were grouped together as described below.

7.3.4 Analysis based on axial coding

Axial coding was performed by grouping the codes. This created new insights, such as the fact that some codes gave rise to a concept that could be regarded as a new sensitizing concept. For example, the concept of diversity as a characteristic of a cluster became an important element to describe and explain port–port city relationships. This proved to be such a fruitful code, that the original sensitizing concept 'commonalities' was not further used. This coding led to a combining of the distinguished concepts to construct a theory.

Networks could be created by relating the codes to one another and defining their interrelationship. This was done per port, per annual report (per year), and per sensitizing concept as formulated by the model. When the codes were summed up, the networks for annual reports showed how much attention was given and apparently marked as important. By doing so per year for each port, a development of themes of importance could be reconstructed, assuming that themes that were worth mentioning and seen as important for that year were incorporated in the annual report.

For the interviews, the sensitizing concepts were first established based on all the interviews at all three ports. This created schedules (overviews) about the sensitizing concepts. This was repeated per port per sensitizing concept and accompanied by 'arguments for', where (relevant) striking quotations were presented. These were of course limited to the respondents from the port in question. So, quotations supporting the Latin approach were found in the interviews with the Antwerp respondents,

whereas the more Liberal Market Economy (LME) approach was supported by the interviews with the Rotterdam respondents.

This process of analyzing the annual reports and the interviews with representatives of the port and port city communities resulted in the explanations that form the theory of differences in port–port city relationships in the Le Havre–Gdansk Range, confined to its three most important ports, Rotterdam, Antwerp, and Hamburg.

Two methods were used to analyze the interviews. The first method was applied during the transcription of the interviews. By listening to and transcribing the interviews, the researcher was forced to reflect and comment on the elements of the conversations belonging to the themes (derived from the sensitizing concepts). The second method was to let the texts speak for themselves through the Atlas Ti program. For that, the interviews per port were selected and, guided by the sensitizing concepts, the text elements representing the responses that covered the various concepts of the various respondents were used to represent the insights. This was done per theme per port. Sometimes, a concept was coded in a way that another term better represented the elements of that concept. For example, business relations in Antwerp were coded as 'business relations', but, during the analysis, it appeared that the code 'complementarities' provided some very interesting remarks (quotes) on that theme as well. In that case, a representation of that was also made to show the insights of the respondents: 'complementarities as business relations POA (POR, POH)'[13]; or 'composition port authority POA (POR, POH)', and 'informal business contacts' as another code representing aspects of economy of touch.

It sometimes happened that a certain quote was used for two representations. For example, in economy of touch, some quotes that nuanced this were represented in two opposing representations (economy of touch present and economy of touch decreasing). In the process of adding quotations to codes representing these sensitizing concepts, this happened when a quotation was analyzed and found to be applicable in the concept that was constructed but also applicable in another concept. So, it was immediately added to that other concept as well, as it served both (or more) concepts. This does not mean that the concept is too broadly defined; it merely illustrates that these concepts are very interrelated and one leads, influences, or determines the other.

13 POA: Port of Antwerp; POR: Port of Rotterdam; POH: Port of Hamburg.

It was not only the sensitizing concepts that were treated in this way; other phenomena were similarly handled. This led, for example, to a representation of Rotterdam's competitive outlook as a kind of wrap up of that theme that was discussed with the respondents. Some representations, therefore, were not the result of an analysis within all three ports, but were in themselves so characteristic that it was interesting to make a representation of them. For example, the representation 'closed community' in the research of the situation within the port/port city of Hamburg was so omnipresent in some interviews that it was worthwhile structuring it as a separate concept as an expression of social networks, because in itself it supports one of the sensitizing concepts, in this instance shared values within Hamburg. The visual representations of the concepts by using quotations supporting them were designed in a way that quotations supporting the concepts were placed on the left site of the overview and quotations that weakened or even opposed the concepts were placed on the right site. This created, when possible, a kind of continuum. This was also done when there were quotations that illustrated that the concept was far more present in another port. In Rotterdam, some respondents used examples to show how this was the case in Antwerp or Hamburg. These quotations can be found on the right side.

