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The Blue Ports reviewed

A revised study of the economic importance of Dutch inland ports.

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Abstract

In this research, the economic importance of Dutch inland ports has been further investigated. With the strong development of transport systems, inland ports become increasingly more important as nodes. Here, a detailed analysis is provided of the Blue Ports method, used in former studies, which examined how inland ports contribute in terms of economic impact to the national economy. This paper discusses various economic effects occurring in inland ports. Specific attention has been given to determine the most optimal method for monitoring these effects, considering the former economic impact studies (Blue Ports reports). The aim of the research was to propose such a method, which can be used to update the economic effects biannually. Here, also a case study has been applied, which contributed to the development of an inland port monitor. It turns out that there is still a wide gap between theory and the applicability of these theories in practice. However, a solid method is presented to monitor the economic impact of Dutch inland ports.

Preface

In front of you lies my master thesis, the final part of the master program Urban, Port and Transport Economics at the Erasmus University Rotterdam. The Nederlandse Vereniging van Binnenhavens (NVB) gave me the opportunity to complete my master study with a graduate internship, which consists of developing a method to determine the economic impact of Dutch inland ports in a convenient way. It was a very interesting research topic, which finally gave me the opportunity to use scientific knowledge gained during my study in practice.

The main purpose of a preface is however to thank people. First of all, I would like to thank my colleagues at the NVB/CBRB for their support during my internship. The daily walks around the boulevard and all different conversations made this internship quite enjoyable. However, I would like to express my gratitude to some people in particular.

I would like to thank my supervisor, Bart Kuipers, for his insights and guidance. He helped me a great deal throughout the writing process and was always there to give constructive and accurate feedback on a short notice. Furthermore, Lijdia Pater- de Groot, as my supervisor at the NVB, for her assistance, constructive criticism and willingness to help. And of course Thomas Wermer, one of my colleagues at the NVB/CBRB. After wandering from workspace to workspace, I ended up sharing a room with Thomas. It was a great time with all the endless topics that came by during the days and things I have learned. This internship has certainly contributed to my personal development.

And last, but certainly not least, I would like to thank my parents who gave me to possibility to study Economics & Business and for all their support during my study!

Thank you,

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1. Introduction

Inland ports are probably the most underestimated links in (maritime) transport systems among the general public. When talking about ports, most people often think about huge seaports, for instance Rotterdam, Antwerp, Hamburg and so forth. And indeed, these ports do appeal to the imagination of people when talking about ports. However, these ports would not be so huge without the existence of the relative smaller inland ports. The development of inland ports is part of a trend involving a closer integration between maritime and inland freight transport systems, a process that has been labeled as port regionalization (Notteboom and Rodrigue, 2005). In this point of view, inland ports are fitting with a regional economic geography by linking a region to global supply chains (Rodrigue, et al., 2010). Many different (maritime) actors have been active at exploring and developing inland freight distribution options, the development of inland ports within their planning frameworks. And even port authorities are becoming increasingly aware and proactive in the coordination of freight distribution activities within their hinterland (Van der Horst and De Langen, 2008). Combining all these trends together, it can be concluded that inland ports are still increasing of importance, not only for the transport sector, but also for the regional as well as national economy. And that is precisely the point where this thesis picks up, to conduct research at the economic importance of Dutch inland ports.

The first comprehensive study of the economic impact in inland ports was performed in 2004, the so-called Blue Ports report[1]. This research was initiated due to a lack of understanding and insights of the economic importance of Dutch inland ports. Results of this report were astonishing; it concludes that the inland ports together are not inferior to the seaport/mainports. The direct value added as well as the indirect added value are slightly lower compared to the seaport, whereas the direct employment is even higher in the inland ports (66.400 to 58.000). These figures indicate the size of the economic value of inland ports for the Netherlands, especially for the regional development. Therefore, this initiated a shift in the focus of the central government regarding the inland ports, they were more supported since then.

In 2012, an actualization of this report was executed on behalf of the NVB. In the period in between, not much has changed regarding to the economic research of Dutch inland ports. Many advisory and policy reports were using the Blue Ports report (TNO, 2004) to underpin their results and conclusions. However, no single update was performed in the meantime. Eventually, this resulted in a new assignment commissioned by the NVB in order to update the economic importance of the Dutch inland ports. Nowadays, the NVB acknowledged that there is a need for better figures and statistics,

[1] This report was conducted by TNO Inro and a&s management.

which are more up to date. With the insights of economic impact studies, like the Blue Ports reports, Dutch inland ports can be included in economic decision-making on infrastructure projects on a full-fledged manner.

The NVB wants to investigate whether the used method in the previous reports, a combination of top-down and bottom-up research, can be developed into a 'Binnenhavenmonitor'. The ultimate goal is to use a frequency of one or two years to do such an investigation. Main problem is that the current method turned out to be very time consuming and rather difficult to conduct due to the variety of persons that had to be contacted. Therefore, research has to be done in order to propose a more standardized method, which is easy in use and can quantify the economic importance of inland ports in the best way. This leads to the following research question:

"Present a scientific assessment and suggestion for the further development of the "Blue Ports" method of economic impact analysis to develop a convenient way to measure economic effects of Dutch inland ports"

It is very useful to look at this question. The reason why further development of the Blue Ports reports is needed, lies in the fact that, due to time and money constraints, there has to be a convenient way to measure economic effects of Dutch inland ports. The former reports were relatively time consuming, which is contrary to the wish of a standardized method. When an answer will be found, it can be used to make several improvements for the society as a whole. Mapping the economic impact of inland ports will provide more insights in the development and economic growth. Such figures are important in policy making and decision policies, especially for regional development. Better planning and policies will (hopefully) result in more growth, enhancing the regional economy.
Scientifically, this research adds to the existing body of knowledge. There are multiple sources to be found on components of economic impact studies, but there a nearly no articles/studies about those effects in inland ports. Of course, there are general articles on this topic, but not specifically related to inland ports. Also, the studies that exist are often used on a broader geographical scope; mostly on seaport level. Finally, this research aims to combine the insights of theory with a practical assessment. Theory and practice are not really adapted to each other, meaning that there are a lot theoretical assumptions underlying to the problem of conducting economic impact studies in practice.

To answer the research question, several sub questions are formulated. To indicate the economic effects in inland ports are, the first question is to know what the general characteristics of ports are.

They largely determine what inland ports are, how they work and are classified. The second question is related to the advantages and disadvantages of the current Blue Ports method. It is necessary to have a critical view on the current method in order to determine whether this method is strong enough to continue with. The third question involves the indirect economic effects; which indirect effects, backward as forward, are created in inland ports? Related to this, it is important to know how they are measured. In earlier reports, only backward indirect effects were measured. The main question here is whether forward indirect effects can be included. Finally, the answer to the research question can be approached by determining how all the different economic effects can be measured as convenient and accurate as possible in other studies. These are a great source of methods, which have proven itself already over time. Therefore it is quite important to review these studies, and to learn something from them. Combining the sub questions will provide an answer to the research question. The sub questions are:

1. *What are the relevant (economic) effects to study the economic impact of Dutch inland ports?*
2. *What are the advantages and shortcomings of the current Blue ports method?*
3. *Which indirect economic effects occur in inland ports, especially forward effects, and how are they measured?*
4. *How do other studies measure the economic impact of ports?*
5. *Is there a possibility to develop a monitor which can be used in the Netherlands, and probably also in other European countries?*

In the remainder of this thesis, first, existing literature will be discussed in section 2 based on what can be found about measuring economic impact and specifically related to inland ports. This includes, among others, general characteristics of inland ports, direct economic effects and indirect economic effects. These concepts are important to investigate, as they can form the initial picture of measuring economic impact. Section 4 will discuss the methodology of the research on economic effects of inland ports. The employed method mainly consists of reviewing many different articles and distilling only the highly valuable information. After this, in section 5, attention will be paid more specifically to the different interviews with maritime experts and the practical assessment of economic impact studies. The unique results of the research of the interviews and quantitative data will be presented in this section. Then, the case study of Bergen op Zoom will be presented in section 6, giving essential insights of the feasibility of the method. Of course, the results of the literature review will also be discussed where necessary. The paper will conclude in section 7.

2. Literature review

In this chapter, existing literature on the economic impact of inland ports is discussed. This chapter contains general information about economic effects occurring in port related business on the one hand, while on the other hand literature specifically about inland ports will be discussed. Basically, this literature review elaborates on the literature review of the previous Blue Ports report (2012). There might be some overlap in some parts, but new insights are provided. Eventually, providing a clear and complete overview of economic effects of inland ports. After reviewing the existing literature in this chapter, a theoretical framework will be constructed in the next chapter.

2.1 Port characteristics

Before studying the economic importance of inland ports, some general characteristics of ports have to be outlined in order to get a better understanding of what ports are and how they work. According to the literature, defining a (sea)port is very difficult. According to Stopford (1997, p. 27), a port is "a geographic area that facilitates the berthing of ships in order to (un)load their cargo". In addition to this, Goss (1990) states that seaports function as a gateway whereby goods and passengers are being transferred between ship and shore. Although such definitions sound very clear, which covered the ports back in the days, nowadays there is no such thing as the seaport. Throughout the years, ports evolved and started to go beyond the primary function of just transferring goods between ship and shore and storage of goods, ports became a location on which a collection of different although related economic activities are settled. Nowadays, ports have become links in global logistical chains (Robinson, 2002).

As a result, ports are eager to enhance the quality of their hinterland transport services (Notteboom and Winkelmans, 2004). This trend could favor the role of inland ports in the hinterland, which increase their economic impact and importance. When more volumes are shipped to inland ports, this will eventually mean more employment and added value being generated at those inland ports. Such a trend is currently going on with the extended gate model of ECT, a container terminal in Rotterdam. ECT pushes most of the container to inland ports in the hinterland, where they have a strategic partnership with inland terminals participating in the European Gateway Services.

Another interesting characteristic is that ports cannot determine their own markets; they are highly dependent on other actors in the logistical chain. Basically, ports are intermediates between other parties; the market itself cannot be influenced. As a consequence, demand of ports is double derived. Seaports are dependent on transport flows, which are in this case dependent on global trade flows. Thus, the economic significance of ports is highly dependable on actual demand, despite of the state of the art services and the favorable natural location which they might possess. This

characteristic is applicable for seaports as well as inland ports, whereas inland ports are also dependent on seaports.

2.1.1 Inland ports

Now that it is clear that the role of inland ports has significantly increased over time, it has to be clear how inland ports are defined. Especially with a view of diving into the literature about methods to measure the economic impact of inland ports. As this research has his main focus on Dutch inland ports, it will mainly elaborate on these inland ports. This is also partly based on the fact that, according to the literature, no clear definition can labeled to inland ports (Rodrigue, et al., 2010). This is mainly due to the number of actors, ownership and functions of a port. Especially the functions of inland ports are quite debatable. Rodrigue (2010) states that three main criteria are fundamental in defining inland ports, namely:

1. Containerization: inland ports are dominantly linked with handling containers.
2. Dedicated link: the inland port has to be linked with a port terminal, which has a high capacity corridor.
3. Massification: the inland port has to be able to handle volumes at lower unit costs, thus permit economies of scale in inland distribution.

Looking at these criteria, it seems that the main focus lies on inland ports handling containers. However, many (Dutch) inland ports are specialized in handling other commodities, whereas 340 out of 389 Dutch inland ports primarily transship sand and gravel goods (CBS, TNO, 2004-2011). Thus the definition of Rodrigue, and other former research, does not seem to cover the whole picture, due to the various actors, commodities and functions of inland ports.

Therefore, this research will use a much easier definition of inland ports; an inland port is a transshipment hub of goods located on a waterway, as well as the port-related industrial area and economic activities (TNO, 2004).

According to this view, three functions of inland ports can be derived:

1. Hub-and-spoke location in logistical networks, especially for transshipment.
2. Business location for establishing production, services and clusters.
3. Link in (inter)national supply chains.

Especially the second function of some inland ports is becoming more important nowadays, inland ports could develop to some kind of decision centers. According to Kuipers et al. (2010), service companies relocate their business locations from the mainport (Rotterdam) to inland ports (Drechtsteden). By doing so, coordination throughout these ‘decision centers’ with the hinterland is better arranged by being a link between the mainport and the hinterland.

In order to clarify some other confusion about terms related to (Dutch) inland ports, a few of them are outlined. First of all the mainports in the Netherlands are basically the Port of Rotterdam and Schiphol. These mainports are the big economic drivers of the national economy. However, this thesis has its focus on inland ports, especially the so-called Blue Ports, which is basically a specific type of inland port. It has already been mentioned before, a Blue Port is a transshipment hub of goods located on a waterway. The latter feature is important in order to be a Blue Port. Furthermore, there exists also a term called Green Ports. Green Ports are related to the agricultural cluster in the Netherlands, which has an huge economic impact, national and international.
In addition, there are some other terms, which are related to the general term of inland ports. The term inland terminal often refers to a facility where containers are transshipped between different modes of transport. Furthermore, there are the so-called extended gates/gateways, which are mentioned before. This is basically a collection of inland terminals that are connected with each other within a European network, also called the European Gateway Services. It offers high frequent rail and barge connections between Rotterdam and the European hinterland.

Other issues, which might cause confusion, are the so-called dry ports. This term is often used to refer to a terminal where activities like cargo handling and value adding take place, and which are connected to seaports by road or rail services (Roso et al., 2009).

The typology of inland ports will remain the same as in the former Blue Ports studies (TNO, 2004; van der Enden, 2012). The classification is based on the primary commodities handled by the port. It is often the case that different commodities are handled at inland ports, however a distinction is made on the basis of the most dominant commodity. Although the fact that the majority of inland ports handle sand and gravel goods, research showed that the economic impact of other kinds of inland ports is significantly higher. Five different categories are distinguished, which could make it easier to determine the economic impact per kind of port:

- Multifunctional port: no dominant commodity, various goods are handled and transshipped. These inland ports are often quite big, in terms of throughput, related to other inland ports.
- Sand/gravel port: relatively small ports, which are often used by the construction industry
- Industrial port: related to loading and unloading of all kind of raw materials, which are being used in production processes.
- Agro port: in principle the same as industrial ports, however agrarian products are dominant.
- Container port: considered to be the most important inland ports, facilitate container flows between seaports and the hinterland. As mentioned before, container ports are growing due to the extended gate principle of some container terminals to increase efficiency.

2.2 Economic impact

Measuring the economic impact of inland ports can be very helpful for policymakers, the government and other stakeholders can get insight in the economic importance of inland ports on the region. However, it seems that measuring these effects is quite difficult, where many different methods are used to grasp these effects. In order to determine the total economic impact of inland ports, economic effects are determined by direct and indirect port related activities. Davis (1983) makes a distinction between the primary impact of the port and the secondary impact of ports. The primary impact includes all activity necessary for operation of the port facilities as well as those activities relying directly on the use of the port facilities for shipping and receiving commodities. The secondary impact indicates that all activity in the region is economically dependent on primary impact activity, whereby the secondary impact is made up of indirect and induced effects within the region. Critique on this view came from R.C. Waters (cited in Goss (1990) about measuring economic impact measuring in terms of added value or employment related to the port. He criticized such studies on the basis that "*their aggregate approach negates any possibility of relating them to investment appraisals, which are essentially incremental; that they ignore the ports being only one element in a large number of producing and distributing systems all of which actually contribute to the employment shown as resulting from the port; that they ignore the effects of imports; and that multiplier effects, if included at all, ought to be disaggregated between different kinds of cargo*" (Goss, 1990, p.217). However, as will become clear throughout this literature review, most studies use the primary and secondary impact in order to determine total economic impact of ports. This sub-paragraph will start with outlining direct effects, which are relatively quite easy to measure. Thereafter, the indirect effects will be discussed, which will be more problematic along the way.

2.2.1 Direct effects

As mentioned before, the economic effects can be divided into direct and indirect port-related activities. As the indirect effects are dependent on the primary impact, it makes sense to define the direct effects and related activities first. The direct economic importance, of in this case inland ports, is often measured by its contribution to the GDP (Gross Domestic Product) or regional/national employment (Oosterhaven and Stelder, 2002). In other words, accounting the added value and employment factors directly related to the inland ports will determine the amount of direct effects of this sector.

But first of all the economic region which has a direct relation to ports has to be defined. According to Louter (2003), four different methods are proposed to make this distinction; a strict classification, a broad classification, all companies active on the seaport site and a classification based on the

Havenmonitor[2]. The strict and broad classifications are based on activities of the companies, whereas the third classification is more based on location of the company. An overview of the four different classifications:

- Strict classification: the main activity of a company must depend on throughput via water, at least 50% of all the company jobs is located at the seaport site.
- Broad classification: a more broader classification compared to the strict classification, at least 10% of all the company jobs is located at the seaport site
- Entire seaport/industrial area: all companies/activities located at the seaport/industrial site
- Havenmonitor: classification based on list of sector, which is compiled by experts.

In line with these different classifications, is the classification used by the Blue Ports method (TNO, 2004). This method does also use a strict classification in order to define the economic impact of inland ports. The basis of this definition is that a company's main activity must depend on throughput via water, next to the fact that the company is located on a wet business location. Main objective of this classification is to determine economic impact of inland ports as accurate/realistic as possible. As can be seen in figure 1, outcomes of all classifications differ significantly.

