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Choosing a port as a distribution centre for steel

- A case study of CMP, Chinese steel producers and the Baltic Sea Region

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Lund University School of Economics and Management,
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Abstract

Title: Choosing a port as a distribution centre for steel - A case study of CMP, Chinese steel producers and the Baltic Sea Region

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Key words: Port, Distribution centre, Steel, logistics, China, Baltic Sea Region, Copenhagen Malmö Port AB

Purpose: Main purpose: To identify the advantages for Chinese steel producers setting up a distribution centre in the Northern Harbour when entering the Baltic Sea Region. Second purpose: To develop a framework that identifies important factors when choosing a port as a place for a distribution centre for steel.

Methodology: A qualitative case study has been conducted with two steps; one to make a generic framework and one to apply the framework on our case. As the case port is partially compared to another port it has elements of a comparative case study.

Theory: The literature review addresses different perspectives on ports, distribution centres, steel as well as impediments that can hinder trade.

Empirical foundation: The empirical data mainly consist of semi-structured interviews with Chinese steel producer and a stainless steel company. Moreover, smaller interviews by mail were held with the Port of Antwerp and several steel companies.

Conclusion: The results of this study led to the development of a framework, which means to facilitate the process of finding a suitable port for a distribution centre for steel. The framework was applied on the case of the port CMP, the market the Baltic Sea Region and Chinese steel producers Shougang and NISCO. CMP was also compared to the Port of Gothenburg. The findings showed that CMP had a slight advantage over the Port of Gothenburg, and also that it is a suitable port for Chinese steel producers.

Abbreviations and acronyms

CMP, CMPort	Copenhagen Malmö Port AB
Shougang	Shougang Jingtang Iron & Steel Company Co., Ltd.
NISCO	Nanjing Iron & Steel United CO., LTD
DC	Distribution Centre
BSR	Baltic Sea Region: Norway, Sweden, Finland, Estonia, Latvia, Lithuania, Poland, Germany & Denmark
EU	European Union
WTO	World Trade Organization
WSA	World Steel Association
EUROFER	European Steel Association
Jernkontoret	Swedish Steel Association
EUSBSR	European union Strategy for the Baltic Sea Region
TEN-T	The Trans-European Transport Networks
Scan-Med	Scandinavian-Mediterranean Core Network Corridor
EAF	Electric Arc Furnace
BOF	Basic Oxygen Furnace
TSU	True steel use
LNG	Liquefied Natural Gas

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1. Introduction

Entailed in this chapter is an explanation behind the study and an outline for the coming chapters.

1.1. Background

The world has never been as fast-changing as it is now. The globalization and the technical development have decreased the distances all around the globe, putting a higher pressure on the performances of all businesses. Ports are no different. Their purpose of being a point between water and land has expanded to being a substantial part of logistic systems and supply chains of the businesses using the ports (Song & Panayides, 2012). Ports are significant to their countries and inhabitants. They create employment directly and indirectly, enable trade, and contribute to investments. For example in the Netherlands, ports stand for 3% of the GDP of their total economic activities (European Commission, 2013). In one part of the world, a new port authority has managed to connect two countries even further. In 2001 the Öresund Bridge connected the capital of Denmark, Copenhagen, with Sweden's third biggest city, Malmö. Upon this decision another one was made to combine the two cities' ports into one. The result was Copenhagen Malmö Port AB (CMP), the port authority now running the business on both sides of the Öresund. CMP is self-proclaimed as the logistics hub for the Baltic market, situated like an entrance to this big market. CMP has recently opened its new area in Malmö, the Northern Harbour. The first stage of the Northern Harbour measures 0.65 km² and will continue to grow until 2020 to 0.9 km^2 (City of Malmö, 2015). All this area is not yet leased to companies and businesses, and CMP sees this area as a great potential for companies wanting to start a long-term business relationship.

Another industry has also noticed the new conditions of the world. At a first glance, the steel industry might look like a steady and profitable industry. Steel is according to World Steel Association (2015) one of the greatest industries to contribute to the global economy. The industry and its surrounding businesses employ together over 8 million people around the globe. The steel industry is a vital supplier to significant industries such as the automotive, transportation, power and construction industries and steel can be found everywhere in our daily lives. Steel is also part of the green economy; completely recyclable and is the main material utilized in sources of renewable energy. However, the steel industry is facing some serious issues. The demand has decreased rapidly, while the supply has continued. The steel producers are dealing with challenges such as volatility of raw materials and demand as well as excess production and capacity leading to severe competition. The only real solution is shutdown of capacity, a solution that will be fatal to many producers. Especially difficult is the situation in China, the before so rapidly growing economy is slowing down, taking the steel demand with it meanwhile the excess capacity is growing (Ernst & Young, 2014). The Chinese steel producers are looking for opportunities abroad in order to survive when domestic demand is slowing down.

CMP has also observed the Chinese steel industry's challenges. CMP is eager to show the Northern Harbour as a great location for Chinese steel producers to set up a distribution centre in, to reach new customers around the Baltic Sea. The producers are however not completely convinced this is a beneficial investment for them, even though their domestic market is falling apart.

Could it be a successful match between Chinese steel manufacturers and CMP's Northern Harbour to distribute steel to the Baltic Sea Region?

1.1.1. Theoretical problematization

The literature and knowledge about our topic is spread into three main areas: ports, distribution centres and steel.

Song and Panayides (2012) describe the evolution of the port. Starting in the 1980s, ports were basically seen as a point between water and land and as a part of transportation. Reaching the new millennia, the view on ports has changed. The term "supply chain" was merely mentioned in research before 2000 but is now a vital part in theory together with other words closely connected to business such as management and communication. Having had to develop much in short time while being historically crucial, the port is an interesting area for research. Our most interesting area is port selection, how is a port selected. Aronietis, Van de Voorde and Vanelslander (2010) have compiled a substantial number of studies combined with an empirical study made by them to point out the most important factors when choosing a port.

The distribution centre can be closely connected to the businesses of a port. Langevin and Riopel (2005) emphasize the fact that distribution centres are often forgotten in literature and used as a synonym to warehouse or storage. Oum and Park (2004) have a similar experience and argue the issue of locating a distribution centre has been given too little attention.

As already mentioned, the steel industry is under huge pressure and excess capacity and slowing demand is problematic. Another problem highlighted in literature in this industry is the issue of sustainability. The steel industry is the second largest industrial user of energy and the number one industry when it comes to CO2 emissions (OECD, 2012). Moreover, since steel is big, heavy, and clunky it requires certain conditions to be handled and transported efficient and effective.

Steel is one of the biggest industries; it employs millions of people and contributes to the global economy. Therefore, the issues of the industry are well worth researching. Ports and some areas of steel are widely written about, while distribution centres seem to be forgotten. Ports are as earlier stated vital to the whole society, creating opportunity for import and export as well as creating jobs. There is yet no clear combination of these areas, or even port and distribution centre, and therefore it is difficult to comprehend how they affect each other. This framework will help us evaluate the possibilities with Chinese steel in the Northern Harbour.

1.2. Purpose

Our first purpose and step is: *Develop a framework that identifies important factors when choosing a port as a place for a distribution centre for steel*.

Our second step and main purpose is: *To identify the advantages for Chinese steel producers setting up a distribution centre in the Northern Harbour when entering the Baltic Sea Region.*

Our main purpose will include the following actors:
Suppliers: Chinese steel producers: *Shougang Jingtang Iron & Steel Company Co., Ltd.* (Shougang) and *Nanjing Iron & Steel United CO., LTD* (NISCO).

Port: *CMP*
Market: *Baltic Sea Region* including Norway, Sweden, Finland, Estonia, Latvia, Lithuania, Poland, Germany and Denmark (BSR).

To easier identify the advantages we choose to compare the application of CMP with the application of the Port of Gothenburg.

1.3. Contribution

This study will contribute to the theory with a combined picture of port and distribution centres together with a focus on the huge and critical steel industry. As earlier mentioned, there is today no combination of these areas. Moreover, the topic of distribution centres is forgotten even though logistics are growing more and more important to businesses. Ports act as natural transhipment and therefore a distribution centre at a port should be meaningful to investigate. The framework will be generic and can be used by others interested in other steel producers, ports, and markets. It aims to be guidance for future decisions. This is the study's contribution to the theoretical knowledge.

Empirically, this framework can lead to easier decisions to establish a distribution centre and also shines light on important issues which should be guidelines for the decision. For our case, it can be used by either party to gain more knowledge about their situation and to evaluate what the port needs to work on or improve to be able to fit as a distribution centre for steel. Moreover, as the steel industry's impact on the environment is an issue, a smoother transhipment of the goods can prevent further costs, both of money and of the nature. Combining these three areas can provide a solution beneficial to all parts.

1.4. Delimitations and explanations

Our purpose indicates that the decision to focus on the Baltic Sea Region and to establish a DC has already been made. We investigate the advantages with choosing the Northern Harbour when looking at this specific market. Therefore we will not consider and compare this result with other options such as establishing a DC in another region or a DC in Malmö that will serve the whole Europe or likewise.

Due to time limit and limited resources we cannot compare CMP with all other ports close to the Baltic Sea and have therefore decided to look at the possible biggest competitor, the Port of Gothenburg. This study has had access to more material concerning CMP than the Port of Gothenburg. As the purpose is to evaluate the advantages with CMP, the Port of Gothenburg is included as a mean of comparison to see where CMP might be shortcoming. CMP has already put significant time to establish this investment and as many of our respondents are familiar with CMP. This is however only the empirical data, which still could be biased and therefore in the applications as much facts as possible are used.

China and Chinese steel is often described in the theory and the making of the framework, even though this part should be general and not biased on our later case. This is because China and Chinese steel is such a vital, huge player in the steel market therefore the literature often relates to the country (Ernst & Young, 2014., Jernkontoret, 2015).

Russia is excluded from the market in step 2 even though it has coast to the Baltic Sea, due to the fact it is such a big country and if China want to send steel to some parts of Russia, the land way would be more efficient and it is difficult to split up the country's statistics. Moreover, Russia differs from the other countries that are all members of the EU (except Norway) and moreover, the country is in a labile situation.

As setting up a distribution centre takes time and is a significant, probably intended as very long-term, investment the chosen time perspective is longer than the five coming years, depending on the information sources. Although, it is important to remember that forecasts are made by earlier data and even though not as secure as looking directly at the past, this is the best option to fulfil the purpose.

Advanced mathematics is used in many research papers about port selection and how to find the most suitable port. If they have general conclusions not described by numbers they will be shortly included otherwise they will not be used as it outside of our study area and knowledge.

1.5. Outline

Below follows a disposition of our study and the contents and purposes of each chapter.

Chapter 2: Method

In this section the procedure and the strengths and weaknesses of the study is discussed, ending with an analysis of the validity and reliability.

Chapter 3: Literature review

This chapter covers the literature and information needed in the areas of ports, distribution centres and steel. Each section ends with a brief discussion. Moreover it discusses general impediments to trade such as trade barriers and cultural differences.

Chapter 4: Empirical data

In this chapter we present the compilations of our interviews. The interview guides can be found in the appendixes.

Chapter 5: Framework

The motivation of the different factors of the framework followed by the actual framework is enclosed in this chapter together with experts' thoughts on its accuracy.

Chapter 6: The case

The different players in our case will be presented one by one.

Chapter 7: Application of framework

The factors from the framework are applied on the case earlier described together with a application of the framework on the Port of Gothenburg.

Chapter 8: Discussion and conclusions

Conclusions are drawn from the applications and proposals for future research in the area are presented.

2. Method

As the methods used in a study shape the result it is crucial that these are described and critically evaluated (Jacobsen, 2002). In this chapter we discuss the methods used in this study.

2.1. Procedure

To answer our main purpose (*To identify the advantages for Chinese steel producers setting up a distribution centre in the Northern Harbour when entering the Baltic Sea Region*) we need to fulfil our second purpose (*Develop a framework that identifies important factors when choosing a port as a place for a distribution centre for steel)*. This framework will be generic so it can be applicable to other ports, steel producers and markets in the world. To answer these two purposes we need to distinguish them by dividing them into two steps. Step one will be to answer the first purpose which is to develop the framework. The second step is to answer our main purpose by applying the framework to CMP, Chinese steel manufacturers and the market the Baltic Sea Region. The second step also includes applying the framework to the Port of Gothenburg. Finally, we will end with a discussion and conclusions.

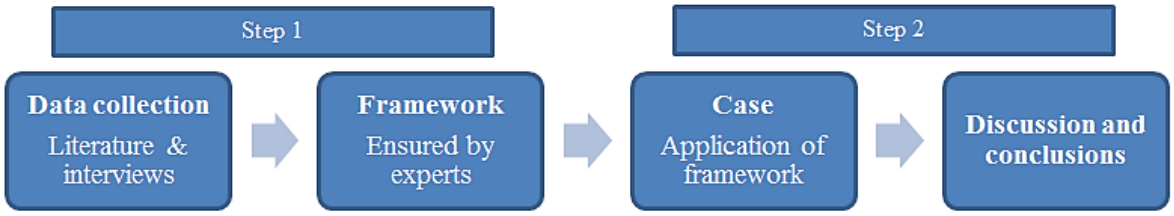


Figure 1. Procedure of the thesis.

2.1.1. Step 1

The first move was to understand what theoretical approaches might be needed. To be able to develop a framework that identifies important factors when choosing a port we first of all need to identify what is required in a port. How is a port selected and how does a port work are significant parts of the thesis. The framework needs to cover the criteria required in a port to be able to serve as a distribution centre. Since we want our framework to include criteria that ought to be fulfilled when placing a distribution centre in the port, we also need to do research on distribution centres and find out the implications of using a distribution centre and what should be considered when placing one. Steel is the third part that we need to consider in our framework. Steel is the good which will be stored and processed in the distribution centres. It is relevant for us to find out if the sufficient resources etc. are available at the port in order to handle the logistics of steel. Moreover, the classical hurdles with international businesses are added, trade barriers and cultural differences.

Our first interviews were held to fill in the early gaps in the literature. The respondents were employees at multinational steel companies. A port already successful when it comes to steel-transhipment is the Port of Antwerp. Because of its achievements, we asked for a review on what they believed is the key to success. Furthermore we interviewed two steel producers in China as well as a stainless steel company, with a distribution centre in Malmö.

These two processes of interviewing and writing literature were done in the same time, complementing each other depending on the information collected.

Finally the framework was created and it was ensured by the help of experts. The experts evaluated the framework according to their knowledge and gave feedback.

2.1.2. Step 2

We applied the framework on the Chinese steel producers, the port CMP, and the market Baltic Sea Region, consequently to see how well they fit the Chinese steel producers. To identify CMP's advantages, they are compared to another port, the Port of Gothenburg. A discussion followed with an evaluation of CMP's advantages in this situation as well as the disadvantages. Finally, conclusions were drawn.

2.1.3. Research design

The research strategy for this study is qualitative. Our study focuses on words and not numbers and does not use measurements (Bryman & Bell, 2012). A qualitative study will let us be flexible and adapt our research design to new discoveries.

As a qualitative method does not have certain questions with given alternatives but the situations or persons observed decides the information that will be given to us, the internal validity is high. The observations we get will be a picture of the reality as the questions are more open contrasting to quantitative method. As Jacobsen (2002) describes it, qualitative strategy is flexible and the data is analysed as it is gathered, and affects the following data collection. This matches very well to our study.

The research design provides a framework for the collection and analysis of data. Bryman and Bell (2012) describes one of the designs, case study, as "*a basic case study entails the detailed and intensive analysis of a single case*" (p.62). As we examine the case of CMP and its attraction towards Chinese steel producers this design fits this study well. The case should be examined intensively and detailed, which we ought to do through the application of the framework. According to Jacobsen (2002) a case study is appropriate when we would like to gain a deep understanding of a certain situation, in this case the advantages with using CMP as a distribution centre for Chinese steel.

The choice of our case object was easily selected. Our case is a revelatory case, which means the case has before not been accessible to study and we got the opportunity to (Bryman & Bell, 2012). As CMP decided they wanted this matter researched, they gave us the task to evaluate their role as a distribution centre for steel; we got access to not only their information but also their partners such as a stainless steel company and possible future partners such as Shougang. This enabled us to implement this study. It would have been very difficult or even impossible for us ourselves to get in contact with both a port and a non-domestic supplier with the same willingness to give us information.

According to Bryman and Bell (2012), comparing two contrasting cases implies that we better can understand social phenomena. We compare the case of CMP with the Port of Gothenburg and therefore our study will have features of a comparative design which Bryman and Bell (2012) defines as a design that entails the study using more or less identical methods of two or

more contrasting cases. Since we do not use identical methods for CMP and the Port of Gothenburg the study will not completely be a comparative design.

