



UNIVERSITY OF GOTHENBURG
SCHOOL OF BUSINESS, ECONOMICS AND LAW

European RoRo Short-sea Shipping – What can Ship Operators do to Unleash its Potential?

Case studies in Norway and Sweden

Louise Andreasson and Shan Liu

Graduate School
Master of Science in
Logistics and Transport Management
Master Degree Project No.2010:63
Supervisor: Ove Krafft

Preface

During our studies on the master programme in Logistics and Transport Management we have had the opportunity to enroll in selective courses related to shipping and maritime logistics. It was during these courses that we began to consider writing our master thesis within a related topic. Many of the courses on the programme have focused on sustainable logistics, intermodal supply chains and possible solutions to current problems of congestion, pollution and land-use conflicts, to name a few. Sea-based transportation is a mode with considerably less emissions per unit of cargo freighted compared to especially road transport, which is the dominating mode at present, and therefore RoRo short-sea shipping might be an important ingredient in future sustainable supply chains in Europe.

The thesis is built upon a thesis proposition from Det Norske Veritas (DNV), which we had the great pleasure to co-operate with on this thesis. The proposition suggested that RoRo short-sea shipping is an important transport mode with vast future potential but that its growth in the freight transport market is, among other things, dependent on the ship operators' ability to make the mode more attractive to various actors in the European freight market. The thesis aims to investigate and understand the present situation and to conclude what ship operators can do in order to make RoRo short-sea shipping more attractive for freight transports, at the same time increasing their business opportunities as well as building on sustainable European transport networks. This aim has been achieved by conducting several case studies and an in-depth literature review.

The work on this thesis provided the opportunity to gain invaluable insight to the European intermodal transport market, and especially RoRo short-sea shipping. The thesis takes on a holistic approach to the topic which resulted in conclusions with a holistic alignment. RoRo short-sea shipping's potential in European intermodal supply chains needs to be further, and deeper, investigated and the possibilities for supplementary research on the topic are many.

Abstract

Globalization and world trade creates increasing demand for transportation. Europe is strongly influenced by the automotive industry and large quantities of cargoes are transported by truck, resulting in congestion and pollution affecting human health and the environment. Short-sea shipping is promoted by the EU as a sustainable alternative to road to avoid overloading road networks, thus minimizing bottlenecks. RoRo short-sea shipping provides great potential to create more energy- and cost efficient transport networks throughout Europe.

To unleash its potential as well as increase business opportunities within RoRo short-sea shipping, ship operators need to become more attractive to cargo owners and logistics service providers. Through multiple case studies with in-depth interviews with ship-operators, logistics service providers, as well as related industry actors it became evident that ship operators must focus more on their customers' needs, implement effective marketing strategies and supply chain management as well as integrate to a larger extent into the European intermodal transport networks. RoRo short-sea operators must increase their visibility in the marketplace and create awareness of RoRo short-sea shipping's benefits among shippers i.e. cargo owners as well as logistics service providers. When ship operators have gained knowledge of, and implemented, overall marketing and supply chain strategies, as well as have mitigated the by shippers experienced weaknesses with RoRo short-sea shipping, their business opportunities in the European freight transport market are likely to increase. Marketing, collaboration and integration throughout the supply chain are identified as key success factors in RoRo short-sea shipping.

Acknowledgements

First and foremost we would like to direct a warm thank you to our tutor Ove Krafft for guidance, support, and encouragement during the process of completing the thesis. The task at hand provided us with several challenges and problems to overcome and our discussions have inspired us to work hard. We would also like to thank Johan Woxenius for sharing his experience within maritime economics and logistics by giving us initial guidance in regard to the topic and scope of the thesis.

Sigrid Ramuz-Eriksen and her colleagues at DNV, department of Maritime Solutions, has provided us with feedback and input during the course of the thesis. Their knowledge of the industry has been invaluable in our work with this thesis. It has been a rewarding process to write the thesis in close connection with the shipping industry and in co-operation with DNV and we therefore direct our warmest thanks to Sigrid and DNV.

This thesis would not have been possible to write had it not been for the important contributions from all the people that devoted their time to help us during our research. We would like to thank the following people:

Carl-Johan Westas – DHL

Christer Älveborn – Cobelfret

David Forsberg – DFDS Tor Line

Ivar Vannebo – Drammen Havn

Hans Hansson – Stena Line Freight

Helgi Ingolfsson – DB Schenker

Henrik Frick – VSD Logistics

Håkon Helliesen – Höegh Autoliners

Lennart Hovland – Norwegian Logistics and Freight Association

Per Nordvang – DFDS Group

Stian Omli – Höegh Autoliners

Tommy Svendsen – Oslo Havn

Gabriela Stojicevic – Höegh Autoliners

Simon White – United European Car Carriers

Last but not least, we would like to thank our friends and loved ones for the support during our work. The challenges we encountered along the road became much easier to handle thanks to you. Despite the hardship inherent in writing a thesis the overall process has been truly rewarding and it has contributed to both our personal- and academic development.

Table of Contents

Chapter 1 - Introduction.....	1
1.1 RoRo short-sea shipping’s future potential.....	1
1.2 RoRo short-sea shipping and sustainable logistics.....	2
1.2.1 Energy.....	2
1.2.2 Environment.....	3
1.2.3 Capacity.....	3
1.2.4 Infrastructure.....	3
1.2.5 Government support.....	4
1.3 Objective.....	4
1.4 Possible contributions of the thesis.....	4
1.5 Structure of the thesis.....	5
Chapter 2 - Area of study.....	7
2.1 Definitions.....	7
2.2 Problem discussion.....	8
2.2.2 Background.....	9
2.2.3 Current challenges.....	10
2.3 Scope and research aspects.....	13
2.4 Research questions.....	14
2.5 Assumptions.....	15
2.6 Delimitations.....	15
Chapter 3 – Methodology.....	19
3.1 Research and business research.....	19
3.2 Research approaches.....	19
3.3 Choice of method.....	20
3.3.1 Applied method.....	21
3.4 Literature review.....	22
3.5 Case studies and qualitative interviews.....	22
3.5.1 Sample design.....	23
3.5.2 Interviews.....	24
3.6 Validity.....	25
3.7 Reliability.....	26
3.8 Reflections on validity and reliability.....	27

Chapter 4 - Literature review	29
4.1 European freight transport.....	29
4.1.1 Intermodal transport.....	30
4.1.2 Maritime transport.....	31
4.2 Maritime Transport policy	35
4.2.1 European maritime transport policy.....	35
4.2.2. Scandinavian maritime transport policy.....	39
4.3 Transport mode choice theory	41
4.3.1 Purchasing theory.....	42
4.3.2 Mode and carrier selection and service qualities	43
4.4 Marketing theory	46
4.4.1 Marketing of transport services	47
4.5 Logistics theory	49
4.5.1 Supply chain management.....	49
4.5.2 The role of the port.....	50
4.5.3 Capacity utilization	51
4.6 Short-sea shipping economies	53
4.6.1 Cost structure	53
4.7 Conceptual model for analysis	54
Chapter 5 - Results	57
5.1 Case studies	57
5.2 Case study 1 – RoRo short-sea line operators.....	58
5.2.1 Valued service qualities.....	58
5.2.2 Marketing	59
5.2.3 Supply chain and logistics management	59
5.2.4 Strengths and weaknesses of RoRo	60
5.2.5 Political initiatives.....	61
5.2.6 Competition and competitiveness	62
5.2.7 Future potential	62
5.3 Case Study 2- RoRo short-sea feeder operators.....	64
5.3.1 Valued services qualities	64
5.3.2 Marketing	64
5.3.3 Supply chain and logistics management	64

5.3.4	Strengths and weaknesses of RoRo	65
5.3.5	Political initiatives.....	66
5.3.6	Competition and competitiveness	66
5.3.7	Future potential	67
5.4	Case study 3 – logistics service providers.....	68
5.4.1	Transport mode selection and valued service qualities	68
5.4.2	Image of RoRo short-sea shipping.....	70
5.4.3	Supply chain and logistics management	70
5.4.4	Strengths and weaknesses of RoRo	71
5.4.5	Future potential	72
5.5	Case study 4 – Related industry actors	74
5.5.1	Transport mode selection and valued service qualities	74
5.5.2	Image of RoRo short-sea shipping.....	75
5.5.3	Supply chain and logistics management	75
5.5.4	Strengths and weaknesses of RoRo	76
5.5.5	Political initiatives.....	76
5.5.6	Future potential	76
5.6	Summary of key findings	78
Chapter 6 -	Analysis	83
6.1	Company image	84
6.1.1	Marketing	84
6.1.2	Market segmentation and service differentiation.....	85
6.1.3	Customer relationship marketing.....	87
6.1.4	Environmental perspective on marketing.....	87
6.2	Customer value	88
6.2.1	Valued service qualities.....	88
6.2.2	Buyer – supplier relationship.....	90
6.3	Integrated supply chain management.....	91
6.3.1	Competition	92
6.3.2	Competitiveness.....	94
6.3.3	Short-sea shipping in the intermodal freight market.....	95
6.3.4	Short-sea shipping economies	96
6.4	Surrounding environment.....	97

6.4.1 Political.....	97
6.4.2 Market	98
6.5 Transport mode selection	98
Chapter 7 - Conclusions.....	101
7.1 Assumptions	101
7.2 Research questions.....	101
7.3 Recommendations.....	104
7.4 Further research	105
List of abbreviations	107
References.....	109
Books, articles, scientific articles, and other publications	109
Internet sources.....	115
Primary sources	117
Appendices.....	119
A Interview guideline – Ship operators	121
B Interview guideline – Logistics service providers	123
C Interview guideline – Port	125
D Interview guideline – Branch organization	127
E Calculation of imports and exports transported by sea to and from Norway	129

List of Figures

Figure 1-1: Thesis disposition.....	6
Figure 2-1: RoRo vessel.	7
Figure 2-2: Strengths and weaknesses in short-sea shipping.....	11
Figure 3-1: Course of action	21
Figure 3-2: Continuous process of learning and validation of method in the interview process	24
Figure 4-2: Example of intermodal supply chain.....	30
Figure 4-3: Short-sea shipping divided according to region, shares in weight 2006.	32
Figure 4-4: Short-sea by cargo type, shares in weight 2006.....	32
Figure 4-5: Driving forces for competition in short-sea shipping.....	34
Figure 4-6: Purchasing in the value chain.	42
Figure 4-7: Schematic model of shippers' logistical decision-making process.....	44
Figure 4-8: Third-party logistics product offerings and relationship type.	45
Figure 4-9: Brief overview of strategic market management	47
Figure 4-10: Air Emission factor ranges for Truck, Rail, and Marine, in g/tonne-km.	49
Figure 4-11: Illustration of capacity utilization and over a time period when fluctuations in demand are present.	52
Figure 4-12: Conceptual model based on reviewed theory.	55
Figure 5-1: Case studies.....	57
Figure 6-1: Conceptual model identical to Figure 4-12	83

Chapter 1 - Introduction

The first chapter of this thesis presents the research topic, why it is of interest to elaborate upon in a thesis, the objective of the thesis, and the structure of the thesis. It provides a comprehensive initial description of the topic and the problem and aim to give the reader a good base of understanding for further reading.

1.1 RoRo short-sea shipping's future potential

Short-sea RoRo shipping has an unreached potential, which realization can result in benefits for both shippers and receivers of goods as well as society as a whole ((1) EC & DG-TREN, 2006). As the Scandinavian countries, as well as many European, have extensive coastlines and in many cases a substantial fleet of small and middle sized commercial vessels the potential to develop short-sea transport is great. (Papadimitriou, 2001) RoRo short-sea shipping may have great potential to be better integrated in the trans-European transport networks (TEN-T) as parts of the transport chain often need to be conducted by a land based transport mode although the main haul can be carried out by RoRo short-sea shipping. As the European Union (EU) have begun to fully integrate policies dealing with TEN-T and the maritime sector, the political environment for short-sea shipping to explore its possibilities in the European freight transport market is just right. This holds especially true for RoRo short-sea shipping since RoRo is the main focus of the policy initiative Motorways of the sea, aiming at creating efficient sea highways integrated into the overall transport networks. (Casaka & Marlow, 2007) Shifting cargo from land to sea to the extent possible is evidently a desirable future development and as of this RoRo short-sea shipping and its growth potential is highly interesting. Already today, RoRo short-sea shipping is an important component in the European transport links (Lumsden & Sthyre, 2003-2005). However, despite this and despite the policies clearly promoting RoRo short-sea shipping the mode has not reached its full potential and is not well integrated into multimodal transport chains (EUROSTAT, 2005; Casaka & Marlow, 2007) Casaka and Marlow (2007) claim that this is due to insufficient infrastructure to link short-sea shipping with land-based transport modes which sustain the disadvantages and constraints of broken transport chains.