	Arbeidsplaatsen (* 1000)		Toegevoegde Waarde (* € mln.)	
	1996	2001	1996	2001
Zeehaventerrein				
1 Chemie en basismetaal	35.5	31.2	5953.8	4823.6
2 Overige industrie	26.0	25.8	1359.5	1472.8
3 Groothandel	12.0	14.5	665.5	954.7
4 Transport	31.6	33.0	1857.5	2113.4
5 Overig	54.3	65.3	3446.8	4048.8
Totaal	**159.5**	**169.8**	**13283.0**	**13413.3**
Strenge indeling				
1 Chemie en basismetaal	29.3	26.0	5230.3	4178.4
2 Overige industrie	7.7	6.3	280.9	230.8
3 Groothandel	0	0	0.0	0.0
4 Transport	21.9	20.9	1868.8	2208.1
5 Overig	3.7	4.3	294.0	344.3
Totaal	**62.6**	**57.5**	**7674.0**	**6961.6**
Ruime indeling				
1 Chemie en basismetaal	35.0	31.4	5844.0	4842.0
2 Overige industrie	13.7	12.3	760.9	765.4
3 Groothandel	5.7	6.0	308.6	390.6
4 Transport	40.0	42.4	2822.0	3341.1
5 Overig	15.1	16.9	1193.0	1473.9
Totaal	**109.5**	**109.1**	**10928.4**	**10813.0**
Havenmonitorindeling				
1 Chemie en basismetaal	37.4	32.9	6077.5	4982.2
2 Overige industrie	23.0	20.5	1147.6	1088.4
3 Groothandel	13.1	13.6	711.2	877.5
4 Transport	34.7	37.5	2527.8	3059.5
5 Overig	9.3	10.0	743.8	862.4
Totaal	**117.4**	**114.5**	**11207.8**	**10870.0**

Figure 2: Differences in outcomes of various classifications

[2] The Havenmonitor is a Dutch annual review of the economic impact of Dutch seaports.

Differences between employment numbers and added value are over 50% between the strict and broadest classification (entire seaport). Thus, it has to be considered which classification will account for the economic impact in the most realistic way. Classification choice is therefore mainly based on the interest of the level of port related activities. In principle, if the classification is broadened, it will result in a higher outcome of economic impact due to the fact that more economic activities are included. Therefore, the strict classification is used to provide a more realistic view on the economic impact of inland ports (TNO, 2004). Table 1 provides an overview of advantages and disadvantages of the four different classifications.

In favor to this preference of the strict classification is the fact that various other companies settle within port sites due to several other reasons, which are not related to port related activities. Other location factors could attract companies to settle themselves in or near port site to benefit from physical characteristics, accessibility or environment issues. Besides, ports create cluster effects from which companies benefit (de Langen, 2004). All these characteristics could attract companies to port sites, even though the companies are not related to maritime related activities. Thus, here again, a consideration has to be made whether to include these economic effects in determining the total economic impact, or to leave this aside and keep the focus mainly on the companies which are highly dedicated to the inland port (strict classification). Cluster effects, which are discussed later, will be excluded in the strict classification, which could lead to underestimation of the total economic impact. Therefore, location choice is mainly based on the demarcation of the research, it depends on the level of economic activities that are of interest.

Now that the inland port related activities are more clarified, measurement of direct effect will be outlined. As mentioned before, the direct economic impact is often measured with indicators such as value added and employment, which are, from a historical perspective, the best indicators to justify and show economic contribution (ESPO, 2012). Besides, these indicators are most relevant for convincing stakeholders of port development and importance, as these indicators are widely accepted and understood. Former researches conducted about the economic importance of inland ports have also used employment numbers and added value to measure these direct effects. In addition, Dooms (2012), argues that employment and value added indicators can be somewhat extended. Some examples are measuring direct employment/value added per tonne or per hectare.

Furthermore, there is some consensus about accuracy of the proposed methods regarding the employment and value added figures. Measuring direct effects according to the classification of Louter (2003) has not been used in practice, like annual reports, thus practical application is uncertain. Due to this, two different methods can be used; the so-called top-down method and the bottom-up method. The Havenmonitor (Nijdam et al., 2013) makes use of the top-down method,

gathering total employment and value added figures and divide them over the different sectors. Opposed to this method the bottom-up method is being used by the Blue Ports (TNO, 2004) and the National Bank of Belgium (NBB, 2013). The NBB determined the total economic impact of Belgian ports by field research. Individual companies/organizations are examined and their numbers are added up. Biggest advantage of the Belgium method is the amount of data that is available. The NBB is in possession and allowed to make use of necessary firm specific information. In the Blue Ports methods, a same method is used. Here, figures per inland port are gathered, which will determine port related activities more accurate. However, it seems to be a time consuming business to collect all data of the many different inland ports (van der Enden, 2012).

Table 1: An overview of advantages and disadvantages of the four different methods.

Bottom-up method (Blue Ports / NBB)

Pros

- Accurate determination of port related activities
- Selection procedure is straightforward
- Data availability (NBB)

Cons

- Time consuming to complete the list of all port-related organisations
- Lack of geographical scope (NBB)
- Keeping track of all changes requires a large organisational effort
- Outcomes partly based on bottom-up research and partly based on estimation (Blue Ports)

Louter classifications

Pros

- Clear geographical scope (seaport industrial sites)
- Straightforward selection procedure (10%, 50% and 100% rule)
- Suitable method for annual updates

Cons

- Outcomes are less accurate
- Not tested in practice (annual reports)

Top-down method (Havenmonitor)

Pros

- Selection based on port related activities
- Proven method, all Dutch seaports participate

Cons

- No clear geographical scope
- Outcomes are less accurate due to broad definition of maritime related activities (50% rule)

Source: van der Enden (2012)

2.2.2 Indirect Effects

Next to the direct effects are the indirect economic effects, which will be discussed in this sub paragraph. Opposed to the direct effects, indirect effects are somewhat more difficult to measure. The existing literature is not always clear about measuring such effects, and even defining the indirect effects seems to be a topic of debate. This sub paragraph will start with reviewing the different interpretations given to economic effects. Thereafter methods of measuring these effects will be outlined. This overview could provide the current Blue Ports method with useful insights in how to measure and monitor indirect effects more convenient and accurate.

Indirect effects can be divided into backward economic effects and forward economic effects. However, this is where the first problem already comes up. According to the literature, there is quite some consensus about whether to speak about real effects or just economic linkages (RebelGroup Advisory - Buck Consultants International, 2006). The reason underlying to this problem is regarded to the causality. With economic effects, the causality of the effect is clear, while on the other hand, when speaking about linkages, the causality is not clear. This problem mainly arises with measuring the forward economic effects. Often there is no clear causality direction, which turns the effects into linkages. More about this subject will be discussed later in the sub paragraph about forward economic effects.

2.2.2.1 Backward indirect effects

Backward indirect effects are the sum of indirect employment and indirect value added, derived from the same indicators used to measure the direct economic effects. But first of all, backward indirect effects have to be defined. As been mentioned before, the secondary impact which Davis (1983) discusses, consists of 2 components; indirect and induced effects on the region (see also Dooms, 2012; Oosterhaven, 2002). Indirect effects are regional activities, which are dependent on the primary activities through technical (sales/purchase) relationships. Thus, a change in the level of primary activities will directly affect those sectors that supply inputs to these activities. The induced effect is related to the household consumption linkages; these are activities that are dependent on the income of direct and indirect employment of the port sector. These employees will spend their money in grocery markets, clothes shops, leisure activities and so forth. Therefore, these sectors are partly dependent on the port sector.

In order to measure the impact of the indirect effects, often a multiplier is used (ESPO; Davis; Oosterhaven). These multipliers indicate the interdependency between different sectors. Thus, the impact of a change in one sector to another can be measured. Multipliers are generated by input-output tables, which will be discussed later. By multiplying employment or added value figures with

this sectorial multiplier, the total economic impact will be obtained. Thus, the indirect effects can be derived through this method by subtracting the direct employment/value added from the total impact.

2.2.2.2 Forward indirect effects

This subparagraph will outline former research done to examine forward economic effects of (inland) ports. Most of the, if not all, case studies conducting research about forward effects, are not unambiguous. The definition of 'forward economic effects' is rather fuzzy, which is not always clear in the literature. Many different terms, like effects, linkages, relationship etcetera, are used to define this part of economic importance of a sector. In order to examine possible forward effects, some consensus about different definitions has to be cleared. First of all, a distinction has to be made between 'backward and forward relations' (linkages) and 'backward and forward effects'.

- Forward relations/linkages: reflects the potential and cumulative impact of a sector on the regional economy through the input-output relationships (linkages) downstream. They are usually calculated through the use of input-output techniques (RebelGroup Advisory - Buck Consultants International, 2006).
- Forward effects: are the changes at the supplier side that have a clear causal effect on the functioning of the customers. They are also usually calculated through the use of input-output techniques. (RebelGroup Advisory - Buck Consultants International, 2006).

The existence of forward effects is neither denied nor ignored in the literature. However, it appears that they are often used as descriptive indicators instead of statistical indicators to display the mutual interdependence of economic activities downstream (customer side). Those linkages are not frequently translated into indicators as employment or value added due to the lack of scientific evidence. Furthermore, the direction of forward indirect linkages is also quite debatable. It can be questioned whether the linkage between economic activities is a forward or backward effect. One might argue that a forward indirect effect from A to B, can be seen as a backward indirect effect from B to A. Thus, with this causality problem between relationships of economic activities, interpretation of indirect effects should be done very carefully. Besides, methodology, and its theoretical background and assumptions, of measuring these effects is not unambiguous. All these problems will lead to overestimation of indirect effects, which are therefore quite unreliable. More about the methodology will be discussed hereafter.

Overall economic growth is partly dependent on sectorial growth rates, which are being influenced by the linkages between sectors. The connections between different sectors are highlighted by these linkages, and are important for the achievement of a healthy economic system. A sector needs good

relations with another sector to function properly (Hoen, 2002). In order to measure indirect linkages, different models are being used in the past. Davis (1983) discusses four different types of models for estimating indirect linkages, namely; economic base analysis, income expenditure analysis, input- output analysis and using multipliers form other port studies. However, according to the literature, input- output tables are widely used to measure indirect linkages, whereas this model has numerous advantages over the other proposed models (CenSA, 2010, Davis, 1983, Oosterhaven, 2002). The biggest advantage is that a multiplier per sector can be established (Davis, 1983).

The input- output model has its origin in the concept of Leontief (1936). However, it was Rasmussen (1956) who introduced the idea of inter-industry backward and forward linkages as measures of structural interdependence. These linkages has been used in the identification of key sectors by Hirschman (1958), who assumed that a relatively small number of industries accelerate and amplify initially small changes, which eventually affect the whole economy. In short, the input-output model is a method, or better an economic modeling technique, which tries to expose the interactions between different economic sectors, producers and consumers. Therefore, it provides an overview of the value of products and services bought and sold in an economy for a single year, indicating interdependencies of different sectors/industries and relationships between consumers and producers. However, the results of an input-output model indicate the impact of a whole sector/industry, thus is not product specific. In order to achieve such specific output, a bottom up analysis is needed (CenSA, 2010). Ghosh (1958) came up with an alternative for the Leontief input-output model, which is its counterpart. This proposed model led to some new debate about the plausibility of the model, mainly questioned by Oosterhaven (1988). Main point of critique is that the supply driven input-output model assumes that when the value added (or other input) of one sector increase by one unit, this will lead to an increase of output in all other sectors. Thus, production in those sectors is increased without any increase in value added in those sectors. In addition, Dietzenbacher (1997) argues that the supply driven model is viewed to describe physical output changes which are caused by changes in physical inputs of primary factors (see the previous example, which is criticized by Oosterhaven). However, the correct interpretation should be that the sectorial output values increase due to price changes, which are caused by price changes for the sectorial inputs of primary factors. Therefore it is called the Ghosh price model. Furthermore, Dietzenbacher states that the Leontief quantity model seems to be more convenient to apply compared to the Ghosh price model, whereas the Ghosh model needs exogenous final demands translated into indexes, and translated back into output values after the results are computed. It's a supply-driven input-output model whereas the Leontief model is demand-driven. Numerous authors used the same input-output methodology for different economic sectors (Aroca, 2001; Han et al., 2004; Kawk et al.,

2005) as cited in San Cristóbal and Biezma (2006), which is also one of the main objectives of this research. Existing literature about input- output models related to linkages is huge, therefore the focus on the remainder of this paragraph lies on input- output models and alternative proposed methods used to examine linkages in port related business.

For instance, Louter (2003) examined the indirect economic impact of port-related activities measured in input and output linkages, which do not concern any location factors. According to this report, there are three different input-output methods to calculate these linkages:

1. National input-output tables; standard methods without any geographical scope.
2. Bi-regional input-output tables, based on Oosterhaven (2001). With this method, the national tables will be divided into regional tables. Thus indirect effects can be measured within the own region, to other regions and to abroad.
3. Inter-regional input-output tables; an even more specific methods compared to the bi-regional one. Effects to the rest of the country can be more broken down.

However, it were Oosterhaven and Stelder (2002) who came up with new insights related to measuring indirect effects with multipliers. According to them, multipliers were often misused due to the fact that certain multipliers were multiplied with industries output to determine their size. However, those multiplier should be multiplied by the final demand, otherwise it will result in double counting, which overestimates the economic importance. Therefore, Oosterhaven and Stelder proposed a new kind of multiplier, the net multiplier.
The net multiplier corrects for the issue of double counting, allowing multiplying it by the final sectorial output, employment or value added of an industry. As this research is mainly interested in indirect value added and employment, total output will be less highlighted. In order to create net multipliers for value added and employment, the ordinary multipliers have to be standardized (Oosterhaven 1981). The net multipliers are found by multiplying the ratio of final demand over the sector's output by the ordinary multiplier.

Critique on the proposed methods of Oosterhaven and Stelder came from De Mesnard (2002). He argues that the net multiplier suffers from instability over time, which is also acknowledged by Oosterhaven and Stelder. De Mesnard proposes a more stable alternative as he considers the instability undesirable. The proposed multiplier by De Mesnard is to calculate the traditional output multiplier minus one. Oosterhaven (2004) reacted on the proposed alternative of de Mesnard; his iterative net multiplier did not have informational value next to the gross multiplier. Dietzenbacher (2005) reviewed the proposed methods, concluding that neither of them is correct and that all three of them are plausible, however, each have their focus on different aspects. Furthermore, in his latest

comment, Oosterhaven (2007) clarified the consensus about the term 'net multiplier' which he used. Although the net multiplier has to be multiplied with the endogenous employment or value added, without the risk of double counting, it is not a real multiplier. It is a new key sector indication, which looks at the two-sided dependency of the sector to the rest of the economy. However, Oosterhaven (2007, pp. 282) states, "it definitely may not serve to derive any economic conclusion, as the comparative static equilibrium model to which it applies does not specify the dynamics of the adaptation process". In other words, due to the time inconsistency problem, which caused the instability of the net multiplier, no conclusion can be drawn.

The net multiplier method is also proposed as a solution in an exploration report of forward economic effects of the Havenmonitor (RebelGroup Advisory, 2006). This report examined the possibility of measuring forward effects in the current Port Monitor. However, it was concluded that due to the top down approach and unilateralism (thus possible overestimation), the classic input output method was not suitable. Therefore the net multiplier method was suggested as a solution to measure the net importance of port related activities for the Dutch economy. This offers the bilateralism of the linkages with other economic activities and provides more insight in the causality; are impulses sent or received? However, this method will replace the need of measuring backward and forward effects, as only net effects of the impulses will be accounted. In order to achieve this, the top down method have to be replaced by an input output method based on input output analysis with separated rows and columns for the port sector. Last remark is that some of the limitations still exist.

To conclude, it seems that the literature is not unambiguous about measuring indirect economic effect. The problems of these effects already start at defining them. Besides, methods to measure the indirect effects are extensive. However the classic input output is the most common used method to do so, much criticism has been raised in the literature. Though, it seems that methods to measure these effects are somewhat evolving over time, whereby the net multiplier method provides the most accurate outcomes. But it should be noted that this method does also have its limitations.

2.2.3 Other effects

Besides the more general accepted direct and indirect economic effects, some other effects, which could occur in inland ports, are highlighted. These effects are the so-called location effects and cluster/agglomeration effect. Both are often neglected in economic impact studies, though it is worth to take a look at them.

2.2.3.1 Location effects

Other effects which could occur in/near inland ports are the so-called location effects. These effects concern the economic activities as a result of the presence of a (inland) port. When a port is present in a country or region, it could increase the attractiveness of that country/region for certain companies to locate there. This applies in particular to ports with an extensive network of connections. Location decision behavior of companies is highly influenced by the relations within all kind of different networks, like supplier networks (Stichting Planologische Diskussiebijdragen, 1990). Thus, a (inland) port that has such an extensive network will be favorable for companies to locate near to that port. As a result, extra economic activities will be located in/near the port, which stimulate the overall economic impact of the region. In addition, Krugman (1998) argues that the location decisions of companies are being made by the fact where the lowest transportation costs can be achieved. An inland port with good connections to seaports and the hinterland could benefit enormously from the advantage they poses to attract more companies. The total impact of location effects is dependent on the level of commitment to the port.

- Location effects are part of the indirect forward effects and concern the companies/users, which are located in the region because of the presence of an inland port (for which the port is a critical location factor).

However, measuring these effects is somewhat difficult, and have not been applied to (inland) ports before. Though, there has been a study done which includes the location effects of Schiphol in determining the total economic impact (TNO, SEO and BCI, 2006) Aim of determining the location effects is to identify the companies which rely their location decision on the quality of the airport product. This report distinguished three different kind of definitions in order to determine location effects, which are related to an airport, although might be applicable to ports:

1. Airport-bounded activities: location decisions of companies are directly influenced by the development of the airport, because the airport is a crucial location factor.
2. Strong airport-related activities: intensive use of the airport, however the airport itself is not an essential location factor, but plays an important role in international location decision processes.
3. Other airport-related activities: intensive use of the airport, and the airport is of importance for the functioning of the economic activities. However, the airport does not play a role in the location decisions of companies.

Determining the value of these location effects is a quite extensive task and requires and bottom up method. With the use of surveys and interviews, all economic activities in or near the airport can be

analyzed and categorized based on the three definitions. This approach seems also to be applicable to ports, using the same three categories.