Since we want to test how existing theories can contribute in making new findings, deduction, as well as see how our research can generate theory, induction, our study will have characteristics from both sides and therefore be abductive (Bryman & Bell, 2012). Jacobsen (2002) also agrees on this and describes deduction as, translated by the authors, "*from theory to empiricism"* and induction as "*from empiricism to theory"*. Deductive as in we use the theory to get an overview and create interview guides as well as inductive as we also used empirical data to fill out the gaps in theory to form a framework.

2.2. Data collection

There are two different kinds of data collection; primary and secondary data. Primary data is the data collected first hand from the source. Interviews and observations are examples of primary data. Secondary data is based on data already collected by others such as articles, statistics or annual reports.

2.2.1. Secondary data

To find relevant theories we asked lectors in logistics and supply chain management relevant theories and books for our topic. Moreover, when we found appropriate articles, we did not only use the article itself but also used it to find references in its literature overview. The search engines used are Google Scholar and LUBsearch. To ensure the quality of these articles we tried to the furthest to use ones that were peer reviewed or/and had been quoted many times. We also used a book we were recommended from Ulf Paulsson, Supply Chain Management lecturer at Lund University School of Economics and Management, called *Logistikens Grunder.* From the same book we found theories about how distribution centres work, which was complemented with the book *Managing Supply Chains: A Logistics Approach*, also recommended by Ulf Paulsson.

2.2.2. Primary data

Our main source of primary data is interviews. Below follows a table of our interviews.

Who	Why	Respondents	How	With	Where
Steel companies in and out of case market	Information about important factors in general markets and in the case market	5 companies; producers, distributors and buyers	By mail and phone	Written questions	-
Port of Antwerp	Success factors of a port handling steel	Sr. Business Development Manager	By mail	Written questions	-
Shougang	Information about what general and case suppliers look for	Vice general manager, vice director of marketing dept., manufacturing deputy director	Face-to-face	Semi-structured interview guide with themes and open answers	Office in HQ, Caofeidian Industrial Zone
NISCO	Information about what general and case suppliers look for	General manager, strategic development director, sales manager	Face-to-face	Semi-structured interview guide with themes and open answers	Office in HQ, Nanjing
Stainless steel company	Information about steel and logistics but also regarding the case port and market	Technical Manager	Face-to-face	Semi-structured interview guide	Office in service centre, Malmö

Table 1 Interviews.

We conducted interviews by mail, phone, or in person depending on what information we needed, how interpretable the questions were and convenience of place and time. To meet a person face to face might have been the best option but due to lack of resources such as time and money this could not be possible. As the answers to our questions were similar no matter whom we asked, we quickly understood what was important to include in this study. Therefore we felt, with the thought of limited time and money in mind, that the interviews held were enough. Before all of our interviews we presented ourselves and the purpose of our thesis and stressed the respondents that a thesis is a public paper. The interview guides and questions sent by mail can be found in the appendixes 1- 4. All interviews are concluded into a running text found in chapter 4. Naturally, we also critically evaluated the empirical data and considered some things as too biased or incorrect to be further used.

Our first questions to the steel companies were asked because we needed information that was not available elsewhere for the creation of the framework. In appendix 1 we have compiled these questions. Depending on what we already knew about the companies and their business not all questions were sent to all respondents. These questions were asked in order to find out what is important about our different areas. Producers, distributors, and end consumers in the steel industry were asked. Regarding these interviews, the questions were selected after considering the information we already had and what could be needed according to existing knowledge. The

questions are hard to misinterpret and are not concerning delicate information, hence these questions were sent by mail. We first called the companies to get responses fast and secure that our topic and purpose was completely understood. By mail we also asked the already successful port when it comes to transhipment of steel, the Port of Antwerp to gain a comprehensive picture of what is of importance regarding steel.

Due to the language barrier in China we used CMP's Business Developer in China, Joanna Pan, as a translator in the interviews with Shougang and NISCO.

A face-to-face interview can be more or less open. In a completely open interview the conversation will continue without any guide or decided sequence. Since we knew the purpose of conducting these interviews and somewhat the nature of the answers we wanted to collect, this would not be a good approach for us. The other extreme is a very structured interview where the answering alternatives are already decided (Jacobsen, 2002). Since we are not sure what answers we can expect and want our respondents to give their own thoughts, we did not choose this alternative either. Instead we chose to conduct semi-structured interviews with themes in our guide.

The two interviews held in China were group interviews. We did not know before which persons we would meet, or their occupation, as we were not the ones booking the interviews due to the language and cultural barrier. As it turned out we met with the persons listed in the table above. As different persons had the most insight in different questions this solution was successful. Before the interviews, we presented a PowerPoint with an overview of our study and the purpose of it, we did not find it necessary to elaborate on this even further but started the interview by asking our questions. We had divided our questions in different themes such as steel and international business and the first questions in each theme were more open to give our respondents the opportunity to talk about what they find important. Jacobsen (2002) suggests finishing off the interview in a soft way, and we did this by asking if there was anything more they would like to add which we had not been discussed so far.

2.3. Validity and reliability

Validity deals with the integrity of the conclusions that are drawn from a study. External validity deals with generalization of the results of the study and is therefore important to our research design, case study, which often tends to focus on small samples (Bryman & Bell, 2012). Our framework is built to be used in other situations, with other steel producers, ports, and markets, which makes it generalizable and has a value for other researchers. All of our respondents except the Port of Antwerp are somehow connected to our case. Because of the limited time this was the most efficient way because the material could be used both in step 1 and step 2. All respondents were employees at multinational companies or at companies with international businesses.

External validity can be difficult to capture. It deals with generalization of the result. The framework itself is applicable to other cases and therefore the external validity is high in the first step of our thesis. The external validity of the second step is of course much more limited as it is case study. A case is not meant to be generalized, as Jacobsen (2002) points out, which we are aware of. An exception is the generalization of Shougang and NISCO, two big Chinese steel producers. These two will be seen as representatives for Chinese steel producers. Everything applicable to these two are of course not same for all producers, but the things they agree on are

strong indicators that it is something of significance for all producers. The internal validity was secured by asking experts to evaluate our framework. This is a way proposed by Jacobsen (2002) to ensure the study's accuracy.

Furthermore, to make the study more credible triangulation is helpful. Triangulation includes using multiple sources and methods to secure the result from the first source (Bryman & Bell, 2012). We have used triangulation as we have conducted interviews in different ways for example by mail or face-to-face, and with persons of different nationalities and titles with connection to our topic. We have also used written sources such as articles and books. As will later be shown, both interviews and literature led to the same results. This can also be connected to the issue if we have got information from the right sources. The answer to this we claim is yes because we have interviewed several players in the market with different levels of connection to our certain case and moreover the subject and questions of this study are quite simple to comprehend, even though it is not before combined in literature.

Reliability deals with the issue if the study is trustworthy. For example one can ask the question if this study would lead to similar result if it was conducted again. Another problem with reliability can occur if the researcher's influence the interviewed or if the researcher is affected by the relations forming throughout the information collection (Jacobsen, 2002).

The interviews held in person were either recorded and listened to afterwards, compared to the notes taken during the conversation, or ensured with feedback through sending back the notes taken during the interviews to the respondents. This was done to avoid mistakes by us as persons while taking notes. Both of us always participated during the interviews and at first individually assessed the material. Afterwards, we together compared our interpretations of interviews, as well as other material included in the thesis. The risk of making mistakes and misinterpret the data was smaller. Bryman and Bell (2012) calls this internal reliability; if the study is conducted by more than one researcher, if they agree on the conclusions.

The whole thesis is dependent on the accuracy of the framework. It is crucial that the framework covers the right factors and that these factors are thoroughly covered. In order to assure the accuracy of the framework beyond the compilation of primary and secondary data, the framework was sent to experts on the areas of ports, logistics, and steel. They were asked to evaluate the framework and the parts they have expertise in. When also they accepted it as accurate according to their knowledge, the framework was considered complete.

To conclude the internal validity and reliability of our study is relatively high, because the answers and information collected from our different sources show great similarity, which show that it is something of significant importance to the steel industry.

2.3.1. Objectivity

This thesis is written in collaboration with CMP. They provided us with contacts to respondents of our choice and also provided financial support and invaluable help concerning our visit in China. As Jacobsen (2002) argues this is not an indicator of an unethical thesis. A research should be open and new and therefore the result can be surprising even to the researchers. With this in mind, this study was conducted with objective and critical eyes with no intention to

manipulate the result to satisfy our constituent, but only to provide them with objective conclusions and information they can use how they want, as the thesis is a public paper.

3. Literature review

This chapter contains the findings from the literature and fact research.

3.1. Port

Port research has as many other areas developed over time. In the 1980s ports were basically seen as a part of transportation. Reaching the new millennia the view on ports changed. For example was the well-known concept "supply chains" merely mentioned in research about ports before the 2000s (Song & Panayides, 2012). The two areas of interest to us are port selection and port logistics. First we describe a port.

3.1.1. Definition

There are many words with similar meaning to ports, such as harbour. Barnes (2013) describes the differences as following:
Harbour: A physical area where the sea meets land and can be natural or manmade for example with breakwaters.
Port: An area on both land and water (sea or river), that provides resources for vessel to load and unload cargo. A port is usually a place within a harbour.
Terminal: Is one man made facility that handles vessels with cargo. There are several terminals in one port and they can be managed by different operators.
Therefore the correct term here is port and that is also evident when researching the area in articles.

3.1.2. Role and function

The definition of a port has expanded from being an area capable of handling ships and their cargo from ship to shore and vice versa into a critical link in the supply chain that creates value through logistic services (Song, 2012). A port has different functions that need to be conducted in order to get a well-functioning supply chain. The key functions are loading and unloading cargoes and to be a connection to inland transportation. But it also has various other supporting logistics activities adding value such as offering a distribution centre (Roh et al, 2007).

Lumsden (2006) agrees with Roh et al. (2007) that an essential function of a port is to load and unload cargoes. Therefore it is important to decrease the time the ships are in the ports for emptying and loading, the so called turnaround time. This will improve the departure frequency as well as increase the transport capacity. The faster the turnaround time gets the more area to put the goods while waiting for transport is required. The space to put the goods is situated close to the quay to make the turnaround time smoother and quicker. The handling of goods on and off the ship is done by cranes. Movement inside the terminal area is handled by for example straddle carrier trucks. Movement on and off trucks are handled by forklift trucks and side lifters while the same thing to railway carriages are done by shipyard carne (Lumsden, 2006).

3.1.3. Port logistics

Pettit and Beresford (2009) has studied the role of ports in supply chains and how this role has changed during the last 40 years towards becoming leaner and more agile logistic concept, with focus on value-adding activities. Due to this development of the logistics chains some effectiveness criteria can be identified. These include port-logistics chain integration, adaptability to the changes in the environment, customer satisfaction, communication

management, service quality, and resource acquisition e.g. financial, technological and infrastructural. Although these measures are feasible, they are mostly intangible and depend on subjective judgement which is why they are not sufficient for an overall performance evaluation of the port (Song, 2012).

Because of increased competition and shifts in the power of the actors in supply chains, it has become more important for ports to extend their activities toward hinterland and logistics chains (Song, 2012). Ports are central nodes in a supply chain and do not compete as sole entities but as parts of a complete supply chain. Ports, foreland and hinterland should be closely bound together (Notteboom, 2001). The integration of supply chains can bring many potential benefits at strategic, economic and operational level. These benefits have been recognized in the maritime sector (Song, 2012).

Effective ports within logistics chains need port authorities who act as coordinators, facilitators, and integrators in the chains. This means they will need to follow market developments, promote and sustain intermodal transport system, develop strategic relations with supply chain partners, invest in the port community system and cooperate with inland terminals and neighbouring ports (Song, 2012).

Ports should be a link between shipping transport and land transport, e.g. railway or truck. The biggest difference between these two transport modes is the vast capacity of the ships, and this difference has to decrease. This can be done either by having a large amount of trucks and railway carriages in the ports or by storing the goods in the port. The first alternative is only possible in huge ports since it requires a lot of planning. It is also very costly to have the right resources such as trucks available to empty the ship. Instead most ports use storing as a solution when the arrival times of the ships varies and the resources can be used more flexibly (Lumsden, 2006).

3.1.4. Port selection

The issue of port selection, or port choice as it is also called, is widely written about. Slack (1985) established through his research on traffic between North America and Western Europe that decision-makers who choose ports, are more influenced by price and service than by the entry and exit of the port. Murphy, Daley & Dalenberg (1992) conducted a framework for choosing transportation based on the two dimensions: the researched decision and the respondent's role in the process. By the help of univariate and multivariate analyses they show that port choice factors are assessed differently by different participants. Kanafani and Malchow (2001) used a multinomial logit model with distinctions to explain port selection for bulk, foods, fabrics, and manufactured goods. In 2004 the previous authors used an alternative form of discrete choice model to support port choice considering the same commodities, and found the location of the port is of most importance. De Langen (2007) looked into the case of choosing port for cargo to and from Austria, an example of a hinterland. The conclusion was that shippers and forwarders see differences in ports in different regions as more significant than those between ports in the same region. This is because the ports in the same region have the same hinterland infrastructure which opens up for cooperation, or competition between, ports.

According to Tongzon (2007) there are nine key determinants of a successful port and also a logistics hub: port operations efficiency level, cargo handling charges, reliability, port selection

preferences of carriers and shippers, the depth of the navigation channel, adaptability to the changing market environment, landside accessibility, product differentiation, and government role.

Aronietis et al. (2010) have in their article compiled 27 articles that have investigated what factors influence decision makers in port selection. The decision makers in these articles alter between shippers, forwarders, shipping companies and terminal operators. Port authorities and government agencies were also mentioned as influencers. The factors, in order of how many times they were mentioned, are: cost, location, port operations quality/reputation, speed/time, infrastructure/facilities availability, efficiency, frequency of sailings, port information systems, hinterland/intermodal links, and congestion in port. To test this information interviews were conducted. The result was the same as in the literature review. Investments were also viewed as positive, although investments in extra capacity were not always considered advantageous.

The selection of the port is done by the shipping company and is influenced by which clients can be reached. When choosing transportation mode, the forwarder or the sender, sometimes together with the shipping company, makes the decision (Aronietis et. al. 2010).

3.1.5. Discussion

Most of the literature written on ports is about what it is and what it should look like in order to stay competitive. Different kinds of ports have different definitions and meanings but in order to be a part of a supply chain most research show similar success factors. There are no specific theories that only concerns how logistics in ports should be exercised, this was also underlined by an Engineering Logistics lecturer at Lund University. The logistics activities can be performed in different ways depending on different factors such as the surrounding environment. However, a lot of research has been done on which criteria ports need to fulfil in order to stay competitive and to be the choice of a supplier wanting to send goods. This extensive research discusses many factors important when searching for a suitable port working as transhipment for the goods.

3.2. Distribution centre

3.2.1. Definition

Logistics are becoming increasingly crucial to companies in pace with the globalization (Langevin & Riopel, 2005). A distribution centre, or DC as it is commonly named, is different from a warehouse or storage. The latter is focusing on long-term storage of inventory in static warehouses. Nowadays those kinds of warehouses are less common; instead they often provide a variety of capabilities to the supply chain making them distribution centres (Langley et al., 2012). Langevin and Riopel (2005) argue in their book that distribution centres are an area that supply chain management have forgotten about. Often warehouses and distribution centres are used as they are synonyms. Langevin and Riopel (2005) provide a similar description; the difference between a distribution centre and a warehouse is that the first one focuses on movement of the products rather than being a storage as the latter one is. Examples of these movements inside the distribution centre can be sorting or assembling of goods. A distribution centre that is more central to the supply chain is often called a hub (Lumsden, 2006).

3.2.2. Role and function

Langley, Coyle, Gibson and Novack (2012) describes the four primary functions performed in distribution centres: Accumulation of different products, sortation to assemble similar products together for storing, allocation of matching orders to inventory, and assortment, matching orders with multiple products.

Although these are the primary functions, contributing to the success of the distribution centre, other functions and features are needed. Many distribution centres take on additional roles with the purpose of creating more customer value and are viewed as activity centres where space and labour are flexible and can be used for different customer needs such as product labeling and light manufacturing (Langley et al., 2012).