The modal shift has received much attention in papers and academic journals as well as by governments and NGO's in recent years. There is a general consensus on the necessity to lower the negative impacts such as congestion, pollution and noise, from freight transports. A modal shift from, primarily road, to short-sea shipping is needed in order for Scandinavia and Europe to cope with ever increasing transports as a result of globalization. First and foremost the benefit from a modal shift to short-sea shipping is environmental, and secondly of course economical as cost per unit transported can be lowered by using sea transport in the supply chain. Important socioeconomic benefits that promote this modal shift is the decrease in congestion on road networks utilized above their capacity as well as less pollution ((1) EC & DG-TREN, 2006). A modal shift is an important part of the solution to stop ecological

degradation and health problems deriving from transportation and the burning of fossil fuels. Nevertheless, road is the dominating mode of transport currently, when excluding transoceanic sea transports (Jegou, 2008).

This thesis is an attempt to develop an understanding as to why RoRo short-sea shipping does not constitute a larger part of the cargo transports within Scandinavia and the EU and what RoRo short sea operators can do in order to become more attractive to shippers and unleash the true potential of RoRo short-sea shipping in intermodal freight transports. In order to understand this and also be able to understand how ship operators can influence the situation there is a need to investigate what determines a shipper's choice of mode. Papadimitriou (2007) suggests that flexibility and frequency of services are the shippers' main concern and according to the OECD (2001) short-sea shipping in general is perceived by shipper to be not flexible enough technically and in addition slow. The discrepancies are evident and therefore it is equally important to understand how ship operators perceive their customers and their needs as there need to be coherence between the services offered and the ones demanded. If there exist a gap between what is demanded and what is in fact offered by ship operators this gap might explain why not more cargo is transported by short-sea. Papadimitriou (2001) emphasize the need for marketing efforts in short-sea shipping, and if such are lacking this can partly explain the current situation. In addition, Evangelista & Morvillo (1998) state that short-sea shipping companies' management lack strategic plans to govern their operations. It is the aim of this thesis to consider economical, practical and political aspects in relation to the potential of RoRo short-sea shipping and thus section 1.2 elaborates briefly on such aspects in order to gain a holistic view of the problem.

1.2 RoRo short-sea shipping and sustainable logistics

There are several reasons as to why RoRo short-sea shipping can be considered as an important mode of transport in the challenge to create more sustainable supply chains. RoRo short-sea shipping is accordingly a highly relevant thesis topic. Below the potential of short-sea shipping in general is elaborated upon within several areas.

1.2.1 Energy

Seagoing vessels consume vast resources of energy, and one cannot argue the damage done from burning fossil fuels (EEA, 2007). However, in comparison to road transport the amount of fuel consumed per unit of cargo is less (Casaka & Marlow, 2007). In addition, sea transport is its underdeveloped compared to road transport in regard to design of e.g. engines, and currently ship design is developing at a rapid pace. The potential to lower fuel consumption and emissions of harmful substances in maritime transport are great and thus a reason to promote short-sea shipping. Decreased fuel consumption has implications for the operational costs in short-sea shipping which may increase the modes competitiveness. (Mulligan & Lombardo, 2006) Nevertheless, seagoing vessels fuel efficiency needs to be improved in regard to several elements as shipping steadily increases its contribution to air pollution in Europe according to the European Energy Agency (EEA) (2007). However, the European short-sea fleet consist vessels above average age (Casaka & Marlow, 2007). Accordingly,

there is potential to lower emissions from vessels, but cleaner technologies must be implemented. Evolving legislation in regard to the sulphur content of the fuel from the International Maritime Organization (IMO) mitigate the problem further by forcing short-sea shipping to become more sustainable (UNCTAD, 2009). Moreover, if one considers the energy efficiency, the potential to develop ship technology, and the current road congestion problems in Europe today, RoRo short-sea shipping emerges as a viable future alternative to road transport.

1.2.2 Environment

Maritime transportation affects the environment in four major ways: air pollution, waste, transportation of non-indigenous organisms with ballast waters, and accidents such as groundings and collisions (HELCOM, 2006). The transport sector is accountable for 14 % of the world's total emissions of greenhouse gases. Of these 14 %, road account for as much as 10, 5 % of the emissions implying that sea, air, and rail together make out no more than 3, 5 % of emissions that contribute to e.g. climate change. (Jegou, 2008) According to Short-sea Shipping Turkey (n d) the external costs (e.g. noise, pollution and climate change costs) are lower for short-sea shipping than for road, rail, and air. By increasing short-sea shipping's share of regional cargo transports, pollution and congestion can be decreased (CAO, 2005). Moreover, alternative fuels in short-sea shipping can lower emissions of NO_x and SO_x considerably (Marintek, 2009). Nevertheless, it must be considered that the seas are sensitive eco-systems, and e.g. the Baltic Sea – a busy short-sea area (OECD, 2001) – is particularly sensitive to e.g. eutrophication from nitrogen emissions and thus putting more pressure on the system by increasing short-sea – if that is not adapted to specific environmental requirements – can be questioned (Petzoldta & Uhlmann, 2006).

1.2.3 Capacity

A RoRo short-sea vessel can carry considerably larger amounts of cargo than a truck. The capacity advantage has implications for the fuel consumption per unit freighted and emissions for the same. Adding the favorable fuel economy to the equation paints a positive picture of RoRo short-sea shipping. (Mulligan & Lombardo, 2006) Although this holds true, the capacity of a RoRo short-sea vessel is expensive compared to that of e.g. a bulk carrier due to its capacity utilization constraints (Sthyre, 2009) and in addition a RoRo vessel costs approximately three times more than a regular container vessel of the same size (Casaka & Marlow, 2007) Taking this into consideration, it is clear that RoRo short-sea shipping requires a large and consistent cargo flow to be economically viable (Casaka & Marlow, 2007) On the other hand, short-sea vessels have an advantage due to their size that allows travels on regular seaway routes as well as inland waterways and provide a greater level of accessibility to inland areas, which is of value for shippers (Coyle, Bardi & Novack, 2006).

1.2.4 Infrastructure

The European road network is under pressure and urban areas experience harsh congestion. RoRo short-sea shipping can relieve the heavy burden on road networks and mitigate congestion. Moreover, the mode reduces the need for expensive and time-consuming land-based infrastructure thus also minimizing land-use conflicts (GAO, 2005). Short-sea shipping

requires infrastructure in the form of ports and hinterland connections. Improved such infrastructure is a necessity to increase the attractiveness of short-sea shipping and to meet the demand of efficient distribution. RoRo short-sea shipping faces harsh competition from rail, which also has a potential relieve congested road networks, and lower emissions. (Casaka & Marlow, 2007) On the other hand, the modes can be complimentary to one another and a balanced development of various transport modes could be achieved. Hence, the potential of RoRo short-sea shipping is not necessarily hampered by a development in rail infrastructure. However, in order to enable RoRo short-sea shipping's ability to meet the requirements of international business and trade, port development has to fulfill requirements such as being flexible, efficient, accessible to intermodal transport, etc (Casaka & Marlow, 2007).

1.2.5 Government support

The EU has repeatedly stated the need to promote and support intermodal transport in general, and short-sea shipping specifically, as a competitive alternative to road transport to achieve a sustainable societal development. Short-sea shipping is an important part of a European intermodal transport network according to the EC (2007). Casaka & Marlow (2007) highlight that this is especially the case with RoRo short-sea shipping as Motorways of the sea are integrated into TEN-T. The EC supports short-sea shipping in order to govern and stimulate the development of transportation in the right direction. Government policies, in particular their social, environmental, technical and fiscal aspects, have an impact on the development of short-sea shipping. Proactive legislation has to be proposed and acted upon in order to assist the development of short-sea shipping. All governmental supports, local as regional, are backbones to a more sustainable development of cargo transports and the development on short-sea shipping, in Europe. ((2) EC & DG-Tren, 2006)

1.3 Objective

The objective is to understand what RoRo ship operators can do to become more attractive to shippers and logistics service providers and increase their business opportunities in the European cargo transport market. The aim is also to learn how the potential of RoRo short-sea shipping can be realized through the work of RoRo ship operators within areas such as marketing, customer relations, taking advantage of market conditions, to name a few.

1.4 Possible contributions of the thesis

Contributions from the thesis will hopefully be a deeper understanding of specifically Scandinavian RoRo short-sea operators' possibilities to increase their part in freight transports under current market conditions. The results might be helpful for DNV in their support services to shipowners and ship operators especially within the European short-sea segment. Further, the thesis can provide additional insight on important determinants in the transport mode decision and specifically how Scandinavian RoRo short-sea shipping is affected by this and what ship operators can do to overcome hindrances in becoming a more dominant mode in European intermodal supply chains.

Castells and Martinez de Oses (2006) support the need for studies on how short-sea shipping can be improved so that it can be the best option of transport. In addition the EC (2006) have identified a few fields that require emphasis in future research and development in relation to short-sea shipping. It is stressed that motorways of the sea need to keep up with modern logistics in the information society and research within the following field, among other, is way to achieve this.

- Improvement in logistical performance to ensure frequent, reliable and fast short-sea services. The future objectives is to be able to operate high-frequency connections, to efficiently integrate into freight corridors, and gain higher commitment among all supply chain partners to improve the quality of intermodal services. (EC & D-Tren, 2006)

Specifically the need for improve logistical performance within short-sea shipping falls within the research scope for the thesis. There is an evident lack of research done in this field and specifically in regard to how ship operators can work to make RoRo short-sea a more attractive mode to shippers and service logistics providers. The thesis might give rise to new questions and problems which can be of interest to explore in yet another master- or doctoral thesis resulting in further contributions within the field.

1.5 Structure of the thesis

The thesis is constructed according to Figure 1-1 and firstly presents the subject, the problem, the research methodology and then the results as well as an analysis and the final conclusions and recommendations. Hopefully the reader will benefit from this structure as it is believed that he or she will have no difficulties in following the research process and how the results are generated. In addition the literature review that precedes the results provide a sound foundation for the reader to understand the results. The analysis that follows is well built-up by both the literature review and the results and the natural step to proceed is of course to present the authors conclusions, and then finally recommendations.

Chapter 2 provides the reader with an in-depth description of the area of study, its scope and important research aspects as well as definitions required for the reader of the thesis. Moreover, the limitations of the thesis are elaborated upon and the underlying research problem is discussed and analyzed. Finally the research question and hypothesizes are presented.

Chapter 3 contains description as well as motivation of research methodology, and discussion concerning the reliability and validity of the study. The aim of the chapter is to provide the reader with a thorough description of the research process and the case studies carried out.

Chapter 4 reviews relevant literature within the area of study and present the conceptual model for analysis. The scope of the literature review entails maritime transport, intermodal transport, and European transport policy in interconnectivity with logistics theory, transport

Chapter 1 – Introduction

mode choice theory (including purchasing theory), marketing theory (including environmental marketing) and economic theory. Finally a conceptual model for analysis is presented.

In chapter 5 the results from the empirical study are presented case study by case study. The empirical findings are compared within each case study. The chapter is ended by presenting the key findings from the case studies.

Chapter 6 contains the interpretation and analysis of the results in relation to the conceptual model. Each aspect relevant for the scope of this thesis and the conceptual model will be analyzed and discussed from a holistic viewpoint. Conclusions and recommendations are given in chapter 7.