7.3.5 Searching for relations between coded items: the process of selective coding

Finally, visual representations of the most striking concepts with their interrelations were produced to sum up the issues in each port/port city. These were the different types of political-economic systems, the concepts of trust, shared values, ownership, company's investment in society, and economy of touch. This led to a number of schedules (networks) of the variety of code groups. The networks based on code groups for the interviews are shown in Table 7.1

Table 7.1 Networks interviews port/port city representatives

	POA	POR	POH
Arguments for LME/CME/Latin economy	x	x	x
Business relations	x	x	x
Characteristics of the port	x	x	x
Closed community	o	o	x
Company's investment in society	x	x	x
Complementarities as business relations	x	x	x
Composition port authority	x	x	x
Conflicts	x	x	x
Diversity	x	x	x
Economy of touch -	x	na	na

Table 7.1 Networks interviews port/port city representatives (continued)

	POA	POR	POH
Economy of touch +	x	x	x
Family companies	x	x	x
Foreign ownership	x	x	x
Local ownership	x	na	x
Port/port city relationships	x	x	x
Shared values	x	x	x
Tacit knowledge	x	na	x
Trust	x	x	x

Note: LME: liberal market economy; CME: coordinated market economy; na: not applicable; o: not constructed, no data to substantiate; POA: Port of Antwerp; POR: Port of Rotterdam; POH: Port of Hamburg

Table 7.1 lists the original concepts (economy of touch, company's contribution to society, business relations, and trust). Other networks represent the concepts found to influence port–port city relationships: complementarities, foreign ownership, closed community, and diversity. The networks not specifically analyzed are those that support the stated concepts. They were created to understand the phenomenon, but support another concept. For example, tacit knowledge is not extensively analyzed per se, but supports the concepts economy of touch and trust. The networks based on the code groups formed during the analysis of the annual reports are shown in Table 7.2.

Table 7.2 Networks annual reports of the port authorities of Antwerp, Rotterdam, and Hamburg

	AR 2011	AR 2012	AR 2013	AR 2014	AR 2015	AR 2016
Antwerp						
Business relations	x	x	x	x	x	x
Company's investment in society	x	x	x	x	x	x
Shared values	x	x	x	x	x	x
Rotterdam						
Business relations	x	x	x	x	x	x
Company's investment in society	x	x	x	x	x	x
Shared values	x	x	x	x	x	x
Hamburg						
Business relations	x	x	x	x	x	x
Company's investment in society	x	x	x	x	x	x
Shared values	x	x	x	x	x	x

As can be seen, the range of code groups differs considerably between the annual reports and the interviews. The annual reports deal with three of the five original concepts as formulated in the research model. The concepts economy of touch and trust are not dealt with. This does not mean that they were overlooked. The texts in these annual reports just did not provide any connections to these concepts. This is not surprising. Annual reports are meant for public reading and serve different purposes. Not only do they have an informative function in terms of reporting on actions taken, results achieved, and future prospects, they also have a more marketing-directed function. Discussions about how more intimate relationships are formalized (or not), what the economy of touch concept entails, or how trust is built are not subjects for broad publication. In contrast, in the interviews, these issues could be exhaustively discussed, and so they form the source material for evaluating these concepts. Examples of these schedules, in code structure as well in text fragments, are available in the appendices. For an example, see Appendix 3. These schedules helped to clarify the relationships between concepts.

The researcher interprets these kinds of representations to a high degree. The lines connecting the concepts visualize relationships like ‘is a property of’, or ‘supports’, or ‘contradicts’. These representations are therefore accompanied by visualizations that form the arguments behind the selection of the concepts and the choice made to attribute a certain kind of relationship. These visualizations consist of supporting text fragments from interviews or annual reports.

As already stated, besides the analysis of the coding process, during the reading of the annual reports and the transcription of the interviews, insights and observations were established that were noted and remarked on immediately, providing additional information and allowing interpretations on the spot. This was particularly interesting for the annual reports because it enabled comparisons to be made between these reports over consecutive years on certain subjects. To sum up the sources and their instruments for analysis, Figure 7.3 visualizes this database.