Lumsden (2006) describes almost the same phenomenon but using the name hub instead. The hub and spoke model has its origin in the need of frequent deliveries and creating a sufficient transport service for the shipper as well as helping the sender fulfil its goal to use its resources as efficient as possible. A hub and spoke system can solve the problem of keeping frequent transports to customers while keeping a high resource utilization. According to this model centrally placed hubs are used for sorting and assembling different goods for the needs of the surrounding regions. The hub is used to interconnect produced units through spokes, direct transportation. The goods are thereby drawn together to the hub where it is sorted and put together with other units. This system creates an effective flow of goods by letting them pass through a central hub. The goods are unloaded, sorted, stored, and then processed and finally loaded together with other goods for transportation to the receiver.

A distribution centre can serve as transhipment. As the word unveils it refers to taking goods from one transportation mode, for example a vessel, and loading them onto another, for example a truck. This is one of the most important parts of the hub and spoke model, as earlier has been described. The studies on transhipment often regard environmental issues in different forms. The performance of the distribution centres can be measured with the measures used on warehouses such as KPI or as a part of the supply chain as with the balanced scorecard (Langevin & Riopel, 2005).

According to Langley et al. (2012) a distribution centre can help a company overcome several challenges they might face. It can help balance supply and demand with inventory to consequently protect against uncertainty and forecast errors. Economies of scale in both purchasing quantities and transportation are another benefit with DCs. A DC can also support production requirements if for example a product needs to age or ripen before being sold. Other advantages include enhanced customer service by helping supply chains create time- and place utility i.e. having goods available when and where customers need them.

By positioning goods in a distribution centre in production- and market-facing positions, the goods can be accessible whenever they are needed. This will result in shorter lead times, increased product availability and decreased delivery cost that increases effectiveness and efficiency of the supply chain (Langley et al., 2012).

3.2.3. Facility location

The area of facility location is the concept dealing with where to place your facilities and is of course of importance to this study. It is substantially covered and the articles use models similar to these in port selection, using mathematics. Multiple criteria decision making methods, mathematical programming, heuristics, and weight factor analysis methods are examples of models used to solve the problem of facility location and various fuzzy approaches to select location (Chen, 2001; Beasley, 1993.). Melo, Nickel and Saldanha-da-Gama (2008) have written a thorough review of the concept of facility location models within supply chain management. They stress the fact that it is impossible to go through all literature associated with supply chain and facility location. The paper identifies basic features the models need to cover to support the decision-making of the location. A problem of this kind involves customers and facilities to serve their demands and parameters such as costs and changing demands. They conclude that most location models are cost-oriented and that the models available still needs to be improved. The solutions and models used in this specific area of theory are of no further use to us, as we are not even acquainted with this advanced mathematics.

An extensive article by Oum and Park (2004) includes an overview of knowledge with articles from 1975 and forward connected to our concept. They claim that the problems of locating a distribution centre have been given too little attention; Oum and Park (2004) base their literature review on closely related topics such as selection of location of manufacturing facilities, subsidiaries or R&D. They claim it is believed that there is a link between these topics and the location of distribution centres. Earlier research have analysed the selection of host countries and the factor determinants were: market size, economic growth, labour costs, geographical proximity to host countries, government policies towards FDI, location advantage in logistics, host country infrastructure, technological capability of the host country, cultural distance, and labour unions. Regions have also been studied and the factors here were: market demand, labour market quality, and capacity of infrastructure, mainly transport, industry cluster, and once again government incentives towards FDI. Other studies mentioned in their review concluded that low corporate tax, skilled manpower, market size, market growth rate, and government policies towards FDI were the decision factors. On the contrary, low levels of investment in Japan were not because of poor location but high invisible costs in the form of cultural differences (Oum & Park, 2004).

DCs today are close to impossible to relocate in the short term due to huge investments and it is therefore vital that the centre is located at the right place in order for the supply chain to be efficient. Langevin and Riopel (2005) describe and discuss facility location models, similar to the ones earlier mentioned solved by algebra. There are three distinguished trends in supply chain management that have affected distribution centres since the 80s: Reduction of warehouses, focus on the flow of products and increased outsourcing of activities connected to the facilities.

3.2.4. Discussion

Distribution centres are important parts of a supply chain. The nature and demand and supply of steel is relatively stable and seen in a long term, compared to for example smartphones. Combined with the fact that the facility will be providing more services than just storage, the facility in the study is named distribution centre. The decision to use this article by Oum and Park (2004) as one of the main sources for the topic of DCs and location was based on it being a

well-cited article (99 times) and the paper's very thorough literature review. Unfortunately the empirical data and result of the study was dealing with where to place a distribution centre in Asia and was therefore not useful to us. Langley et al (2012) and Lumsden (2006) were suggested by a professor in supply chain management and gave a sufficient description of DCs. The book by Langevin and Riopol (2005) complemented the area with further aspects on logistics and the role of distribution centres as it discuss and review many other studies.

The findings in the literature match our early interviews with the steel companies. Thus we find it sufficient to base a framework on as it is a sign that the findings and interviews are correct and important to the study.

3.3. Steel

3.3.1. Definition

World Steel Association (2015) describes steel as:

"*Steel is an alloy of iron and carbon containing less than 2% carbon and 1% manganese and small amounts of silicon, phosphorus, sulphur and oxygen. Steel is the world's most important engineering and construction material. It is used in every aspect of our lives; in cars and construction products, refrigerators and washing machines, cargo ships and surgical scalpels*."

Steel today is mainly produced through two methods; integrated (blast furnace and basic oxygen furnace (BF/BOF) or electric arc furnace (EAF). The first one uses both scrap metal and raw materials to make steel, whereas the electric arc furnace method uses scrap metal alone. The second one is easier and faster. There are still other methods, but the use of them is declining year by year. Steel is completely recyclable, have great durability and the energy it takes to produce steel is relatively low. Steel is therefore considered environmentally friendly according to the World Steel Association. Today there are more than 3 500 different sorts of steel, all with their special purpose (World Steel Association, 2015).

3.3.2. Supply and demand

The global steel market is estimated to grow from 1.4 billion tonnes in 2011 to 2.3 billion tonnes in 2025. The demand is however slowing down much due to the stagnating demand in China and the small demand growth in developed countries (OECD, 2012). According to the Swedish steel association, Jernkontoret, the global production of crude steel precisely reached an all-time high in 2014. This increase is mainly seen in the U.S. China on the other hand, whose production during the 2000s grew six fold, has due to a weaker economic development not increased their production of steel in 2014. The country is trying to move from export and investments to become more driven by consumption. In addition, their property market is also slowing down. China is in fact the biggest sole explanation to the weak global market for steel even if the following of the financial crisis can still be seen. Disturbances such as the one in for example Ukraine also have an impact on the steel industry (Jernkontoret, 2014).

Ernst & Young (2014) concludes in their report that excess capacity will be the biggest threat to the steel industry. Smaller threats are the increasing age of steel mills with the need of maintenance, rising labour costs, and lower productivity due to aging steel plants. Consumption of steel has for several years been below production and below total capacity by far. In order for the profit margin of the industry to reach a sustainable level, 300 million tonnes of capacity

needs to be cut permanently. This might however be difficult due to governmental actions to retain employment in the regarding countries. Demand is continuously shifting from developed countries to the BRIC countries (Brazil, Russia, India and China) and also later to Africa. The latter might notably increase demand in the coming years, possibly creating a shift in the industry.

Ernst & Young (2014) claim the steel markets that indicates growth in demand are infrastructure, construction, and oil and gas. OECD (2012) claims similar opinions, the increase in demand will be found in the sectors of construction of buildings and infrastructure in emerging countries, mechanical engineering, and pipelines and tubes.

As economies mature the peak in consumption declines. China's steel is forecasted to reach its peak in 2020. Steel producers can increase their competitiveness by creating a niche in higher-value markets and larger steel producers have a larger opportunity to enter other geographic markets due to lower freight rates. Relationships in the higher-value markets are a key, but major actors in the higher-value markets already have established relationships. The largest producers in China will benefit from the intensification of the competition as producers with old technology and high-cost production will not survive. This gives the top producers a higher chance of improvement both in cost and quality, and both in China and globally (Ernst & Young, 2014).

To survive competition some steel producers have innovated value-added solutions, such as steel with anti-graffiti and -corrosion coatings to increase margins (Ernst & Young, 2014).

A major challenge for the industry is to increase its sustainability. The steel industry is the largest industrial emitter of CO2 and second largest user of energy. Another challenge according to OECD (2012) will be to ensure fair competition between private and state-owned enterprises.

Laplace Conseil, a metal and mining consultant, made a report on steel companies and profitability. They conclude that generic strategies for steel producers have not worked. Neither moving to growing demand markets, increasing high value added goods, growing by mergers and acquisitions, or integrating upstream into mining have not lead to a higher result. There is however three factors that separates the most profitable companies from the less profitable. Authenticity, which translates into actions not only empty words, commitment seems to be the key. These companies are genuinely devoted to new ideas, research and adapting to new technology. They are committed to their customers and employees and are staying close to them (Laplace Conseil, 2013).

3.3.3. The steel industry in research papers

The main subject, and issue, in steel literature today is sustainability which is evident by just searching "the steel industry" in engines such as Google Scholar or ScienceDirect and choosing the latest years. The steel production has been growing and is one of the biggest industries when it comes to energy consumption (OECD, 2012; XU & Chang, 2010; Hasanbeigi, Price, Chunxia, Aden, Xiuping & Fangqin, 2013). Yellishetty, Mudd, Ranjith and Tharumarajah (2011) claims steel is still the world's most used and recycled metal but still suggest a higher use of scrap metal in the production of steel to prevent more damage on the environment. To use EAF instead of BOF will not only be more sustainable due to recycling but the process also consumes less energy. 2010 the same authors proposed streamlining the flow of materials to contribute to the

sustainability until there are breakthroughs in production technology (Yellishetty, Ranjith & Tharumarajah, 2010). Hasanbeigi, Price, Chunxia, Aden, Xiuping and Fangqin (2013) concludes that it is difficult to compare energy intensity in different countries and that communication between countries in terms of research, in this case the U.S. and China, will be beneficial to both sides. Gielen and Moriguchi (2002) argue that even though there are many studies analysing emissions reduction within the industry neglects the economic consequences of the emission reduction. Their model shows that taxes will make the reduction of emissions increase and therefore contribute to sustainable development. Their specific case is Japan. With a global tax on emissions the impact on Japan's competitive position is limited, though there is a significant disadvantageous change to Japan with loss of production if only Japan and Europe adapt the taxes. According to the authors, an import tax can compensate the loss.

As the topic being most researched today is about sustainable development and not closely connected to either of our purposes a further description of the literature and methods is excessive.

3.3.4. Measuring steel demand

Unless there is a demand for steel in the focused on market there will be no trade and the framework is unnecessary. Therefore it is essential to be able to measure the demand in a proper way. World Steel Association (WSA) has published *Steel Statistical Yearbook 2014* that presents different statistics of the steel industry.

We will investigate if there is a sufficient demand for steel in our concerning market. It is of course important to see the current demand but to get a better picture of the demand and how it fluctuates over a period we need to look at the consumption of the past years; we chose to look back ten years. This is enough data to give us an adequate picture of the existing demand right now and also lets us estimate the future demand.

Demand for steel, according to WSA, is defined as *"the quantity of steel products that users are willing and able to buy at a given price over a given period in a certain country/region"*. WSA has developed different methods of measuring steel demand. The concept we have chosen allows us to measure the amount of steel required to meet the region's daily needs, the true steel use (TSU). TSU is expressed in volume terms as deliveries minus net exports of steel industry goods plus net indirect imports. TSU also considers the trade of steel embedded in cars, ships, machines, and other products called indirect trade. If for example country A uses one tonne of steel producing a car and then sells it to country B, country A's TSU will remain the same while the TSU in country B will increase by one tonne (World Steel Association, 2012).

3.3.5. Discussion

The steel industry is under hard pressure. The two most crucial difficulties are the lack of demand in relation to the capacity and the concern for environmental impact caused by the industry. These are fundamental issues that require attention. A demand is elementary for all products and services in market economies. A discovery or an invention of a material more environmentally friendly and cheaper than steel could be devastating. These are the huge problems the industry deals with daily, and it is evident in the literature and all currently being written about steel.

3.4. Impediments to trade

Even though there are the right presumptions for business there are other impediments that influence the decision, which is why we think it is necessary to clarify this. The first impediment is trade barriers which include for instance tariffs and import quotas. The second one is culture which is a form of a trade barrier, but since it differs from the others it is presented alone.

3.4.1. Trade barriers

International trade is an important part of our society. World Trade Organization, WTO, is the authority contributing and supporting free trade all over the world. However, free trade is not always seen as an advantage for all parties (OECD, 2010).

Trade barriers are tools used by governments or other public authorities to prevent, restrict or limit international trade and investment through tariffs and practices. The point is to give domestic companies a leading edge compared to foreign companies. Trade restrictions have due to globalization increased in significance. However, international trade liberalization has meanwhile reduced import restrictions and tariffs. Trade barriers can be both legal and illegal depending on their setup (Ministry of Foreign Affairs of Denmark, n.d.).

There are several reasons tariffs are used. A higher import means less domestic goods, which can lead to less domestic employment. Developing countries may use it so their infant companies get a chance to establish themselves without superior competition from foreign incumbents. Developed countries may on the other hand protect the domestic industries they view as strategically vital for their country. One example of this is the United States protection of its defence industry. The trade barriers can be monetary such as tariffs but also non-monetary such as import quotas or licensing. Easily explained, trade barriers favour producers and disfavours consumers (Investopedia, n.d.).

The level of free trade of raw materials is influencing the health of the world steel industry claims OECD (2010). Only a few countries are self-sufficient in the raw materials required for steel production. There are countries with export restrictions of these materials such as prohibitions and taxes. For example, to keep scrap metal in the country, an export tax is applied. Export restrictions have two implications in the market. The domestic supply increase and the domestic prices decrease while international prices raise and the importers' production cost raises. Moreover it creates uncertainty in the market as the restrictions change rapidly and consequently make it difficult to estimate costs of material due to price volatility. In addition, export restrictions not only affect the market of raw materials but every industry and product and long-term investment involving steel is affected. According to OECD (2010), WTO has received questions regarding the consistency between export restrictions on raw materials and international trade rules.

3.4.2. Culture

Even though both a demand and supply exists and there are no other significant trade barriers there might still be obstacles hindering trade between two countries, culture could be one reason. Hofstede has done extensive research on culture and defines culture in his article *Culture and Organizations* from 1980 as:

"Culture is the collective programming of the human mind that distinguishes the members of one human group from those of another. Culture, in this sense, is a system of collectively held values"(p.24).

If two parties cannot get along because of cultural differences they might seek another business partner. Differences in culture is well-known as well as the problems that might occur. Research involves both why and how culture can be a barrier when doing business as well as how to get past the cultural barriers.

Barkema, Bell and Pennings (1996) argue that firms entering new global markets have to face various cultural adjustment costs, especially when they are facing both corporate and national cultures. However, results from their study also showed that cultural barriers were also reduced through learning. When starting a new venture the firm will benefit from previous experience of expansion in that country, as well as if it is in a country with similar culture. Whether or not a firm is willing to bear the initial costs for future gains through learning is linked to the long-term strategy of the firm.

Higgs (1995) has also studied the globalization of businesses and to overcome the problems with cultural differences he suggests that firms need to develop effective international management teams. This will enable firms to think more about cross-cultural issues and valuing the benefits of diversity in international teams. McDermott & O'Dell (1997) agrees and states that overcoming these cultural barriers has to do with how you design and implement your knowledge management effort rather than changing your culture. You have to balance visible (values, philosophy and mission) and invisible (unspoken set of core values) dimensions of culture and find knowledge sharing networks and build on these.

4. Empirical data

The empirical data of this study is interviews. The interviews are presented in a chronological order, which explains the different levels of them.

4.1. Interviews

4.1.1. Steel companies

To understand the steel industry, some players in the Swedish market were contacted by phone or by mail with the intention to understand what they think are important considering steel and logistics. The five respondents defined themselves as least one of the following: steel producer, distributor or buyer. Here is a compilation of the answers:

The companies were players in from two countries up to 50 ones, all present in the Swedish market. The steel is transported with vessels, train or truck and one respondent claims the choice depends on the supplier. Some said vessels before train and truck, other said the opposite. The most important factor when buying steel was either quality or price. Other factors often mentioned were logistics, followed by laws and regulation of the supplier, and lead time.

All of the companies have some kind of a warehouse or distribution centre. The shape of these varied, for example one had one central warehouse and one distribution centre while another one had them placed on different locations and could reach all their customers in 24 hours.