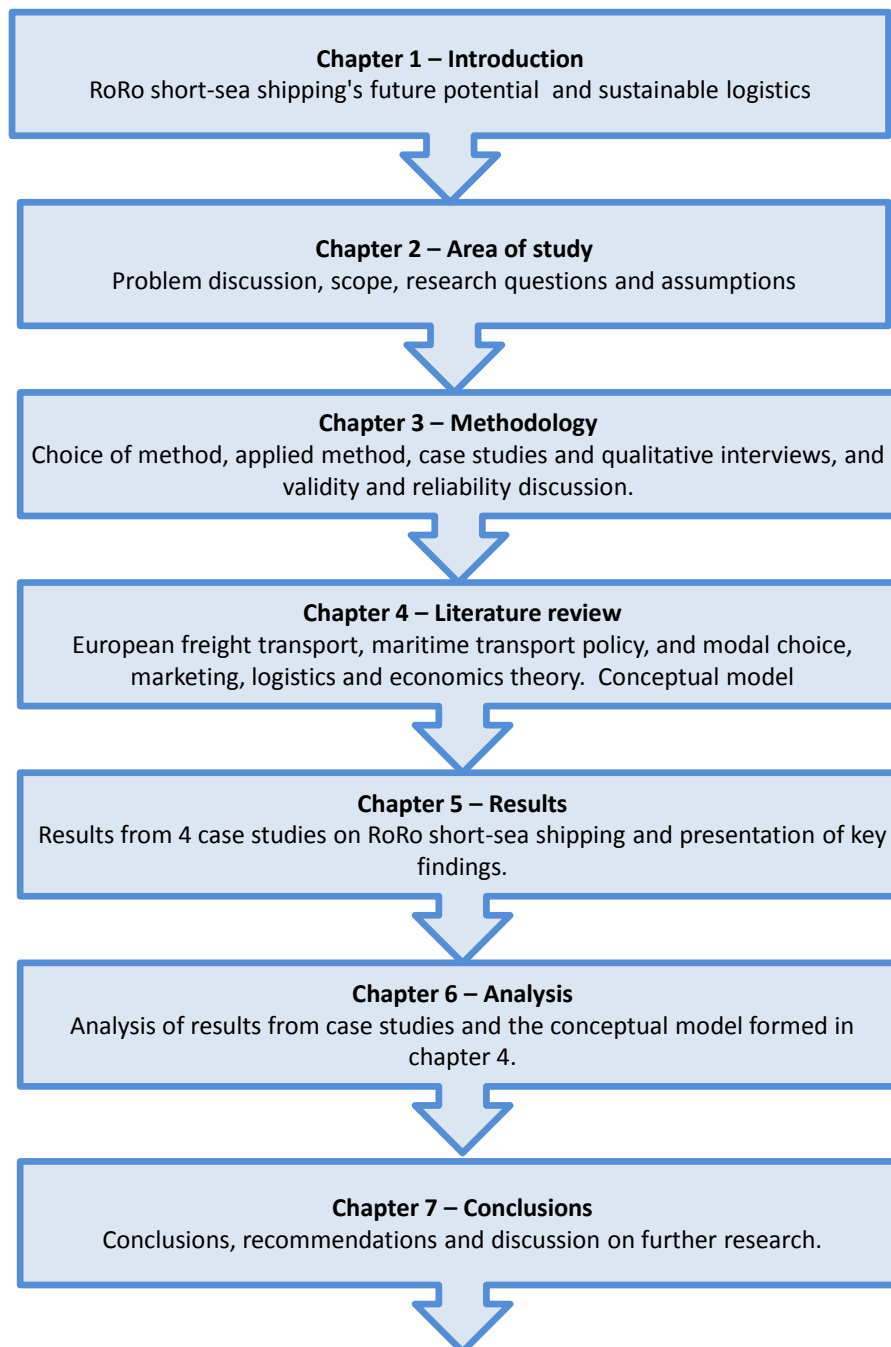


Figure 1-1: Thesis disposition

Chapter 2 - Area of study

The area of study is RoRo short-sea shipping in primarily Scandinavia area, but also within Europe as a whole, due to the international characteristics of short-sea shipping as a mode. In this chapter necessary definitions are provided as well as the analysis of the research problem. The scope of the thesis is explained in detail by presenting the research aspects. Finally the research questions, hypothesizes and delimitations of the thesis are presented.

2.1 Definitions

Short-sea shipping can be said to be transportation by sea that do not involve ocean crossings. This type of maritime transport can be carried out along coastlines, between mainland and islands, between islands, and between mainland and mainland within the EU. Short-sea shipping in this sense covers only national transport, so called cabotage, and transport services across borders. Transportation from, or, to the hinterland on river is also considered as short-sea shipping. (OECD, 2001) In this thesis vessels that feeder cargo on behalf of deep-sea vessels but do so within the boundaries stipulated above are also considered a part of the short-sea segment (Casaka & Marlow, 2007).

The above definition of short-sea shipping is applied throughout the thesis, and in addition, a more comprehensive definition is needed to explain what is meant by RoRo short-sea shipping. In RoRo short-sea shipping in this thesis the following types of RoRo vessels are included; RoRo, RoPax, CC, PCTC. In RoRo shipping, deep-sea as well as short-sea, the cargo mainly consists of trucks, trailer, cars, heavy machinery and other types of cargo that can be rolled on and off the vessel, thus the vessels name, either on its own or by the use of rolling equipment. A RoRo vessel's cargo capacity is defined in the maximum available lane meters and a RoPax vessels capacity is defines in the maximum available lane meters and the maximum number of passengers. (Branch, 2007)

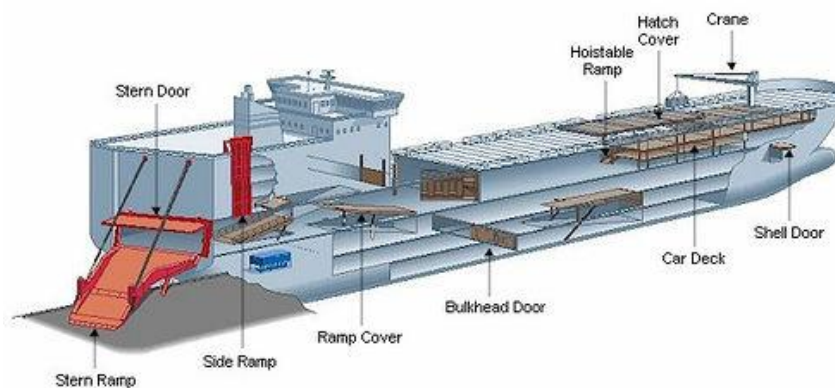


Figure 2-1: RoRo vessel. Source: Eagle Speak (2010)

In this thesis no distinction is made between e.g. deep-sea and short-sea vessels in regard to size (gross tonnage). Instead a RoRo short-sea vessel is defined as a ship employed in a trade

that falls under the definition in 2.1, paragraph 1, and entails the characteristics of any of the vessel types described previously in this paragraph.

Intermodal transportation must include at least two different modes of transport that follow on each other in an unbroken chain (Lumsden & Sthyre, 2003-2005).

Ship operator is defined as the person/entity that retains commercial control of the ship and takes the commercial risks and benefits of its operation, deciding whether to trade the ship directly for his own benefits or charter the ship out on a time charter, voyage charter, bareboat charter or the equivalent (IMO, 1998).

Shipper is the person/entity that ship cargo from one destination to another (Branch, 2007). In this thesis the shipper is defined as the person/entity which contracts the RoRo operator to perform a transport service, meaning that the shipper can be a cargo owner or a service logistics provider, the latter acting on behalf of the cargo owner. In this thesis the shipper can also be denoted as the customer. The perspectives of the cargo owners are in the case studies herein represented through interviews with logistics service providers acting on the cargo owners' behalf.

The term logistics service provider is used in this thesis to define companies that provide transport and/or logistics services. A logistics service provider can thus be a freight forwarder and a third and/or fourth party logistics provider according to the distinction made in this thesis. The term logistics service provider is used as a collective name for the logistics companies dealt with in the case studies.

A third party logistics provider (3pl) takes on to carry out either all, or part of, the logistics activities that are required to achieve a flow between a company and its customers. Most commonly a 3pl carry out the physical transportation of goods and/or is responsible for the inventory and the inventory management. ((1) Logistikföreningen Plan, 2010) As can be interpreted from this definition a freight forwarder fall under the definition 3pl.

Services from a fourth party logistics provider (4pl) are more comprehensive compared to a 3pl; a 4pl is alone responsible for all different logistics activities for e.g. a producing company. The 4pl both organizes and administer the purchase of services from other logistics providers required for the producing company to fulfill their tasks. ((2) Logistikföreningen Plan, 2010)

2.2 Problem discussion

A growing economy with an increased demand for transports has its challenges and there is consensus today on the adverse environmental effects of transport, as well as its implications for human health. Intermodal transport networks where RoRo short-sea shipping is better integrated and better utilized than today might offer a prudent step on the route towards sustainable and in addition more efficient supply chains from both an economic and social perspective. Section 2.1.1 provides a brief background to European short-sea shipping and the

EC's attitude towards short-sea shipping. Current policy developments related to short-sea shipping are briefly mentioned to give the reader a perception of the market- and political environment that RoRo short-sea shipping operates in. Section 2.2.2 debate the current challenges that society faces due to increased transports as well as challenges that short-sea shipping in general is up against. The aim is to argue in favor of RoRo short-sea shipping while at the same time shed light over the obstacles the mode must defy in order to grow.

2.2.2 Background

Almost 90 % of the European imports and exports are transported by sea ((2) EC & DG-Tren, 2006), an indication in itself regarding the importance of seaborne transport. Meanwhile shipping contributes with as little as approximately 4 % of the world's total CO₂ emissions (Stena AB, 2008) and less than 3.5 % of total emissions contributing to climate change (Jegou, 2008), implying that seaborne transport is a relatively sustainable transport mode. The EU is s an important market in an international context and the need for transport both from and to the EU as well as within is apparent. The European Commission (EC) has in many communications addressed the issue of development of sustainable transport systems, capable of protecting the environment, despite the growing need for transports, to sustain healthy ecosystems for current and future generations while at the same time maintain economic growth. To reach this aim, the EC proposes the shifting of goods from road to short-sea shipping. In the EU, large cargo volumes are already transported by intermodal transportation and about 40 % of the intra-European trade went by short-sea shipping in 2006 according to EC & DG- Tren ((2) 2006). According to Amerini (2008) 63 % of European maritime trade was transported by short-sea shipping in 2006. These number differ somewhat, and it is difficult to establish the precise differences in how these statistics have been produced. The lack of solid and coherent statistics is highlighted by the OECD (2001) as a hindrance in the development of sufficient policies to support short-sea shipping.

In the light of the rapid growth of inland freight traffic, congestion, and pollution the EC has developed strategies to mitigate this by promoting short-sea shipping. The White Paper (2001) was the start for the extensive work to promote short-sea shipping and integrate the mode in TEN-T. In 2003 the EC embarked on the first Marco Polo funding programme, for which the foundation was laid in the White Paper (2001). The Marco Polo program aims to facilitate the shifting of freight transports from road to sea, inland waterways, and rail. This modal shift means less traffic on the roads which will lessen congestion and pollution as well as provide more reliable transport services. The second Marco Polo programme includes European non-member countries such as Norway. The ambition of the EU to combat the problems of un-sustainability is clearly stated through actions such as this funding programme. The White Paper (2001) also laid the foundation for Motorways of the sea, an action considered to support sustainable economic growth, social development and protection of the environment. Motorways of the sea particularly favor the growth in RoRo short-sea shipping. (EC & DG-TREN, 2009)

“Genuine motorways of the sea are therefore aimed at acting as a substitute for motorways on land, either to avoid saturated land corridors, or to give access to countries separated from the rest of the European Union by seas.” This is valid for passenger as well as cargo

transport for four European maritime areas (the Atlantic, the Baltic, the Western Mediterranean, and the Eastern Mediterranean) via the use of Ro-Ro ships /.../". (Van Miert report 2003; (1) EC & DG-Tren, 2006)

Besides policies focusing on short-sea shipping the EC has initiated several projects, such as REALISE which work to encourage the use of short-sea shipping. REALIZE has duration of three years, has 26 member countries and fall under the EC's *Competitive and Sustainable Growth Programme*. (REALIZE, 2010) European policy on short-sea shipping, e.g. the Marco Polo programmes, have been successful but and have also sometimes failed to reach shift targets (Steer Davies Gleave, 2009), and general transport policies aimed at promoting intermodal transport have not always been successful according to Tsamboulas, Vrenken & Lekka (2007). They argue that policies need to target specific areas within e.g. the supply chain to be able to identify certain actions that could have potential to shift cargo from road to alternative modes. This may imply that Motorways of the sea have potential to result in satisfying results as the action have a clear focus on maritime motorways within TEN-T. Casaka & Marlow (2007) believe that Motorways of the sea is likely to result in elimination of sea-shore interface bottlenecks, and only when this is fulfilled can short-sea shipping fully take advantage of being a part of the European transport network.

2.2.3 Current challenges

Europe experience harsh congestion and pollution problems that will only get worse unless road traffic is decreased. If road traffic is allowed to continue to increase, it is estimated that inland freight traffic within the EU-15 countries will go up by 70 % by 2020. ((1) EC & DG-Tren, 2006) The authors of this thesis argue this will inevitably lead to a substantial increase in air pollution in densely populated areas and the socioeconomic costs of such an increase in road traffic are yet to be estimated but are surely great. A modal shift from road to RoRo short-sea will remove much of this pollution from the most sensitive areas, i.e. urban population centers. Moreover, ships are energy efficient per unit freighted in comparison to trucks and legislation continuously forces shipping to move on to cleaner fuels and/or technologies. During the past decades the fuel efficiency of ships' engines has improved remarkably. As it is possible to increase ship size without increasing the fuel consumption relative to the increase in ship size, the emissions per container carried across the Atlantic Ocean is 70 % less of the emissions from the same 30 years ago. (Stena AB, 2008) It may be established that RoRo short-sea shipping has a potential to contribute to more sustainable intermodal transport chains; "*In terms of energy efficiency and the weight of goods which can be moved one kilometre by one liter of fuel, the figure for road haulage is 50 tones, for rail haulage 97 tones and for inland waterways 127 tones.*" (Agence française de l'environnement et de la maîtrise de l'énergie; EC, 2001)

On the other hand, short-sea shipping has its own drawbacks. Short-sea shipping is considered to be complex to organize due to overlapping contracts of carriage and liability regimes. Second to this, the in general old short-sea fleet results in technical inflexibility, slow shipping operations and increased lead-times (OECD, 2001). Figure 2-2 presents the strengths and weaknesses in short-sea shipping, and it is reasonable to here focus on the weaknesses as the thesis aim is to learn how such weaknesses can be overcome by ship operators. There are

Chapter 2 – Area of study

of course certain weaknesses that may not be possible to eliminate by actions from the ship operator, such as weaknesses nr 1, 4, 8, 9, 10, 11, 12, 15, 16 and 19. The remaining weaknesses have good potential to be conquered by ship operators by implementing organizational changes, technological improvements and changes in management style and strategies (Casaka & Marlow, 2007). In the right column in Figure 2-2 the weaknesses are segmented into *can influence* and *cannot influence*. Figure 2-2 further illustrate that poor image seem to be a problem in short-sea shipping. This aspect is also highlighted by the OECD (2001). According to the OECD (2001) shippers perceive short-sea shipping as complex and also Figure 2-2 put forward this aspect as well as the problem of bureaucracy. Weaknesses 3, 13, 14 and 19 may be overcome by e.g. marketing efforts. Weakness 19 is categorized as *cannot influence* in Figure 2-2 however, it is possible that marketing efforts from ship operators may have some influence on how customers value environmental friendliness in the choice of mode. The strengths and weaknesses herein mentioned will be considered throughout the thesis.