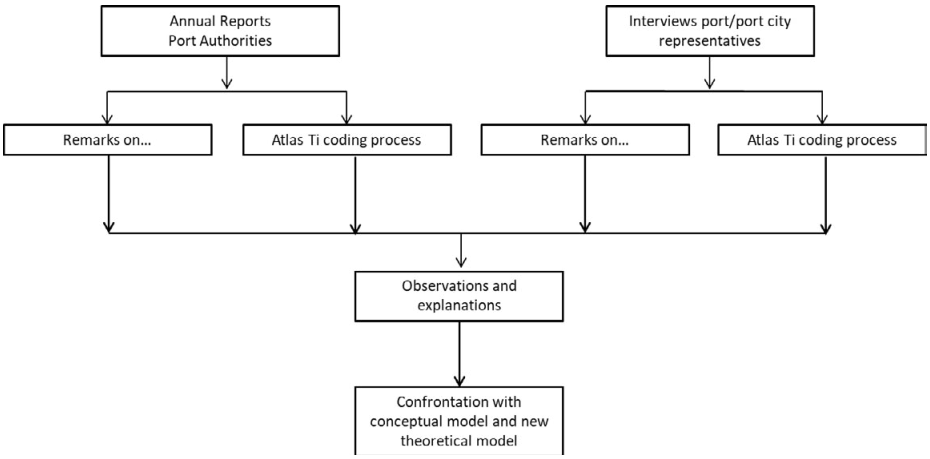

Figure 7.3 The structure of the field research on port–port city relationships

7.3.6 Interviews: the respondents from the three ports

To conduct an inquiry into the port–port city relationships of Antwerp, Rotterdam, and Hamburg, respondents from different backgrounds were needed who could be seen as shaping and influencing these relationships. The following groups of respondents were distinguished:

- Scholars;
- Representatives of port authorities;
- Representatives of port cities;
- Representatives of influenced municipalities in the port region;
- Representatives of port companies, especially container terminal companies;
- Representatives of consultancy agencies, non-municipal organizations, and so on.

Finding respondents from the three ports presented various difficulties. Respondents from the port and port city of Antwerp were found rather easily. A scholar from Antwerp University acted not only as a respondent but also as an expert with an extensive network that included appropriate, knowledgeable respondents. This provided the researcher with a first set of names that could be increased by the snowball method and by using the interviewed persons as a reference for new conversations. It was very difficult to make contact with the management of large international corporations, and it was thanks to the cooperation of a former executive top manager of an international container terminal company that information from that level and field could be acquired. In total, 10 interviews were conducted with representatives of Antwerp.

The situation in Rotterdam was even easier because this was home ground for Erasmus University. Faculty members know a lot of port actors, but an employee of the Rotterdam Port Authority also played a very important role as she knew many influential actors on a personal basis and could act as an intermediary. In total, 16 interviews were conducted.

Getting into Hamburg was far more difficult. Even email requests were often unanswered. Some respondents were persuaded to cooperate only after the intervention of other personalities, and in the case of the Hamburg Port Authority top level management, this was done only by written statements on a questionnaire. The interviews that could be conducted took place in a very friendly and open atmosphere, and the respondents acknowledged that it is very difficult to get to speak to someone in Hamburg. In total, 11 respondents were interviewed, but it must be noted that two of them completed the written questionnaire instead of having a face-to-face interview.

The interviews lasted 1 to 1.5 hour each and were transcribed verbatim. This allowed for the interpretation of some quotations as most serious, humorous, or ironic. Given the phenomenological approach of having the data speak for themselves, it is most important not only to have the exact words, but also to be able to make the most applicable interpretation by observing the context conveyed by respondents' non-verbal or non-explicit expressions.

The interview structure was open-ended, although some topics were discussed in every interview. Depending on the expertise, the experience, the respondent's (former) function, and his/her willingness to discuss these topics, initially the following list was used:

- Positions and interests of the various factions in the port/port city;
- Foreign ownership;
- Relationship port city;
- Business relations;
- Company's investment in society;
- Manifestations of trust;
- Shared values;
- Comparison with other ports.