2.2.3.2 Cluster effects

Another effect that can occur in inland ports are the so-called cluster effects. These effects have already been discussed shortly; though will be outlined further in this sub-paragraph. Examining clusters can result to a better understanding of economic processes, which is in case useful for policy makers because clusters can provide a basis for policies that should enhance economic growth. Besides, industries will also profit from cluster analysis as it might improve cooperation and coordination among firms.

Although various definitions of clusters exist (Markussen, 1996 and Beccatini, 1990), De Langen (2004) defines a cluster as *'a population of geographically concentrated and mutually related business units, associations and public(-private) organizations centered on a distinctive economic specialization'.* There are numerous advantages, which can be achieved due to the concentration of related economic activities. Such advantages are; low transport costs, shared labor pool, network/supplier advantages and knowledge spillovers. This supports economic growth by encouraging innovation and the creation and development of new business opportunities. However, these cluster effects occur more often in seaports than in inland ports due to the geographical scale of the port related activities. Measuring cluster effects is however somewhat difficult. It is of importance that the different clusters are correctly defined, although this might be arbitrary, by starting with defining the core economic activities of the cluster. According to De Langen (2004), four steps has to be taken in order to delimit a cluster. These are;

1. Select an economic specialization and a roughly defined region for which the cluster analysis will be made.
2. Identify economic activities and non-business organizations included in the cluster.
3. Define the relevant region for the cluster.
4. Identify the cluster population, consisting of business units, associations and public (-private) organizations that are both relatively strongly linked to the cluster core and located in the relevant cluster region.

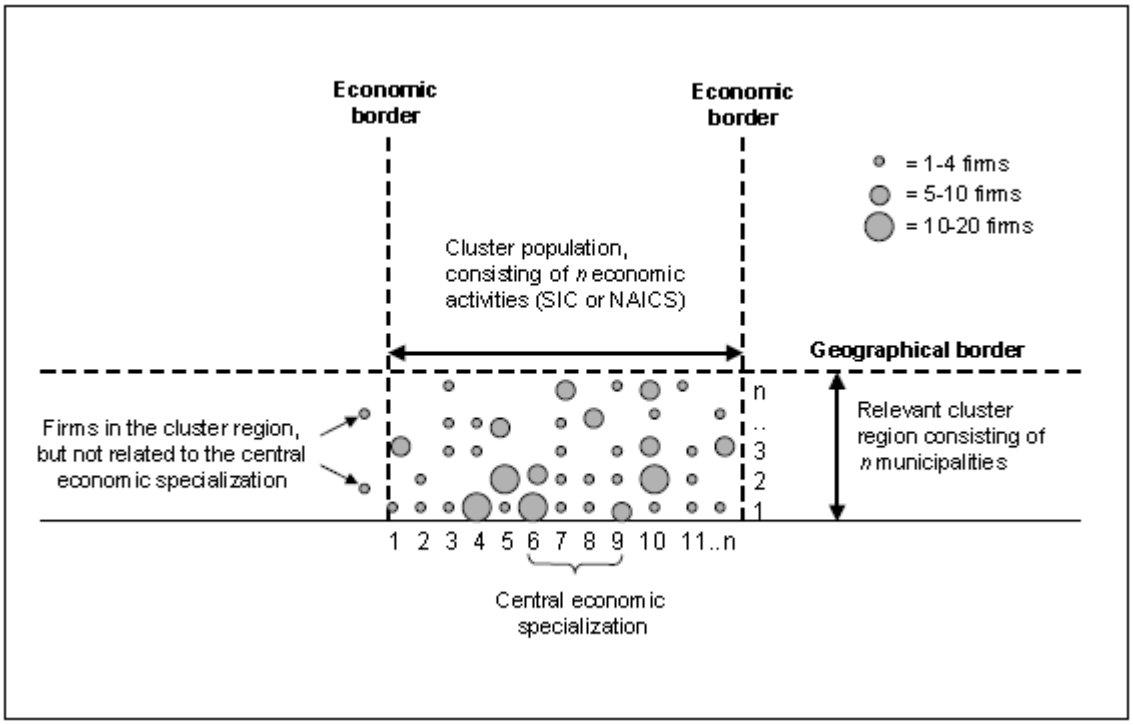
Selecting an economic specialization, which should be relative primary, is mainly based on the location advantages, which are present in the region. In this case it would be the maritime cluster, as this is the most important specialization in the region of inland ports. Identification of economic activities in the cluster is already somewhat more difficult. There are various ways to determine these economic activities, namely: cluster association, input output analysis, qualitative analysis of the structure of a value chain and location quotients. The input output analysis and location quotient

will be outlined. First of all, the use of input output analysis is a tool to identify economic activities in a cluster. Such an analysis reveals the importance of transactions between different economic activities. However, such a methods can be limited due to the lack of data, especially on lower geographical scales. Secondly, the use of location quotients can be helpful. A location quotient is an indicator that shows to what extent a region is specialized in certain economic activities. Assuming that the cluster as a whole is relatively important in the region, the higher the location quotient, the more likely it is that this industry is a part of the cluster (de Langen, 2004).

Furthermore, the relevant cluster region has to be defined, which is related to defining the geographical borders of the cluster. According to De Langen, this is done through a location analysis obtaining the relative share of cluster activities in a municipality (dividing the number of firms active in cluster activities by total number of firms). Areas with a high share are more likely to be included in the relevant cluster region. Finally, the cluster population has to be identified. These are all the companies located in the relevant cluster and active in economic cluster activities. Figure 2 provides a view of delimiting cluster activities. After the economic and geographical borders are defined, the consisting firms of the cluster can be determined

Cluster performance is often measured in added value of companies, which are part of the cluster (de Langen, 2004). Though, cluster effects in inland ports can be difficult to measure due to the small scale, which limits defining the right clusters. In addition, Nijdam (2010) emphasizes the role of leader firms in port clusters, playing an important role in the development and health of the cluster.

Figure 2: Delimiting cluster based on geographical and economic borders (source: de Langen, 2004)



2.2.3.3 Investments

The last effect, which is often included in economic impact studies, is investments. The number of investments could be an indicator of economic growth in the region. When the amount of investments is increasing, it could indicate that companies are willing to continue (or expand) their operational activities in the area. Opposed, a decrease does not mean that the region is declining. Investment can be divided into maritime and non-maritime related investments (NBB, 2013). Furthermore, the Havenmonitor (Nijdam et al.,2013) makes a distinction between private and public investments related to maritime related sectors. However, due to a lack of available data and limitations in collecting such data, it is hard to provide a complete overview of the total amount of investments. Therefore, examining investments in inland ports could be more difficult due to the smaller geographical scale, which probably result in even less data available.

2.3 Strategic Value

Most of the literature related to the economic importance of ports is regarding the economic value that ports create, often indicated in direct and indirect effects. This quantitative way of measurement could provide a clear overview of the economic impact although the used methods could be debated, which is outlined before. However, another way to examine the economic importance of ports is looking at the strategic value instead of the economic value (van den Bosch et al, 2011). The qualitative way, which is used for measuring the strategic value of ports, will be discussed in this paragraph. As mentioned in the report of van den Bosch (2011), no other study has been done in order to determine the strategic value of ports, although the methodology is based on strategic literature. Focus of the report lies on the port/industrial complex of Rotterdam. In 2013, the same methodology is used to determine the strategic value of the port of Amsterdam (van den Bosch et al, 2013). From this point of view, this report is the only source that can be used for this literature review and will therefore be highlighted in order to make a possible connection with determining strategic value of inland ports later on in the research.

Other than the economic approach, the strategic approach focuses more on innovation- and competitive dynamics, whereby also strategic mechanisms are highlighted, which create value on the long term to maintain an international competitive position. The strategic value of a company is rather difficult to grasp, many different resources can contribute to create strategic value. This could include; knowledge, location, company specific structures, etcetera. These resources must consist some features in order to create value, such features are; scarcity, hard to copy/imitate and valuable.

However, in order to determine the strategic value of a whole complex, in this case the PICR (Port- and Industrial Complex Rotterdam), a framework of Michael Porter has been used. This framework

shows how a set of different determinants interact with each other in order to stimulate productivity and innovation, and so the international competitiveness of an industry, cluster of region in a country.

The four different determinants, which are assumed to influence the competitiveness are:

- Factor conditions: production factors like natural resources, as well as human resources and capital resources. At the other hand also available infrastructure, not only transport based but also related to ICT and science.
- Demand conditions: related to the demand of customers of the PICR. Leader firms tend to be more demanding, thus encouraging to keep innovating and increase productivity.
- Related and supporting industries: impact of supplier on the international competitive position. Depends mostly on the size of network of suppliers, how bigger this network is, how stronger the position.
- Context for firm strategy, structure and rivalry: highlights especially to level of competition within the port. This is highly related to the incentive of constant innovation due to competition.

In addition to the Diamond Framework, strategic connectivity is added to the model. This connectivity concept is extremely important, especially in port- and logistic related industries. Strategic connectivity indicates the relationships between companies, organizations and governmental institutions, which contribute to the access and utilization of determinants, which are present elsewhere. These are especially (inter)national collaborations.

Strategic connectivity is divided into two dimensions. First, the strategic connectivity of the PICR with other ports and logistic hubs (national strategic connectivity), and second the strategic connectivity of the PICR with other countries(international strategic connectivity). Cooperation with other national ports is vital for development of the four different determinants mentioned before, especially innovation and specialization. A network of cooperating ports will increase the strategic value of the PICR itself, but also for the involved inland ports. Furthermore, international connectivity strengthens the competitive position, as more international companies will locate in/near Rotterdam. With the ongoing globalization and expansion of scale, this position may come under pressure.

An overview of determining the economic importance as a whole:

Quantitative Part
Economic Impact
- Direct value added
- Indirect value added
- Direct employment
- Indirect employment
- Investments
Qualitative part
Part 1: Influence of the determinants on the international, innovation driven competitiveness
- Factor conditions
- Demand conditions
- Related & supporting industries
- Context for firm strategy, structure and rivalry
Part 2: Influence of the strategic connectivity of PICR with other ports/logistic hubs on the international, innovation driven competitiveness
- Strategic connectivity (national)
Part 3: Influence of the strategic connectivity of PICR with other foreign ports/logistic hubs on the international, innovation driven competitiveness
- Strategic connectivity (international)

It can be concluded that the economic importance will be significantly higher when the strategic value is also considered next to the economic value. In the case of PICR, the strategic value is even 30% higher than the economic value. However, it seems to be quite difficult to measure this value for inland ports, especially due to the amount and size of most ports.

2.4 European aspect

The interest of monitoring the economic importance and impact of inland ports to create more awareness does not only exist in the Netherlands. Along Europe, multiple port authorities and other stakeholders are also interested in the economic effects of their inland ports. Different initiatives will be highlighted in this section.

2.4.1 PPRISM: Port Performance Indicators

The European Sea Ports Organisation (ESPO) initiated the PPRISM project to enhance performance measurement in European ports in 2010. The PPRISM project, Port PeRformance Indicators: Selection and Measurement, is co-funded by the European Commission. It states *"the general objective of the project is to identify a key list of sustainable, relevant and feasible indicators that would allow monitoring the overall performance of the European Port System and assess its impact on the society, the environment and the economy of the EU"*[3].These indicators are categorized in five different categories; market trends and structure, socio-economic impact, environmental performance, logistic chain and operational performance, and governance (including financial,..).

Throughout the project, both internal and external assessments were done among various stakeholders to determine the most relevant indicators, which have to be used measuring the socio-economic impact of ports. A set of various indicators was listed in an earlier stage of the research. This list was spread among the representatives of European ports in European Sea Port Organisation (ESPO), the internal assessment. A survey was made with questions related to the acceptance and feasibility of the different indicators (ESPO, 2011). Outcomes of the internal assessment are shown in figure 3.

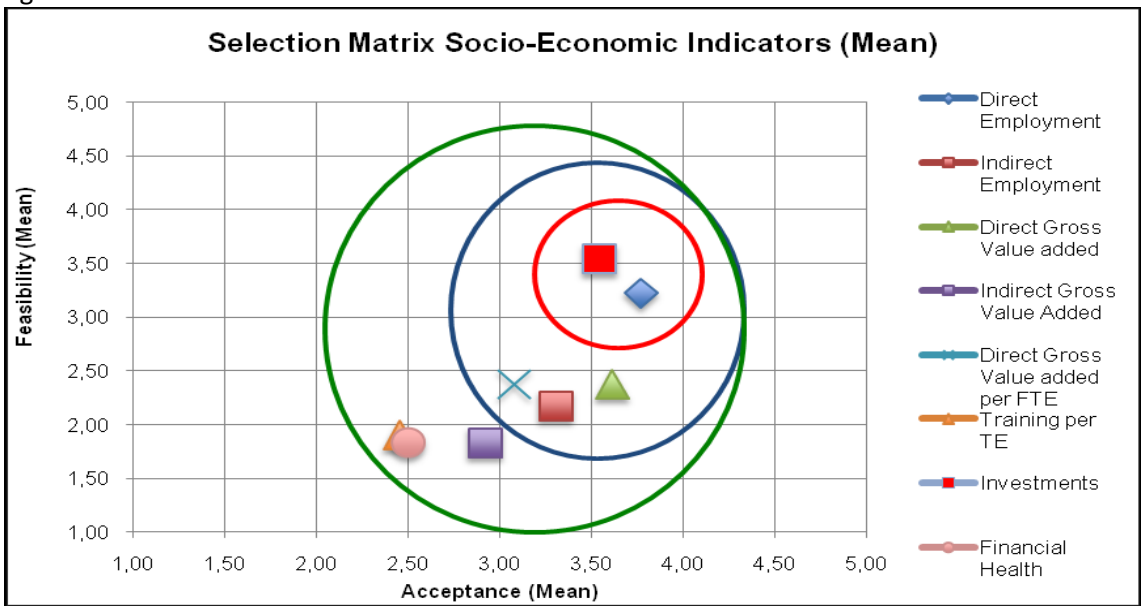


Figure 3: Outcomes internal assessment of feasibility socio-economic indicators.

[3] http://pprism.espo.be/ProjectOverview/Objectives.aspx

It can be seen that direct employment and investments are high priority (red circle), having a high score for acceptance as well as feasibility. However, direct gross value scored better on acceptance than investments.

At the external assessment, direct gross added value and direct employment came out as top-two indicators. Here, investment had also some lower acceptance compared to the internal assessment among the broader set of stakeholders (ESPO, 2001). Outcomes of the survey can be seen in figure 4.

	1st Internal Assessment		2nd Internal Assessment		External Assessment	Lower than 3
	Acceptance	Feasibility	Acceptance	Feasibility		
Direct Employment	4.78	3.47	3.77	3.23	3.93	0
Indirect Employment	4.42	2.55	3.31	2.18	3.78	1
Direct GVA	4.11	2.89	3.62	2.38	3.97	1
Indirect GVA	3.78	2.61	2.92	1.83	3.73	2
Direct GVA / FTE	3.55	3	3.08	2.38	3.62	1
Training per FTE	2.88	2.17	2.45	1.91	3.55	2
Investments	3.66	2.17	3.55	3.55	3.67	0
Financial Health	2.8	2.4	2.50	1.83	3.47	2

Notes: (scores of 1-5 where 1=least and 5=most)

Figure 4: Outcomes external assessment of feasibility socio-economic indicators.

Conclusion based on the assessments was to include direct gross added value and direct employment in the pilot. Basically because these indicators are most relevant to convince stakeholders of the necessity of national/regional port development and operations (ESPO, 2012).

However, The PPRISM project demonstrates that in many ports, these indicators are missing. On top of that, the variety of methodologies used to calculate these indicators is large. Finally, PPRISM has established a sample of ports with annual employment and value added data. This sample can be used to monitor the evolution of both indicators. The main objective in the short run is to increase the participation of ports to the sample (ESPO, 2012).

2.4.2 The German method

In Germany, the Bundesverband Öffentlicher Binnenhäfen (BÖB), is highly interested in the development of determining the importance of inland ports for policy makers and stakeholders. They cooperated with the Technical University of Hamburg-Hamburg in order to develop a method to measure employment effects of inland ports, especially in the short term. Other possible effects (fiscal, ecological, etcetera) might be interesting to look at on the long term. The Bundesverband Öffentlicher Binnenhäfen acknowledged that there is not sufficient detailed inland port data available regarding employment figures. Thus, a guide and a questionnaire have been developed to support inland ports with identifying the regional economic effects on basis of an uniform and workable methodology. The purpose of the evaluation of the regional employment effects is to highlight the performance, socially as well as economically, of the ports in the regional economy more accurately. Moreover, the developed survey system helps to a more transparent view of the port-related businesses and thus serves as a strategic analysis tool.

In this method (Wolff et al., 2013), employment effects are distinguished in three different categories; direct employment, indirect employment and induced employment effects. Here, induced employment effects is employment that is generated through spending of direct and indirect employers. Often, induced effects are not included in comparable studies due to the complexity of accounting them and the risk of double counting (SEO economisch onderzoek, 2010).

Concerning the methodology, there are similarities with the Blue Ports method, though also some differences. Hence, the German method focuses only on the employment effects, added value figures are not included. Main difference is the collection of employment figures. Both the German method as the Blue Ports method collect this data through surveys. However, the German method surveys port-related companies as the Dutch method uses the port authority/municipality as contact person to gather the necessary data. Indirect effects are on the other hand measured with the use of multipliers, based on input-output models and the Leontief model. This is a similarity in both methods, as employment multipliers will be included in the revised Blue Ports method.

Furthermore, direct employment is based on three different categories of companies. This had been done in order to collect more accurate data about the real employment effects of inland ports (Wolff et al., 2013).