Strengths	Weaknesses	Can influence
<ol style="list-style-type: none"> 1. Cost lines in excess of 67,000 km 2. Can offer services at lower freight rates due to inherent economies of scale and distance 3. Unlimited capacity of the sea 4. No time restrictions in regard to use 5. Port investments and port maintenance are low 6. Does not require huge land 7. The market players possess the knowledge for operating this transport mode 8. Inclusion of external transport costs in freight rates 9. Environmentally friendly. Contributes to reduction in energy consumption 10. Contributes to the development of the EU shipbuilding industry 11. High safety levels in the transport of dangerous goods. Removes such from roads 12. Underused capacity for expansion 13. A favorable common transport policy supporting underused capacity 	<ol style="list-style-type: none"> 1. Capital intensive industry 2. Can hardly offer door-to-door transport on its own – broken value chain 3. Old/traditional organizational cultures 4. Need to plan carefully the development of port/dedicated terminal layout 5. Higher inventory costs 6. Lack of information technology/information systems compatibility 7. Lack of shipping operations flexibility, frequency, reliability 8. Very bureaucratic industry 9. Time in port depends on the port's physical conditions 10. Lack of good road and rail links to ports 11. Low speed of operations, lack of empowerment, lack of port capacity, lack of transparent port tariffs 12. Low levels of port reliability 13. Poor image 14. A passive attitude towards shipping companies 15. Lack of reliable statistics 16. Trade imbalances 17. High sailing times 18. Complicated to arrange sea transport 19. Customers do not choose transport because of environmental friendliness 	<p data-bbox="1246 891 1402 1227">Can influence</p> <p data-bbox="1246 920 1310 943">Nr. 2</p> <p data-bbox="1246 949 1310 972">Nr. 3</p> <p data-bbox="1246 978 1310 1001">Nr. 5</p> <p data-bbox="1246 1008 1310 1030">Nr. 6</p> <p data-bbox="1246 1037 1310 1059">Nr. 7</p> <p data-bbox="1246 1066 1310 1088">Nr. 13</p> <p data-bbox="1246 1095 1310 1117">Nr. 14</p> <p data-bbox="1246 1124 1310 1146">Nr. 17</p> <p data-bbox="1246 1153 1310 1176">Nr. 18</p> <p data-bbox="1246 1227 1402 1294">Cannot influence</p> <p data-bbox="1246 1317 1310 1339">Nr. 1</p> <p data-bbox="1246 1346 1310 1368">Nr. 4</p> <p data-bbox="1246 1375 1310 1397">Nr. 8</p> <p data-bbox="1246 1404 1310 1426">Nr. 9</p> <p data-bbox="1246 1433 1310 1456">Nr. 10</p> <p data-bbox="1246 1462 1310 1485">Nr. 11</p> <p data-bbox="1246 1491 1310 1514">Nr. 12</p> <p data-bbox="1246 1520 1310 1543">Nr. 15</p> <p data-bbox="1246 1550 1310 1572">Nr. 16</p> <p data-bbox="1246 1579 1310 1601">Nr. 19</p>

Figure 2-2: Strengths and weaknesses in short-sea shipping. Adapted from: Casaka & Marlow (2006; 2007)

Development of short-sea high-speed vessels (HSV) poses as a potential to overcome long lead-times (OECD, 2001). Becker, Burgess & Henstra (2004) also see the potential in HSVs, however Castells & Martinez de Oses (2006) claim that such a solution is not feasible on journey shorter than 12 hours if not the shorter lead-time off-set the higher price. In addition the increased fuel consumption from increased speed must be considered (Casaka & Marlow, 2007). Moreover, short-sea shipping vessels comparatively small which make it difficult to

achieve the necessary economies of scale needed to be able to provide a more flexible service with e.g. more frequent departures, as is indicated by weakness 7. Underdeveloped infrastructure in ports as well as into the hinterland are contributing factors for weakness 7 that makes it difficult for short-sea operators to meet the demand on flexibility and speed from its customers. Functional hinterland connections are crucial to provide seamless, door-to-door logistical solutions and it is an important factor in the realization of short-sea shipping potential, as shipper will likely not be keen to choose this mode if the logistical service do not meet their demands on time, price, and flexibility etc. Lead-times are crucial in today's agile supply chains as stocks are minimized in order to save money (Enarsson, 2006). The time-window for transportation is very narrow and slow transportation or delays are unacceptable. (Garberg, 2001 and Martinez & Olivella, 2005) This implies that Ro-Ro short-sea shipping must be able to provide fast, reliable, and safe transportation in order to be the chosen mode by shippers. A growth in RoRo short-sea shipping requires that weaknesses are mitigated and strengths enhanced. The mode needs to build an image that appeal to shippers. Evers et al. (1996) concluded that shippers often put overall service quality above cost, however, cost is often more important than each service feature separately. Garberg (2001) argue that the transport decision is made upon various parameters such as frequency, time, security, controllability, and flexibility. Such parameters could be referred to as service quality. Garberg (2001) further state that customers in the RoRo segment often demand value-added services in addition to the basic transport service, of special interest are wider transport- and logistical services. Weakness 2 in Figure 2-2 confirms that lack of such services is considered a drawback in short-sea shipping in general. According to a study mentioned by Garberg (2001) ship operators should mainly focus on adapting their basic services to the demands of their customers. Value-adding services should be tailor-made according to a customer's needs.

European companies have a tendency to use road transport mainly for operational reasons. Despite the efforts from the EC, limited changes in the transport system have been realized. Short-sea shipping or coastal shipping usage is far below expectations and is still far behind road transport as highlighted by EUROSTAT (2009). Sea transport is a competitive mode and a good alternative to land transport which could relieve bottlenecks in e.g. the Alps and the Pyrenees. ((1) EC & DG-Tren, 2006) Since the benefits from shifting cargo from road to sea are deemed to be great, it is important to investigate what can be done to increase RoRo short-sea shipping; nevertheless, there are many dimensions to this issue. The policy initiatives from the EU have evidently not provided for a quick solution to integrate short-sea in the European transport network.

The modal shift is hindered by e.g. the fact that road transport does not pay for its adverse effects through taxes, tolls, or fees which provide the mode with an economic competitive advantage that trickle down to the customer in the form of lower freight rates. It has proven difficult for short-sea shipping to compete with this which creates barriers that hold back the development of sustainable transport links at sea within the EU. (EC, 2009) Short-sea shipping has to become a truly profitable as well as affordable mode in order to shift cargoes of the roads. In order to attract more customers to RoRo short-sea shipping, the mode must

offer convincing economic advantages to shippers before they will be willing to shift from another transport solution. Cost-competitiveness with other modes as well as reliability, frequency and flexibility, as shown in Figure 2-2, is a must to position RoRo short-sea shipping services as a viable alternative to both road and rail. Brooks and Frost (2004) concluded that short-sea shipping has problems to meet the requirements of shippers regarding both service and price, which further strengthen the notion that this study is a well-grounded contribution to current research. There is a need to develop an understanding for how RoRo short-sea ship operators can work to increase the usage of the mode by improving e.g. service quality. According to EC & DG- Tren ((2) 2006) maritime transport is and will continue to be the backbone in international trade both within and outside the EU, but this might not hold true in the future if the mode cannot keep up with the requirements from shippers.

2.3 Scope and research aspects

The scope of the study entails a few major aspects to achieve results that enable the answering of the research question presented in 2.4. However, in order for the scope of the thesis to be manageable during the limited time available to conduct the study and write the thesis, these five aspects are not covered equally in detail. Consequently, these research aspects are ranked with descending priority from one to five. Number one through three will therefore receive special attention in this thesis, while aspects four and five receives the attention necessary for the fulfillment of the thesis purpose. Each research aspect is followed by a short background to the topic to further explain the scope.

1. What criteria are the most important when selecting transport mode? How are the transport decisions being made?

Criteria in transport mode selection and their difference in importance are related to the characteristics of the mode, cargo and shipper. Mode related criteria are characteristics such as time, price, service quality, flexibility etc (Evers et.al., 1996); cargo related factors are value, volume, product demand predictability etc; and shipper related criteria include supply chain strategy, contractual terms etc (Brusset, 2005). How transport decisions are being made, and by who, is interesting in relation to ship operators marketing and at who these efforts should be aimed.

2. Marketing of RoRo short-sea services

Implementing appropriate marketing strategies is decisive in any business. To market and be visible will influence the business opportunities for any RoRo short-sea operator, as well as the possibilities to achieve efficient and long-lasting commercial operations. It is important to apply niche marketing strategies to improve the planning and operations of short-sea shipping. Marketing and customer relations in general are further also of fundamental importance for keeping customers satisfied and loyal. (Nash& Ulrich, 2007)

3. Political environment

As have been clear through previous parts of this thesis the political environment have a large impact on RoRo short sea shipping's growth and development. Both national European governments as well as the EC consider short-sea shipping as one of the most feasible way to alleviate the steadily increasing congestion (Castells & Martinez, 2006). Therefore it is of interest to investigate how ship operators and other actors participating in this research are actually influenced by policies and other initiatives and whether or not the current situation is experienced to enable a growth in RoRo short-sea shipping. Are policy intentions resulting in changes that ship operators can benefit from?

4. *Environmental issues and how these influence the transport decision*

Short-sea shipping is promoted, developed and enhanced for its contribution to reductions in congestion and related environmental degradation. (ECMT, 2000) Environment is interesting in relation to how it influences the shippers in the mode selection. Currently, road is seen as the cheapest mode to transport shipments within Europe, however this is a result of the fact that neither the road transport sector nor the end user pays for the externalities, such as pollution and congestion, that road transport is responsible for. As a result shippers are reluctant to pay for short-sea shipping in spite of it being an environmentally friendly mode compared to road transports as the pricing and what externalities the price actually comprise differs between the sectors. (Tenekecioglu, 2004)

5. *Contractual and juridical matters*

The somewhat complex contact structure in maritime transport in general contributes to worsening the image of short-sea shipping. (OECD, 2000) However the complexity in RoRo short-sea shipping is less than in short-sea shipping in general as trucks and trailers that are driven onboard a RoRo vessel is governed by road transport rules in most cases. In Scandinavia a trailer onboard a RoRo vessel is governed by NSAB 2000 a regulatory framework agreed upon within the Nordic Freight Forwarders Association, where both parties' rights and obligations are regulated according to various internationally ratified conventions (NSAB, 1998).

2.4 Research questions

The main question, stated below, on which this study is based is followed by several sub-questions that separately cover the areas within which the study is concerned. By answering these questions it will be possible to also answer the overall research question which is the aim of the study.

What can ship operators do to become more attractive to cargo owners and logistics service providers and realize the unreached potential of RoRo short-sea shipping to create more business opportunities?

1. *What qualities are considered by shippers? Who makes the transport decision (3/4pl, cargo owner)?*
2. *Are ship operators visible enough for potential customers? Do ship operators need to focus more on marketing activities?*
3. *What are the main advantages and disadvantages of RoRo short-sea shipping and how can advantages be enhanced while disadvantages eliminated?*
4. *How can ship operators use the existing transport policy and political initiatives to develop their RoRo short-sea shipping services?*
5. *Does the increasing environmental awareness have positive implications for the development of RoRo short-sea shipping?*

2.5 Assumptions

First of all, it is assumed that one of the reasons that the potential of short-sea shipping is not realized is that ship operators lack information and knowledge about the decision makers for cargo transportation and the relevant qualities to focus on in order to attract cargo. *Secondly*, it is assumed that short-sea shipping services are not marketed in an appropriate way, or, to the extent needed, in order to attract potential customers. *Finally*, the political support and market conditions have implications for the development of RoRo short-sea shipping. The assumption is that political changes that influence the market conditions can favor a positive development within RoRo short-sea shipping. Thus ship operators should be more active politically.