The question "What factors are important when placing a distribution centre/inventory?" received similar answers. Closeness to the customer and good logistics/easy transportation were mentioned by all. Two respondents explained that the distribution centres and warehouses were placed and built a long time ago and due to significant investments difficult to move to another place. One highlighted the issue of sustainability and the centres should be close to a port or a railway. They do however, according to them, unfortunately need to use not-fully loaded trucks, implying that the option is not as sustainable as vessels or trains.

4.1.2. Port of Antwerp

In order for us to get a better understanding of how a port can attract steel companies we contacted the Port of Antwerp in Belgium which is the biggest port in Europe for transhipment of steel. The questions were answered by mail by Wim Dillen, Senior Business Development Manager- Marketing, promotion & commercial relations in the Port of Antwerp.

The steel is transported from all around the world to the Port of Antwerp and a large part of the volumes are imported by international trading companies while another part of it is controlled by the steel producers themselves. Major origins of imported steel are countries like China, India, Russia, and Ukraine. In the Port of Antwerp the unloading of the steel of the vessels are performed by terminal operators, which are private companies who rent land from the port authority on a long-term basis to perform their logistic activities. The organization, responsibility and cost of transport to final customer depend on the contractual agreements between buyer and seller. There is ample place to store steel in either covered or uncovered areas.

An ideal steel terminal has at least about 800-1000 meters of quay length and the terminal should also be sufficiently deep, about 300-500 meters. In other words around 0.35 km^2. The terminal

should be big enough to store products without disturbing the normal quay operations for loading and unloading vessels.

Some ports have steel producing companies inside the port area, Genth and Dunkirk have an Arcelor Mittal plant, and Amsterdam a Tata-mill. The Port of Antwerp has no such thing, however, it has many logistic service providers who are specialized in steel logistics, and also many steel traders have their offices in Antwerp. Antwerp has 17 break bulk terminals, all of which handle steel, and Antwerp handles steel of almost all known steel producers today, including but not limited to Arcelor Mittal, Thyssen Krupp, Vallourec, Salzgitter, Tata, Voest Alpine, Erdemir, Baosteel, Essar etc. The Port of Antwerp has so called steel service centres that are adding value to the steel by pre-treatment of the product. Antwerp has the processing possibilities of e.g. de-coiling, cut-to-length, slitting, sand-blasting, oxy-plasma-cutting, and sawing.

In order for a port to be a place for a distribution centre for steel it first of all need proximity and connectivity to the markets. The first since it decreases the logistic costs and transit-times. However, it is not only important to be close to those markets, one also has to have excellent connections to reach them. This is something that the ports can affect themselves and is something that has enabled Antwerp to hold a unique leadership position. No other port connects to overseas markets like Antwerp does. With over 230 regular liner-sailings per month it has about 8 times as much as their main competitors. At the same time they offer excellent hinterland trimodal connections to and from all major industrial and consumption areas of North Western Europe.

Apart from the factors already mentioned, the Port of Antwerp has become so successful in attracting steel companies since they also possesses unmatched expertise and skills of their labour-force together with a can-do-mentality, all of which resulting in high productivity. On top of that they boast the lowest claim-ratio in the Hamburg- Le Havre range. To underline this there is an example of a vessel a while ago with 38.000 tonnes of steel cargo from India that was unloaded in less than 48 hours. In any other port it would probably have taken two to three times as long.

4.1.3. Shougang

Present at this interview were Xia Chunxue, Deputy Director of manufacturing department and cold rolled products department, and Zhu Yuqiu, Vice Director of Marketing Department, both representing Shougang. Present were also Qin Yueyi and Chai Zhiyong, Vice-General Manager, from Shougang International.

The most significant feature of the Chinese steel market today is the very well-known overcapacity. The capacity in China is 1.1 billion tonnes, while the actual production is 800,000 million tonnes. The domestic demand is 720,000 tonnes. The demand is declining and is lower than the supply, which means that prices are declining and the Chinese steel companies need to look for overseas markets, according to Shougang. As long as there is a demand for steel somewhere, Chinese steel producers will export there. China is today exporting to Asia, Middle East, North America, EU, Russia, and some to Africa. When it comes to the Baltic Sea Region Shougang exports a small amount there, e.g. to the Danish windmill company Vestas. The disadvantages of selling to the Baltic Sea Region consists e.g. of cultural differences and the

geographic location, argues Shougang. Compared to steel from other countries, there are not any specifically benefits with Chinese steel. For example, Russia has better quality and Turkey has middle and lower quality but both these countries have a better geographic location. The costs are therefore higher for Chinese steel companies and since the price of steel fluctuates from day to day, the price is likely to change from the shipping day to the arrival day.

Shougang sees three different solutions to the problem of overcapacity in China. First of all Chinese steel companies need to control the production and avoid price competition. Second, China can do various macro controls on a country level. Lastly, they can look for international markets.

Shougang claims steel is very important to China. Shougang explains since China is growing fast, other countries may not accept China. Therefore they wish to change the general reputation of Chinese steel in the world. They want to change it to higher technology, higher quality and lower cost.

Shougang exports about 300.000 tonnes of steel to Europe, which is 20% of all exports. To the United States they export around 90.000 tonnes and to Mexico about the same amount. They mostly know about its geographic location and about some companies who uses steel in their products. There are however changeable factors that could be beneficial for them compared to local companies in the Baltic Sea Region, e.g. if the rate is stable.

Four major obstacles of selling abroad are mentioned by Shougang. These obstacles are trade barriers, technical barriers, tariffs and compulsory inspections. It can also be difficult when other countries increase import taxes so Chinese companies cannot enter. Moreover, they identified four problems they need to solve in order to start selling to the Baltic Sea Region market. The first one is that they need to identify the total demand of the market. Second is that the criteria of the products may need to fulfil EU standard. Third is the cost of transportation and the production. Forth are different economic factors, culture, and location.

Shougang sees positively on the solution of having a distribution centre, and even though they do not have it yet, they think it could be a very good solution in the future. They think it is necessary that it is possible for the distribution centre to be able to conduct the following services; in-ward processing, warehousing, logistics, sales and info collection. The placement of a distribution centre should be close to where the end-customers are. For example near a car company if they export car plates.

Shougang further explains an important factor for a port is its closeness to customers, i.e. its geographic location. And if the port should be a good place handling steel, it needs to provide support and comprehensive service facilities.

The relative quality of Chinese steel varies depending on which country you compare it to. It has higher quality than for example India provides, but lower quality compared to Japanese and South Korean steel. In Shougang they manufacture all different kinds of steel on their different sites, except stainless steel. What type of steel different customers are requesting is difficult to say since the same customers and have different requirements when it comes to costs, quality etc.

Shougang has not done market research on the Baltic Sea Region; instead they focus on South-East Asia, South Korea, other parts of Europe, America and Middle East which are their major international markets today. Their strategic plans stretch 3 years short-term and 5 years long-term. Expanding towards the Baltic Sea Region is not in their strategic plans as they feel that that they need to do their market research first.

Shougang is working hard with CSR mentioning ISO 14001, which is an international accepted standard, and that emission in China are better than EU standard. For example they work with circular economy where lots of wastes are recycled and they are ready to push this even further.

4.1.4. NISCO

The interview was held in Nanjing in NISCO's office with Zhu Ping, Deputy General Manager, Liu Changliang, Strategic Development Department Director and one of the sales managers.

NISCO describes in general terms the supply is bigger than the demand in China which means the prices will decrease. The price of steel, however, fluctuates a lot, going up and down. The reason for this is the price for iron ore which China uses 1.1 billion tonnes of in one year. The daily iron ore need in China is 3.74 million tonnes and NICSO have a stock of 97 million tonnes in their port, which represents one month's stock.

NISCO mostly sell their steel in the domestic market, around 90%, and the rest is sold abroad to e.g. Great Britain, India, Indonesia, UAE, New Zealand, Ghana, Greece, and also the company Vestas in Denmark. In the EU they see several opportunities and they already have an office in Italy. The see their decreasing domestic market as a potential reason to move their operations to Northern Europe. However, they do not believe there is much construction in the market, except some pipelines and wind power. There are also different problems with shipping steel to Europe. It costs 40 US dollar per tonne steel shipping. But more importantly the shipping takes 40 day to transport from China to Europe, so it will be a gamble since the market change. Therefore forecasting is the biggest problem. As the GDP and market demand in China is going down as well as NISCO's CPI, they are looking to sell through agents instead of directly to the end customers, which is according to them quite uncommon.

They see the excess capacity as a trail of the slowing demand in China as a problem. In the whole steel industry only 70-80% is sold. However, NISCO is almost selling 100%. The solution to this problem is to a higher extent use R&D to develop new products, add value to old products by adding service, and to look for big customers.

NISCO feel that the establishment of a distribution centre depends on the market. If there is no or a small demand, there will be no need for a distribution centre. They could be able to provide the Baltic Sea Region with steel in different forms, e.g. plates, off-shore plates, pipes, and bridges in the future. NISCO is leading in bridge steel construction and has built the bridge between Hong Kong and Macao.

While mentioning the reputation of Chinese steel, NISCO is stating that China is a large place with not only mass production and but also high quality products. They claim the price advantage and great facilities as the advantages with Chinese steel.

Their plans for international sales stretch 5 years, but each year they are doing small adjustments. Around 70% of NISCO's customers are a long-term cooperation. However, affected by the economic situation even the demand for these customers is decreasing.

In China pollution are regulated by the government and if it is not sufficient and fails to fulfil the requirements, the company is shut down. This means more motivation for sustainability which leads to more competitiveness. This is a very important matter for NISCO, they look to the environmental sustainability first, and when that is done they can concentrate on quality, which is their focus now.

4.1.5. The stainless steel company

A stainless steel company's Technical Manager was interviewed. The company does not want their name included; it will be referred to as "the stainless steel company".

According to the Technical Manager, the stainless steel company is the second or third largest stainless steel company in the world. It operates in Spain, South Africa, USA, and Malaysia, and on different locations over the world they also have service centres. The service centre in Malmö serves Scandinavia, the Baltic countries, and Ukraine. The steel comes to Malmö in coils, sheets and plates and then the stainless steel company cuts it and sells it to end-users or wholesalers.

The difference between ordinary steel and stainless steel is the 8-10% of nickel you add. Nickel is expensive and stainless steel has the same functions as ordinary steel except it tolerates rougher environments, such as chemical technical environment. Stainless steel usually does not compete with ordinary steel since you use stainless steel in areas where ordinary steel is not good enough, it depends on the environment. Stainless steel is about five times more expensive than ordinary steel.

When choosing a place to put you distribution centre for steel it is important to locate the distribution centre close to the water and a port. The centre should also be close to rail and roads. The stainless steel company also chose a place that was good for serving the North European market which is why they ended up in Malmö.

The steel is transported by ship in either containers or break bulk to Malmö where the steel is unloaded by the stainless steel company's employees in Malmö harbour if it is delivered in containers otherwise CMP handles the unloading and also make a damage control. Then they use mafi-trailers, long trailers that can carry very heavy weights, to transport the steel the short distance from the port to the stainless steel company's service centre. The mafi-trailers can carry 60-70 tonnes and it takes 2-3 minutes. After the ship is unloaded it will continue with the remaining cargo to another service centre in Poland. If the ships would only have been shipped to Malmö and would not have continued to Poland, it would probably have been cheaper to freight the steel in containers instead of using break bulk as well. Whether to use container or not depends on the shipping price.

The stainless steel company only uses trucks when transporting the steel from the service centre, sometimes in containers. If the steel is to be transported to the Baltics, it is transported by truck to a port on the Swedish east coast, for example Karlshamn and then by ship to the Baltics. Since steel is very heavy, the ports need to have the right resources, above all the right cranes

and vehicles that can carry the coils that weigh 20-25 tonnes. The port should also be deep enough to be able to handle the deep ships.

The stainless steel company established themselves in Malmö in 2001. One man had been selling to Scandinavia and when the business expanded, more sellers were hired and they had one storage on the West coast. That is why they started to search for a port to set up a distribution centre in to serve this market and that is how the cooperation with CMP started. The stainless steel company owns the land themselves where they have placed their distribution centre. From here they can reach the whole Baltic Sea Region. Russia and Poland have grown and consequently have their own DCs. The location is excellent and the cooperation with CMP has been working very well, according to the respondent.

The stainless steel market suffered a lot from the Global financial crisis in 2008. The demand decreased in the Baltic Sea Region and the stainless steel company had to reorganize themselves. However, the economy has started to recover and people buy new washing machines etc. Since the economy has started to grow again, the stainless steel company is hoping for a steady and slow development which they think would be most beneficial for the stainless steel market. Ordinary steel, just as stainless steel, follow the same pattern which depends on the general economy. However, there are still worries about what will happen in Ukraine with Russia.

Shipping steel from Spain to Malmö takes 7-8 days depending on the weather, and 3-4 weeks lead time from shipping until it reaches the end-customer. If shipped from South Africa the lead time will be even longer. Today the stainless steel company does not have much storage in Malmö so customers can not order today and receive it the next day. But since they have big contracts with many of their customers, the forecasting is not such a huge problem since they already know the demand. The new regulations about emissions in the Baltic Sea affect the stainless steel company since forwarders add costs to the freights.

The stainless steel company sees the location, close to the water and the market, as the biggest advantage of being in Malmö. Even though some other ports like Antwerp has less loading/unloading costs the goods has to be transported to the Baltic Sea Region and then the costs will increase and there will be a bigger risk for damages. Ports like the ones in Helsingborg and Gothenburg is further up north which means a longer transportation distances for the stainless steel company. They also have a close relationship with CMP and everything today is very fast and effective, everyone knows what to do. Before they had a lot of meetings but because of the learning curve that is not so important anymore, and to have regular meeting very often is not equally important anymore.

The stainless steel company also argues that an ordinary steel company would have the same advantages of being placed here as they have i.e. closeness to big roads, close to a good port with good resources.

5. Framework

Below follows the explanation and ensuring of the framework, also presented, created by the knowledge in our literature review and the empirical data in form of interviews.

5.1. Explanation

The theory and empirical data presented above has been compiled into a framework. This framework aims to highlight the factors that are important when placing a distribution centre for steel. The motivations behind the different factors are all collected from the literature and interviews and an explanation of this is entailed in this following sector.

First of all, it is a necessity that there is a demand for steel in the chosen market. This is something straight forward. Both Shougang and NISCO did also tell us that this is a condition, for them as steel producers, to consider a strategic move. This is however a situation that regards all products and all markets worldwide.

Supply chains and logistics have often been mentioned in our collected data. Earlier, ports acted merely as a place between water and land but nowadays it is a significant part of a supply chain and logistic system according to Song (2012). Roh et al. (2007), Pettit and Beresford (2009), Notteboom (2001), and Langevin and Riopel (2005) have all discussed the importance of supply chain performance and development in order for ports to be successful. Therefore we conclude that the port's integration in the supply chain is a factor in the framework. Moreover the port should be more than a place in terms in form of cooperation and relationship building, as mentioned by the Technical Manager of the stainless steel company.

As this model implies that the steel will be moved, transport, and hinterland infrastructure is crucial. Roh et al. (2007), Song (2012), Lumsden (2006), Aronietis et al. (2010), and the Technical Manager of the stainless steel company have all pointed out the importance of this. Moreover, Dillen of the Port of Antwerp claimed it to be one of the major factors contributing to their leading position. Hence, transport and hinterland connections are another part of our framework.

From our research, location has for several reasons turned out to be a substantial factor, which moreover is visible already in our purpose. Different authors have mentioned different reasons why location is a substantial factor. Kanafani and Malchow (2004) declared the location of the port to be the most vital of all factors when selecting a port. Aronietis et al (2010), Oum and Park (2004), and Tongzon (2007) also talked about location as one of the most significant variable. The location of the distributions centre has also been covered in the literature by Langley et al. (2012) and from our empirical research by various Swedish steel companies, the Technical Manager of the stainless steel company, and Dillen of the Port of Antwerp, stating that the distribution centre should be close to customers, proximity and connectivity to markets, and access good logistics and transport solutions. Oum and Park (2004) also adds location-specific factors e.g. cheap labour costs, economic growth, and good infrastructure, that determines the best location of the distribution centre. As most literature confirms, location is a crucial element. The Technical Manager also included that the distance between the quay and the distribution centre should be limited. This is also stressed by Lumsden (2006); the storage should be situated close to the quay to make the turnaround time shorter.

As the price of steel fluctuates daily and the market changes as described by Shougang and NISCO, long lead-times are a disadvantage and will be a factor of the framework.