1. Port affinity through existence dependency
2. Port affinity by service provision
3. Port affinity through use of services

The first category, is related to the companies that could no longer maintain their business when an inland port is not offering its logistics function. Another interpretation would be that the company would not have settled in the region or at the port area if the port does not exist. Therefore, all employees of these companies are accounted to direct employment.

Port affinity by service provision are companies that provide port-related logistics services and are direct or nearby the port area located, *thus their dependency is assumed fundamentally for the port.* Here, not all employment of those relevant companies is included. If a company is involved in the service provision of the port and is located in the port area or in close proximity, all employees of the company will be attributed to the direct employment effect. If the company is not in the port area or in the immediate vicinity, only those employees related to the explicit port-related activities will be attributed to direct employment effects.

Regarding 'port affinity through use of services', the following can be said. Of companies that benefit from the logistics node function of the port, handling 30% or more of their total cargo volume through railway and inland waterways cover of company, all employees of the company will be accounted to the direct employment. However, if they reached a share of freight traffic less than 30%, the company's employees are allocated according to a linear structure conversion key. This 30% has no scientific reasoning or basis though.

So to conclude, the German method is partly in line with the Blue Ports method. Both investigate the employment effect of inland ports. However, differences occur in data collection, both methods use other sources.

2.4.3 Other European methods

Furthermore, another initiative is the INWAPO-project. This project aims on activating the unexploited potential of waterborne transport in central Europe and the role of the river and seaports to achieve better inter-modality of inland and seaports. The focus of this project lies on 3 different waterways[4]:

- The Danube river ports (Vienna, Budapest, Bratislava, Komarno and Sturovo)
- The Northern Adriatic ports (Venice, Trieste and Koper)
- The Czech and Polish inland waterways (Elbe, Vistula and Oder systems), with an extension towards Baltric Ports

The report (INWAPO, 2012) consists some benchmark parameters, which are on one hand related to descriptive indicators implying technical characteristics of a port and on the other hand there is a strong focus on performance indicators referring to operative and economic aspects. Many of these

[4] http://www.inwapo-project.eu/

parameters can be applied to seaports as well as inland ports. The total set of economic indicators was selected mainly on the basis of the insights from the PPRISM project, which are:

- Gross Value Added
- Direct full time employment
- Indirect full time employment
- Investment of private or public companies per quay length or per m2 of port area
- Waterside trade values (export, import, domestic)

Thus, it can be concluded that other European studies, which try to identify economic indicators for inland ports, use the same indicators as used in the Blue Ports report. However, the practical assessment is, also in these studies, rather difficult. The scale of some European countries is significantly wider compared to the Netherlands, which makes data collecting more difficult.

This year, a project, called PORTOPIA[5], has started in order to create an integrated knowledge base and management system of port performance to serve the industries stakeholders in improving the sustainability and competitiveness of the European Port System. In this project, inland ports will also be covered, where the aim is to integrate them into the ports observatory dataset. The main goal of this would be to create a starting point for the collection of reliable data through a performance management tool that would support inland ports in their development as well as policy discussions with their stakeholders. The concern of a lack of reliable data is a problem throughout whole Europe, thus limiting the possibilities to develop uniform method.

[5] http://www.espo.be/index.php?option=com_content&view=article&id=439:portopia-increasing-transparency-in-port-industry-performance&catid=34:espo-press&Itemid=109

3. Theoretical Framework

In this chapter, the theoretical framework of the research will be outlined. After discussing the existing literature in the previous chapter, more information is acknowledged in order to examine the economic impact of inland ports. All kind of different effects are discussed, of which some of them are assessed as quite debatable in the literature. Therefore, constructing a theoretical framework helps the research by combining the different scientific theories in order to get a complete overview of the impact of different effects. In addition, measuring these effects is also not straightforward, especially due to the fact that there are not many former studies on economic impact of inland ports. Outlining the effects and the proposed methods to examine them is the main goal of this chapter.

3.1 Geographical scale

The theoretical framework will start by defining the geographical scale on which the economic effects have an impact. There are basically four different scales that can be distinguished (see figure 5), namely;

1. The inland port itself
2. Local scale, which is in principle the municipality
3. Regional scale, which can be viewed as the province
4. The rest of the country
5. International scale

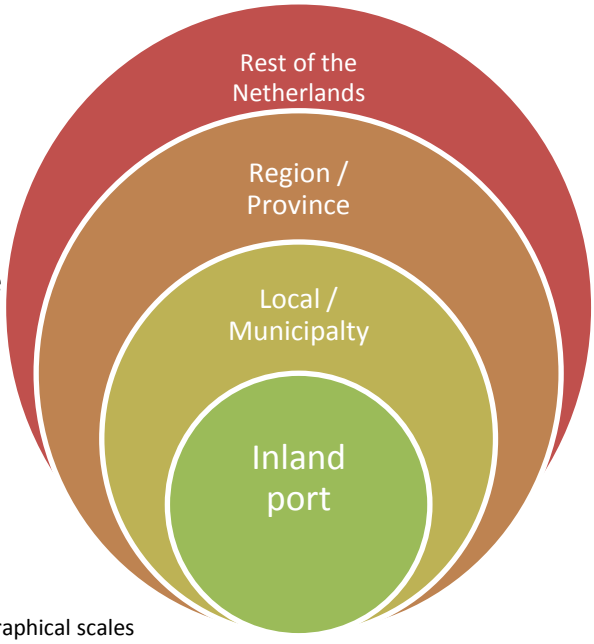


Figure 5: Geographical scales

3.1.1 Local scale

The first geographical scale is the inland port. However, this scale can be combined with the local scale, as many effects overlap with each other. Economic effects which occur at this scale are predominantly direct effects and cluster effects. As direct effects are mainly measured in employment numbers and value added figures (Nijdam et al., 2013), the major part of this impact is generated locally. Value added is generated by the companies that make use of the Blue Ports according to the strict classification of Louter (2003), whereas employees are often living close by. Furthermore, cluster effects are also regarded to have an impact on the local level.

Cluster effects will be measured according to the theory of De Langen (2004). These effects are predominantly on the local scale, as cluster companies are often located closely to each other. However, it is rather arbitrary to match every effect with one special geographical scale. Thus, all effects can also have (minor) influence on the other scales. In order to measure the cluster effects, the right specialization has to be determined, which can be different for all inland ports. Thereafter, economic activities have to be identified. This is done by input-output analysis indentifying transactions between different economic activities. Location quotients will also help to show to what extent a region is specialized in certain economic activities. If this quotient is significantly higher than the national average, the industry is more likely to be part of a cluster. Furthermore, the relevant region has to be defined by using location analysis. This will determine which companies are in the economic as well as the geographical border of the cluster, thus have to be included in measuring cluster effects. Last, value added figures of the cluster companies have to be collected in order to measure the absolute value.

Investments are also considered as having an impact on local level. As mentioned in the Havenmonitor (Nijdam et al., 2013), a distinction between private and public investments can be made. This will also be done in this research. With the use of surveys, investments plans for the upcoming five years will be collected. As investments can be considered as indicator for economic growth, this will give an overview of the development of the inland port over the years.

3.1.2 Regional scale

Next is the regional scale, which can also be considered as the COROP-region. Measuring indirect effects is the biggest bottleneck by determining the economic impact in most studies according to the literature (Oosterhaven, 2002; de Mesnard, 2002). In order to determine the backward and forward economic impact, the location of suppliers and customers of companies located in the Blue Ports must be examined. By this way, the proportion of suppliers/customers per geographical scale can be determined, which lead to insights in the distribution of indirect effects. A possible way to do this is to hold surveys among the concerned companies and determine the proportion per geographical scale. Another option to measure the indirect effects is, according to the literature, by making use of input-output models providing multipliers. These multipliers have to be multiplied with the direct employment and value added figures to determine the indirect effects. However, the first option is preferred as there is some consensus in the literature about measuring indirect effects with multipliers (Oosterhaven, 2002; De Mesnard, 2002; Dietzenbacher, 2005).

3.1.3 Rest of the country

The third geographical scale is ‘the rest of the country’, in this case the Netherlands. The strategic value of an inland port is the main effect on this level. Connectivity is the key of determining the

strategic value of an inland port. More specific, the connectivity to a seaport, port of Rotterdam, is vital in this case due to the fact that most cargo are shipped from/through this seaport by the inland waterways. Though, it is difficult to measure connectivity in absolute values, as done by van den Bosch et al. (2011). Therefore, connectivity will be measured with some indicators to compare the connectivity and accessibility of different inland ports. By this way, some kind of ranking could be established of strategic position of inland ports.

3.1.4 International scale

Finally, the international scale. The economic effects on this scale are predominantly a result of activities of seaports whereas those of inland ports are rather small (or non-existent). This is mainly due to the difference in seizing of the hinterland. As the OECD (Merk and Notteboom, 2013) states "*Rotterdam is unmistakably the main hub port in Europe for containers and dry and liquid bulk, whereas Amsterdam is a major hub for petrol, steel and cacao. Most of their hinterlands are located outside the Netherlands, with Rotterdam being the main port for large parts of Germany, as well as a major port for Central Europe and Eastern Europe, Switzerland and northern Italy*". The hinterland of inland ports is often limited to the national borders, which limits the economic effects to the Netherlands. The indirect economic importance of the seaports is also examined by the OECD (Merk and Notteboom, 2013), stating that: *"The multiplier calculated for the port of Rotterdam is 1.13; this means that one more euro spent in the port leads to 0.13 eurocents additional demand for suppliers to the port cluster. This indirect impact of the port of Rotterdam on the national economy is smaller than found for other ports in North-West Europe, notably Hamburg and Le Havre. This could be explained by the fact that Rotterdam is a very large port in a relatively small country, whereas Le Havre and Hamburg are smaller ports in much larger countries; so presumably a considerable part of the indirect economic effects of Rotterdam is taking place in other countries than the Netherlands and not showing up in the multiplier".*

An overview of the different geographical scales in combination with the related effects is provided in table 2.

3.2 Container terminals

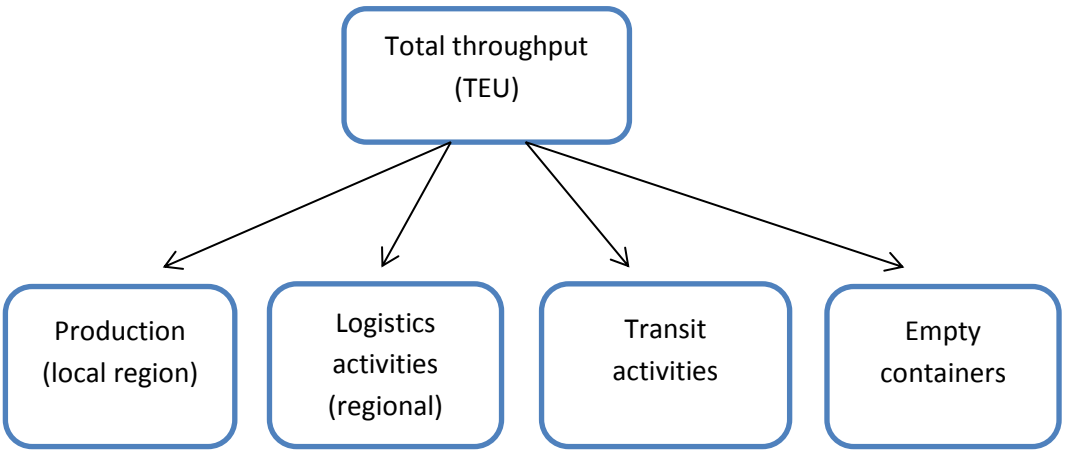
A 'side-step' in this research, which is in interest of the NVB and therefore needs special attention, is related to the forward effects, which occur at container terminals located at inland ports. To recall, forward effects are hard to define due to the causality problem, thus forward linkages is a better term to use. These forward linkages reflect the potential and cumulative impact of a sector on the regional economy through the input-output relationships (linkages) downstream. But first of all a more detailed view of container terminals will be provided.

As mentioned before, container terminals in the hinterland are increasingly becoming more important. Therefore, the economic impact on the regions in the hinterland rises significantly, mainly due to the containers pushed by container terminals located in seaports. Though, an increase of direct employment as a result of these inland terminals is small because container terminals are highly automated nowadays. As turned out in the literature review, it is very difficult to quantify locational effects of container terminals (or inland ports).

3.2.1 Economic value

In order to assign economic value to the presence of a container terminal, four different purposes of containers shipped to inland container terminals are distinguished; containers used for production, logistics activities, transshipment and empty containers. Three of the four have their own impact on the economy. First of all the transit function, when containers are being transshipped in the port, hardly any added value is generated. Containers come in, are stored and will be shipped out again. Thus, the economic impact generated in the inland port is small. Second, the logistics purpose. This is more related to the regional scale and thus related to distribution centers (DC) that are close by. Containers that are transported to these DC's do generate added value. Often, logistics activities, like labeling, customizing etc., are being done in these centers, thus generate economic value. Next, the production purpose, which is more related to the local scale. In this case, end destination of the containers is the inland port, where the located companies/industries make use of the cargo. Last, are the empty containers, which create hardly any value and are often only temporary stored at terminals.

In order to determine any economic value to the containers handled by a container terminal, the average value per container per purpose has to be determined. Furthermore, the proportion of total throughput handled has to be categorized in the four different categories. When the value per container is multiplied with the corresponding number of containers, it might indicate the value which is realized by the container terminal.



3.2.2 Strategic value

Another option to quantify effects of container terminals is to identify the strategic value, possibly related to the different geographic scales. As mentioned earlier in the literature review, it is quite difficult to translate the strategic value of a port into an absolute value. Here, connectivity was a key indicator of assigning the strategic value of a port. This indicator can also be applied to container terminals. First of all, there is the connectivity to the nearest seaport. When an inland port is connected with Rotterdam, the largest container seaport of the Netherlands, its strategic value will be higher compared to an inland port, which is poorly connected. Although it is hard to assign any value to this fact, it indicates the strategic position of the container terminal in the network.

Another effect that could occur due to the presence of a container terminal, is the attraction of certain companies, the so-called locational effects. Location effects are part of the indirect forward effects and concern the companies/users, which are located in the region because of the presence of an inland port (for which the port is a critical location factor). However, as mentioned in the literature review, these are difficult to measure. The most common way to do so is by surveying companies and determine their relationship with the container terminal, which is an extensive task.
However, on the other hand it can be questioned to what extent an inland container terminals attracts (major) companies of which the container terminal is the main factor in their location decision. Historically, many distribution centers of major companies (i.e. Heineken) were already established before the emerge of inland container terminals. Although these container terminals are probably a significant improvement to decrease costs and improve efficiency for those DC's, the container terminal was not a locational factor for most of these companies. Additionally, a container terminal needs a critical mass of containers to be viable. Estimations of container flows, in TEU, that are made to check the potential of the container terminal are therefore mainly based on potential customers that are already located. So the container terminal could definitely enhance the business climate for the attraction of certain companies, however the effects might be relatively small. It can be questioned if companies follow container terminals or the other way around.
Furthermore, port users aim to minimize the generalized transport costs. These generalized costs not only include the direct transport costs, but also the costs related to transport time, reliability and other factors. The presence of a container terminal can be beneficial for companies to lower their generalized costs. During the last decades, the oversea transport costs of containers have been substantially decreased due to economies of scale which have been facilitated by continuously increasing vessel sizes (Scholtens et al. 1999, p. 7). In inland ports, lower transport costs can be achieved by developing inland container terminals to handle the increasing amount of global containers flows destined for the hinterland. Here, economies of scale can be achieved as the cost of

transportation by barge is often lower than transport by road of rail. Thus, lower transport costs, and therefore lower generalized costs, favors the use of inland container terminals, which might strengthen the strategic position of the container terminals in transport networks.

So to conclude, the importance of an inland container terminal could be expressed in either an economic value as a strategic value. However, measuring this impact in terms of an absolute (economic) value might be rather difficult as no perfectly suited method is present. Though, it is interesting to qualify the container terminal in terms of the strategic position it express in the (national) transport network. It certainly creates advantages with respect to inland container flows (i.e. economies of scale, lower transport costs) and perhaps the attraction of more business activities. In order to do so, the next sub paragraph will distinguish different types of container terminals

3.2.3 Types of inland container terminals

Just like inland ports, container terminals can be categorized according to the specific role they perform in transport networks. There are different types of container terminals, each with a different function and position in transport networks (TNO, 2008). These types will be discussed shortly:

1. Ensuring access of the local companies/industry, which are located on a waterway.
   Function: Enable waterborne transport for companies/industries bounded to the port
2. Transshipment terminal for maritime goods.
   Function: transshipment of local and regional cargo
3. Inland satellite of a deepsea container terminal.
   Function: Efficient waterborne transport of containers from the deepsea terminal in order to decrease congestion and maximize efficiency.
4. A hub in inland transport networks.
   Function: central place in transport networks

Here, the hub function of a container terminal is interesting to look at. The hub function can be described as a port terminal that dominantly specializes in the transshipment of containerized cargo from one shipping network to another. Since limited handling is done on cargo, transshipment hubs provide lower levels of added value. Although the economic value of such a terminal is not enormous, the strategic value is significantly higher. Connecting different cargo flows in transport networks, increases efficiency and decreases congestion at seaports. As a result, a high frequency of barges between seaport and inland terminals is established. Here, economies of scale are an important factor to enhance the importance of the terminal in the transport network. The concept of an hub could lead to a competitive advantage, which is in interest of stakeholders at different

geographical levels. However, it is rather difficult to express this value in any absolute value, but could be used as a descriptive indicator of presenting the importance of the terminal as well as the whole inland port.

The different types of container terminals can be matched with corresponding geographical scale, which implies the level on which they serve the market. Figure 6 provides an overview that can be combined with the different functions described above. Here, the type of container terminal can influence the location choice of certain companies. When more companies locate in a certain region due to the presence of a container terminal, more economic impact (in terms of employment and value added) will be generated in that region. Although this is difficult to translate in an absolute value, it is interesting to know what type of container terminal is present.