2.6 Delimitations

Due to constraints in regard to especially time to conduct the research it is vital that the scope of this thesis is delimited distinctly. The objective of the thesis is to understand what ship operators can do in order to increase their own business opportunities within RoRo short-sea shipping. Therefore, mainly the perspective of the ship owner will be dealt with throughout the thesis. Customer's i.e. shippers' perspectives are considered to understand if and how ship operators lack knowledge regarding the modal choice and its determinants/valued service qualities. The focus throughout the thesis is on RoRo short-sea shipping, and no other types of short-sea. RoRo and RoPax ferries is an important part of European short-sea shipping transport links already and has great potentials to be much more developed (Lumsden & Sthyre, 2003-2005); as a result, it provides for an interesting research scope in shifting more cargo from road to sea over longer distances than today. The distance travelled by sea could be extended by a better RoRo short-sea shipping logistics system throughout Scandinavia and Europe.

The ship operators and/or ship owners that are considered in the scope of this thesis are the ones referred to as *ship operators*. Their main business is to sell maritime transport services; often these ship operators have a mixed fleet of self-owned and chartered vessels. There are other types of shipowners such as *Tonnage Providers*, which charter vessels to e.g. ship operators that have the commercial management of the vessel(s) and this type is not relevant for the thesis. Besides, other types of transport service suppliers, for instance, freight forwarders, 3pl's, and 4pl's are included in the research scope however, only aspects relate to RoRo short-sea shipping falls into our research study. Further it should be emphasized that the scope entails European and Scandinavian RoRo short-sea shipping, with a special focus on Norwegian and Swedish operators as financial constraints made it impossible broaden the scope in this aspect.

Contractual relationship within short-sea shipping is interesting but is not a major aspect in this research and it will only be discussed as an aspect that might either hinder or facilitate short-sea shipping.

Environmental issues, which are highly relevant in the promotion of short-sea shipping, will in this thesis, be related to how these can be used as a selling point in marketing of RoRo short-sea services. In addition it will be considered how environmental concern influences the transport decision. This thesis will not in discuss measures ship operators could or should take to make their transport services more environmentally friendly.

The competitive situation between RoRo short-sea shipping and e.g. containerized short-sea shipping is not included in the thesis scope.

Political influences and legislation on short-sea shipping will be discussed in relation to how it affects the ship operator's potential business opportunities. How legislation is formed, implemented and why it is needed, it is an interesting subject, however, is not found relevant for the scope of this thesis. Of relevance is merely transport policies and how ship operators can relate to these policies and legislations and use it to create opportunities and advantages. In addition the effectiveness of policies promoting short-sea/RoRo short-sea shipping will be dealt with briefly from the perspectives of mainly the ship operators in the analysis. Otherwise these instruments effectiveness is left aside in this thesis.

Another political aspect that will be left aside in this thesis is taxation, such as the tonnage tax, and its impacts on the competitiveness of RoRo short-sea shipping. The tonnage tax is a fiscal incentive meant to stimulate shipping and the industry's competitiveness by lessening the tax burden of the ship owners (Marlow & Mitroussi, 2008) It would have been very interesting to address this issue however, it would provide enough scope for an entire thesis, accordingly it cannot be dealt with in this one.

The fact that Norway is not a member of the EU is disregarded throughout this thesis as Norway none the less is involved in e.g. the Marco Polo funding programmes, is a member of the European Shortsea Network, and in addition has similar maritime transport policy and legislation to Sweden which is a member of the Union. The difference in potential of RoRo short-sea shipping between Norway and member countries could be an interesting topic for

Chapter 2 – Area of study

another thesis, but the difference is likely not major which is a second reason to not consider it.

The statistics referred to throughout the thesis are in most cases from e.g. Eurostat, the EC, or Statistics Norway. Nevertheless, we have learned that there are definite uncertainties in many of the statistics despite that they are collected from reliable sources. These uncertainties will not be elaborated on further as the quality of the statistics is sufficient to support arguments in the thesis however the reader needs to know that these uncertainties exist. N.B. in statistics from the EC Norway is mostly included due to its importance as a shipping nation. The term EU-27 can thus be said to include Norway when it concerns European maritime transport.

The delimitations of course put constraints on the research, and it may be that the results would have benefitted from including e.g. contractual matters to a greater extent. However, the authors argue that the thesis would have been disadvantaged by a broader scope due to limitations in regard to time, geography and economy that would likely have resulted in a thesis of poorer quality. In conclusion, the delimitations contribute to the quality of the study.

Finally, this thesis is written in a manner that requires that the reader has basic knowledge of maritime transport, logistics and economy.

Chapter 2 – Area of study

Chapter 3 – Methodology

In this chapter the essentials of research methodology is briefly introduced and described as is different approaches to business research. The focus of the chapter is to present, describe, and motivate, the choice of method for this thesis and also to discuss the validity and reliability concepts as well as relate them to the conducted research.

3.1 Research and business research

Research is defined as a process where new knowledge and increased knowing can be brought forth by systematic research work. In 1970 the Organization for Economic Co-operation and Development (OECD) agreed upon a common terminology where research was divided into basic research, applied research, and development work/research. The research herein presented can be referred to as applied research as it is defined by a systematic and methodical search for new knowledge and new ideas keeping a specific application of this knowledge in mind. (Nationalencyklopedin, 2010)

Business research is crucial to decision making processes in both companies and organizations and business research is according to Blumberg et al. (2008) a systematic inquiry with the objective to create knowledge and information that will allow managerial problems to be solved.

This thesis encompass both traditional, academic research, and business research as the purpose of the thesis is to first and foremost fulfill the academic requirements for research done at an advanced level, and secondly, also to fulfill the requirements, i.e. answer the business research questions for Maritime Solutions. The School of Business, Economics, and Law primary concern is that the work with this thesis is carried out in a proper way, while DNV's primary concern is to be able to make use of the results from this research in their consulting business. This aim will be fulfilled by the method described in the following parts of this chapter.

3.2 Research approaches

There are two main approaches to research; the quantitative and the qualitative method. Quantitative research relies on information that can be quantified, i.e. described by numbers and figures, while qualitative research is based upon narratives, sentences, words etc. (Blumberg et al., 2008) In practice, the quantitative method is based on tangibles while the qualitative one is not. A prerequisite for use of the quantitative method is that results etc. can be measured and described by e.g. numbers and scales. In Blumberg et al. (2008, p. 192) the two methods and their differences are made clear by a vivid textbook example; "*Quality is the*

essential character or nature of something; quantity is the amount. Quality is the what: quantity the how much.”

Within many fields of academia there is often a predominance of either of the two research approaches, however in management studies and other social studies no such clear predominance exists. It is clear that no matter which method is used, as long as the chosen method is executed in a correct way, the results from either method can be just as correct and useful. Many research problems can, in the very same study, benefit from being investigated both quantitatively and qualitatively. (Blumberg et al., 2008) This thesis is based on the qualitative research approach, for which the reason is elaborated on in the following section.

3.3 Choice of method

In order to be able to decide upon a suitable method to conduct research Blumberg et al. (2008) recommends that four questions should be answered. The choice of method will be elaborated on, as well as motivated, below by answering those questions one by one.

What is the research problem?

The research problem is to find the answer to what ship operators can do in order to attract more cargo and become more attractive to logistics service providers to realize the unreachd potential of short-sea shipping and increase their business opportunities.

Are you attempting to conduct an explorative, descriptive, casual, or predictive study?

The aim is to conduct an explorative study, thus to explore how ship operators can work to increase their business opportunities within short-sea RoRo shipping. However, there are many descriptive aspects of the study as well, but overall the attempt is to carry out exploratory research through case studies. As we need to explore ship operators' possibilities to attract more cargo within the segment short-sea RoRo shipping to realize what we believe is an unreachd potential of short-sea shipping, the study requires that interviews are performed with primarily the ship operators but also with their customers and other prominent actors within the shipping industry. Therefore we are of the opinion that the qualitative method is a suitable approach for our research. A qualitative study is more likely to unveil unexpected results as the method is often governed by a less strict structure than the quantitative study, leaving leeway to explore interesting avenues during the course of the research. Because of this explorative studies often have a qualitative character (Blumberg et al., 2008).

What is the objective of the study?

The objective of the study is to deliver answers to our research questions, and to test the stated assumptions. To be able to access information that makes it possible to answer the research question, a qualitative study can be an appropriate line of action. The nature of the research question and the field of subject promote a qualitative method.

What kind of information do you want to obtain and what do you already have access to?

The information already available in transport economics, marketing, intermodal transport, logistics, and shipping et cetera, is vast. Also in regard to short-sea shipping a lot of information can be found. However, it is the objective of this thesis to understand what ship operators can do to increase the attractiveness of RoRo short-sea shipping and in this aspect the information available is rather scarce. A qualitative study is an appropriate choice of method to gain sufficient knowledge of the market and the ship operators to answer the research questions. This qualitative study comprises in-depth case studies.

3.3.1 Applied method

The applied research method is explorative and qualitative, involving four different case studies with prominent actors within and in relation to the RoRo short-sea segment. The thesis stands on two main pillars; the theoretical one including the literature review and the conceptual model on the one side, and the empirical one with the four case studies on the other side. This is illustrated by Figure 3-1, which also illustrates the course of action throughout the thesis work.

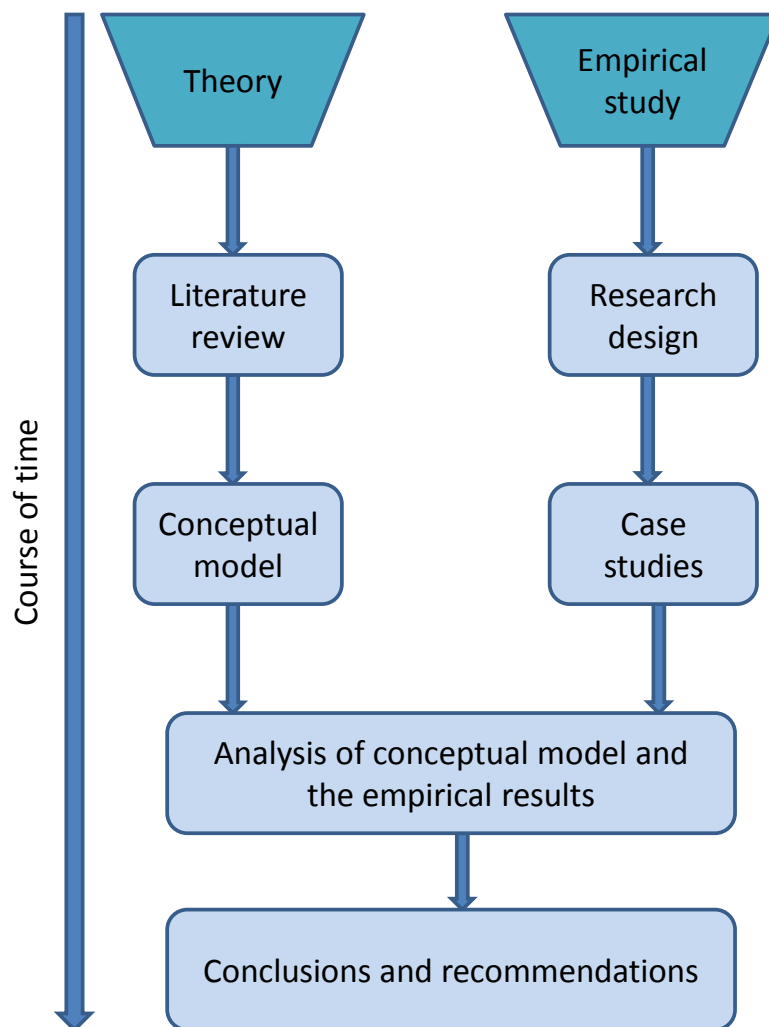


Figure 3-1: Course of action

As can be seen in the figure the literature studies and the empirical study have been conducted in conjunction with one another. This approach has been beneficial as the process of research is one of learning and the empirical study has been enriched by new ideas gained from the literature studies, and vice versa. In Figure 3-1 the literature review and the design of the research takes place at the same time, which proved to be useful as it was possible to enhance the research design and the interview guidelines as the knowledge of the subject got deeper through the literature studies. By applying this method when developing the interview guidelines, these may have facilitated the gathering of relevant information during the case studies better. The conceptual model was developed once the literature studies had been conducted and meanwhile the case studies were carried out. The information from the case studies provided a deeper understanding of the research topic and was helpful in creating and visualizing the conceptual model. Practical issues during this course of action have been to divide focus as two processes took place simultaneously but in the end the benefits from this method are appreciated to be greater than the disadvantages. Moreover, the method required the work to be thoroughly structured.

3.4 Literature review

The aim of a literature review is among other things to show what knowledge already exists, establish a context for the research problem based on previous research within that field, and relate theories as well as ideas to the problem at hand (Blumberg et al., 2008). The literature reviewed is gathered from various sources; books, scientific journals and articles, theses and dissertations, encyclopedias et cetera. Internet sources such as government websites are also used to gather information. Focus has been put on selecting reliable sources and research done by well renowned researchers within the field.

The objective of the literature review that constitutes the base line of this thesis is to present existing knowledge and relate this knowledge to the research problem. The review also provides information that can increase the understanding of the problem and lays a foundation for an analysis of the results from the study. In addition it identifies the gap which this study aims to fill in the light of already existing knowledge. The theories and ideas put forward in earlier research are to be discussed and analyzed as well as compared in the literature review. Finally, a conceptual model created from the reviewed theory is presented. The study is based on this model which lay the foundation for further analysis of the empirical results when applied on the same.