There are several elements a port needs to be well-functioning. It should be able to provide fast load and unload of cargoes as both Roh (2007) and Lumsden (2006) establishes as well as Dillen of the Port of Antwerp claims to be one of their strengths in dealing with steel. The Technical Manager of the stainless steel company stresses that what before took three days regarding unloading now takes half the time when the port's staff does it. Lumsden (2006) and Dillen stresses the need for space in the port. Considering the good of our research is a big and heavy one, space becomes even more fundamental. Depth and length of the terminal has been mentioned as necessary variables by Dillen and Tongzon (2007). Finally Lumsden (2006) talks about having the right resources in a port e.g. trucks, necessary to have a well-operated port.

As culture and trade barriers can be obstacles as described not only by literature but also by Shougang, the Technical Manager of the stainless steel company, and by Oum and Park (2004) and are common to all kinds of businesses, these will be a part of the framework. Moreover, as the steel industry's impact on the environment is in focus, this will also be included.

We will take these different factors and rank them by giving them different priorities. The framework will function by looking at the different priorities one after another. First evaluate whether the first priority factor can be fulfilled. If that is the case you can continue to the second and third priorities. In this way you will be able to get an overview of whether the chosen location can be a satisfactory place to set up a distribution centre or not, depending on how well the different factors are fulfilled. All the factors of the framework will directly or indirectly relate to either a lower cost or a higher income. The framework can be used for a producer when a port and a market have been selected. For instance two ports can be compared.

The framework has different level of details. Some priorities are hands-on and easy to answer with a short sentence. Some other priorities need more of a discussion and reasoning behind them. This is because not all aspects can be measured by numbers and a simple yes or no, such as if the water is deep enough. The priorities regarding more invisible and intangible resources need reflection. For example the priority about promoting long-term relationship. This is obviously not something that is possible to know beforehand and therefore requires a discussion about the possibilities. Moreover, some priorities are easily connected to the port's resources and capabilities whereas some are not as simply affected by the port. For instance, it is easy for the port to purchase cranes, but more difficult to affect the hinterland infrastructure or trade barriers. The first factor and priority is impossible for the port to affect but needs to be included. However they are all important factors for the steel producers in whatever level the port can provide.

5.2. The framework

First priority:

1. *The chosen market should have a demand for steel.*
- *It is a necessity that the chosen market has a will to buy and use steel.*

Second priorities:

2. The port should be located close to the market.

- *The closeness depends on how heavy the steel is and how much it costs to transport the goods to the market.*

3. The port should have adequate transport system and hinterland connections.

- *This includes transport by ship, rail or truck depending on the products, time pressure to deliver, and the price of the transport. A short distance to these systems decreases the cost of extra transport between the DC and the next transportation mode.*

4. The quay should have sufficient depth of the water for the vessels transporting steel.

- *The ship transporting steel needs a minimum (depending on the ship type) depth of the water in order for the ships to unload.*

5. The location of the distribution centre should be close to the quay.

- *To prevent costs and complications concerning the transport of the heavy and clunky steel from the vessel to the distribution centre, this distance should be as short as possible, this is extra important for steel which is heavy and costly to transport.*

6. In order to fulfil different customer needs the port needs to have sufficient capacity in terms of free space and extra resources.

- *The capacity to unload a big volume of steel, the capacity of being able to expand and having the capacity to be flexible.*

7. The port should have the right tangible resources.

- *Right tangible resources include cranes and vehicles, which can carry the heavy steel.*

8. Due to the environmental concerns in the steel industry, the port should contribute and support sustainability.

- *The issue of sustainability is one of the major concerns in the steel industry and if the port could provide transportation solutions and other services with less impact on the environment it is beneficial.*

Third priorities:

9. The port should develop and integrate the supply chain and consequently the logistics system of the port's activities.

- *The port should work towards creating a more efficient supply chain e.g. by avoiding unnecessary reloading of goods.*

10. Lead times from producer to end-customer should be as short as possible, the shorter the distance the more advantage you have.

- *The price of steel fluctuates a lot which can be a problem if there are long lead times. The producers need long contracts with customers in order to know the demand in advance.*

11. The port should support the overcoming of potential cultural differences between the supplier and the market.

- *The port acts as a link between the buyer and supplier and should ensure these differences do not ruin the business.*

12. The port's location should minimize trade barriers between the supplier and the market.

- *If there are certain tariffs and suchlike in a certain region where the port is situated this could be an impediment to trade.*

13. The port should support the steel producer to a long-term relationship.

- *As the investment of a distribution centre will be significant and because long-term contracts are important in the steel industry the port should support this kind of relationship.*

5.3. Ensuring the framework

In order for us to ensure that this is a framework that can be used as a help for ports and companies, we sent it to different experts. We asked them to give their opinions about it based on their knowledge and expertise. We sent the framework to two experts in logistics, one expert in ports, and one expert in steel. The two experts in logistics are both working at Lund University. The first one, Sebastian Pashaei, says the framework is general, but sufficient to be a framework. The second one, Ulf Paulsson, had more opinions and gave four concrete proposals that he suggested us to include in our framework in one way or another. The first one was capacity, e.g. high capacity when unloading the steel making the process from the ship to the distribution centre faster. The second one was flexibility, e.g. is there only one wharf in the port that is suitable for the unloading of the steel or is there many. Third, possible to expand, e.g. can the port handle an increase in the steel volumes, e.g. double the volumes in five years. Vulnerability, what disturbances and discontinuances are there? Are there any backup plans if things would go wrong?

After considering these suggestions and opinions we decided to add "capacity" by integrating Paulsson's first, second and third suggestion, where capacity will involve all kinds of capacity including the ability to unload a lot of steel, the capacity to be able to expand and having the capacity to be flexible. Since this is a point that involves many different things that are also very important we decided to put it in the second priority group. We decided not to include the last factor Paulsson suggested, vulnerability, since this is not something that has occurred in our theoretical and empirical research, which is way we do not believe vulnerability is crucial to add.

The expert in ports was Lars Andersson from Sjöfartstidningen, who also checked with his colleagues before giving their thoughts of the framework. Sjöfartstidningen is an independent paper about maritime shipping from a Nordic perspective. Andersson said that he and his colleagues thought it was a substantial suggestion to a framework and that they did not have any critical suggestions only a few comments. First of all they thought we should prioritize "the right tangible resources" more which we had in the third priority group. They thought that having the right cranes, trucks and other vehicles for lifting heavy steel should be more prioritized. Second, they also suggested that the environmental factor should be more prioritized since environmental issues is crucial for the steel industry. Lastly, they thought it could be a good idea to add a factor

about long-term commitment to steel from the port. For example, if the port is planning to in ten years handle different goods than steel, then the shipping of steel might not be prioritized.

Their first suggestion we agreed to and moved “the right tangible resources” to the second priority group. We also agree that the environmental concerns in the steel industry is very important, and since the steel industry has a big impact on the environment we decided to put this factor in the second priority group as well. We felt the last suggestion they had was a bit diffuse and not equally concrete as the other factors are. Moreover, our factor about long-term relationship is covering similar thoughts. That is why we did not include that factor.

The expert on steel, Jenni Ranhage, representing Jernkontoret, thinks that the framework looks feasible. There are two things Ranhage mentions to be important. The first one is to avoid unnecessary reloading of goods, since reloading is costly and tend to affect the delivery safety negatively. We think this suggestion is important too, however we feel that avoiding unnecessary re-loadings is connected to the development of an efficient supply chain which is a factor we have under the third priorities in our framework. Therefore we decided to clarify this factor by adding Ranhage’s suggestion as an example.

Ranhage’s second suggestion was to prioritize the right resources higher. She thinks that having the right equipment to e.g. load and unload the steel is more important than what our framework is indicating. This is something we already changed since Lars Andersson, Sjöfartstidningen, had the same suggestion.

6. The case

Our purpose is to identify the advantages for Chinese steel producers setting up a distribution centre in the Northern Harbour when entering the Baltic Sea Region. To complete the purpose we need to choose the supplier(s), the port and the market(s). This chapter will contain the description of the actors in our case.

The suppliers that will be examined are two Chinese producers, NISCO and Shougang. The port is CMP, more specifically the Northern Harbour in Malmö. The market is the Baltic Sea Region which will include Sweden, Norway, Denmark, Germany, Poland, Lithuania, Latvia, Estonia, and Finland.

6.1. The port: CMP

Copenhagen Malmö Port is located in the middle of the Öresund region. Having its operations both in Sweden and Denmark it is also the gateway to the entire Baltic Sea Region (Cmport, 2012a). After the Öresund Bridge was build the ports in Copenhagen and Malmö merged into one in 2001, creating CMP. CMP is consequently a Danish-Swedish joint venture. The merger was successful and since 2001 CMP has increased net sales by 70%, while staff number only has grown by 8%. There are new investments in the port, including establishing new ro-ro facilities, a new container terminal in Malmö and new quays for cruise ships in Copenhagen (Cmport, 2012b). CMP is one of the biggest port and terminal operator in the Nordic Region (Cmport, 2012a).

CMP is selected as a core port by the EU which means CMP is an important part of the infrastructure in the EU (Satz, 2015). CMP will also be a part of the new Trans-European Transport Network (TEN-T). The project aims to support the economy in its recovery until 2020 and has a budget of 26€ billion. One of the nine new transport corridors, and the biggest one, will be the Scandinavian-Mediterranean Core Network Corridor (Scan-Med). This will connect Malta in the south all the way through Italy, Austria, Germany, Denmark, and Sweden up to Finland (European Commission, n.d.). CMP is one of the significant hubs in the Scan-Med corridor.

Pat Cox, the EU commission coordinator for the Scan-Med, is responsible to increase the efficiency of this corridor and has visited CMP to evaluate if Sweden will be granted money to build a bridge between two of CMP's ports. Pat Cox was impressed by not only the port's size and its ability to make business, but also the port's direct connections with rail and motorway (Satz, 2015). CMP's CEO, Johan Röstin, explains as a core port, CMP will easier receive co-financing for future infrastructure investments in the port (CMP, 2014b).

The best logistic location in Sweden is every year since 2011 determined by Intelligent Logistik. They have chosen to base their evaluation on the distribution of consumer goods because this spurs the development and is the most dynamic part of logistics. This can however be used as an estimation for other goods as well as the overall location. The Malmö region (Malmö, Landskrona & Lund) ranked number 9 with 72 points. The points were explained by big population, cluster for car import and transport and logistics education at Malmö University and at Lund Faculty of Engineering. Furthermore the Northern Harbour was praised with its excellent infrastructure and access to new areas. According to Intelligent Logistik, the cities of Malmö, Helsingborg and Copenhagen have not yet grown fully together to be one logistics region. The high number of inhabitants does not mean that consumer goods are distributed over the sound,

yet. However, Intelligent Logistik can see this change when the Fehmarn Belt Fixed Link is established (Intelligent Logistik, 2011).

6.2. The suppliers: Chinese steel producers

As has already been mentioned the biggest threat to the Chinese steel industry is overcapacity (Ernst & Young, 2014). This is also underlined by Zhang Guangning who was elected chairman of the China Iron & Steel Association in January, 2015. According to Zhang China's steel production has already hit a peak or a turning point. He also states that it is crucial that the industry at this point changes its focus from expansion to quality and efficiency, since this difficult period is the most optimal time for adjustments and upgrading (Sanderson, 2015). China produced half of the total steel production in the world in 2014. However, the domestic steel demand fell 3.4%, which was the first drop in 30 years, so China's growth in steel production almost completely went to exports.

The Chinese steel industry is highly decentralized; it consists of a small number of large steel companies. The industry as a whole is also widely dispersed geographically even though steel production is concentrated in the north-east of China, where the major iron ore mines are located. Since the industry is both decentralized and dispersed, concerns have been raised that the industry might not fully be able to exploit economies of scale. This could also be an underlying factor to the prevailing overcapacity (Holloway et al, 2010).

6.2.1. Shougang

Shougang Jingtang Company is located in Caofeidian, Tangshan City of Hebei Province. Shougang's steel plant is under guidance of the CPC Central Committee and State Council. It is also included in national key projects of the 11th five year plan in China. The steel company follows an international advanced level which is in full accordance with recycling economy (Sgjtsteel, n.d.).

Shougang Jingtang main features include adjacent to the sea and close to a port which provides a convenient transport and a significant reduction in raw material and product transportation cost. The entire chain of convergence of the steel plant is very compact and space is compressed to cut down operational costs. It is also very efficient and uses large-scale equipment that is currently the largest in China. Shougang Jingtang target customers that want high-grade quality in automobile producing, ship building, bridges, pipelines etc. At the same time this is a green plant that is environmental friendly, society-serving and resource-saving (Sgjtsteel, n.d.).

6.2.2. NISCO

NISCO is located in Nanjing at the Industrial Development Zone, a location with convenient transportation conditions. There are several things NISCO attaches great importance to and focuses on. These include technical innovation, management innovation, new product research and development, quality management and energy saving and emission reduction (Njsteel, n.d.).

NISCO has the capacity of 8.5 million tonnes steel per year and the production capacity of its key product plate, which is coil, is more than three million tonnes per year. Looking towards the future, NISCO aims to the goal of building a modernized steel and iron company with advanced technology, first-class at home and international reputation (Njsteel, n.d.).

6.3. The market: the Baltic Sea Region

The region includes the countries around the Baltic Sea in Northern Europe: Denmark, Sweden, Finland, Estonia, Latvia, Lithuania, Germany and Poland. Also Norway is included. Picture 1 (adapted from amCharts 2015) shows the countries marked by blue. To simplify we will mention these countries as the Baltic Sea Region.

Picture 1 The Baltic Sea Region (Adapted from: amCharts, 2015).

The European Union Strategy for the Baltic Sea Region (EUSBSR) is an agreement between EU and the European Commission to strengthen the relation and cooperation between the Baltic Sea States, who face joint challenges. It covers all the states mentioned above except Germany, though the country is also invited to join the cooperation. One example of what can be gained from this cooperation is a bigger market for products and services and also the possibility to shine light on issues that will benefit import and export such as transportation (Swedish Agency for Economic and Regional Growth, 2014).

Three distinctive goals can be read in the agreement: Save the sea, Connect the region and Increase prosperity. Save the sea covers as can be guessed the severe polluted Baltic Sea and how to save it from further problems. One of the objectives includes making the region an ideal for clean shipping. The goal of Connect the region is to bring people and knowledge together and integrate transport systems, which have due to historical reasons been developed independently of each other. Eight of the nine states are members of the EU and the trade between the states is significant but could increase furthermore (Swedish Agency for Economic and Regional Growth, 2014).

7. Application of the framework

This chapter will include the applications of the framework on both CMP and the Port of Gothenburg. As mentioned before we will use our own framework to see how the Chinese steel producers can benefit from this strategic move.

7.1. CMP

First priority:

1. *The chosen market should have a demand for steel.*
   - *It is a necessity that the chosen market has a will to buy and use steel.*

There is no long-term forecast for steel demand in these countries. To evaluate the steel demand we chose to look at population development, GDP, and true steel use. Since a move to the Baltic Sea Region for Chinese steel companies is not a procedure that will happen overnight, it is also important to try to predict how the demand will develop.

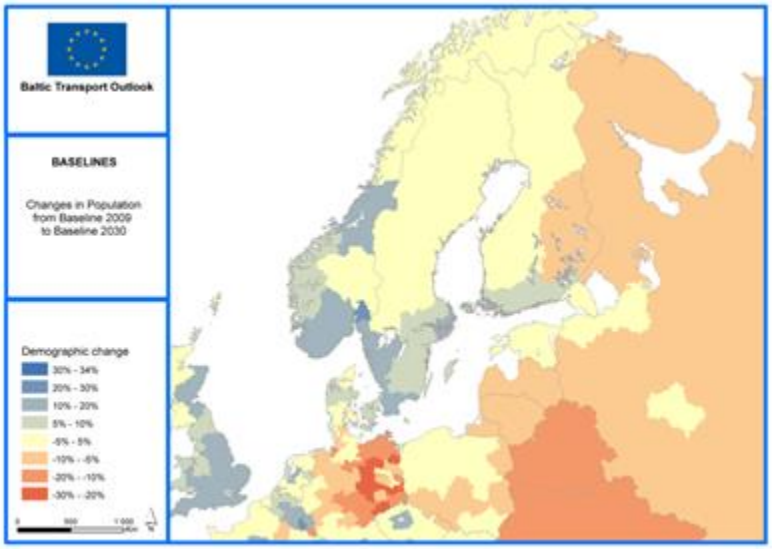
In 2014 the Baltic Sea Region had a population of 153 million people. In 2050 it is estimated to be around the same, increasing in Sweden but decreasing in Germany and the Baltic countries. In 2080 the population is estimated to be 135 million, significantly decreasing in Germany and Poland but growing in the Nordic countries (Eurostat, n.d.).