Thus, in order to determine the strategic value/position of container terminals, some characteristics have to be identified. Interesting things to look at are A way to do this, is by setting up a survey which will be sent to the different stakeholders (container terminal, municipality, port authority).

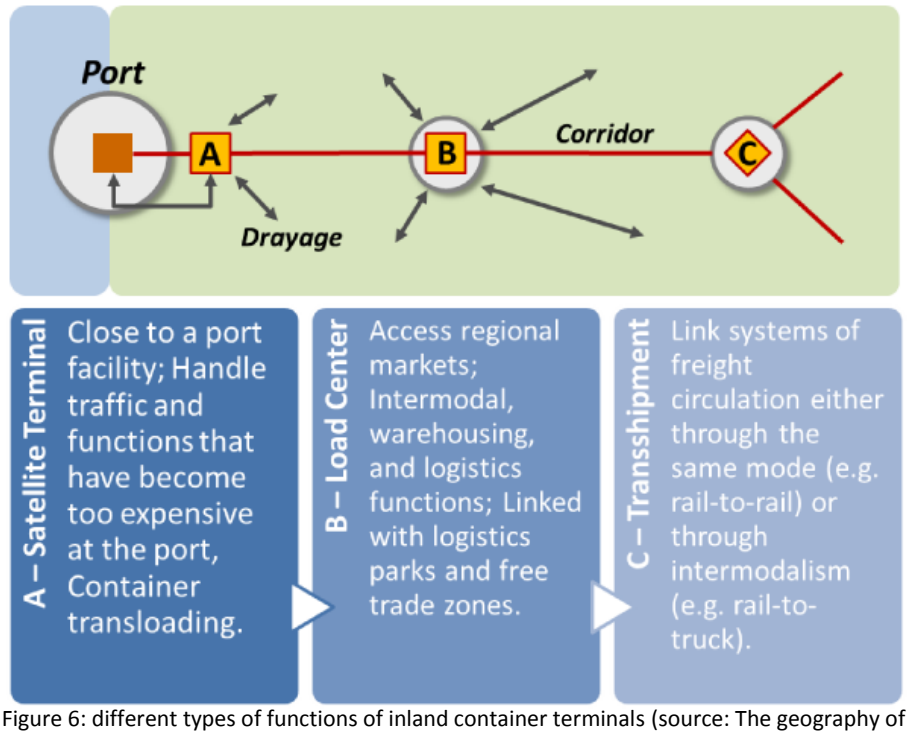


Figure 6: different types of functions of inland container terminals (source: The geography of transport systems, J.P. Rodrigue, 2013)

Table 2: Overview of the theoretical framework per geographical scale.

Inland port	**Effect**	**Information requirements**
Local	Direct effects	• Employment figures • Value added figures
	Cluster effects	• Determining the core economic activities • Input output analysis • Location quotient • Location analysis • Value added of all firms located in the cluster
	Investments	• Amount of public investments in the inland port / infrastructure • Amount of private investments in the upcoming 5 years
Regional	Indirect effects	*Backward effects* • % of suppliers in inland port • % of suppliers on local scale • % of suppliers on regional scale • % of suppliers on national scale
		Forward effects • % of customers in inland port • % of customers on local scale • % of customers on regional scale • % of customers on national scale
	Locational effects	• Determine which companies are located because of the presence of an inland port

National	Strategic value	• Distance to port of Rotterdam • Depth of inland port • Availability of trimodality • Type of barges that can enter the port (3 or 4 layers) • Size of the inland waterway • Bottlenecks on the inland waterway • Connectivity with foreign countries
Container Terminal	Economic value/ Strategic value	• Total throughput • % of volumes for production • % of volumes for logistics (DC's) • % of volumes for transshipment • Weighting factors per purpose • Function of the port (typology) • Number of DC's nearby, plus number of users • Hub function • Connectivity to nearest seaport

4. Methodology

In this section, the research approach that will be used is being discussed. Attention will be paid to the qualitative data used in this research, obtained by conducting interviews.

4.1 Qualitative data

The qualitative data used in this research is of three different kinds, namely literature, interviews with experts who have professionals knowledge on maritime related business and a case study to test the final method in practice. Each will be discussed shortly in turn.

4.1.1 Literature

The first data source is the literature on the topic of the economic impact in inland ports. There was no literature extensively describing all different economic effects and details of the total economic impact, so literature on specific topics was used. Finally, this was linked together to depict the total economic impact of inland ports. This literature is described in section 2, although it is also of significant value to the proposed method and final results in later sections. Not only scientific literature is used, but also literature from specific companies or professional reports. The benefit of this is that economic impact is not only analyzed from an abstract, scientific and academic point of view, but also from a more practical view, which gives more insight in the feasibility of applying the theory in practice. These reports are of recent date, while the scientific articles are in some cases older. However, this does not pose big problems for the research, as little seems to have changed.

4.1.2 Interviews

Next to the desk research already described, this research also employs unique qualitative data. This is eventually the main goal of this research; to propose a method that really adds something to the existing literature on the topic. Interviews with experts who have professional knowledge on maritime related business are namely used to give more insight in what is happening in the world of (inland) ports, and especially, in measuring the economic impact related to those inland ports. With these interview, a unique view is given on what insiders think of the best method in order to determine this economic impact.

Regarding the interviews, the following can be said. The selection criteria of the experts, contacted to participate in this research, were based on the expertise and professional experience in the maritime sector. Therefore, interviews were conducted with experts from:

- The Port Authority of Rotterdam
- The Erasmus University, Department of Regional, Port and Transport Economics

- Policy Research Corporation
- Buck Consultants International

The interview at the port authority, with Arwen Korteweg, was mainly for exploratory research. Exploratory research is meant to forge an understanding of what the research subject is about.

In general, the interviews had a semi-structured (open) structure, meaning that there were some questions that were written on paper and prepared before the meeting. Those were asked, but some follow-up questions could be asked that were not prepared. Therefore, it was not possible to present the interview in the form of a Q&A structure. However, the interviews were recorded with a voice recorder for reassessment later. Main aim of the open structure of the interviews was to gather as much input as possible from the opinion of the expert. With the voice recorder, the interviews were re-assessed and summarized completely in the appendix. The necessary information is distilled from it and processed into determining the most optimal method to measure the economic impact of inland ports.

On September 17, 2013, an interview was conducted at the port authority of Rotterdam. During the interview, questions were asked to the project leader logistics Arwen Korteweg. The questions contain general issues about the different economic effects, which occur in inland ports and how to measure these effects. In addition, due to the involvement of Arwen Korteweg in the former Blue Ports report (2004) and his help during the second report in 2012 , some additional questions were asked about the process related to the gathering of data. These specific questions were asked, since it is of importance for the case study. The involvement of Arwen Korteweg in the former reports made him a crucial expert to interview, whereby his knowledge and expertise of the whole sector provided more insights.

The second interview with Michiel Nijdam of the Erasmus University Rotterdam was conducted on the 23th of September 2013. The questions that were asked there mainly involved the methodology of the Havenmonitor, which is in line with the methodology used in the former Blue Ports reports. As the lead author, Michiel Nijdam provided useful insights in the (im)possibilities of the measurement of economic impact. Furthermore, he also gave some tips concerning the collection of relevant data.

Next, on the 7th of October, an interview with Harry Webers of Policy Research Corporation (PRC) was conducted. The rather critical view of mister Webers gave essential insights building a strong basis of the methodology. PRC is an initiator of the ‘Nederlandse Maritieme Cluster Monitor’, an annual report of the economic impact of the maritime cluster in the Netherlands. Harry Webers in one of the researchers participating in this report.

Finally, an interview with Irene van Dongen of Buck International was conducted on the 11th of October. This interview differed in some ways compared to the other three interviews, whereas it was more kind of a discussion about some topics. Buck Consultancy International is involved in many different projects in inland ports, thus having enormous knowledge about the sector and related reports. This interview gave the author the opportunity to test whether the already sharpened method could be used in practice.

4.1.3 Case study

Finally, a case study of the port of Bergen op Zoom is performed in this research. This is done to assess the proposed method in practice. The case study will to some extent involve the information obtained from the literature, of which a theoretical framework was constructed and later refined in the interviews with the experts. This inland port is chosen because of its willingness to participate in this research. At the annual conference of the NVB, representatives of general members were asked to get involved in the practical assessment of this research. Additionally, an invitation was sent to all members of the NVB with more or less the same question to participate. Six different members of the NVB responded;

1. Zwolle, Meppel and Kampen (jointly)
2. Municipality of Bergen op Zoom
3. Province of Zeeland
4. Municipality of Enschede
5. Venray
6. Veghel

Eventually, the port of Bergen op Zoom (Theodorushaven) was chosen due to its size, the availability of a container terminal and their enthusiasm about the research, which made gathering data easier. Furthermore, Bergen op Zoom was already included in the former Blue Ports reports. After conducting the case study, a comparison will be made with the results from the Blue Ports report of 2012 in order to check for (major) differences. It will be quite interesting to see whether the new method will significantly differ from the case study performed in 2012.

On the 5th of November, a meeting was arranged with Jos Breker to discuss the practical assessment of the method regarding the inland port of Bergen op Zoom. Mister Breker is currently working as harbour master in the Theodorushaven. Main aim of this meeting was to gather information about data availability of the inland port and to test the practical feasibility of the method. Additionally, the insights and experience of mister Breker contributed to a better understanding of data monitoring in inland ports. At the meeting, the method was explained, which led to a discussion of all kind of

practical (im)possibilities. Furthermore during this meeting, a spontaneous appointment, that same day, was made at the municipality Bergen op Zoom with Dietmar Lemmens, project leader economics at the municipality. Because of the lack of socio-economic figures at the inland port itself, Mister Lemmens was recommended by mister Breker due to his activities at the economic department of the municipality.

5. Results

In this section, the results of the research will be discussed. Of course, the literature review already gave some results regarding the measurement of economic impact in inland ports. A theoretical framework was built, which proposed a complete and practical method consisting different kind of (in)direct effects. Here, however, the author himself performs the research and in that sense the results are unique. From these results, based on the interviews with maritime experts, the proposed method, on basis of the literature, is critically assessed and shaped into a practical method. More specifically, a clear answer to the research question can be found with the help of these results. The results are based on a mix of input gathered from the four conducted interviews, the knowledge and expertise gained during this interviews provided enough insights in the (im)possibilities of the proposed method in chapter 2. It should be kept in mind that the method is adjusted to the wishes of the NVB, which implies that there are some budget and time restrictions. Therefore, considerations had to be made between the 'best' options and the most practical options given those restrictions.

5.1 Direct effects

The direct effects are basically the core of this research. The first step is determining which companies should be included in the research. There are various different companies located in inland ports, some of them use the port intensively, and others have no relationship with transport via water at all. Including companies which should not be included at all will lead to overestimation of the overall economic impact, thus a less accurate reflection of the true value. Therefore, a selection has to be made which companies are dependent of the port and thus has to be included. In the former Blue Ports report, this selection was based on two different criteria;

- Be an active port user and dependable on throughput via water.
- Be located on a 'wet' industrial site (industrial site which has a port).

However, these two requirements leave some room for debate, as most companies are partly dependent on throughput via water. For example; a production company is located on a waterway and uses the inland port partly for their activities, where the other share of throughput is via road transport, is just not fully dependent on the inland port. Thus, the term dependable in the first requirement is rather vague defined, it leaves room for different interpretations, thus the possibility that companies incorrectly will be accounted. Besides, the question in the example is whether the company can be accounted for 100% in the research, as (probably) not all employees are directly related to the maritime activities.

In order to deal with these problems, some considerations have to be made. As regards the 'dependable' problem, a directive should be made. Total throughput figures of companies should be inventoried, categorized based on different modes of transport (whereby throughput via water is essential). With these figures, the proportion of throughput via water can be calculated, which indicates the dependability on the inland port. The minimum proportion which a company must meet will be set on 30%, which is in line with the German method (Wolff et al., 2013). The other problem of whether to include a company for 100% or just partly, leads to some different possible solutions. As mentioned before, it can be criticized to include companies for 100% despite of the fact that not all throughput is transported by means of inland waterway transport. The first possible solution is to take the whole company into account in combination with the added restriction of the previous problem. By this way, the set of total firms in narrowed down, thus a more strict view. The second solution, proposed by Irene van Dongen (2013), is to categorize companies on basis of SBI codes (Standaard Bedrijfsindeling), which categories firms in different economic sectors. Based on previous practical studies/data and logical reasoning, SBI codes can be weighted. This will lead to SBI codes of which the consisting companies will only be partly accounted in the research. However, due to practical reasons, the first option is preferred. Although, the second option can be a good alternative.

Another problem is the responsibility of gathering the data needed to conduct the research. The main question is whether the responsibility lies at the researcher or at the municipality to collect these firm specific data? During the interviews, some proposed solutions came up to deal with this issue. Arwen Korteweg (2013), thinks that the responsibility of collecting firm specific data is the responsibility of the municipality. This means providing a list of relevant companies which should be included, as well as employment figures of these companies. As the municipality (member of the NVB) has an interest in a Binnenhavenmonitor, they should be willing to cooperate in the research. On the other hand, Harry Webers (2013), argued that selecting the list of companies is the main task of the researcher, as he has all the expertise and knowledge, and often has a more critical view compared to outsiders. In addition, outsourcing this task increases the risk of skewed observations as a various set of different municipality officials has to provide their data (Nijdam, 2013). It can be attractive to include 'doubtful companies' in order to get an higher value. Thus, a critical view of the researcher is necessary when reviewing these provided figures.

Next are the employment figures. It the most optimal way, these figures are collected by consulting one specific, consistent source. In this case, this would be the Dutch Chamber of Commerce (Kamer van Koophandel). Here, multiple firm specific data can be retrieved, including employment figures and SBI codes. However, Nijdam (2013) argues that in some cases, these employment figures are not

declared, thus will state with zero employees. Therefore, in order to tackle this problem, there are two options. The first one is to consult other sources. For example; Orbis is a database with firm specific data of over 79 million companies worldwide. Here, employment figures can be found. But again, it might occur that these figures are not filled in or are outdated. The second option is that the municipality officer should contact the concerned company and request the figures.

When the employment figures are collected, only a part of the direct effects are clear. In order to determine the direct value added, employment figures should be multiplied with the sectorial added value per employee. These statistics can be found at the CBS. Hence, in some cases the results should be interpreted carefully. For example, the chemical sector has a relatively high value added per employee. However, this is mainly due to the fairly capital intensive use of the sector, which result in an relatively high value per employee. Thus, this could lead to an overestimation of the real value. Such 'outliers' should be kept in mind when determining the direct added value; outcomes should be interpreted carefully and be well argued (Nijdam, 2013; Webers, 2013)

5.2 Indirect effects

Next to the direct effects, are the indirect effects. As mentioned in the literature review, there are backward indirect effects as well as forward indirect effects. First the backwards indirect effects. In the former Blue Ports reports, the backward indirect effects were calculated by multiplying the direct added value with an indirect backward multiplier. These multiplier were obtained from TNO, and were in the latest report updated, which resulted into small deviations. However, a distinction can be made between added value multipliers and employment multipliers, which both can be derived from national input-output tables (Nijdam et al., 2013, 2012; Policy Research Corporation, 2013). These figures are annually updated by the CBS, and therefore are a consistent source to use (bi)annually in this method. Although there are some theoretical assumptions underlying this way of measurement, it is the most optimal manner of measuring the backward indirect effects. Furthermore, measuring backward effects by this way is less time consuming, which enhances the convenience of the method.

Forward indirect effects still remain a question of debate. In line with the literature, the overall opinion of the four maritime experts is to not include any forward indirect effects in the research. Therefore, due to the lack of explanatory value and conflicting issues with the calculation of backward indirect effects with using multipliers (risk of double counting), measuring forward indirect effects will not take into account with determining the economic impact of inland ports. However, there are some suggestions raised during the interviews, which tries to capture some forward indirect effects related events. These will be discussed in paragraph 6.4.

5.3 Other effects

In the literature reviews, some other effects were discussed. These were; locational effects, cluster effects and investments. Based on the interviews, it soon became clear that locational effects (which are very much in line with the container terminal issue discussed in the next sub-paragraph) and cluster effects are difficult to measure. Main problem is the lack of data on regional/local level (Korteweg, 2013; Nijdam, 2013). For example, regional input-output tables are not available on this level, this limits the cluster analysis. Furthermore, the geographical scale on which this research takes place is too extensive to measure these effects for all inland ports, thus they will not take into account. However, the amount of investments can be measured. Although private investments can be hard to collect due to privacy issues, public investments in the port can be collected through contacts at the municipality. These figures can be an indicator to point out the development of the port, where more investments over time can be viewed positive.

5.4 Container terminals

Several different ideas were proposed during the interviews. Arwen Korteweg (2013) came up with the idea of looking at the amount of industrial estate related to logistics activities of the container terminal (or inland port). First of all, the total amount of square meters of logistics area have to be determined around the container terminal. Secondly it has to be determined how much of this total amount can be assigned to the dependency of the maritime related activities. This amount can be multiplied with the value of a single squared meter in that region, which can be found at several specialized institutions. However, this is a very extensive research and it is rather difficult to determine how much of the area is directly related to the container terminal.

Secondly, Nijdam (2013) proposed another method, which aims to compare the distribution of wealth per habitant earned by transport and logistics activities for different regions. Such data can be found at Eurostat, probably on COROP-level. Thus, this level cannot be narrowed down per inland port. However, it might address some value, or indication, of the impact of a container terminal for the region, as logistics companies will locate near such facilities. When an overall average can be estimated, it is possible to check whether a region is above or below that average. Expectation is that region with a container terminal will be above this average.