3.5 Case studies and qualitative interviews

Case studies are common to use in exploratory research and when conducting a case study one studies a phenomenon in its context, which means that the topic of study's surrounding context is also considered. Case studies are especially good at answering "why?" and "how?" and are therefore found to be a suitable approach in the work with this thesis. Case studies are further considered to be appropriate when the number of variables investigated is large, which

is the case in this thesis as five aspects were identified in the research scope; each aspect containing several soft variables. (Blumberg et al., 2008)

In order to strengthen the external as well as the internal validity of the research multiple case studies are conducted. These case studies comprise actors that represent different segments in the transport industry in relation to RoRo short-sea shipping. By looking at the different issues addressed in several different contexts the results are more likely to be reliable and applicable in a theoretical proposition. This notion is based on the logic of replication; if the results are the same or similar in each, or the majority, of the case studies the results can be considered robust. Interviews, observations as well as documentation and archival recourses can be used. (Blumberg et al., 2008) Interviews are a fundamental ingredient in the case studies herein and are the main tool used to collect empirical information.

3.5.1 Sample design

Contacts with possible interviewees were mainly established by exploiting the networks available through DNV and the School of Business, Economics, and Law. Some contacts were initiated by the authors themselves after having located appropriate people to speak to through e.g. organizational charts presented on company websites. Besides the ship operators and other relevant actors in the industry that were located through the networks of DNV and the School of Business, Economics, and Law, the remaining were identified as appropriate participants in the study through the Swedish and Norwegian Shortsea Promotion Centers websites. By using the approach of mainly taking recommendation regarding what actors to include from available personal/professional networks, the sample of possible participants constituted only of actors relevant for this study.

Contacting the sample population, booking interviews and constructing interview guidelines proved to require substantial time and effort and it proved difficult to stay with the initial time plan. However, once all interviews were conducted enough time was left to review and analyze the results. Among our sampled population 10 actors finally agreed to take part in the study. Many of the participants represented large and successful companies, which can be partly explained by the use of available networks and personal contacts to establish participation, and partly by the authors' stamina. The participants represent different segments within the RoRo short-sea business and the transport and logistics sector. By including these diverse actors different viewpoints on the research topic can be accessed, which is believed to add a dimension to the results and conclusions thereof. A common feature among the participants is their relatively high positions within their company. Below a selection of positions held by these are provided.

- Trade manager
- Commercial manager
- Procurement manager
- Line-haul manager
- Business policy advisor
- Director / Assistant director
- Sales manager

- Freight commercial manager
- Branding and marketing

The 10 participating actors are divided into four case studies according to an appropriate segmentation based on line of business. By segmenting the companies into different case studies the possibility to interpret and compare the results is much facilitated which will provide a good basis for the following analysis.

3.5.2 Interviews

Among those interviewed five are ship operators that have business within two different segments of RoRo short-sea shipping, three are logistics service providers, and the remaining two are one port and one branch-organization. All interviewees are considered to have sufficient experience within their fields to be able to contribute with robust knowledge, as is evident from the positions they hold the majority have worked several years within the business. Four general guidelines¹ for the interviews were constructed and moreover, each guideline was slightly modified as to adapt it to the specific setting of each interview to ensure good results. The interview approach was semi-structured and the interviews were conversations with focus on qualitative discussions but supported by a guideline. A disadvantage with this approach is that it is not possible to exactly compare answers however; the respondents are free to express their thought and opinions which is believed to have been beneficial for the quality of the collected information. Throughout the whole process the method as well as the results have been compared and validated continuously. This is illustrated in Figure 3-2 where it is shown that in addition to the interview guidelines being preceded by a pre-study so were each case study. Such a pre-study was carried out to get to know each company better before the interview to be able to adapt the interview guidelines accordingly. Validation was done by comparing the results from the case studies with each other as well as with contemporary research done by others. The validation process led to conclusions that were useful input as the process began again. With respect to the wishes of the interviewees the results are presented anonymously in the thesis due to competitive reasons.

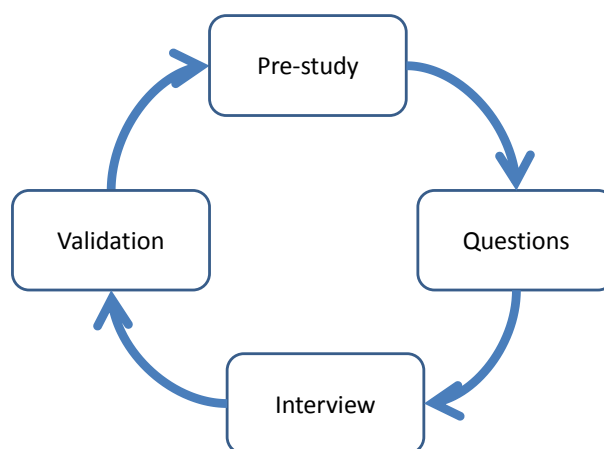


Figure 3-2: Continuous process of learning and validation of method in the interview process

¹Appendices A – D

3.6 Validity

There are two aspects to validity, external and internal validity. External validity is how well the data or the results can be used to generalize, meaning if the results can be applied to for example different companies across both settings and times. (Blumberg et al., 2008) In this study the external validity is supported by multiple case studies that ensure that the results are trustworthy and valid enough to be generalized across other ship operating companies. Of course, the ship operator's different viewpoints and preferences must be taken into account and thus maybe not every finding can be used to generalize. However, the overall results are valid for the segment of Scandinavian and European RoRo short-sea ship operators operating on routes in Europe.

If the method to collect primary data, in this research the interview guidelines and the interviews, gather/measure what is claimed is referred to as internal validity. It is for example important that the differences in results from the various interviews reflect true differences in the opinions etc. among the interviewees. Internal validity can be divided into three main aspects, namely: content, criterion-related, and construct. Each of these is important for high validity. If the design of the study and method used to collect primary data result in enough relevant data to cover the subject of study sufficiently one speak of content validity. Moreover, the study should contain a sufficient number of samples to create a representative picture of the population. (Blumberg et al., 2008) The content validity of this study could perhaps have been higher by conducting more interviews and also more actors within the shipping industry, but constraints such as time and human resources makes this impossible. On the other hand the interviews in combination with other sources of information provide an adequate cover of the research subject. In addition the interview guidelines were constructed to ensure that all matters were sufficiently covered. This judgment made by the authors is of course unavoidably biased; however, emphasis has been put on covering the market by including different actors. The content validity in relation to the interviews is adequate as the interview guidelines were constructed after ambitious literature studies had been done. Criterion-related validity is dependent on the ability of the measures to estimate or predict (Blumberg et al., 2008). The ability of the results in this study to estimate is difficult to measure; nevertheless the results can be used to estimate the situation in the Scandinavian RoRo short-sea market since the actors participating in the study represent a large part of that market. If the underlying theory, as well as the method to gather data, is adequate a study can be said to have construct validity. (Blumberg et al., 2008) Much effort has been put into building a solid and relevant as well as adequate theoretical framework for the study. Since the interview guidelines are based on the knowledge gained through review of existing literature the construct validity is likely to be sufficient. On the other hand, relevant literature might have been overseen due to lack of both time and knowledge in the field. The question is whether or not that aspect would lessen the construct validity to insufficient levels? All in all it might affect the construct validity but gives no reason to question the same.

An important aspect in relation to the validity is the number of interviews conducted, and even though no more than 10 interviews have been conducted due to lack of time and access to appropriate people to speak to, the qualitative dimension of these interviews is deemed to

be enough to keep the validity at a high level. The interviews have been conducted with each relevant person individually however in one case two representatives for a company participated in one interview. The interviewee was encouraged speak freely and also venture onto unexpected avenues. The interviewers steered the interviews in the desirable direction when required and made sure that all questions were answered. Aspects such as the “interviewer effect” are considered (Blumberg et al., 2008), however, this effect is very difficult to measure and therefore it is not considered in the analysis of the gathered material. Hopefully, the efforts to remain neutral when conducting the interviews allow the possible adverse effects of interviewer influence and presence to be ignored. Moreover, as the thesis scope spans over several academic disciplines (logistics, marketing, purchasing) the validity could have been affected by the fact that in 8 out of 10 cases only one person was selected to represent each company. This person is not likely to possess expert knowledge within each field, although this problem is partly remedied as the interviewees all have enough experience from different parts of their company’s operations to provide rich answers. To avoid missing specific information or misinterpret the results all interviews have been recorded and transcribed.

3.7 Reliability

Reliability is a measure for how the method to collect data measures with consistency. The results from using the tool should be as similar as possible in order for the study to be reliable. The concept of validity is dependent on reliability since no result can be valid if the measurement tool measure erratically, thus is not reliable. (Blumberg et al., 2008) According to Silverman (2010) reliability in qualitative research refers to “/.../ *the degrees of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions.* “ (Silverman, 2010 pp.275) Semi-structured interviews as used in this study provide a sound base for reliability since a semi-structured approach ensure that the interviews measure the same thing each time to some extent. By conducting the interviews together the authors have made sure that both assign collected information to the same categories. Moreover, the authors own ability to reason and draw conclusions must be taken into consideration when discussing reliability. Effort has been made not to jeopardize the reliability by using the interview guides throughout each interview. The extensive literature studies that the interview guide is based on further promote high reliability. The overall consistency of the results also indicates that the interviews have been able to measure with high reliability.

The semi-structured interviews might give rise to issues relating to reliability as the results are not completely consistent, however, this approach was used because it grant more positive than negative effects in a qualitative study. The positive effects being that more information is likely to be unveiled in a semi-structured interview compared to a structured interview. On the negative side are of course the somewhat inconsistent results from the interviews, but as the overall results show surprising uniformity the reliability is not compromised.

3.8 Reflections on validity and reliability

In conclusion, the authors have had validity and reliability concepts in mind throughout the research process, and have taken the measures necessary to ensure an overall high quality of the work. Looking back, the validity could maybe have been possible to increase by limiting the research scope more and focus on fewer aspects in relation to RoRo short-sea shipping's potential. The rationale for this is that if fewer aspects were investigated these could have been investigated more thoroughly by e.g. narrowing the sample scope to obtain more samples representative for a very limited population. This could ensure a higher validity as the results can be used to generalize to a greater extent. However, the aim of this thesis has been to provide a comprehensive study on why RoRo short-sea shipping does not constitute a larger part of European freight transports today, and it is the authors' strong conviction that this objective was best achieved by the methodology applied. The drawbacks from possible generalization difficulties are off-set by the qualitative aspects of the study as well as its inclusiveness.

The limitations in the research process, such as time and scope could have implications for validity and reliability. If the research could have been extended to either include more aspects or more case studies the results would likely be of higher reliability and validity. Even so, the research scope and the case studies were designed for a thesis with limited resources, and therefore the research should be of sufficient reliability and validity in relation to its topic and its aim.

Chapter 4 - Literature review

The objective of the literature review is to present theory which will contribute to building a solid conceptual framework on which the analysis of the empirical results is based. The review is thus both a framework of reference as well as a support in the analysis of the case studies. The scope of the literature review entails maritime transport, intermodal transport, and European transport policy as well as logistics theory, transport mode choice theory (including purchasing theory), marketing theory (including environmental marketing) and economic theory. In general terms the scope of the thesis is within the realm of logistics however, as the scope is broad in the sense that it involves several business aspects of ship operations it is necessary to also deal with the above mentioned fields.

The review begins by introducing European freight transport, the market in general and intermodal- and RoRo short-sea transport more specifically. It further discusses the competitiveness of RoRo short-sea shipping in intermodal transport networks. It then carries on to present current transport policies within the EU, Norway and Sweden. The market for RoRo short-sea shipping is governed by these, thus they create certain specific market conditions that are a crucial aspect in this research and thus need to be dealt with here. Throughout the remaining literature review transport mode choice theory (including purchasing theory), marketing theory (including environmental marketing theory), logistics theory (including SCM, the role of the port, etc.), and economic aspects are presented in detail. Finally, a conceptual model for this study is presented. The conceptual model is tested on the case study results and is an attempt to create an integrated theory applicable on the specific research problem described in the thesis. It provides a basis for analysis of the empirical results.

4.1 European freight transport

There is a continuous flow of goods within and between the countries on the European continent. This flow is made possible by transportation either by road, rail, air or sea. The majority of freight transports on in Europe and the EU is by road vehicles of some type. In 2006 road transport represented 73 % of total inland freight transports in the EU. Rail represented 17 % while inland waterways and pipeline represented 5 % each. (EC DG-Tren, 2009) During the past decade the EC has made great effort to raise awareness concerning the negative environmental impact from transportation. The goal is to achieve sustainable transport networks throughout the EU-27. These networks should be sustainable from both an environmental and economical standpoint to increase the competitiveness of the community in a global perspective. The large share of road within European freight transports contradict this vision however the EC has launched several policies, action plans, funding programmes etc. to encourage a modal shift, intermodal transport networks and better utilization of the, at present, under-utilized waterways. According to the EC Europe is in need of efficient, integrated transport alternatives. These must be both environmentally- and use-friendly.