Population 2014	***Millions***
Poland	*38*
Sweden	*10*
Norway	*5*
Finland	*5*
Denmark	*6*
Lithuania	*3*
Estonia	*1*
Latvia	*2*
The Baltic Sea Region (except Germany)	***70***
Germany	*83*
The Baltic Sea Region	***153***

Table 2 The population of the Baltic Sea Region (Adapted from Eurostat, n.d.).

The Trans-European Transport Networks (TEN-T) has created *Baltic transport outlook 2030* which is co-financed by the European Union, where they have estimated the population development 2030 against 2010. As shown in picture 2 most areas in the Baltic Sea Region will

have a change in population similar to the one predicted by Eurostat (n.d.). The biggest increase will be found in the Nordic countries while especially Germany will see a decrease in population.



Picture 2 Population development 2030 against 2010 (Baltic Transport Outlook 2030, 2011).

GDP measures the value of final goods and services produced by a country during a period, minus the value of imports; thereby it is a measure of people's material living standards (OECD, 2015). Growth in GDP is an indicator that people are spending more money on all products and services and are not limited to products containing steel. However, if the GDP forecasts would turn out to be positive, this would indicate that the country will face better times and the production of products containing a significant amount of steel like cars and buildings will increase as well. Therefore, the GDP of the BSR countries will be investigated.

International Monetary Fund, IMF, an international organization with 188 member countries which are working together to foster global growth and economic stability, has estimated the GDP change for each country until 2020. From these figures we have created a table which can be seen below in table 3 which shows the annual GDP percentage change.

Country	Subject, unit	2015	2016	2017	2018	20192	2020
Latvia	GDP, constant prices, percent change	2,298	3,346	3,732	3,888	3,938	3,951
Lithuania	GDP, constant prices, percent change	2,849	3,213	3,365	3,559	3,661	3,729
Poland	GDP, constant prices, percent change	3,483	3,479	3,551	3,573	3,634	3,582
Estonia	GDP, constant prices, percent change	2,523	3,394	3,376	3,397	3,393	3,376
Sweden	GDP, constant prices, percent change	2,661	2,825	2,745	2,547	2,443	2,32
Denmark	GDP, constant prices, percent change	1,637	2,006	2,128	2,172	2,177	2,219
Norway	GDP, constant prices, percent change	0,969	1,549	1,798	1,889	2,034	2,048
Finland	GDP, constant prices, percent change	0,826	1,421	1,521	1,692	1,751	1,755
Germany	GDP, constant prices, percent change	1,62	1,665	1,488	1,286	1,287	1,256

Table 3 GDP change 2015-2020 (Adapted from International Monetary Fund, 2015).

As we can see from table 3 all three Baltic countries, Latvia, Lithuania and Estonia, have an increasing GDP percentage change. This is also underlined by Ernst & Young (2015) who have ranked 19 European countries by how the GDP will develop during the period 2015-2019 and the three Baltic countries take the top spots, getting even better annual forecasts than the one's IMF provided. Lithuania being ranked first are estimated to have an average growth of 4,4%, Lativa second with an average of 4,1% and third Estonia eight and average of 3,3%. The two other countries on this list that are also part of the Baltic Sea Region, Germany and Finland are also in accordance with IMF's forecasts being on the bottom half (EY, 2015).

TEN-T and the EUSBSR are other indicators of a growing region, which the EU believes is worth developing. The countries of the region are already connected by geography and the trade could be even more substantial when the region's connectivity will improve.

To know the future demand for steel the past demand in our concerning countries was examined. With the use of the statistical data from World Steel Association the following diagrams of the true steel use (TSU) over the period 2003-2012 were created for the Baltic Sea Region. Those years are the ten most recent years and are included in World Steel Association's *Statistical Yearbook 2014*.

True steel use/ year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Poland	7548	8126	7342	10748	11479	10457	6489	8185	9106	7883
Sweden	3657	3849	4286	4783	5172	4669	2678	3935	4314	3869
Norway	597	1179	1870	2491	2250	3339	1854	2522	2261	2681
Finland	1936	2106	2118	2290	2575	2432	1421	1416	1362	2129
Denmark	2056	2129	2038	2767	2809	2374	1140	1346	1552	1674
Lithuania	485	881	796	955	1047	783	198	308	470	436
Estonia	660	653	365	658	561	385	103	195	340	357
Latvia	405	646	539	739	822	541	272	372	643	313
The Baltic Sea Region (except Germany)	**17344**	**19569**	**19354**	**25431**	**26715**	**24980**	**14155**	**18279**	**20048**	**19342**
Germany	25728	28551	27235	31896	32221	32985	22237	29838	32748	28621
The Baltic Sea Region	**43072**	**48120**	**46589**	**57327**	**58936**	**57965**	**36392**	**48117**	**52796**	**47963**

Table 4 True steel use in the Baltic Sea Region (Adapted from World Steel Association, 2014).

Germany is by far the country that uses most steel which is due to their big population. Over this ten-year period the steel use in Germany is at the same level in 2012 as it was in 2003, despite some ups and downs, where the global financial crisis in 2008 is the most significant deviation. Consequently the demand has been relatively stable over the period even though it has decreased slightly in the last years. As Germany is such a big market and closely connected to other major ports in Europe we decided to also include one line that shows the true steel use in the Baltic Sea Region where the German demand is excluded.

Poland has had some fluctuations in their demand but has just like Germany started to decrease in the last years. Sweden was also struck hard by the financial crisis of 2008 but was able to recover before the demand started to decrease again. Norway had a significant rise from 2003 until the financial crisis in 2008 where their steel use had a dip. However, Norway seems to have recovered well and their demand is pointing upwards. The steel use in Finland is peaking upwards since the financial crisis. Denmark has since the financial crisis had a stable rising trend. Lithuania's demand for steel has been going relatively stable since the financial crisis. Estonia's demand has increased quite a lot since the financial crisis, passing Latvia as the Baltic country with the least demand for steel. Lastly, Latvia has had significant fluctuations, and is now in a negative trend.

To summarize every country's consumption of steel was affected negatively in 2008 due to the global financial crisis. Some countries for instance Finland and Estonia have had a positive steel demand trend over the past years. However, this is not excluded to this region. For example, in

the UK, France, Argentina, South Africa and South Korea to mention countries from different parts of the world, their TSU is also declining. Most countries with an increase in consumption have had a quite modest one until 2012 where the statistics end (World steel association, 2014). The Baltic Sea Region includes developed countries like Norway and Sweden, and the general economy of the region is pointing upwards (International Monetary Fund, 2015). What can be said about the Baltic Sea Region is that it is sparsely populated compared to Central Europe (Worldbank, 2013) which can be a disadvantage since all kinds of constructions, appliances etc. requiring steel would have been built and used to a higher extent if the population had been denser.

Based on this the future is looking bright in general for the region, which will also have a positive influence on the steel demand. To sum it up, there is a demand for steel in the Baltic Sea Region.

Second priorities:

2. The port should be located close to the market.

- *The closeness depends on how heavy the steel is and how much it costs to transport the steel to the market.*

CMP is placed in two of the markets countries. The Technical Manager of the stainless steel company (interview, April 24, 2015) says that if we would investigate which of these ports have the best location to support the Baltic Sea Region, CMP would be mentioned by many. Being situated in the inlet of the Baltic Sea all seaway transport has to go through the port in order to reach the rest of the Baltic Sea Region. (Cmport, 2012a).

When it comes to steel having a port that is situated in a suitable location is more important compared to if you would have handled smaller and lighter goods. Steel is big and heavy and therefore more costly to transport. That is why the port has to be as close to the market as possible. If you were to support the Baltic Sea Region from Antwerp, the steel would have to be transported by truck, which is more expensive than ship, and the costs would rise.

3. The port should have adequate transport systems and hinterland connections.

- *This includes transport by ship, rail or truck depending on the products, time pressure to deliver and the price of the transport. A short distance to these systems decreases the cost of extra transport between the DC and the next transportation mode.*

The port should not only be situated in a suitable location, it also has to have different adequate transportation modes so the steel can arrive in the port and then be sent away from it efficiently and cost effective (Roh et al, 2007; Song, 2012; Lumsden, 2006; Aronietis et al, 2010). Steel is transported in different ways. The Technical Manager (interview, April 24, 2015) says that the stainless steel company only transports their steel away from their distribution centre by truck. Another company we interviewed usually transports their steel by rail, and then there of course is the alternative of transporting steel by ship. This would be the case if Chinese steel companies were to ship their steel from China to the Baltic Sea Region, mentioned both by Shougang (interview, April 15, 2015) and NISCO (interview, April 16, 2015).

The port should therefore be able to offer all these three transportation modes in a proper way. CMP, as mentioned before, has an appropriate location and all ships that are going to the Baltic Sea has to pass their port (Cmport, 2012a), which means the transportation by ship can be handled in a good way. Four times per week, there are ships leaving Malmö for Poland, UK, Germany, Russia, Estonia, and Finland (Cmport, n.d.a). CMP also has a railway inside their port which can, if necessary be loaded with steel and then being sent away from the port. Malmö can serve the whole Scandinavia by rail on a daily basis (Cmport, n.d.a). In February, 2015, CMP made a press release that more departures by rail to and from the Northern Harbour was about to be installed. The new service starts from the Netherlands and serves Malmö three times a week. After arriving in Malmö it is reloaded and returns to the Netherlands and Germany (Cmport, 2015b). Lastly we have the transportation by truck. Trucks leave on a daily basis from Malmö to for example Sweden, Denmark and Norway (Cmport, n.d.a). As we have previously mentioned especially the stainless steel company talked about the great road facilities leading to and from CMP which they used and were happy about according to their Technical Manager (interview, April 24, 2015). It is also simple to reload freight in the Northern Harbour between ship, train, and truck, making CMP a practical nodal point for logistics, says Ann-Charlotte Halldén Åkeson, Key Account Manager in CMP (Cmport, 2015b). Consequently can CMP offer hinterland connections and an adequate transport system.

4. The quay should have sufficient depth of the water for the vessels transporting steel.

- *The ship transporting steel needs a minimum (depending on the ship type) depth of the water in order for the ships to unload.*

In The Northern Harbour there are three different terminals where freight is shifted between ships, trains, and trucks (Cmport, n.d.). The Container terminal is 9.2 metres deep (Cmport, 2013) while the depth of water in the RoRo Terminal is 8.5 metres. The RoRo terminal can also be increased to receive even bigger ships in the future (Cmport, n.d.). CMP handles various heavy goods today, cars, stainless steel etc. so the depth of water in CMP is also sufficient for vessels transporting steel.

5. The location of the distribution centre should be close to the quay.

- *To prevent costs and complications concerning the transport of the heavy and clunky steel from the vessel to the distribution centre this distance should be as short as possible.*

The Technical Manager (interview, 24 April, 2015) argues that there can be advantages of being just outside the port area, for example then you can own the land where you have your distribution centre. However, in order to lower costs, with less transport, it is probably better to place your distribution centre inside the port area to get closer to the quay. CMP has new, available land where they would like companies to settle down. There is no problem to find free space to set up a distribution centre inside the port, which is something that makes it possible to place you distribution centre close to the quay (Cmport, 2011a).

Closeness to the quay can not only be measured in terms of distance but also in terms of how easy and convenient it is to transport the steel from the quay to the distribution centre. In the Northern Harbour CMP uses an automated access control system. The system scans and identifies freight and lorries to get a flow in and out of the port area with minimized risks of queues forming. In the beginning of 2012 CMP also installed barriers and lights at all level

crossings in the Northern Harbour. This also decreased the risk for queues and disruptions, making the transportation from the quay to the distribution centre in the Northern Harbour easier (Cmport, 2014c).

6. In order to fulfil different customer needs the port needs to have enough capacity in terms of free space and extra resources.

- *E.g. the capacity to unload a big volume of steel, the capacity of being able to expand and having the capacity to be flexible.*

CMP is ready for more companies to settle down in their port and are ready to manage the goods of the Chinese steel companies, if they choose to settle down. CMP has a lot of space in the Northern Harbour, right now 0.65 km² and it will continue to grow up to 0.9 km^2 (City of Malmö, 2015). It would be possible for them to expand if that would be requested, if for instance a steel company would like to increase their volumes in the port.

7. The port should have the right tangible resources

- *Right tangible resources include cranes and vehicles that can carry the heavy steel.*

Sören Balken Petersen, Marketing Coordinator of CMP, claims that even though CMP is a relatively small port it handles various heavy goods today e.g. cars and stainless steel (conversation, Februari 6, 2015). The resources they have access to are also sufficient to handle steel. Using mafi-trailers from the ships around the port would probably be the best possible solution. By the quays they also have adequate cranes etc. In Malmö, the container terminal has three gantry cranes, 12 straddle carriers, 11 container trucks, 10 terminal tractors and four container movers (Cmport, 2013). The first dry bulk terminal is e.g. equipped with three 20 tonnes stationary cranes and one 64 tonnes mobile crane. The second dry bulk terminal has another 64 tonnes mobile crane (Cmport, 2012c). The resources CMP has access are sufficient for managing steel.

8. Due to the environmental concerns in the steel industry, the port should contribute and support sustainability.

- *The issue of sustainability is one of the major concerns in the steel industry and if the port could provide transportation solutions and other services with less impact on the environment it is beneficial.*

China's rapid development has not only been positive. Improving their sustainability is an issue for the whole China. Regarding the steel industry, problems such as increased energy consumption and pollution has followed (Yin & Chen, 2013). As Shougang described it, steel is one of China's most important livelihoods. For example, Shougang is working with their environmental impact through a circular economy, which shows that it is of importance to them.

CMP has an environmental policy and are working on reducing their impact both locally and globally. For example they participate in networks and organizations such as EcoPorts, they work and take lead to find innovative technical solutions and cooperate with their costumers to find beneficial environmental measures for both. They are ISO 14001 certified. One example of their engagement is building wind power is in the Northern Harbour (CMPort n.d.).

In 2008 the international maritime organization (IMO) decided sharpened the threshold value for sulphur in maritime fuel by 2015. The strictest of these rules apply to among others the Baltic Sea, the North Sea and the English Channel. If possible there will be further reductions. Investigations made by both the Swedish Maritime Administration and the Finnish equivalent shows that it will affect the industrial life badly. The impact on the steel industry is predicted to be significant. The increased cost of transport will mean a compensation for the companies through a higher price for the customer. In an already highly competitive global market this will decrease the profit margins for the steel industry (Sjöfartsverket, 2009). As the sea around CMP is affected by the new regulations regarding limited sulphur in ship fuel, this means the port and the ships visiting the port will have to be even more environmentally friendly than in other places. A consequence of this will be that CMP are forced to even further work on the already mentioned policy, improving their environmental-friendly approach. In the Northern Harbour, two facilities with the new marine fuel called Liquefied Natural Gas (LNG) are to be established. This is not only for the ships visiting the port, but also for other ships that want to access this fuel. The Chinese steel producer can use the new fuel to decrease their impact on the environment.

An issue with the new regulations is the concern that instead of ships, rail and road will be used, which is worse for the environment. If the controls are not uniform, ships might choose ports because of their application of the rules says CEO in Danish Shipowners' Association, Anne Steffensen. Industry expert Mikael Castanius highlights the unfairness of putting such hard restrictions on some areas, and not on others such as Southern Europe where pollution is worse (CMP, 2014a). This shows that the implications of the new rules might not be fully understood and might be changed on behalf of the companies and ports operating around the Baltic Sea.

Third priorities:

9. The port should develop and integrate the supply chain and consequently the logistics system of the port's activities.

- *The port should work towards creating a more efficient supply chain e.g. by avoiding unnecessary reloading of goods.*

CMP is not owned by another company and can decide themselves in which order to prioritize ships which creates more efficiency according to Joanna Pan, CMP's Business Developer in China (conversation, March 9, 2015). The fact that they also have other fittable transportation modes away from the port (Cmport, n.d.a) enables CMP to have the ability to develop the supply chain. Since CMP also have free land available, steel companies could set up a distribution centre and do inward-processing. This can also benefit and create a more efficient supply chain since the steel also could be stored in the distribution centre until customers request it says Joanna Pan (interview, March 9, 2015). An example that indicates that CMP is working to a more efficient supply chain is that CMP is getting faster when it comes to loading and unloading cars. CMP is also counting on growth in the total volumes (Sjöfartstidningen, 2013).

10. Lead times from producer to end-customer should be as short as possible, the shorter the distance the more advantage you have.