The method that was proposed in the theoretical framework is rather difficult to conduct. Collecting throughput data and dividing this into the three categories is not the biggest problem, although some container terminals might be unwilling to provide such information due to privacy reasons. However, it is the weighing of the different types of containers that is the biggest issue. First of all, it would be hard to determine what the value of a production, logistics and transshipment container is for the region. Such values must be well argued, but no values can be found in earlier research. Thus,

such values cannot be set without extensive research to justify them. Secondly, this differs not only per region, but also per type of goods which is shipped with that specific container. For example; a production container which will be used by an manufacturer of electric goods somewhere south in the Netherlands, has a completely different value compared to a production container for the production of milk powder somewhere up north. This method might be better when value per type of good are determined, however, this needs a whole new research (van Dongen, 2013).

So, the eventual method will be more descriptive, without indicating any absolute value of economic impact of the container terminal. Therefore, throughput figures will be guidelines here. Development of these figures will indicate the performance of a container terminals over the years. As a Binnenhavenmonitor will be conducted biannually, trends in throughput can be distinguished (Webers, 2013). Additionally, it would be interesting to inventories the most important customers of the container terminal. By this way, an indication can be provided of the importance of the container terminal for the region (Korteweg, 2013; van Dongen, 2013).

5.5 Overview method

In this section, an overview of the method will be given. This refined method, compared to the one in the theoretical framework, shall be used in the case study performed in the next chapter.

1. Compose a list of the concerning companies based on the renewed requirements. This list should be composed by contacts at the municipality. Next to this list of companies, employee figures and SBI codes of those companies should be supplied. Hence, a critical view is still needed to determine whether the provided list is correct. Furthermore public investment figures are also of importance to collect from these contacts
2. Determine the sectorial added value per employee based on CBS figures. This table is annually updated.
3. Multiply the employment figures with the sectorial added value per employee. This will result in the total direct value added (categorized per sector).
4. In order to determine the backward indirect effects, direct employment and value added will be multiplied with the corresponding multipliers. These are calculated on basis of national input-output tables provided by the CBS.
5. Collect throughput data of container terminals, preferably categorized in function. Additionally, obtain a list of the top-5 customers of these container terminals to determine their function and impact for the region. This task should also be outsourced to municipality officials.

6. Case study Bergen op Zoom

In this section, a case study will be applied. Because of the importance whether the method is applicable in practice, a case study of the inland port of Bergen op Zoom is provided here. As mentioned in chapter 4, this inland port is chosen due to the cooperation in the earlier Blue Ports reports. First of all, the plan of approach will be discussed, thereafter the results are presented which will be compared to those of the latest Blue Ports report.

6.1 Plan of approach

In order to determine the economic impact of the port of Bergen op Zoom, the Theodorushaven, some data had to be collected. As concluded in the previous chapter, the municipality should be more involved and concerned about collecting this data. Therefore, a survey has been made (see Appendix B). This survey was sent to mister Jos Breker, who was the contact person at the port. Mister Breker is currently working at the Theodorushaven, where he works as harbor master.

However, it turned out that the proposed method is subject to some pitfalls, these will be outlined next. First of all, there is a lack of data availability at the port authority of Bergen op Zoom. The method consists employment figures as well as throughput figures (overall and firm specific). However, employment figures are unknown at the port authority, these were provided by the municipality of Bergen op Zoom. On the other hand, the municipality is not fully aware of throughput figures. Thus, two different institutions must be contacted to gather relevant data, which is not the most optimal way. As a result, the minimum proportion of throughput via water of a company, which was set on 30%, is not possible to determine for most companies.

Secondly, throughput figures are largely available at the port, recorded by the harbor masters. However, here two different problems can be distinguished. Many firms located in the port are not very cooperative with sharing throughput figures, such firm specific information is often handled with caution due to competitors. Therefore, the port authority is not allowed to provide firm specific throughput figures, just aggregated throughput. Only if the source of the figures is public, such figures can be included in the report. In order to include more disaggregated (i.e. NSTR-chapters), a public source is needed to provide this information. Hence, these figures were available up till 2009 at the CBS. Thus provision of information can be realized by public sources. Furthermore, this matter also applies for container terminals. It turns out their willingness to provide information about their customers is fairly low due to privacy reasons.

6.2 Results

The results of the case study will be discussed in this subparagraph. Furthermore, the results will be compared with the findings of the Blue Ports report (van der Enden, 2012).

Looking at the direct employment figures (table 3), it can be concluded that there has been a slight decrease total employees (1828 vs. 2005). Several events underlie to this decrease. First of all, some companies that were included in the former Blue Ports report, are left out in this study. It appears that those companies were not dependable on the inland ports, thus will not be accounted in the study. Furthermore, there has been some changes in the employment figures at some companies. Employment in the 'manufacture of food and beverages' industry increased, whereas in the 'manufacture of plastic and building materials' industry employment declined.

Appendix C lists the value added per sector, per employee. Multiplying the employment figures with the corresponding sectorial added value results in the direct value added. Although the changes in the employment figures in earlier mentioned industries, the difference in value added is largely caused by the 'manufacture of chemicals' industry. The chemical industry is fairly capital intensive (van Dongen, 2013). As value added is accumulated of factors of production; land, capital and labor, an high capital industry will result in an high national added value. As a result, the value added per employee in this sector is quite high. Therefore, it is important to make sure that the gathered employment figures of this industry are accurate, as a (small) deviation could lead to a high overestimation, thus unreliable results (Nijdam, 2013).

Indirect effects and corresponding multipliers can also be seen in table 3. The backward multipliers are based on national input-output tables of the Dutch annual accounts, and were constructed with the IRIOS (Interregional Input Output Software) application software[6]. Although this program is designed for interregional input-output tables, it also allows the user to build national or single-region models. Furthermore, additional variables, like employment, can be added to compute employment multipliers as well.

The outcomes of the overall effects, including price adjustments, are lower compared to 2011 (€660 million vs €525,5 million). This is in line with the decreasing direct effects, as the multipliers does not have changed significantly over time. The biggest difference is the addition of an employment multiplier. This multiplier is the number of employment units generated in the entire economy per exogenous employment unit in the consistent sector. Thus, this leads to a total employment effect of 3473 employees as a result of the activities of the port dependable companies in the Theordorushaven.

[6] http://www.rug.nl/research/reg/research/irios/

However, it should be kept in mind that due to the theoretical assumptions of input-output analysis (based on the Leontief input-output model) , these results must be interpreted with caution.

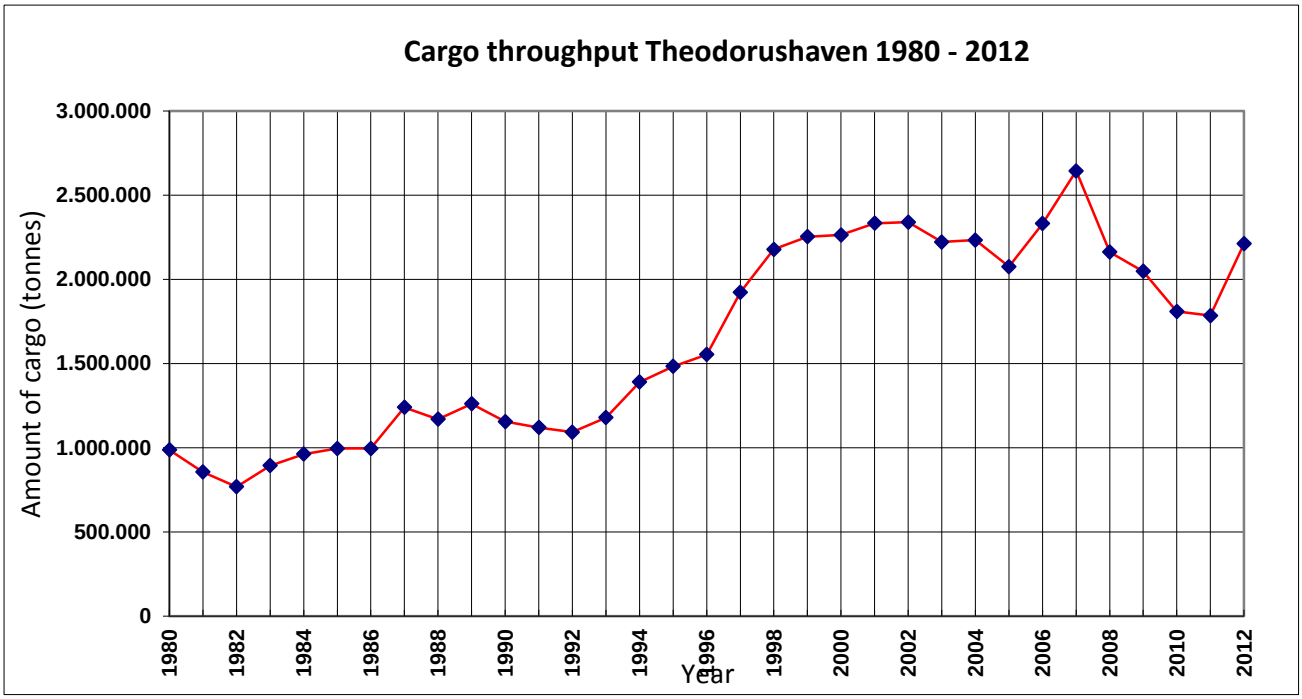
Regarding the investment plans of the inland ports, the following can be said. In the Strategical Vision Theodorushaven (2009) are several goals stated:

Spatial	1. Optimal use of existing business space 2. Expansion of nautical space
Economics	3. Attracting labor-intensive companies 4. High value added at new companies
Mobility	5. Leading good flows in the desired direction 6. Growth of bulk goods via water, 5% per year 7. Containers via water, increase of 11.000 TEU to 35.000 TEU in 2014
Environment	8. Sustainable and safe development of business activities and cargo transport

The most important point of this Strategical Vision are the expansion of nautical space and expanding the container terminal (points 2 and 8). For investments regarding the first matter is currently €25,3 million reserved (up till 2019). This budget will be used to improve and expand the nautical space. Investment regarding the container terminal are currently not clear. However, total investment to realize a new container terminal are estimated at €24 million. Half of this investment will (probably) be paid by the terminal operator, which leaves €12 million that has to be paid by the municipality. Although there is no municipal budget reserved, this amount will be accounted to the total investments. The new container terminal will be built outside the Theodorushaven and should have a capacity of at least 200.000 TEU.
Total investments for the upcoming five years are approximately €37.3 million. This enormous amount of money emphasizes the importance of the inland port for the municipality of Bergen op Zoom.

Figure 7 gives an overview of the total cargo throughput of the Theodorushaven in the period from 1980 till 2012. Although no absolute economic value can be addressed to these figures, it is a good indication of the development of the inland port over time. An upward trend can be seen in the figure, with strong development since 1996 and 2005. Moreover, after 2007 the throughput sharply declined. This is mainly as a result of the crisis from which the (maritime) transport sector suffered. However, significant recovery can be seen in 2012.

Figure 7: Total cargo throughput Theodorushaven, Bergen op Zoom



Regarding the container terminal, the following can be said. In 2012, the container terminal of Bergen op Zoom had an transshipment of 70.000 TEU (van der Enden, 2012). This year, until the 1th of November, the total throughput is estimated at 51.000 TEU. This will probably result in slightly less throughput compared to 2012. However, in the light of forecasts made several years ago related to the development of the container terminal, throughput is yet significantly higher (see table 4). Nowadays, total TEU is already at the level of 2020. Thus, it can be concluded that the container terminal is developing above expectations, which initiated the expansion mentioned earlier.

Obtaining a list of important customers of the container terminal was not achievable. Due to privacy restrictions, the municipality was not able to provide such firm specific information.

Year	TEU	Growth
2008	15.000	
2009	15.000	0%
2010	20.000	33%
2011	25.000	25%
2012	30.000	20%
2013	35.000	17%
2014	40.000	14%
2015	45.000	13%
2016	50.000	11%
2017	55.000	10%
2018	60.000	9%
2019	65.000	8%
2020	70.000	8%

Table 4: Forecasts throughput container terminals. source: Buck Consultants International)

Table 3: Results case study Bergen op Zoom

	Direct employment 2011	Direct employment 2012	Indirect employment multiplier	Total employment		Direct value added 2011 (mln)	Direct value added 2012 (mln)	Difference	Indirect effect multiplier	Total value added 2011 (mln)	Totaal value added 2012 (mln)	Difference
Agriculture			*1.55*						*1.79*			
Manufacture of food and beverages	271	349	*1.86*	649		28.5	38.94		*1.51*	47	58.9	
Manufacture of paper-, wood products			*1.93*						*1.47*			
Manufacture of coke and petroleum			*3.29*						*1.17*			
Manufacture of chemicals	1455	1402	*1.90*	2668		355.8	291.9		*1.57*	583.6	457.3	
Manufacture of plastic and building materials	245	43	*2.15*	92		14.8	3.1		*1.56*	26.3	4.9	
Manufacture of basic metals and -products			*1.78*						*1.63*			
Transport equipment			*2.64*						*1.53*			
Other manufacturing and repair			*1.40*						*1.41*			
Electricity and gas supply			*2.99*						*1.74*			
Water supply and waste management		4	*3.69*	15			0.5		*1.75*		0.9	
Wholesale trade		15	*1.12*	17			1.4		*1.42*		1.9	
Land transport	15		*1.30*			0.8			*1.48*	1.1		
Water transport			*2.99*						*1.52*			
Warehousing, transport-, postal services etc.	19	15	*2.10*	31		1.4	1.1		*1.46*	2.0	1.6	
Recreation			*2.04*						*1.73*			
Totaal	**2005**	**1828**		**3473**		**401.3**	**336.9**	**-64.4**		**660.0**	**525.5**	**-134.5**

7. Conclusion

7.1 Concluding remarks

This study has tried to provide more insights in the determination of economic impact of Dutch inland ports. Throughout this research, it became clear that there is a wide gap between theories of economic effects and the practical implementation of them in economic impact studies. Several different forms of economic effects are distinguished as a result of port related activities; direct as well as indirect effects. However, converting these effects into a practical way to measure them turned out to be rather difficult, often due to causality problems or a lack of available data. A brief overview of the answers to the sub questions is given, based upon the respective chapters.

1. *What are the relevant (economic) effects to study the economic impact of Dutch inland ports?*

Measuring the economic impact of (inland) ports can be very helpful for policymakers, the government and other stakeholders to get insight in the economic importance of those (inland) ports, which could guide them in determining related policies. However, in order to do so, the relevant economic effects had to be determined. According to the literature, direct economic impact is often measured in two socio-economic indicators; employment figures and value added. These socio-economic indicators are generally considered as key indicators in most economic impact studies. Additionally, some other indicators, like investments, could also indicate direct economic impacts of inland ports, however they are not regarded as key indicators. Problems regarding determining economic impact arise at the indirect effects of employment and value added. Here, two different kinds can be distinguished; backward and forward indirect effects. The former concerns effects at the supplier, where the latter is related to indirect effects at the customer. Especially the forward effects are a problem where the literature is not unilaterally about the direction of these effects. Mainly causality is a bottleneck, which limits the option to include such effects in an economic study. Furthermore, some other possible effects are highlighted, like cluster effects and locational effects. However, it turned out that including these effects in an inland port study would be very difficult given the small geographical scope, numerous inland ports and lack of available data. Especially given the assignment of this research, developing a convenient way to measure economic impact, this is difficult to realize.

2. *What are the advantages and shortcomings of the current Blue Ports method?*

The Blue Ports method, as used in the two former studies, has some advantages and disadvantages in determining the economic impact of inland ports. Some advantages are the accuracy in

determining the port related activities which should be included in the study, as well as the relative simplicity of the methodology. Disadvantages on the other hand, are related to the time consuming task to gather all necessary data and organizational task to keep track of all changes in the different ports. Although these shortcomings, along the interviews it became clear that the current method has the best basis to elaborate on. However, some adjustments had to be made in order to refine the method, thus dealing with these disadvantages. Main adjustment is that a shift in the responsibility of data gathering has to be made. The municipality, as well as the local port authority, should be an active player in the process by providing the necessary data. With these data, the NVB can rather simply determine the economic importance of an inland port with an mathematical tool which can be updated annually.

3. *Which indirect economic effects occur in inland ports, especially forward effects, and how are they measured?*

Forward indirect effects are certainly present in inland ports, they reflect the potential and cumulative impact of a sector on the regional economy through the input-output relationships (linkages) downstream. However, quantifying these effects turned out to be not feasible in this research. It conflicts too much with the calculation of backward indirect effects, which increases the risk of double counting. Furthermore, the causality problem whether an impact is a forward indirect effect from A to B, or a backward indirect effect from B to A, still remains. There has been very much debate about this topic over time in the literature, and still no solid, consistent method has been presented. Additionally, including forward indirect effects was not recommended by the interviewed experts, as it has no explanatory value.

The side-step regarding the container terminals; it turned out to be rather difficult to propose a scientific reasoned method to account an absolute economic value to the forward effects of container terminals. However, defining the strategic value of container terminals as a descriptive indicator could be possible.

4. *How do other studies measure the economic impact of ports?*

Throughout this research, three different other port related studies are reviewed to use them in comparison with the Blue Ports method. These studies are: the Havenmonitor, de Nederlandse Maritieme Cluster Monitor and the Flemish Monitor of the National Bank of Belgium. The Belgian variant has a significant advantage over the different Dutch monitors considering data availability. Employment as well as value added figures are better tracked, retrievable and the NBB is allowed to

make use of all firm specific information. Therefore, the bottom-up study of the NBB is very detailed and gives an fairly accurate overview of the economic impact of Belgian ports.
The methodology of the two Dutch monitors are very similar to each other, though differ significantly in outcome. Although both methods are viewed as top-down, the employment figures of the Havenmonitor are collected bottom-up (company level), where those of the Cluster Monitor are based on sector level, thus top-down. This difference in approach in one of the main reasons in outcomes. Furthermore, the Havenmonitor is bounded to port related activities in the seaport area, where the Maritieme Cluster Monitor other activities outside the seaport area includes.
Hence, the Blue Ports method is very much in line with the Dutch Havenmonitor, only at a more detailed geographical scale.