Moreover, to realize this objective maritime and inland waterway transport and rail transport must be made more attractive in the context of inter-modality. Integration of modes in efficient supply chain is a condition to ensure long-term sustainable development of freight transports in Europe, especially as the freight volumes are expected to grow with 50 % from 2000 until 2020. ((3) EC, 2007)

4.1.1 Intermodal transport

The interest for intermodal transportation has continuously increased and intermodal transportation has received more and more attention for its prospects as a more efficient, effective, and sustainable way to transport goods. Intermodal transportation is recognized as a crucial component in the transport industry today and a viable alternative to road-only transports. (Lumsden & Sthyre, 2003-2005) This integrated approach allows for each transport mode's strong point to be exploited creating an efficient and effective door-to-door supply chain with the lowest possible negative environmental impact as well as the most competitive price. (Eurostat, 2002) Lumsden & Sthyre (2003-2005) share this opinion and state that the main advantage with using intermodal transport is that one can use the mode which has the most comparative advantages for each transport link in the chain from origin to destination. By using intermodal transportation one can create much more efficient, as well as sustainable, transport chains that the overall supply chain will benefit from. Intermodal transportation should involve at least two different modes of transport, but can also involve an unlimited number of modes and shifts between modes. As can be seen in Figure 4-1, intermodal transportation often also involves warehousing and/or repackaging at some point in the supply chain. In intermodal transport the interception points (reloading docks, ports, warehouses) along the transport route must be supported by sufficient and purpose-adapted infrastructure, as well as equipped accordingly, to ensure a smooth flow of goods throughout the supply chain. Quick and simple loading, unloading and reloading is crucial in any intermodal chain under current conditions when lead-times are preferred as short as possible. Sea ports require state of the art facilities to cope with the demands of an intermodal supply chain. (Sthyre, 2009)

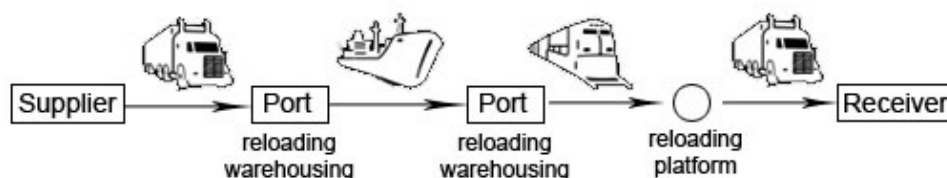


Figure 4-1: Example of intermodal supply chain. Source: Transportation – **Logistics: Logistical way of life...** (2010)

Short-sea shipping has a large potential to contribute to a sustainable development of European intermodal supply chains. Shifting of cargo to short-sea shipping is one of the most feasible ways to alleviate the congestion and pollution problems which in Europe. The mode is one of the pillars of the current European transport policy. ((2) EC DG-Tren, 2006) The bottlenecks in the Alps and the Pyrenees could be bypassed as well as relieved by greater use

of RoRo short-sea shipping. (EC, 2001) However, promoting inter-modality has obstacles such as costs, different liability regimes, European infrastructure interface problems, and underdeveloped transport chains. (Blonk, 1994) Nevertheless, these problems are being mitigated by attempts to harmonize European transport networks, transport law and so forth. The gains from intermodal transport provide reason to promote this development no matter what obstacles are encountered along the way. The OECD is also of the opinion that short-sea shipping must be promoted and state that short-sea shipping is once piece in the puzzle to solve congestion, environmental and health issues that relate to land based transport. (OECD, 2001)

4.1.2 Maritime transport

During the last decade shipping has experienced an enormous upturn; this is evident in the continuously increasing size of ships and ports. This development is a result of increased globalization, trade and increased economic activity. (Lumsden & Sthyre, 2003-2005) Transports in general are crucial for economic prosperity, and there is a clear correlation between increased gross domestic product and world trade. Globalization allows us to truly take advantage of the idea of comparative advantage and division of labor. In this situation, the demand for transport will inevitably continue to increase. (HUI, 2008) The current situation in Europe, with increasing freight transport, does not only result in increased economic growth it also results in problems of both societal and economic nature namely: environmental degradation, climate change, and pollution and health problems (Bergqvist & Esping, 2002). Maritime transport constitutes as much as approximately 90 % of worldwide cargo transports and is an important element in world trade and a global economy (Jegou, 2008).

4.1.2.1 Short-sea shipping and RoRo short-sea shipping

Within the EU-27 approximately 40 % to 62 % of intraregional trade involved short-sea shipping (EC & DG- Tren (2) 2006 & Amerini, 2008). Short-sea shipping is already a important component European intermodal transport networks, in line with the EC's ambitions to build sustainable freight transport networks.

The Scandinavian countries all have long coastlines substantial parts of imports and exports are transported by sea. In Sweden up to 85 % of the cross border handling of goods is carried out in a port. (Lumsden & Sthyre, 2003-2005) The corresponding figure for Norway is approximately 58.7 %² according to Statistics Norway ((2) 2010). Out of the total Norwegian maritime transports, 74 % is between Norway and foreign ports (Statistics Norway, 2010). These statistics strongly emphasize the importance of sea-based transportation in cross-border handling of goods both in Sweden and Norway.

There is a predominance of short-sea shipping over deep sea shipping in many European countries however it is particularly pronounced in Sweden, Norway, Finland, Malta and Greece among European countries. The North-Sea and the Mediterranean are the largest short-sea shipping areas with 28.1 % and 26.3 % of total European short-sea shipping,

² Appendix E provides calculation

respectively. The Baltic comprise 19.8 % in the European short-sea market. In all areas, liquid bulk is the main cargo. (Amerini, 2008)

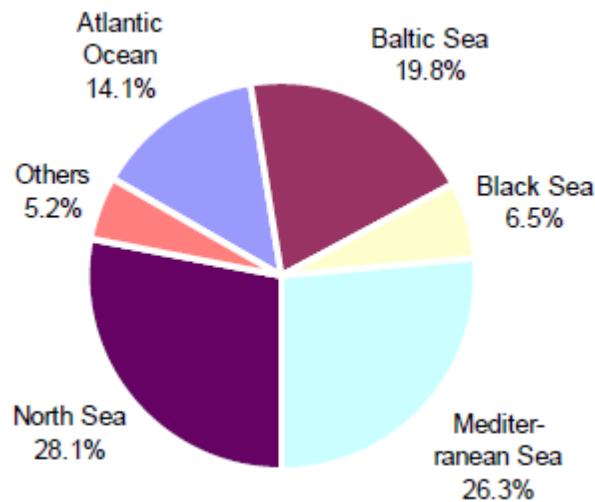


Figure 4-2: Short-sea shipping divided according to region, shares in weight 2006. Source: Amerini (2008)

Even though short-sea shipping composes a substantial part of European maritime transport only 12.8 % is RoRo, Figure 4-3 illustrates the shares of various cargo types. The individual shares of RoRo in the Atlantic Sea and the Baltic Sea are the only ones to reach above 16 %. RoRo cargoes are most common in the Atlantic Sea, and second and third most common in the Baltic Sea and the North Sea respectively. (Amerini, 2008)

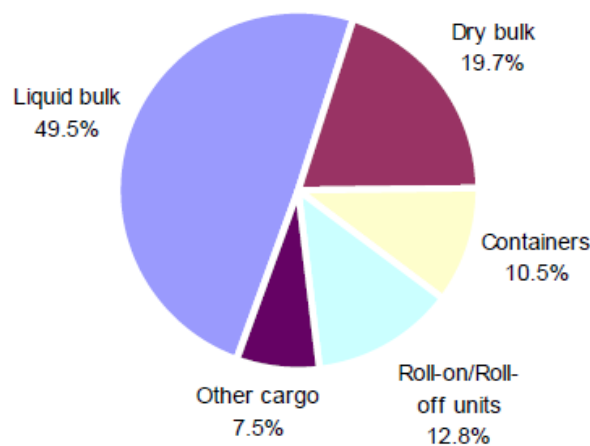


Figure 4-3: Short-sea by cargo type, shares in weight 2006. Source: Amerini (2008)

According to Casaka & Marlow (2005) there are three main types of short-sea shipping within Europe; the intra-urban, the regional and the international type. The intra-urban type applies only for short-sea between urban areas along a coastline or accessible via inland waterways. It is the remaining two types that offer possibilities to integrate into an intermodal supply chain and that truly has the capacity to shift cargo from road to sea. According to Amerini (2008) the top short-sea ports for RoRo cargo in Europe is at present Dover and Calais. The result is not surprising as the United Kingdom dominates in RoRo unit transportation, while Sweden is

second and Germany third. Norway freights RoRo units by short-sea corresponding to 14.6 % to that of Sweden. Port of Gothenburg has a notable prevalence of short-sea- in comparison to deep-sea shipping. The same is valid for Oslo Havn and Drammen Havn (Statistics Norway, 2010).

In the Scandinavian transport network RoRo- and ferry transports are highly important and it is a prerequisite for efficient intermodal supply chains. Inter-modality including RoRo short-sea creates the possibility to move cargo between sea and land in an effective manner. (Lumsden & Sthyre, 2003-2005) RoRo short-sea shipping is an essential component in an efficient Scandinavian transport network. It can be argued that RoRo short-sea shipping will play an important role in developing more efficient, effective and sustainable transport chains that will be beneficial for the goods owner, freighter, end customer as well as the environment and society at large. The Van Miert report in 2003 emphasized the importance of RoRo short-sea shipping in, among other aspects, avoiding saturated land corridors ((1) EC & DG-Tren, 2006).

4.1.2.2 RoRo short-sea shipping in intermodal freight transport

Intermodalism involves mainly two types of short-sea shipping; container and RoRo. The nature of the cargo units makes these two types the most suitable for intermodal transportation. The standardized dimensions of a container make it possible to easily shift between rail, road and sea-based transportation regardless of the content of the container. The same holds true for RoRo units that roll on their own and can be driven on and off the vessel, quickly “changing” between one mode and another. The benefit with RoRo in an intermodal system is that the truck, or train for that matter, itself is transported by sea thus taking away the need for reloading or lifting activities in order to shift between modes. (Castells & Martinez de Oses, 2006) In European short-sea shipping, container and RoRo, account for 10.5 % and 12.8 % respectively (Figure 4-3).

4.1.2.3 Competitiveness of RoRo short-sea shipping in intermodal transport

Casaka & Marlow (2005) state that the modal shift is far from being a reality, regardless of the few success stories promoted by the EC and Eurostat data point out that the effort to create a modal shift has contributed exceedingly little towards attaining desired results. Casaka & Marlow (2005) believe that short-sea shipping must be put on a more competitive level within European intermodal supply chains. The short-sea market is under high profitability pressure despite European transport policy working in its favor. While intra-European trade flows cannot be changed, it is believed that if short-sea shipping drawbacks are minimized and its services well integrated in intermodal supply chains, the modes competitiveness increase. The short-sea industry is cannot change the market structure and neither reduce their competitors performance. Short-sea shipping is subjected to the five basic competition forces developed by Porter as illustrated in Figure 4-4. First of all, a short-sea operator will be subjected to the competition within the segment, secondly the operator is subjected to the threat of new entrants into the segment that will further increase the rivalry among short-sea operators, and thirdly there is the threat of a transport service that may substitute short-sea shipping. Finally, the ship operator has to deal with the bargaining power of buyers and of suppliers. The

bargaining power of buyers and suppliers is related to supply-demand relationships. (Casaka & Marlow 2005)

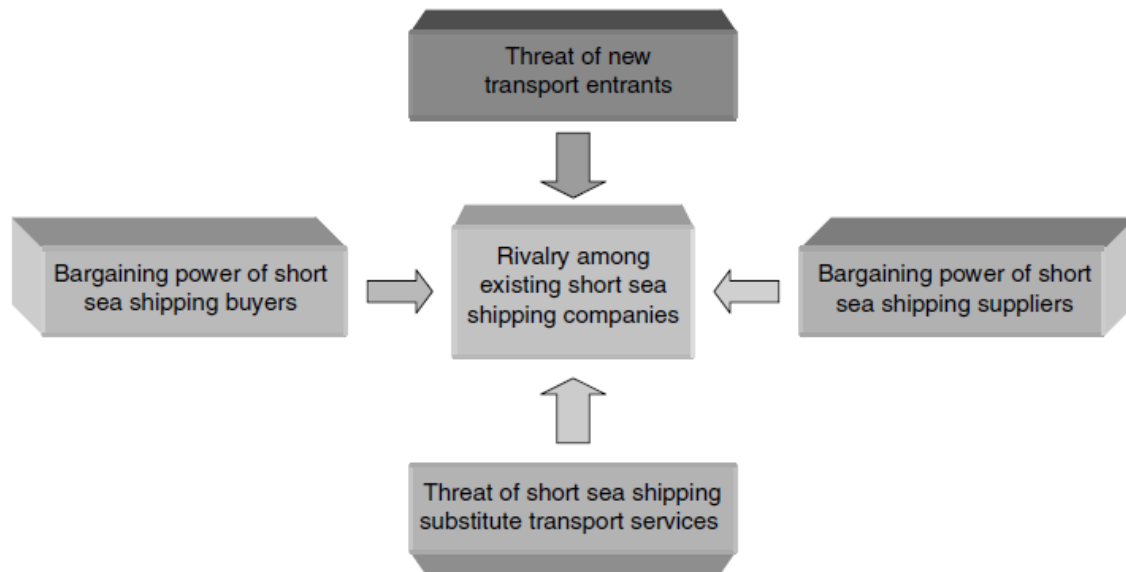


Figure 4-4: Driving forces for competition in short-sea shipping. Source: Porter (1980); Casaka & Marlow (2007)

The trend in short-sea has been to provide port-to-port services rather than door-to-door services. According to Casaka & Marlow (2005) “/.../ *this has prevented /.../ short-sea operators /.../ from having control over the cargo flows, from gathering information about other modes, and from becoming freight integrators, resulting in a loss of market share.*”. This imply that the short-sea segment have lacking control of the driving forces for competition. Short-sea shipping has in many senses been an isolated mode which has not developed strategies of collaboration with other modes. As a result, short-sea is hindered by its own strategies, or lack of strategies, of becoming more integrated in intermodal supply chains (Casaka & Marlow, 2005).