- *The price of steel fluctuates a lot which can be a problem if there are long lead times. The producers need long contracts with customers in order to know the demand in advance.*

How long the lead times will be is hard for the port to control and is rather an issue for the producer to solve. The lead times is of course related to the distance the steel has to be transported, which mostly has to do with how far away the chosen port is located. In our case the Baltic Sea Region is located far away from China and according to Shougang (interview, 15 April, 2015) it will take about 40 days for the steel to be shipped from China until it reaches the Baltic Sea Region. During these days the demand and price of steel will fluctuate a lot which creates uncertainty for Chinese steel companies.

Having a distribution centre in the port could be one solution because then steel could be shipped over to CMP and being stored there until local companies would like to buy it. The Chinese steel companies can solve the problem of long lead-times and price fluctuations by having the same approach as the stainless steel company, long-term contracts with their customers, which the Technical Manager (interview, 26 April, 2015) mentioned.

11. The port should support the overcoming of potential cultural differences between the supplier and the market.

- *The port acts as a link between the buyer and supplier and should ensure these differences do not ruin the business.*

There are many differences between the Western culture in the Baltic Sea Region and Chinese culture (Kermeliotis, 2011). The business relationships westerners are used to are usually shallower and not equally long lasting as Chinese relationships. With the Chinese, building relationships takes long time, but once it is developed, it usually last for a long time. For many Chinese companies, culture adaptability, patience, flexibility and tolerance for others beliefs are more important than technical and management skills which is usually what Western companies think will create the best relationships (Legacee, n.d.).

However, CMP has started to overcome some of the problems with the cultural differences. CMP has hired a Chinese Woman called Joanna Pan whose job assignment, among others is to find suitable companies for CMP in China. Joanna has been studying in Sweden and knows about Western culture as well as about Chinese culture. Using Joanna's knowledge and experience can help CMP overcome cultural differences that might arise.

12. The port's location should minimize trade barriers between the supplier and the market.

- *If there are certain tariffs and suchlike in a certain region where the port is situated this could be an impediment to trade.*

For a country like China where the share of domestic consumption in GDP still is relatively low, trade is the solution to sustaining the economic growth (World Trade Organization, 2013).

Looking through the newsletters and press releases in the webpage of EUROFER, the European Steel Association, it is evident that China is troubling the European steel companies. EUROFER declare they do not want EU to grant China Market Economy Status (MES), as they believe

government has a hand in the price setting and prices are not only followed by the supply and demand. In 15 years a provision has been making it acceptable for WTO members to impose duties on China, but in the end of 2016 this agreement expires and the big questions has arisen: if all member countries have to accept China as a market economy, will they consequently be forbidden to impose anti-dumping duties on China? A product that is dumped is sold overseas at a cost below the buying country's domestic cost of production (Dalton, 2014). Obviously this is creating problems for the domestic market. For example, the steel companies in Sweden is said to have a higher cost due to rules and taxes, while Chinese steel companies on the other hand get a lower cost by indirect subventions such as lower cost on raw material and beneficial loans. The consequence of the cheap Chinese steel hits the employees of steel companies, as in this case, in Sweden (Kaliber, 2015).

The EU has already imposed anti-dumping tariffs on some Chinese steel products. This summer an anti-dumping investigation concerning Chinese steel is to be finished by the EU (Kaliber, 2015). It is clear that the state involvement in the Chinese steel companies, such as Shougang, is an issue to the European market.

As CMP is under EU's regulation, as both Denmark and Sweden is, they have to obey these rules and this might be a negative factor depending on how the regulations will develop.

13. The port should support the steel producer to a long-term relationship.

- *As the investment of a distribution centre will be significant and because long-term contracts are important in the steel industry the port should support this kind of relationship.*

Long-term contracts benefit all parties in the steel industry says Shougang (interview, 15 April, 2015) and if CMP are able to support this, they can be more attractive for Chinese steel companies. CMP has already put a lot of effort in contacting and informing Chinese steel companies about their port, showing their dedication in relationship forming.

An example of one of CMP's current long-term relationships is Toyota. Since 2003 over a million of cars have passed through the port, which was celebrated in the beginning of 2015. The site manager of Toyota explains the high number is possible on account of the well-functioning exchange with companies around them (CMP, 2015a).

Already in 2010 CMP and the City of Malmö started investing in making Chinese companies to choose CMP as their logistic hub in Northern Europe, both being represented by Scandic Sourcing. Business in China has developed significantly in the last 10-15 years and many companies have started to expand to other parts of the world. However, some of them still seem unsure about the European market, even though most of the business owners are really curious about it. From the start this investment was seen as a long-term one and CMP were aware that it might take years before they see results of their efforts. When being a part of this from the start, you can earn trust from companies and having a better chance to be at the forefront (Cmport, 2011). They have a plan customized for the Chinese steel producers and have probably evaluated and scrutinized the proposal, as they will put effort in time into it, the likelihood that they are certain the relationship will last for a long time is high. As CMP will benefit if the companies in

their port stays and companies only stay if they are making a profit, it implies the deal would be long-lasting for both sides.

7.1. Port of Gothenburg

The Port of Gothenburg is located in Gothenburg, Sweden and is the biggest port in Scandinavia (Port of Gothenburg, 2015).

First priority:

1. *The chosen market should have a demand for steel.*
   - *It is a necessity that the chosen market has a will to buy and use steel.*

As the intended market is the same, there is no difference between CMP and the Port of Gothenburg.

Second priorities:

2. The port should be located close to the market.
   - *The closeness depends on how heavy the steel is and how much it costs to transport the goods to the market.*

There is no significant difference in location. Both ports are in great positions to serve the market. Coming by ship from south, like the Chinese steel will do the distance to travel to the Port of Gothenburg is slightly shorter. However, if you want your ship to go on to the Baltic Sea the ship has to pass CMP and then you might as well choose CMP. There is only about 250 kilometres between these two ports. And just as CMP sees their port as the obvious choice to serve the Baltic Sea Region, the Port of Gothenburg does the same (Port of Gothenburg, 2015).

3. The port should have adequate transport system and hinterland connections.
   - *This includes transport by ship, rail or truck depending on the products, time pressure to deliver and the price of the transport. A short distance to these systems decreases the cost of extra transport between the DC and the next transportation mode.*

The Port of Gothenburg has for 14 years in a row been crowned the best logistic location in Sweden. This year's explanation is that it is the biggest port in the Nordic with short transport from quay to storage areas. Moreover, the cooperation's with University of Gothenburg and Business Region Gothenburg were a contributing factor (Intelligent Logistik, 2011).

25 rail shuttles leave the port every day throughout Sweden and Norway, by the Railport Scandinavia which links the port with inland terminals at towns and cities throughout Sweden and Norway, which means rail can replace road traffic to many cities. The rest of the Baltic Sea Region is accessed by feeder traffic (Port of Gothenburg, 2015). The big roads, E6 and E20, are also nearby, and a new motor road and an entrance for trucks are already in place (NCC, n.d.).

4. The quay should have sufficient depth of the water for the vessels transporting steel.
   - *The ship transporting steel needs a minimum (depending on the ship type) depth of the water in order for the ships to unload.*

The general water depth in the port is around 15 metres (Port of Gothenburg, 2015). However, the most deep-going ships in the Port of Gothenburg go as deep as 19 metres (Port of Gothenburg, 2014). These kinds of ships would CMP not be able to handle in their port. The Port of Gothenburg is the only port in Sweden that can handle the world's biggest containerships (NCC, n.d.).

5. The location of the distribution centre should be close to the quay.

- *To prevent costs and complications concerning the transport of the heavy and clunky steel from the vessel to the distribution centre, this distance should be as short as possible, this is extra important for steel which is heavy and costly to transport.*

One of Intelligent Logistik's (2015) claimed advantages with this port is the short distance from the port to the storage or distribution centre. The Port of Gothenburg is expanding with the opening of many new areas and the cost will be 3 billion SEK (Port of Gothenburg, 2015). If any of the new areas are planned for steel or would be specifically suitable for steel is not evident.

6. In order to fulfil different customer needs the port needs to have sufficient capacity in terms of free space and extra resources.

- *The capacity to unload a big volume of steel, the capacity of being able to expand and having the capacity to be flexible.*

The Port of Gothenburg is growing more than it has ever done before. New terminals, logistic areas, roads, and railways are built to ensure the Port of Gothenburg's claimed leading position in Scandinavia. They are building in order to be ready for increased volumes in the future, bigger ships and the increasing demand for transhipment of goods (Port of Gothenburg, n.d.).

In 2012 the Port of Gothenburg decided that over a five year period at least 5 billion SEK should be invested in the port. Among other things they planned to acquire a bunkering ship for floating natural gas (GP, 2012)

An example of the expansion is the brand new port area in Arendal. This project will start in 2016 and is estimated to be finished after 2020. The Port of Gothenburg has had enough capacity before but now due to bigger volumes of goods they need to build this new terminal. This part in Arendal will be 0.22 km^2 and the terminal will also be connected to railway (Port of Gothenburg, n.d.).

7. The port should have the right tangible resources.

- *Right tangible resources include cranes and vehicles that can carry the heavy steel.*

The port of Gothenburg has super post panamax cranes, cranes that are able to handle the biggest container ships (Port of Gothenburg, 2013). These cranes are the biggest in Scandinavia, 45 metres high, and enable faster and better loading and unloading of the new giant containerships. Apart from these they also have eight other cranes in the container terminal (GP, 2013). The Port of Gothenburg's crane productivity, how many units are being handled per crane in an hour, is peaking upwards and in November 2013 it reached an all-time high (Port of Gothenburg, 2013a).

8. Due to the environmental concerns in the steel industry, the port should contribute and support sustainability.

- *The issue of sustainability is one of the major concerns in the steel industry and if the port could provide transportation solutions and other services with less impact on the environment it is beneficial.*

The Port of Gothenburg is just as CMP investing in LNG as a new marine fuel, and their goal is to offer it by the end of 2015 (Port of Gothenburg, 2015). The port is constantly working to minimize the environmental impact of the maritime shipping and contribute to sustainable transportation. The ports big challenge ahead is to reach their expansion plans with as little environmental impact as possible. The Port of Gothenburg's goal is to be a predecessor when it comes to sustainable transportations, and they often conduct this work in cooperation with customers. The port is internationally known for their environmental work and is rated among the leading ports in the world in this area. For instance they were early with electricity connections to ships, rails replacing truck transports and gas recycling when loading and unloading oil (Port of Gothenburg, 2015a). Because of the fact that the Port of Gothenburg offers electricity connection from land it was in 2011 awarded the prize "Energy Globe Award". Nearly 1000 contestants from 105 countries participated and the Port of Gothenburg won in the category *Air* (GP, 2011).

Third priorities:

9. The port should develop and integrate the supply chain and consequently the logistics system of the port's activities.

- *The port should work towards creating a more efficient supply chain e.g. by avoiding unnecessary reloading of goods.*

The Port of Gothenburg offers several different logistic services that can contribute to a more efficient supply chain. The services are conducted in the port and includes services such as container depot, container service and reparations, storage and logistics, cistern- and tank service, safety and surveillance, recycling and stuff and strip (preparing goods for it to be transported away from the port, e.g. by loading containers)(Port of Gothenburg, 2014a). Another example that contributes to making the supply chain more efficient is the rail transport to the quayside. More than 70 trains arrive and depart each day and the fact that they can travel directly to the quayside allows a rapid and efficient reloading to and from the vessels (Port of Gothenburg, 2015). These services can make the whole supply chain work smoother and consequently develop the whole logistics system.

The Port of Gothenburg also wants the amount of containers passing in and out of the port to double over a ten year period, making the container handling faster and more efficient. To double the containers passing in and out of the port they for instance plan more boat lines, including one direct line to South America (GP, 2012).

10. Lead times from producer to end-customer should be as short as possible, the shorter the distance the more advantage you have.

- *The price of steel fluctuates a lot which can be a problem if there are long lead times. The producers need long contracts with customers in order to know the demand in advance.*

Due to the similar locations of CMP and the Port of Gothenburg the lead times from China to the Baltic Sea Region will be about the same.

11. The port should support the overcoming of potential cultural differences between the supplier and the market.

- *The port acts as a link between the buyer and supplier and should ensure these differences do not ruin the business.*

The port launched their Chinese website in 2012 and the port has frequent Chinese visitors. The Port of Gothenburg and China also have a long history of trade starting already in the early 18th century. Over the years the traffic has grown and today it features two direct calls by the world's largest container vessels every week. To deepen this relationship even further the Port of Gothenburg is now also doing a lot of activities to take the cooperation into a new phase. In Gothenburg the port is frequently visited by Chinese delegations and in China the Port of Gothenburg is annually participating in fairs and launch seminars (Port of Gothenburg, 2015). If you are working close to your customers during a long period you will be more likely to overcome cultural differences and develop a healthy relationship.

12. The port's location should minimize trade barriers between the supplier and the market.

- *If there are certain tariffs and suchlike in a certain region where the port is situated this could be an impediment to trade.*

As the Port of Gothenburg also is a part of Sweden the same EU regulations follows.

13. The port should support the steel producer to a long-term relationship.

- *As the investment of a distribution centre will be significant and because long-term contracts are important in the steel industry the port should support this kind of relationship.*

As mentioned above when talking about overcoming cultural differences, the Port of Gothenburg is already having a long-term relationship with China (Port of Gothenburg, 2015) and based on this they could have a long-term relationship also with steel producers.

For instance Swedish wood in all different shapes, e.g. paper and timber has been leaving the Port of Gothenburg for export all over the world for 400 years. There are no plans to end this relationship and the port is investing more now in the relationship than ever before. They aim to take care of their customers and offer the Swedish wood- and paper industry the best and most sustainable solution for a successful Swedish export also in the future. If the Chinese steel companies would become valuable for the Port of Gothenburg, they have the resources to make the cooperation lasting (Port of Gothenburg, n.d.b).

8. Discussion and conclusions

In this chapter we discuss the applications of the framework and our main purpose "To identify the advantages for Chinese steel producers setting up a distribution centre in the Northern Harbour when entering the Baltic Sea Region." will be answered.

8.1. Discussion

To clarify once more, this discussion will only entail the details of choosing the Northern Harbour when the Baltic Sea Region is already decided as the intended market. This means it will not include a discussion about other options such as establishing a DC in another region serving another market.

The discussion will start off by analysing the results of the applications. Factors 1 and 12 are the same for both ports as earlier concluded. These two will be discussed after the comparison.

2. The port should be located close to the market: As the placement of these two ports are both situated close to the market there is barely any difference considering the distance from producer to end-consumer.

3. The port should have adequate transport system and hinterland connections: This is interesting in this case. Both ports have adequate transport systems by sea, rail, and truck, but CMP has a slight advantage in this case. First, the two Chinese steel producers mentioned that they will use ships to transport their steel. This means CMP's port has to be passed no matter what when going into the Baltic Sea and also that the Port of Gothenburg has a short extra distance. The only country closer to the Port of Gothenburg is Norway. Furthermore, a DC in CMP is closer to the BSR than a DC in Gothenburg would be if you consider transport by the seaway. In this case, that means you will have a small time advantage using CMP to reach many of the countries involved in BSR if you have stored the steel in the DC before an order. The Port of Gothenburg's area ranks higher than CMP's by Intelligent Logistik (2015). This list only considers the best locations in Sweden and not regarding the BSR. Also as the Malmö region is growing closer to Copenhagen, it is only a matter of time before these areas are considered one by the Intelligent Logistik. The Northern Harbour, which will be the area for the steel companies if they make the decision, is reviewed excellent.

Depending on how the discussion regarding the limited sulphur in marine fuel develops there could be an advantage of using the Port of Gothenburg. It does not require quite as long transport with ship in the areas affected by the new rules. Instead of using ships from the DC to the end-consumer, trucks or rail might be used to a further extent to cross Sweden to reach the coast of the Baltic Sea. However, bearing in mind the gravity of sustainability in the steel industry and a wish to improve the reputation of Chinese steel, the environmental friendly vessels could still be chosen, despite being more costly. In addition, this distance is as before mentioned only 250km and the short difference might not be a determinant.

4. The quay should have sufficient depth of the water for the vessels transporting steel:
The depths at their terminals are deep enough for large vessels, which they are used to handle. The Port of Gothenburg is a bigger port handling more cargo and can manage the biggest ships, but this makes no difference as it will not be used by the steel producers, at least not today.