5. *Is there a possibility to develop a monitor which can be used in the Netherlands, and probably also in other European countries?*

The question whether it is possible to develop a monitor which can be used in the Netherlands and also in other European counties, remains uncertain. Throughout Europe, multiple port authorities and other stakeholders are also developing own methods to measure the economic importance of inland ports. The German method, which focuses only on employment, seems to be a solid method, though has not been used in practice. Furthermore, the PORTOPIA project has been established, where multiple European countries are participating. However, lack of reliable data is a problem throughout whole Europe, thus limiting the possibilities to develop uniform method. Primary task for the Blue Ports method now is to unfold this method just for the Dutch inland ports. There will probably be some bottlenecks and pitfalls in the first year, which have to be overcome before the method can run properly. Hence, the indicators used in the Blue Ports method are in line with the proposed indicators of other European studies, which leaves the possibility to spread it further out over Europe in time.

As a conclusion, an answer to the research question *"present a scientific assessment and suggestion for the further development of the "Blue Ports" method of economic impact analysis to develop a convenient way to measure economic effects of Dutch inland ports",* which is in fact more a statement. The method to determine the economic importance of Dutch inland ports for the Netherlands is presented in this research, and has its origin in the Blue Ports method used in earlier reports. Only here, some additional features has been included. This method accounts both direct and indirect employment and value added plus investments to account the economic impact of inland ports. Furthermore, some descriptive features could be added to account the strategic position of inland ports. This method turned out to be the best and most convenient regarding the

wishes of the Nederlandse Vereniging van Binnenhavens. However, it can still be a tough task to apply the method in practice due to the practical problems and misunderstandings which could arise at ports. This will be further explained in the next subparagraph.

7.2 Policy recommendations and implications

Based on the outcomes and conclusions of this research, some policy recommendations can be done regarding the set-up of a Binnenhavenmonitor executed by the Nederlandse Vereniging van Binnenhavens (NVB). As it turned out, especially in the interviews and case study, there are still numerous problems which have to be overcome in order to develop a straight Binnenhavenmonitor, equally comparing the different Dutch inland ports. Here lies the main task of the NVB, to overcome these problems. This section will provide some recommendations in order to make the Binnenhavenmonitor a success.

The case study of Bergen op Zoom showed that the practical implementation of the method could be difficult to realize due to the variety and amount of inland ports. Main problem is the difference in data monitoring in these ports. It seems to be that there are no general guidelines for monitoring the flows of vessels and goods in the port. Such a lack of universality makes it rather difficult to gather specific data in one generalized way for multiple ports. As a consequence, a clear structure of a Binnenhavenmonitor will be quite hard to realize in the way things are structured nowadays. Therefore, the NVB should initiate some level of awareness among stakeholders (government, municipality, inland ports etc.) of developing some general guidelines for collecting and providing port specific information. Increasing this awareness will be beneficial for all parties involved. For example, in Belgium is significantly more data available at lower geographical levels compared to the Netherlands. This enhances (economic) research studies which are strongly dependent on statistical data, which increases the depth and quality of those studies. A lobby of the NVB at relatively high governmental level, to increase the awareness to monitor data at lower geographical scales related to inland ports, could initiate more pressure in those ports and the start of better data collection.
Besides, a lot of data related to throughput figures cannot be provided by port authorities due to privacy reasons. Companies are cautious with providing such information because of competitors in the business. Therefore, the municipality should be more involved in distributing such figures, like the CBS often did up until 2009. By this way, the information can be found public which eliminates the privacy aspect of companies. Thus, this should be also more stimulated by the NVB.

Furthermore, the initial year of the practical assessment of a Binnenhavenmonitor might bring some bottlenecks and problems along. It is recommended to guide the participating ports to make sure that they will understand the method. Therefore, a Dutch manual will be written for the NVB as well

as the inland ports to help them throughout the process. Additionally, listing the relevant companies can be quite debatable, as the case study of Bergen op Zoom showed. Constructing this list properly in the first year provides a solid basis to build further on in the upcoming years. Therefore, it is suggested to start with a pilot, which could be performed by a student as part of some kind of working internship. By this way, specific problems at individual inland ports can be solved more easy and ambiguities can be clarified.

7.3 Limitations and further research

The research conducted about the developing a practical method for measuring economic importance of Dutch inland ports imposed several limitations. In this subparagraph, limitations will be discussed, which have constrained the research.

Detailed data on ports, like throughput figures and added value, are generally hard to come by and usually restricted. Compared to Belgium, data availability in the Netherlands is significantly lower. This limits the possibilities to examine relationships between different sector in order to determine indirect effects. Furthermore, it also limits the possibilities of effects which can be concluded in the study. The whole set-up of the method is dependent on the data that is available. Many theories exist, however only a few can be applicable in practice due to a lack of data.
Next is the fact that the author was not able to conduct the method in all inland ports of members of the NVB. At Bergen op Zoom, it turned out there can still some practical problems or different interpretations of the method. It might be better to be intensively involved in other inland ports.

Suggestions for further research are first of all related to container terminals. It turned out that the use of a rather 'simple' multiplier, as done in some other studies, does not give any reliable outcomes concerning economic effects downstream. However, during this thesis some alternative methods were proposed to examine forward effects of container terminals. Although not included in the method, the suggestion of value different sorts of containers might be an interesting research topic. Determining the average economic impact of an container on a scientific basis, could be interesting for the maritime business.

Secondly, it is quite interesting to follow the development of monitoring inland port throughout Europe. When data in other European countries is better tracked and the availability thus increases, it might be interesting whether it is possible to use this method in other European countries. At this moment, the method has not proven itself yet consistently, but when it is feasible and successful, this method could also be distributed along Europe as guideline.

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Appendix

A. Interviews

A1.1 Interview bij het Havenbedrijf Rotterdam met Arwen Kortweg

A1.1.1 Introductie

Arwen Korteweg, is medeopsteller van het eerste Blue Ports rapport, uitgegeven in 2004. Het rapport werd opgesteld om inzicht te krijgen in het belang van binnenhavens ten opzichte van zeehavens. Dit rapport heeft de binnenhavens min of meer op de kaart gezet. Hierna volgde het quick-wins programma, waarbij havens gesubsidieerd werden. Momenteel is hij logistics manager bij het Havenbedrijf Rotterdam. Hier wordt voornamelijk gekeken hoe de bereikbaarheid van binnenhavens verbeterd kan worden. Daarnaast heeft meneer Korteweg onder andere voor Ecorys en de NVB gewerkt.

Niet alle binnenhavens hebben een relatie met Rotterdam, veel goederenstromen kunnen ook uit naar het buitenland gaan vanaf een binnenhavens, bijvoorbeeld van Gelderland naar Duitsland. Dus die nuance moet zeker in ogenschouw genomen worden, er moet goed gekeken worden naar hoe goederenstromen lopen. Daarentegen is het indirecte effect van container terminals uitstralen wel grotendeels terug te redeneren naar Rotterdam, aangezien de meeste containers via zee het land binnenkomen.

A1.1.2 Methodiek

Het belangrijkste punt is dat de methode voor de binnenhavenmonitor niet moeilijker gemaakt moet worden dan dat het is. Dit was ook het startpunt van het eerste Blue Ports rapport, wat uiteindelijk is de methodiek aangescherpt en getoetst door Jelle van der Enden, waarna vervolgens bleek dat er alsnog een stap gemaakt moest/kon worden met betrekking op de indirecte effecten. Veel regio's zetten tegenwoordig ook in op de binnenhavens, maar weten eigenlijk nog niet zo goed wat het uiteindelijk oplevert. Om deze stap te maken, en zodoende een goede binnenhavenmonitor op te stellen moeten een aantal dingen worden gedaan. Ten eerste, vasthouden aan de methodiek die er nu ligt, zij het met een kritische blik. Er moet heel nauw aangesloten worden bij de Havenmonitor, om een zo goed mogelijke lijn te volgen. De gegevens moeten (het liefst) voortkomen uit één bron, voorbeelden hiervan zijn het CBS en de Kamer van Koophandel (KvK). In plaats van de werkgelegenheid te meten door middel van enquêtes bij bedrijven (Blue Ports 2012) zou beter gekozen kunnen worden om die verantwoordelijkheid bij de gemeente neer te leggen en deze gegevens via de Kvk te verkrijgen. Indien een gemeente zich niet bewust is van de bedrijven die daar

zitten, is dit eigenlijk een indicatie van het (mindere) belang dat ze aan de binnenhaven hechten. Dus de verantwoordelijkheid moet voor een deel bij de gemeente liggen. Belangrijk is om de gemeente te betrekken omdat zij het meeste belang hebben bij de binnenhavenmonitor.
Daarnaast is het van belang om overslaggegevens te verkrijgen, wat lastiger kan zijn. Via het CBS loopt dit wat achter, dus deze verantwoordelijkheid kan ook beter bij de gemeente gelegd worden. Er moet een bepaalde basishouding zijn bij de gemeenten om te participeren in de binnenhavenmonitor. Het heeft weinig zin om elk jaar weer de bedrijven te gaan enquêteren als er weinig welwillendheid van de gemeente uitkomt.

De methode moet in het verlengde van de Havenmonitor gehouden worden. Op deze manier heb je consistentie in de methode waarmee je bezig bent. In principe is een zeehaven niet anders dan een binnenhavens, alleen de schaal is kleiner. De directe effecten moeten alleen kritisch bekeken worden. Het is mogelijk dat er inmiddels andere (betere) parameters beschikbaar zijn. Het belangrijkste is in ieder geval een consistente bron.

Het lastigste is het classificeren van havens onder de verschillende types die uiteen zijn gezet, zoals in de voorgaande rapporten. Dit kan een redelijk arbitrair punt zijn. Zeker omdat verschillende havens meerdere soorten bedrijven kunnen hebben. Dit geldt in principe ook voor bedrijven, waarbij het lastig kan zijn om een bedrijf in een bepaalde sector te stoppen. Dit zou misschien ook simpelere kunnen waarbij je een haven gewoon als een haven ziet. Maar wel de enge definitie houden bij het bepalen van havengebonden bedrijven.

A1.1.3 Containerterminals

Het container netwerk is ontwikkeld vanwege 2 redenen. Ten eerste, vervoerders hebben gezien dat wegvervoer niet meer de toekomst is en ook dat wegvervoer is niet handig als je aan het water ligt. Ten tweede, een terminal werkt niet meer alleen als overslagpunt maar ook als opslagpunt (Tilburg-Venlo). Een terminal zorgt ervoor dat voorraad containers tijdelijk in het achterland gestald worden, waarbij de verlader een container op afroep kan krijgen. De grotere terminals zijn vaak gevestigd nabij logistiek parken, met veel DC´s en het liefst in de nabijheid van een binnenhaven. Daardoor is de relatie met de binnenhavens en de logistieke terreinen is heel kort; dat gegeven moet eigenlijk onderzocht worden en moet je terug zien in de indirecte effecten.
Hier zijn 2 manieren voor: 1. Van die inland terminals moet je de goederenstromen weten. Probleem is vaak dat je veel klanten nodig hebt om een grote terminal te zijn, bijvoorbeeld Heineken (100.000 TEU). Er gaan per jaar 2,5 miljoen containers van en naar Rotterdam, dus er zijn veel bedrijven die gebruik maken van zo'n terminal. De terminal heeft een basislading (grote klanten; zoals Heineken),

kleinere bedrijven liften daarop mee. Die terminals weten heel goed wie de klanten zijn, dus dit zou inzicht kunnen geven over de werkgelegenheid bij deze klanten als gevolg van distributie via de haven. Dan zou je de werkgelegenheid van die bedrijven kunnen zien als indirect effect, dat mag je daaraan toerekenen. Alleen is het bijna onmogelijk om al die bedrijven te verzamelen.

Om het te kwantificeren, moet je sowieso overslaggegevens hebben. Dit kan dus via de terminals of de verantwoordelijkheid weer bij de gemeente leggen.
De tweede manier is om te kijken naar hoeveel logistiek er zit qua m^2 op die bedrijventerreinen. Als er wordt geïnventariseerd hoeveel logistiek terrein er in totaal gebruikt wordt en hoeveel m^2 daarvan gerelateerd is aan activiteiten van de binnenhaven, kan er een indicatie worden gegeven van het vestigingsplaatseffect van de containerterminal. Het ligt er een beetje aan of die m^2 zijn te relateren aan een economische waarde. Het zou mogelijk kunnen zijn hoeveel een bepaald oppervlak waard is in economische termen. Bronnen hiervoor kunnen ProLogis of CBRE zijn.

De methode die er wordt gepresenteerd over de container terminals is een goed idee, maar kan moeilijk te realiseren zijn. De vraag is voornamelijk 'wat is nou een goede indicator voor alle binnenhavens over de logistiek, zonder dat je iets over goederenstromen of bedrijven hoeft te weten? En hoe kan je dat mogelijk kwantificeren?'. Het gaat erom dat de monitor eenvoudig is, maar wel wat laat zien. Je kan hem heel uitgebreid maken, wat je ook zeker moet laten zien, maar de essentie moet niet uit het oog verloren worden.

A1.4 Overige effecten

Cluster effecten zijn heel lastig om te meten. Het kan wel meegenomen worden, maar dan meer als richtlijn voor de gemeente zelf om te bepalen. Maar nationaal monitoren op uniforme wijze is heel lastig, voornamelijk wegens een gebrek aan cijfers. Het kan beter als aanbeveling opgenomen worden, die eventueel over een aantal jaar verder uitgewerkt kan worden. Het is nu belangrijk om de monitor zo eenvoudig en consistent mogelijk te houden, zeker omdat het nog relatief in de kinderschoenen staat.

Investeringen zijn ook interessant om te monitoren, alleen is het makkelijker om alleen de publieke investeringen te doen. Hierdoor ligt weer de verantwoordelijkheid weer bij de gemeente. De gemeente zou hierbij ook nog een beeld kunnen geven over private investeringen die op de planning staan. Er moet uitgekeken worden met het enquêteren van bedrijven voor private investering. De relatie tussen gemeente en bedrijven is vaak wat beter, waardoor deze gegeven eventueel makkelijker verstrekt worden. Daarnaast worden de meeste investeringen ook gedaan op basis van een wisselwerking tussen gemeente en bedrijven.

De indirecte achterwaartse effecten nog steeds bepalen op basis van de multiplier methode die is gebruikt in de voorgaande Blue Ports methode. De consistentie van de methode is in dit geval belangrijker dan een gecompliceerdere methode waarbij allerlei vragen gesteld kunnen worden.

De 'beste' methode is er niet. Het gaat er voornamelijk om, om het belang van zo'n binnenhaven aan te geven in economische termen. Daarnaast zijn er nog allerlei andere factoren die het vestigingsklimaat van een haven bepalen. Het is wel van belang om alle mitsen en maren van de methode aan te geven, want het blijft een moeilijk verhaal om alles te kwantificeren. Sommige havens lopen ook achter vergeleken met andere havens, waardoor het een simpele methode moet blijven voor alle binnenhavens.

Als laatste is de regio Venlo/Venray is ook een interessante regio om te onderzoeken, het is dé logistieke hotspot van Nederland, waar ook binnenhavens aanwezig zijn (waaronder ook container terminals). Hier zou een relatie gelegd worden tussen de impact van die container terminals de logistiek daar omheen. Dit voornamelijk om te kijken hoe dat in die regio monitoren, met bedrijvigheid of andere bepaalde interacties. Deze samenhang maakt de regio tot een interessant onderzoeksgebied, zeker omdat de regio logistiek georiënteerd is.
Op deze manier is er ook gelijk de link met de gemeente die, zoals eerder genoemd, een belangrijke centrale rol dient te spelen in het verstrekken van gegevens. De leden van de NVB, wat de meest betrokken schakels zijn, kan gevraagd worden om hun medewerking om de eerste stappen te zetten, zij hebben in principe een belang bij deze binnenhavenmonitor.

A1.2 Interview bij Erasmus Universiteit Rotterdam met Michiel Nijdam

A1.2.1 Overeenkomsten Zeehavenmonitor

De aanpak van de binnenhavenmonitor is voor een groot deel gebaseerd op de zeehavenmonitor, alleen is de afbakening van de binnenhavenmonitor preciezer. De bedrijven die opgenomen worden in het bepalen van de economische impact zijn gesteld aan een aantal voorwaarden. Het bepalen van de werkgelegenheid bij de zeehavenmonitor is in contact met de havenbeheerders. Er wordt een lijst met bedrijven opgesteld die van belang zijn en daarbij welke data nodig is, waarna de havenbeheerder de juiste gegevens verzameld. Zo kan het ook toegepast worden op een heleboel kleinere havens zolang je maar een contactpersoon hebt die zich er in verdiept. Een centrale bron voor het bepalen van de werkgelegenheid is LISA, deze is wat nauwkeuriger dan de Kamer van Koophandel, enig nadeel kan het bepalen van de werkgelegenheid per bedrijf zijn. Het nadeel van de KvK als bron is dat sommige bedrijven geen werkgelegenheidscijfers hebben opgegeven. Een alternatief is dat op de Erasmus Universiteit bedrijfsinformatie opgevraagd kan worden via Orbis en company.info.