These topics are of course in line with the networks derived from the interviews, but, as can be seen, there are more networks in Table 7.1 because, during the period in which the interviews were conducted, it appeared that certain concepts needed

to be elaborated on or needed to be added. To test the validity of an answer, respondents' remarks were regularly used to observe the opinion of another respondent, so that extreme, particular opinions could be eliminated in the analysis of these interviews. This can be seen as a kind of triangulation. The timespan of the interviews was October 2017 to September 2019.

7.3.7 A description of the coding and analysis process for the interviews

Broken down in consecutive steps, the process of coding and analysis can be described as follows:

- Verbatim transcription of the interview texts from recordings made with the respondents;
- During transcription, notes were made with insights, remarks, and first observations based on comparisons with previous interviews. This was recorded in a separate document;
- Coding of the interviews with Atlas Ti;
- First codes based on the conceptual model: business relations, economy of touch, etc.: list coding;
- Elaborations of the codes representing the basic concepts by open coding;
- During coding, it appeared that the names of some codes needed redefinition. In many cases, memos were created to identify a code;
- After coding the interviews of the Antwerp and Rotterdam representatives, the first coded interviews were re-examined to see whether any new codes created during the coding of the consecutive interviews needed to be included;
- Creation of co-occurrence tables to spot correlations between codes and code groups on theme level as well as on port/port city level[14]; creation of a co-document table to spot between codes and code groups on document level;
- Selective coding: creation of relationships between code groups to identify the density and nature of the relationship.

14 This is a tricky feature in Atlas Ti. Atlas Ti gives the opportunity to make statistical inquiries based on these co-occurrence tables, making quantitative something was originally meant to be a qualitative method. As the coding process is based on the researcher's interpretations with all his perspectives, leading to conclusions that aim to meet the criterion of plausibility, making statistical correlations, although with possibly sound quantitative results, is rather questionable from a methodological perspective and casts doubt on validity.

7.3.8 Annual reports of the port authorities of Antwerp, Rotterdam, and Hamburg

To analyze the annual reports, the same procedure as for the interviews was followed, whereby the text of the various reports for the years 2011 to 2016[15] were the input. It was very easy to acquire the reports for Antwerp and Rotterdam, as the websites of both port authorities have an archive where older reports can be found. Acquiring the reports of the Hamburg Port Authority was much more difficult.[16] The reports for the years 2011 and 2012 are detected rather easily, but then suddenly they changed into *Finanzberichte* (*Zahlen, Daten und Fakten*). The content is much more financially oriented, but there are still comments on developments that are like the original reports for previous years. Some texts are even copied integrally, and then suddenly, without any explanation, the 2016 report reverts to the original format.

7.3.9 Considerations on the method used

As stated in section 7.3.4, not only were the annual reports analyzed in Atlas Ti, but also remarks on these reports were written in a separate document and form the basis of the analysis evaluation. Swanborn (2013) considers the use of several different sources – and especially if these sources cover a longer period so that a longitudinal analysis is made possible – as a strong method. He warns against the strict use of only a single qualitative analysis program (like Atlas Ti) (Swanborn, 2013, p. 201). Therefore, using interviews and annual reports and analyzing both sources by using a qualitative analysis program and one's own personal comments is a security against one of the main objections to qualitative research following the coding procedures: the possibility of prejudice during the attribution and interpretation of codes. As stated, the researcher cannot exclude himself, so there is always precognition before starting a project in detail. In this thesis, this issue is tackled by:

- Formulating a research model whose constituent concepts are rationally derived from scientific literature;
- Recognizing the prejudices that exist and therefore deliberately keeping an open mind for findings that touch these prejudices;
- Confronting respondents with conflicting statements and noting that;
- Incorporating these conflicts in the results and evaluations;

15 The analysis was conducted in 2018–2019, and these reports covered the most recent five-year period.

16 The fact that economics faculty members of Erasmus University asked the researcher of this thesis to send them these reports because they were not able to find them shows that it was certainly not the lack of personal ability on the researcher's part that made this a rather difficult task.

- Making use of official sources (the annual reports) and personal insights and opinions of acknowledged peers in the industry, politics, and academic institutions;
- Reporting how conclusions were established.