5. The location of the distribution centre should be close to the quay: The Port of Gothenburg is claimed to have a short distance between the quay and their current DC's. Since CMP's new terminal the Northern Harbour is yet not filled with buildings or other businesses it would be possible to build a DC close to the quay. The distance from the water to the DC would be short in both cases.

6. In order to fulfil different customer needs the port needs to have sufficient capacity in terms of free space and extra resources: Both ports are flexible and can both manage differences in capacity use but as for now CMP has an advantage as they have 0.65 km² new land in the Northern Harbour which is enough for an ideal steel terminal of 0.35 km². The Port of Gothenburg is also expanding, but does not seem to have free space at that significant amount at the moment.

7. The port should have the right tangible resources: The right equipment such as cranes is also possessed by both. This would also be possible to purchase if necessary.

8. *Due to the environmental concerns in the steel industry, the port should contribute and support sustainability:* Both ports have strong policies towards sustainability and are working with new solutions such as LNG.

9. The port should develop and integrate the supply chain and consequently the logistics system of the port: Both ports are improving efficiency and are for instance building new terminals and areas making the loading and unloading smoother as well as improving the flow of traffic.

10. Lead times from producer to end-customer should be as short as possible, the shorter the distance the more advantage you have: The difference between the ports' locations are small compared to the distance between China and the BSR, therefore both ports are considered equal.

11. The port should support the overcoming of potential cultural differences between the supplier and the market: CMP has one employee working full time with the Chinese relations and moreover CMP often visit China or receive guests, similar to the strategy proposed by Higgs (1995). The Port of Gothenburg has been working with China for centuries and visits their expos often, as well as the other way around. They have learned throughout the years as Barkema, Bell and Pennings (1996) suggest. Both ports are considered to likewise fulfil this factor.

13. The port should support the steel producer to a long-term relationship: Regarding the Chinese steel producers, CMP has an advantage, as they already established relationship with at least two Chinese steel producers. Their commitment is one of CMP's advantages. They are showing their willingness to make this deal work and what the port can affect in order to attract the Chinese steel producers they will.

To conclude the applications, both ports are suitable for the market and fulfil most of the factors more than sufficiently. CMP might have a slight advantage compared to the Port of Gothenburg. However, the choice between these two ports might not be of that substantial concern of the Chinese steel producers. As De Langen (2007) explained, shippers often see the differences between ports in different region as more considerable than with the ones in them same region, such as CMP and the Port of Gothenburg. This means that if they are similar it might not play

such a significant role for the Chinese steel producers which port they would choose, as the distance between them in relation to the transport from China to the Baltic Sea Region is very small. This is an interesting point. The difference in location between the two ports might not be seen as especially important to the Chinese steel producers but their resources and capabilities might.

As far as can tell from the applications of the framework, the ports have similar tangible resources. These are the easiest to distinguish. They are both being major ports and used to handle large goods; they have the right water depth, closeness to storage, provide environmentally friendly marine fuel and services, and can handle capacity changes. The intangible capabilities are where CMP takes the lead. CMP is obviously eager to make at least these two Chinese steel producers settle in their port, they send a clear message of a strong dedication and commitment to realize this business. CMP benefits when the companies in their port are in the long run succeeding with their business at CMP, in other words, stay in their port. This tells us CMP would only put stakes in what they believe is a good idea for both.

The two factors completely alike and cannot be affected by either port are number 1 and 12, which also need a discussion. Especially priority 1 is of great importance in order to know if either of the ports is of interest at all.

1. The chosen market should have a demand for steel: Even though our purpose implicates that the choice of market has already been made, this factor is still vital, as the market could have been chosen for the framework without investigating the steel demand beforehand. The biggest concern of the Chinese steel producers is if the demand will be large enough. As can tell from the statistics from WSA and our written sources, the Baltic Sea Region is no exception to the rest of the world. Some countries have an increased consumption, some a decreased. Overall, the supply is greater than the demand. There are some other indicators of the region's growth. All the countries in the BSR are forecasted to have a positive percentage change of GDP until 2020 according to IMF. In addition, the TEN-T project sends a similar signal; Europe is still growing and expanding. It is very well developed but in need of restoring for the future and thus also in requirement of steel. The Scan-Med corridor will benefit CMP in many ways, the infrastructure to and from the port will improve and the financing of new investments will be easier to receive. The Port of Gothenburg will also be a part of the Scan-Med corridor and they will have similar benefits (European Commission, n.d.). It is also a sign of the importance of the not only CMP, but furthermore to the Baltic Sea Region which the EU has decided is worth spending billions on to be more connected. EU has also created the EUSBSR, which moreover shows the importance of this specific region within the EU and its future development. The Technical Manager of the stainless steel company predicts a slow and steady rise in the demand for stainless steel; this is possibly also the future of ordinary steel. Another point to be made is the imposing fact that the steel companies, especially in China, need to change in order to survive. The companies that do survive will have a great opportunity if or when the demand increases due to less competition. A bold move rather than trying to stay safe might be the solution.

12. *The port's location should minimize trade barriers between the supplier and the market:* This factor is also interesting. Further trade barriers could be established in order to make it more difficult and/or expensive for the Chinese steel producers to sell to the Baltic Sea Region. How significant impact this would have is not known, but considering the harsh climate in the industry

it most probably would be substantial. The domestic producers of EU are also struggling and the authorities might impose import restrictions to ensure the survival of the domestic companies. However, this is also a sign of weakness among the domestic producers. It shows that they might not survive and even if the costs will be higher at first, maybe the Chinese steel producers can outrival domestic producers in Europe.

In the future the Malmö region will grow and it might grow together with for example Copenhagen and Helsingborg as Intelligent Logistik (2015) describes it. As has been shown before, the population will increase both in Copenhagen and along the Swedish west coast. With the new TEN-T connections, the distance between Malmö and Gothenburg will decrease. The question is how long it will take before the south west coast of Sweden and Copenhagen are seen as more or less the same area. CMP has shown what a strong cooperation between two ports, Copenhagen and Malmö, can lead to, and few can argue the merger was not successful. The next step might be cooperation between all the ports lined at the Swedish west coast, dividing the goods between them according to their strengths. This is however only a speculation of the far future. For now they act as separate though the idea can be borne in mind.

One can also discuss the choice of not entering the market. Neither Shougang nor NISCO are saying the region is in their plans for the 5 coming years. With the harsh climate in the steel industry overall and especially in China it is evident the producers need to look beyond their home country. Solely relying on their own market will probably not be enough according to our written sources, when the development slows down as it is currently starting to do so. Maybe staying in their current markets is a better option for NISCO, as they have not felt the issues in the domestic market so far and basically sells everything they produce. Not being the first Chinese steel producer to make a move to the Baltic Sea Region would also let NISCO see how well other companies would manage and act accordingly. However, there might be advantages to be the first one too.

Shougang on the other hand, is in a quite different situation. For them international business probably is inevitable in order to survive and placing a distribution centre in the Northern Harbour to serve the Baltic Sea Region could potentially be prosperous. Laplace Conseil (2013) claims being devoted to trying new ideas is a key to success for steel producers. This might be a chance for Shougang. It might be uncertain to enter a new market in this situation, but the risk of not doing anything is superior. For other producers like NISCO without any visible problems, they do not need to act as the companies in Shougang's position, at least not as quickly. European steel producers too are having problems as were discussed earlier, further competition from Chinese steel might change the industry. To early gain a strong position in this market and to start to build relationships at the location could prove to be meaningful in the future if the domestic producers have to be shut down. To cooperate with a company not only with knowledge in and experience of the market but furthermore of the transportation and logistics of the region is a significant advantage when entering and making investments in a market. The Chinese steel producers both say that their quality is sometimes inferior to many other countries' steel as well as having great quality and wishing to change the reputation of Chinese steel. This might be a way to accomplish the desire.

8.2. Conclusions and implications

To conclude the discussion, compared to the Port of Gothenburg, the advantages with CMP for the Chinese steel producers entering the Baltic Sea Region are a slightly better location when using ships, current free space, and their dedication to the Chinese steel producers. Our main purpose is hereby fulfilled. The steel producers of China should definitely contemplate the idea to establish a distribution centre in the Northern Harbour, if they are having troubles in their current markets.

The result of this study shows the importance of the distribution centre and its location's effect on the steel industry. It also shines light over the issue of ports' significance in the decision of placing a distribution centre. To place it in a port is clever, as the port already acts as a natural transhipment and why this has not been investigated before is questionable. CMP, or the Port of Gothenburg, could be a crucial player influencing the Baltic Sea Region's steel trade.

The framework can be used both for theoretical research, which are further described in the next section, and by an actual port or steel producer to evaluate the potential of a future cooperation. In this case it provided a better understanding of the advantages for a Chinese steel producer to establish a DC in the Northern Harbour. It has underlined the advantages, and indirectly the disadvantages. This result can be used by the ports to find shortcomings and make improvements in order to attract the Chinese steel producers. The Chinese steel producers can use the study as guidance for future strategic plans.

8.3. Proposals for future research

A suggestion for future research is to furthermore develop, expand and also test the framework. It is of a simple character, which is both positive as well as negative, and with more time it could be elaborated with more specific factors and details. The framework can be evaluated with a deductive theory. As far as this study can tell, there are no significate differences between countries and regions. However, it would be interesting with the opinions from regions not specifically mentioned in this study, such as South America.

As the framework is based on today's situation even though trying to look into the future, an upgrade of the framework would be interesting to see in the future. For example if the excess capacity is shut down for good and suddenly the economic growth is increasing rapidly together with the demand of steel, how would the framework change?

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10. Appendixes

Appendix 1

Questions for players in the steel industry

How does the steel industry's value chain look?
What is your role in the industry?
In what geographical market are you present?
What type of steel do you buy?
Do you process steel?
Where is the origin of that steel?
What factors are important when you buy steel?
What industries uses the most steel, in other words, buys most steel?
What laws and regulation are important to consider when dealing with steel trade?
How is steel transported?
Do you have an own warehouse with steel?
How are the distribution centers for steel placed?
Which factors are important when placing a distribution center?
Are there significant differences in how you produce and transport, buy and sell steel around the world?

Appendix 2

Questions for port of Antwerp

How does the process work? Who ships the steel to Antwerp, who takes care of unloading the vessels, where is it stored and processed, who transports it to the end customer etc.
How many steel-companies are there at your port?
What do you mean by service steel centers?
What does a port need in order to be a place for a distribution center for steel?
What kind of wharf type is the best for handling steel (straight, pier etc.)
Why/how have you become so successful in attracting steel companies?

Appendix 3

Interview guide for Shougang and NISCO

Steel

Tell us about Chinese steel and the market in China?
Where do Chinese steel producers export today? Where do you export?
Do you have any idea if Chinese steel producer export to the Baltic Sea region?
What advantages do you expect from selling to the Baltic Sea Region?
Are there any disadvantages?
What advantages are there with Chinese steel? In what way is Chinese steel competitive?
Are there any disadvantages with Chinese steel?
What do you think about the problem of excess capacity, is it likely to change? What solutions are you discussing?
What do you think is the general reputation/picture of Chinese steel in the world? Do you agree? Is that picture likely to change?
Could the steel be cheaper in the Baltic Sea region even though it has to be transported very long distances?

Your international strategy

Do you sell any steel to Europe today? How much do you sell a year? How much is the percentage over all export?
What do you know about the Baltic Sea region? What picture do you have?
Do you have any market in Baltic Sea region, namely Nordic, Russia, and Poland, Lithuania, Estonia, Latvia, Germany? How is it?
What makes your steel able to compete with local steel companies in the Baltic Sea region?
What are the major generic obstacles of selling abroad?
What kinds of problems/obstacles are there to sell to The Baltic Sea region?
Could culture become an issue? What cultural problems might arise?
What do you know about the tariffs in the Baltic Sea region, could that be an impediment to trade?

Distribution center

What do you think about the solution of a distribution center? Have you had this solution before?
What services do you think is necessary to be able to conduct in a distribution center?
What do you look for in a distribution center placement?

Port

What do you look for in a port? What are your expectations?
What is considered important in a port for it to be a place one want to send steel to?
What factors can the port itself affect/change?
Could the port be a factor that decides whether or not to sell to the Baltic Sea region?
Have you considered other ports than CMP for this expansion?

Production manager

Does Chinese steel have the same quality as other steel?
Can/do you manufacture all kinds of steel?

Do you know if there are any markets that are requesting more high quality steel compared to other markets?

Sale manager

Have you done own market research on the Baltic Sea region?
Have you been in contact with any steel companies in the Baltic Sea region?
What is known about the demand for Chinese steel in the Baltic Sea region? Do they even want it?
Where is your major international market today? How is that relationship?

Top manager

For how long into the future are your strategic plans?
Have you any strategies of how to start selling to the Baltic Sea region? What do they look like?
Are you looking for a long-term relationship from the start?
How soon do you think it is realistic to expand your operations towards the Baltic Sea region?
Is this potential business deal an important question for you? How do you prioritize?
Have you had experience from similar operations which you can take advantage from?
How are you working with CSR? Is pollution a dilemma?
Is it something else you would like to add which we have not discussed so far?

Appendix 4

Interview guide for the stainless steel company

Tell us about your business?
What is the difference between stainless steel and ordinary steel?
Do you compete with ordinary steel?

What is important when choosing a place for a distribution center?
What is important when choosing a place for a distribution center for steel?
When did you establish here?
Why did you make that decision?
Which were the biggest challenges?

What market did you want to reach?
How good is CMPs placement in relation to that market?
How does the demand for stainless steel look on your market/BSR?
How do you believe the demand will develop?
Do you have an opinion abou the demand for mild steel in this market/BSR?
What other companies are present in this market?

If you produce in other countries, how much can you process the steel here?
What is your opinion on lead times when producing far from CMP?

How has the new rule about sulfur emissions affected you?

What is your opinion on the trasnportsystems to and from CMP?
What do you think a port should contribute to support your business?
What are the major advantages with being placed here?
What are the major advantages with having CMP as your port authority?
Is CMP less expensive compared to toher ports eg. Port of Antwerp or Gothenburg?
What threats do you see?

What advantages could a mild steel producer get from being placed here?

Is it something else you would like to add which we have not discussed so far?

WORLD MARITIME NEWS

The Issue of Attracting Chinese Steel Companies

By Sophia Andersson and Christian Areskoug

Copenhagen Malmö Port is looking into the opportunity of attracting Chinese Steel companies to their port. A new study shows that a cooperation could have a lot of potential benefits.

The world in which we are living in is a world in constant transformation and development. This is creating possibilities as well as putting pressure on all kinds of businesses, ports included. In one part of the world, namely in the cities of Copenhagen in Denmark and Malmö in Sweden, the two cities' ports solved the issue by merging, and the two ports became one, the Copenhagen Malmö Port or CMP. The merger was very successful and since the merger in 2001 CMP has increased their net sales by 70%. However, the port business is very competitive and in order to keep the young port of CMP growing they will have to attract some of the biggest players in the world.

One potential business partner could be Chinese steel producers. The steel industry is one of the greatest industries to contribute to global economy and China produced half of the total steel production in the world in 2014. In China it is also well-know that the Chinese steel industry is facing a serious threat, the threat of overcapacity. The obvious solution discussed in China right now is to look for opportunities abroad, entering new markets. The area around CMP, the Baltic Sea Region, is yet unexploited by many Chinese steel producers, and despite everything they remain unsure whether or not to enter the Baltic Sea Region and thereby using CMP's port. With this background, should it not be a good deal for all parts if cooperation was initiated? Two master students from Lund University School of Economics and Management, Sweden, have addressed this question.

They conducted interviews with representatives from ports, steel companies in the Baltic Sea Region and steel companies in China. To see whether CMP actually could be the perfect match for Chinese steel producers they also compared CMP to one of CMP's biggest

competitors, the Port of Gothenburg which is a bigger port that also operates in the Baltic Sea Region.

The study showed that the most important factor to be considered by Chinese steel companies was the demand in the region. However, the Baltic Sea Region is no different than other places in the world, the supply is greater than the demand. Despite this there are some indications that the Baltic Sea Region is growing and expanding. The Trans-European Transport Networks (TEN-T), a planned set of road, rail, air and water transport networks in the European Union is an example of this.

With the harsh reality of Chinese steel companies, the results indicated that producers need to look beyond China and that the Baltic Sea Region could be a good alternative. However, the Chinese steel companies that were struggling most with excess capacity would benefit more from this move, and the rest would be better off by waiting and see whether or not the first movers would succeed. The steel producers of China who are feeling the domestic demand decline should therefore contemplate the idea of moving to the Baltic Sea Region. There were no significant differences at least not that would concern Chinese steel companies too much, between CMP and the Port of Gothenburg.

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