Maar het delegeren van die gemeente voor het checken van de lijsten met bedrijven en het aantal werknemers is in principe een goed idee, alleen moet er wel gelet worden op het feit dat gemeenten dezelfde afwegingen maken. Hierbij moet gedacht worden aan welke bedrijven wel/niet onderdeel uitmaken van de binnenhaven. Er ontstaat een neiging om dingen mee te tellen die eigenlijk niet meegeteld zouden moeten worden. Dus er moeten duidelijke voorwaarden gesteld worden aan de bedrijven die opgenomen worden in de uiteindelijke lijst.

De methode om de toegevoegde waarde te bepalen (werkgelegenheid x sectorale toegevoegde waarde per persoon) is de beste methode om de toegevoegde waarde te bepalen in binnenhavens gezien de afwegingen in tijd en moeite. Hierbij moet wel opgelet worden welke sector je met wat vermenigvuldigd. Sommige sectoren hebben een hoger TW per persoon, wat tot scheve uitkomsten leidt wanneer het met onjuiste werkgelegenheid wordt vermenigvuldigd. Een andere optie is kijken naar de BTW wat een bedrijf betaald, hiermee kan je de totale toegevoegde waarde bepalen (deze gegevens zijn te vinden op micro niveau bij het CBS). Dit is wel een problematische methode, zeker m.b.t. de geheimhoudingsplicht van het CBS.

A1.2.2 Containerterminal

De voorwaartse effecten van containerterminals bepalen botst volledig met het beeld van een praktische gestandaardiseerde methode waar weinig tijd in gaat zitten. Voorwaartse effecten zijn

daarnaast ook nooit precies te bepalen, moeilijk in te schatten en het kost heel veel werk. Je moet bijna op bedrijfsniveau een afweging maken in hoeverre het gerelateerd is aan de binnenhaven.

De voorgestelde methode met het waarderen van het aantal TEU dat binnenkomt om zo het economisch effect te meten om zodoende een inschatting te geven is een optie, alleen is hiervoor dan wel een goed onderbouwde weging nodig. Een andere manier zou kunnen zijn om te kijken naar de hoeveelheid distributie activiteiten rond de binnenhaven. De methode voorgesteld door Arwen Korteweg (Appendix A1), zou een mogelijke manier kunnen zijn om dit te doen. Alleen moet dit wel per binnenhaven apart worden gedaan waardoor er weer veel te veel tijd in gaat zitten. Concluderend is het zo dat voorwaartse effecten niet te combineren zijn met het doel om een makkelijk reproduceerbare methode te gebruiken. Als gevolg daarvan worden alleen de indirecte achterwaartse effecten bepaald, op dezelfde manier die in de eerdere Blue Ports rapporten werd gebruikt.
Een andere soort benadering is hoeveel wordt er verdiend aan opslag en vervoer in verschillende regio's (op COROP niveau). Data hiervoor is te vinden op Eurostat. Als je dit afzet tegen het aantal inwoners per regio, en dan kijkt welke regio's boven/onder de verwachting zitten. Je zou verwachten dat de verhouding sterker is in een regio met een binnenhaven.

A1.2.3 Overige effecten

Door het hebben van een binnenhavens, sluit je een regio aan op een (inter)nationaal vervoersnetwerk. Dit geeft een bepaalde strategische waarde alleen in het niet te bepalen wat die waarde precies is. Er zou wel per regio gekeken kunnen worden naar wat er zou gebeuren als die haven er niet is. Hierbij moet gekeken worden naar het verschil tussen tijd waarin volumes vervoerd worden met een binnenhaven en zonder binnenhaven. Dit verschil kan dan gezien worden als de 'meerwaarde' die de binnenhaven heeft voor de vestiging van allerlei logistieke activiteiten. Alleen moet dit weer per haven bekeken worden, wat weer in strijd is met het handzame/praktische doel dat voor ogen is.

Concluderend is het advies om de methode die er nu ligt zo te houden maar om het beter te coördineren. De belanghebbenden/contactpersonen die er over gaan moeten in principe alleen de lijst met bedrijven en bijbehorende werkgelegenheid updaten. Dus de vraag moet gesteld worden of er bedrijven zijn bijgekomen/weggegaan en welke veranderingen zich hebben voorgedaan in het aantal werknemers. Als je die methode kan 'automatiseren' zodat het voor elke haven hetzelfde is, dan maak je winst in het opstellen van die monitor. Dan is er daarnaast altijd nog de mogelijkheid om door de jaren heen extra effecten toe te voegen.

A1.3 Interview bij Policy Research Corporation met Harry Webers

A1.3.1 Kapstok van het onderzoek

Je moet een kritische blik hebben op wat je opneemt in de monitor en vooral onderbouwen waarom je het opneemt. Een goede basis (kapstok) is de kern van het hele onderzoek, als deze niet goed is dan weegt dit steeds zwaarder door in de rest van de methode wat uiteindelijk resulteert in een grote overschatting van de economische impact. Hierbij is het vooral van belang om een duidelijke keuze te maken tussen het doel van het onderzoek; een zo groot mogelijke waarde berekenen of een kwalitatief zo goed mogelijk onderzoek dat waarschijnlijk een kleinere waarde zal toekennen. Uiteindelijk zal de tweede optie het meest realistische beeld geven en zodoende een grotere meerwaarde hebben voor de belanghebbenden van de binnenhavenmonitor.

Om tot deze methode te komen, is de afbakening van het onderzoek van cruciaal belang. De basis van de methode ligt bij het selecteren van de 'juiste' bedrijven die toegerekend moeten worden aan de activiteiten van de binnenhaven. Hierin schuilt het grootste gevaar voor het overschatten van de economische impact; hoe meer bedrijven er worden geselecteerd die niet (of maar deels) gerelateerd zijn aan de binnenhaven, hoe groter de uiteindelijk waarde wordt die zodoende geen goede weergave geeft van de werkelijkheid. De gemeente heeft hierin geen goed beeld en ambtenaren zijn ook niet bekwaam genoeg om een goede selectie te maken op basis van een paar voorwaarden, dit zal dus uit eigen onderzoek moeten voorvloeien.

In een binnenhaven zit er verzameling aan verschillende bedrijven, waarvan een deel watergebonden en een deel niet watergebonden is. Stel er is een uiteindelijke lijst van 1000 bedrijven met de karakteristieken watergebonden of niet watergebonden. Hier zal een keuze gemaakt moeten worden welke bedrijven wel en niet opgenomen moeten worden, wat de eerste afweging is. Daarnaast zijn bedrijven die deze selectie overleven vaak ook niet 100% watergebonden, een deel zal bijvoorbeeld ook getransporteerd worden via de weg. De vraag is hier in hoeverre alle werknemers tot de directe werkgelegenheid gerekend kunnen worden. Er zal dus ten aller tijde een goed onderbouwend verhaal moeten zijn waarom welke bedrijven (deels) opgenomen worden in de uiteindelijke selectie. Hierin kan de NVB een grote rol spelen; zij kunnen bepalen welke type bedrijven een uitmaken van de lijst. Als er uiteindelijk een lijst met bedrijven is opgesteld, door middel van een intensieve studie, wordt het makkelijker om in de opvolgende jaren veranderingen op te nemen omdat de verandering in het aantal bedrijven vaak gering is.

Voor het bepalen van de bedrijven heb je meerdere schillen:

1. De container terminals
2. De bedrijven eromheen die (deels) afhankelijk zijn van het water
3. De bedrijven die geen enkele band hebben met de binnenhaven

Het totale gebied bestaat uit een verzameling van bedrijven (ruim), die op basis van eigen observatie ingedeeld moet worden op de bedrijven die uiteindelijk meegenomen moeten worden in de monitor.
Hier is geen richtlijn voor, het is juist zaak om het goed te onderbouwen.

A1.3.2 Directe effecten

Het bepalen van de wekgelegenheid van deze bedrijven moet gebeuren vanuit een consistente bron; de meeste praktische consistente bronnen zijn de KvK en LISA. Vooral LISA kan een goede praktische dataverstrekker zijn voor het bepalen van de werkgelegenheid.

Toegevoegde waarde (TW) wordt berekend door het vermenigvuldigen van de werknemers met de sectorale TW per persoon (gegevens te vinden via het CBS). Hierin schuilt ook weer het gevaar tot overschatting van de werkelijke toegevoegde waarde en zal dus ook weer moeten worden onderbouwd waarom in sommige sectoren de toegevoegde waarde hoog uitpakt. De sector chemie heeft bijvoorbeeld een hoge toegevoegde waarde per persoon omdat het relatief kapitaalintensieve industrie is (TW wordt gebaseerd op arbeid, kapitaal en ondernemerschap). Het vermenigvuldigen met de werkgelegenheid kan dan leiden tot een overschatting van de werkelijke TW. Daarom zal er een goede onderbouwing gegeven moeten worden over de verklaring waarom sommige sectoren eruit springen. Het updaten van de sectorale toegevoegde waarde is relatief makkelijk, er zal alleen een nieuwe tabel bij het CBS vandaan gehaald moeten worden.

In België is veel meer data beschikbaar vergeleken met Nederland. Voor individuele bedrijven zijn veel bedrijfsgegevens beschikbaar die in Nederland moeilijker (of niet) verkrijgbaar zijn. Daardoor is het voor de NBB een stuk makkelijker om de economische impact van Belgische havens een stuk nauwkeuriger te krijgen in vergelijking met de Nederlandse Havenmonitor.

A1.3.3 Indirecte effecten

De indirecte effecten (alleen achterwaarts) in de Maritieme Cluster Monitor worden bepaald aan de hand van multipliers gebaseerd op I-O tabellen (bron: CBS). Dit is de meeste praktische manier voor het bepalen van deze effecten. Daarnaast is het updaten van de multipliers ook jaarlijks te doen, wat dus als een consistente bron gezien kan worden. Daarentegen moeten voorwaartse effecten niet

meegenomen worden in de monitor omdat het geen verklarende waarde heeft. Het vestigingsplaatseffect van containerterminals moet aan de hand van throughput cijfers bepaald worden. Dit vanwege het feit dat het lastig is om hier een economische waarde aan te koppelen die ook nog eens goed onderbouwd is. Sommige indirecte effecten zijn weer directe effecten voor andere sectoren.

A1.4 Interview bij Buck Consultants International met Irene van Dongen

A1.4.1 Introductie

Buck Consultant International werkt op veel verschillende 'natte bedrijven'. Dit kan zijn in opdracht van overheden bij het maken van beleid; maar ook voor herstructureringsprogramma's of maatregelen die gaan over bepaalde investeringsbeslissingen (aanleggen van kades). Daarnaast werkt Buck ook voor bedrijven die gevestigd zijn op het natte bedrijventerrein. Dit gaat ook voornamelijk over investeringsvraagstukken.

A1.4.2 Praktische haalbaarheid

Vanuit praktisch oogpunt moet de methode die er nu ligt geijkt worden om zodoende een kengetal aan de binnenhavens te geven. De hoofdvraag is 'waarom willen we dat kengetallen inventariseren? Wat willen we hier mee bereiken en nemen we voor lief dat de methode niet tot op de komma nauwkeurig is?' Alleen heeft die methode wat sterke en zwakke punten. Een voorbeeld hiervan; in Bergen op Zoom zit het bedrijf Sabic (chemie bedrijf), waar honderden mensen werken. Deze mensen staan niet allemaal in relatie tot de activiteiten van het bedrijf die voortvloeien uit binnenhaven gerelateerde activiteiten. Hoeveel van deze mensen neem je dan uiteindelijk mee in de bepaling van de werkgelegenheid en toegevoegde waarde. Een mogelijke vraag die gesteld kan worden is, 'is het communicerend te maken dat je aan de ene kant zegt dat je de voorwaartse effecten niet mee neemt, maar aan de andere kant alle bedrijven wel voor 100% meeneemt in de studie?' De ruis zit in het feit dat bedrijven die per week maar enkele schepen ontvangen, wel voor 100% meegenomen worden in de huidige methodologie. Want niet alle mensen die bij een bedrijf werken (bijvoorbeeld bij Sabic) hebben een relatie met schip dat daar komt laden/lossen. Maar is het onderaan de streep te compenseren dat je voorwaartse effecten niet meeneemt met het feit dat je de rest wel meeneemt?

A1.4.3 Containerterminals

Wat betreft de voorwaartse effecten van container terminals waarbij de economische waarde berekend wordt op basis van bepaalde waarden per functie (productie, logistiek of doorvoer), is dit lastig te realiseren. Een set van bedrijven dat zich richt op technologie in het midden van het land heeft een heel andere waarde per container dan een bedrijf dat zich richt op containers met melkpoeder. Hierdoor zal er een waarde per sector per type container moeten komen, wat een hele studie op zich is. Wat wel beschikbaar is bij terminal operator zijn cijfers met betrekking tot de overslag per jaar en het klantenprofiel wat daarbij hoort. Dit geeft de optie om te inventariseren wat

bijvoorbeeld de top 5 klanten is per terminal (wat eerder al door Buck is gedaan in een eerdere studie). Er moet wel rekening worden gehouden met het feit dat een deel van de terminals hier niks over wil zeggen. Als deze lijst is geïnventariseerd, zou je op basis van het soort klanten kunnen bepalen of de terminal productie, logistiek of doorvoer gericht is. Het grote 'nadeel' is alleen dat het weer veel werk is om alle terminals te contacten. Er is veel lobbykracht voor nodig om zoveel mogelijk data te kunnen verzamelen

Een andere mogelijkheid zou kunnen zijn om op basis van ervaringcijfers/voorgaande praktijk onderzoeken, verschillende SBI klassen deels mee te nemen in het onderzoek. Aangezien bedrijven worden ingedeeld op basis van SBI klasse, zou voor gekozen kunnen worden om een bepaalde SBI klasse maar voor (bijvoorbeeld) 50% mee te nemen in plaats van de volle 100%. Hiermee worden bedrijven die slechts deels afhankelijk zijn van de binnenhaven op een meer realistischere manier meegenomen wat ten goede komt aan de nauwkeurigheid van het uiteindelijke resultaat. Dit is een mogelijkheid om het probleem van de mate van afhankelijkheid van bedrijven aan de binnenhaven te standaardiseren. In de Maritieme Cluster Monitor wordt er op een soort gelijke methode gehanteerd voor dit probleem, waarbij verschillende SBI klassen deels toebehoren aan bepaalde sectoren.

B. Vragenlijst Binnenhavenmonitor

Voor u ligt een vragenlijst met betrekking tot de binnenhaven in uw gemeente. Het doel van deze vragenlijst is het in kaart brengen van de economische impact van de binnenhaven. Deze economische impact wordt bepaald aan de hand van werkgelegenheidcijfers, toegevoegde waarde en investeringen. Om dit te kunnen bepalen, wordt een inventarisatie gemaakt van bedrijven die gebonden zijn aan de binnenhaven.

(Zie voor het invullen van de benodigde gegevens het bijgevoegde Excel bestand!)

1. Welke havengebonden bedrijven zijn gevestigd in de binnenhaven?
   Dit zijn bedrijven die niet alleen in de binnenhaven gevestigd zijn maar ook actief van de binnenvaart gebruik maken in de aan- en afvoerlogistiek. Een bedrijf zal dus over een kade/steiger moeten beschikken (of eventueel over pijpleidingen) om zodoende schepen te kunnen ontvangen.

2. Kunt u, van deze lijst met bedrijven, de benodigde gegevens invullen in de onderstaande tabel.
   Het gaat hierbij voornamelijk om werkgelegenheidscijfers, SBI codes[7] en overslaggegevens per bedrijf. Gelieve deze gegevens(werknemers en SBI codes) invullen op basis van data van de Kamer van Koophandel. Het hebben van één specifieke bron draagt bij aan de consistentie van de methode.

3. Heeft u de totale overslag cijfers van de binnenhaven ter beschikking?
   Indien mogelijk ingedeeld naar NSTR-hoofdstuk[8] (zie opmaak Excel sheet voor de verschillende klassen)
   Indien deze gegevens niet volgens deze opmaak beschikbaar zijn, gelieve de overslaggegevens mee te sturen als bijlage

4. Heeft de gemeente een groeibeleid ten aanzien van de haven? Zo ja, wat zijn de kernpunten van dit beleid? Kunt u daarnaast ook aangeven welke investeringsplannen de gemeente heeft voor de aankomende 5 jaar.
   Gelieve de investeringsplannen aangeven in absolute waarde.
   De eventuele kernpunten opgeven in het tekstvlak (of meesturen als bijlage).

5. Kunt u de overslag van de containerterminal(s) inventariseren en daarnaast ook de top 5 klanten die zij hebben?
   Mocht het inventariseren van de belangrijkste klanten van een containerterminal niet mogelijk zijn uit privacyoverwegingen, is dit geen probleem. Indien mogelijk, ook het aantal TEU per klant.

[7] SBI codes (Standaard Bedrijfs Indeling) geven aan wat de belangrijkste activiteit van een bedrijf is. Deze indeling wordt opgesteld door het CBS en wordt gebruikt om bedrijven in te delen naar hun hoofdactiviteiten. Deze informatie is op te vragen via de Kamer van Koophandel.
[8] De classificatie van goederen die gebruik maakt van een indeling gebaseerd op de Nomenclature uniforme des marchandises pour les Statistiques de Transport, Revisée (NSTR).

C. Value added per employee, per sector

Sector	Value added (per employee, euro's)
Agriculture	92.571,4
Manufacture of food and beverages	114.244,3
Manufacture of paper-, wood products	69.275,9
Manufacture of coke and petroleum	527.166,7
Manufacture of chemicals	213.367,3
Manufacture of plastic and building materials	74.214,3
Manufacture of basic metals and -products	68.705,9
Transport equipment	75.225,0
Other manufacturing and repair	48.022,6
Electricity and gas supply	412.259,3
Water supply and waste management	118.500,0
Wholesale trade	94.883,0
Land transport	62.270,7
Water transport	84.375,0
Warehousing, transport-, postal services etc.	76.147,9
Recreation	48.411,8

(source: CBS – national accounts, 2012)