Short-sea shipping in general is disadvantaged by long-lead times (Papadimitriou, 2001). There are potential benefits of deploying high-speed vessels deriving from lead-time savings (HSV) in short-sea shipping, which could increase the competitiveness of the mode says Becker, Burgess & Henstra (2004); high-speed maritime transport feature among possible solutions to problems of mainly time facing the short-sea industry currently. However, many ship operators expand their fleets with conventional vessels instead of investing in HSV’s. Moreover, logistics service providers have not identified any clear segment in the freight market in which HSV operations have a significant benefit for dedicated freight transport. According to Castells & Martinez de Oses (2006) fast ships are reasonable to put in use for trips no more than 12 hours, assuming the cost is not of importance to the customer if a minimum of lead-time can be offered. Martinez & Olivella (2005) claim that high-speed short-sea shipping; especially RoRo and container, have good potential to shift cargo from road to sea to relieve the Alps and the Pyrenees from its congestion due to the vast cargo flows by truck. However, there are different opinions regarding the need for speed in short-sea, Becker, Burgess & Henstra (2004) stated that the need for high speed in short-sea

shipping not necessary. Casaka & Marlow (2005) believe that short-sea shipping must act according to the following to become more competitive and remain so:

“To become market leaders, they will make use of time-based strategies to tailor supply chains. Responsiveness, flexibility, agility, leanness and intelligence, combined with industry best practices will increasingly provide the means to support the ever more customer-tailored supply chains and adaptive supply chains. The impacts of these strategies will be severe on transport systems that must develop their capabilities to respond effectively to the challenges.” (Casaka & Marlow, 2005)

Becker, Burgess & Henstra (2004) concludes that EU policy should not focus on promoting HSV for short-sea freight transport. If there is a need for speed in short-sea shipping, actors in the market will look into possible high-speed solution as have been done in the Ro-Pax segment. Instead the focus of European policy should be on short-sea shipping in general to ensure its growth. (Becker, Burgess & Henstra, 2004)

Casaka & Marlow (2005) further mean that short-sea operators should focus on frequent, fast, basic transport services rather than value-adding services to increase the freight volumes. A strategy to improve short-sea shipping logistics is crucial to be competitive in a market characterized by intermodality. Image of the business is that short-sea operators are professional, even more so than their surface mode competitors. However, they are also seen as more conservative. The development of new shipping services is slow within short-sea shipping, and the industry is yet not matured. This portfolio of standard services has made short-sea shipping less prepared to the fierce competition on the intermodal market than road transport. Further, the freight rates in short-sea door-to-door services need to be reduced by 35 % to be competitive with the equivalent service by road and to realize a shift from road to sea. (Casaka & Marlow, 2005)

4.2 Maritime Transport policy

Transport policy govern the market and its various conditions in many senses and is therefore an important aspect in regard to the competitiveness of RoRo short-sea shipping and its possibilities to enhance its performance and take greater part in European freight transports. Appropriate for the scope of the thesis, European as well as Norwegian and Swedish transport policies will be presented in the following sections. In addition, a brief introduction to legal and regulatory developments on an international level that will have impact on RoRo short-sea will be given.

4.2.1 European maritime transport policy

European transport policy within the maritime transport segment is interesting to discuss as the EC has developed policies over the past decade that work to support the development of maritime transport in general and short-sea shipping especially. Numerous communications have been released from the Commission have highlighted the focus on the development of

short-sea shipping and the importance of its integration into the European transport network. Major steps towards an adequate European maritime policy include the accounts in:

1. The White Paper presented in 2001 which elaborated on the development of a common European transport policy (CTP) as well as the Marco Polo funding programmes and Motorways of the sea for the promotion of short-sea shipping;
2. The Green Paper presented in 2006 that aimed at developing a maritime policy for the Union and a common vision for the ocean and the seas. The paper empathize the further promotion of short-sea shipping in an integrated European transport network;
3. The Blue Paper was presented in 2007 and provide an integrated European maritime transport policy that aim to enhance the competitiveness and ability to face future challenges such as climate change, sustainability and security;
4. The Maritime Transport Policy until 2018 presented in 2009 explains the main strategic objectives for the European maritime transport system and focus is put on strengthening the competitiveness of the maritime sector as well as its environmental performance.

4.2.1.1 The white paper

The EC's first White Paper (2001) on the future development of the common transport policy (CTP) declares the features and objectives of the CTP. However, the EC (2001) concludes that there is lack of harmonization in the development of the CTP which creates several problems as seen below.

- An unequal growth in the usage of different modes. Road transport constitutes 44 % of the goods transport market while short-sea shipping constitutes 41 %, rail 8 % and inland waterways 4 %. Road transport prices do not include all external costs, which explain the modes predominance in the transport market.
- Congestion due to over utilized road- and rail networks on main routes in especially urban areas and at airports.
- Environmental degradation as well as health problems due to pollution from road vehicles. Socioeconomic impact from road accidents. (EC, 2001)

The CTP contains important decisions regarding short-sea shipping. Within the EU shifting cargo from land to sea has become an important transport policy decision. A modal shift is a necessity from both an environmental and an economic standpoint and short-sea shipping could substantially help reduce road congestion. The problematic listed above indicate that short-sea shipping has implications for the competitiveness of the European community and its prosperity and economy. An assessment of the CTP and its goal fulfillment showed that the CTP is yet to realize the elimination of congestion and bottlenecks. It is also established that the goal of a modal shift from road to rail has not been achieved. (Steer Davies Gleave, 2009)

The White Paper announced the launching of Marco Polo I, aimed at promoting intermodal services and short-sea shipping and its potential in European intermodal freight transport, in

particular. (EC, 2001) To date there have been two Marco Polo programmes, projects that are included in the second program are, among others, traffic avoidance projects and Motorways of the Seas. (Steer Davies Gleave, 2009) The funding supports commercially viable business ideas that result in sustainable shifts from road in the long-term perspective. (EC, 2001) In conclusion, the Marco Polo programmes have yet had rather limited impact, according to Steer Davies Gleave (2009), although the Marco Polo program has been successful in supporting commercially viable projects. Moreover the modal shift realized in some projects has in many cases proven to be lasting structural changes. On average, completed Marco Polo projects have realized their modal shift target by 75 % and short-sea shipping performs well, realizing 78 % of their target. Nonetheless, short-sea shipping performs significantly worse than rail projects. The programmes have resulted in new co-operations between actors in the transport and logistics sector. (ECORYS, 2007)

Motorways of the sea, alike the Marco Polo programmes, promotes efficient, clean and economic intermodal transport systems involving short-sea shipping. Objectives of Motorways of the sea include improving logistical organization and operations and the concentration of cargo traffic. Motorways of the sea is a part of the trans-European network (TEN-T) and functions as key links in intermodal transport chains. ((1) EC, 2006) Parantainen J. & Meriläinen A. (2007) pointed out that in order to further develop Motorways of the sea, the EC should focus on a bottom-up-approach to develop concrete projects. Projects should result in permanent and economically feasible transport chains.

4.2.1.2 The Green- and the Blue Papers

The development of an integrated European transport policy was initiated by the Green Paper in 2006. In the Green Paper the Commission emphasizes the importance of maritime transport and short-sea shipping for the European countries. Moreover it is concluded that a common European maritime policy can bring increased efficiency in management of European waters and create a situation where short-sea shipping is a just as obvious choice of mode between the member states as road. ((2) EC, 2006)

An integrated maritime policy is needed to facilitate the future development of maritime transport. There is a great potential in sea and waterways, but one must accept that is also a huge challenge to realize this potential sustainably. A common policy is part of the solution to equip Europe with the means to cope with globalization and increased competition, environmental issues, and maritime safety, security and sustainability. ((1) EC, 2007)

The policy aims to unify European maritime surveillance, spatial planning and coastal zone management, and data and information for decision making. Further an integrated maritime policy will act in primarily five areas: maximizing sustainable use of the oceans and the seas, create a knowledge and innovation base for maritime policy, deliver the highest quality of life in coastal regions, promote Europe's leadership in international maritime affairs, and finally increase the visibility of maritime Europe. ((2) EC, 2007)

4.2.1.3 Maritime Transport Policy until 2018

The policy aims to support various other policies within the field such as the CTP (2001) and the integrated maritime policy presented in the Green Paper (2006) and further developed in the Blue Paper (2007). The objective of the new policy is to ensure the growth and success of European maritime transport by implementing several measures such as:

- Maintain competitive conditions for European seaborne transport. This will ensure future resilience in economic downturns.
- Maintain a competitive framework for tonnage- and income taxation in shipping.
- Improve the image of the mode.

Short-sea shipping is a focus area in the policy, and the modes full potential is to be fully exploited by:

- Improve port infrastructure and hinterland connections and adapt those to expected growth in flows.
- Remove administrative barriers, such as duplicate cross-border controls.
- Attract investment to the port sector.
- Reinforce the Motorways of the sea strategy as well as TEN-T projects, including Marco Polo.
- Apply economic instruments to promote short-sea shipping. E.g. internalize external costs in road transport prices to make short-sea prices more competitive. (EC, 2009)

4.2.1.4 European short-sea networks

The European short-sea network (ESN) is formed in collaboration between all national short-sea promotion centers and is supported by the EC's Directorate General for Energy and Transport. It is an initiative in line with contemporary EU transport policy. Members of the network are usually EU member states, but also non-member states with a short-sea promotion centre are encouraged to become associate members. Shortsea Promotion Center Norway is an associate member. The ESN aims to promote short-sea shipping in a broad sense throughout Europe and strengthen the activities of each national promotion center. Short-sea shipping is to be promoted to shippers, forwarders, and other actors in the transport and logistics market. The first promotion center was founded in 1997 in the Netherlands, and soon other countries followed. In late 2000 the number of countries having set up a promotion center was sufficient to create a network and European Shortsea Network became a reality. (Shortsea Promotion Center Norway, 2010)

Short-sea promotion centers are represented in many European countries such as Norway, Sweden, Denmark, Finland, France, Italy, Lithuania etc. The network aims to raise the overall awareness of short-sea shipping. This is in line with the EC's target to enhance the growth of the mode, preferably faster than other modes and then specifically road. Accordingly, the promotion centers complement other EU initiatives that promote short-sea shipping. (European Shortsea Network, 2010)

4.2.1.5 Legal and regulatory developments affecting short-sea shipping

Maritime pollution is tackled by implementing various measures on an international level such as the on-going phase out of single-hull tankers, providing shore-side electricity, and implementing legislation regarding the sulphur content of the fuel. Maritime transport is a sector in which there are great potential to lower emissions. (Steer Davies Gleave, 2009) Also UNCTAD (2009) state the possibilities to greatly lower emissions from shipping by implementing cleaner technologies and operate vessels more efficiently. Nevertheless, regulation is necessary to force development to become sustainable.

The transport industry is responsible for vast emissions, and there is need for regulatory frameworks to achieve a more sustainable development. Seaborne transport emits high levels of SO_x, in addition to the emissions of NO_x. An important aspect in this context is that the emissions from shipping are not regulated by the Kyoto Protocol, although MARPOL 1973/78 (International Convention for the Prevention of Pollution from Ships) deals with air pollution from shipping since 1997. In May 2005 annex VI, *Regulations for the prevention of air pollution from ships*, came into force. Annex VI covers the following emissions: SO_x, NO_x and particulate matter. CO₂ is not covered in the annex VI, but discussions are taking place within the IMO regarding separate legislation for CO₂. During 2008, a revised annex VI was adopted aiming at reducing emissions from ships further, the new legal instrument stating that low sulphur fuel must be used (less than 1 %) will enter into force on the first of July 2010 and have implications for the entire international shipping community to comply with the rules. (UNCTAD, 2009) The IMO agreement on the sulphur content of the fuel will affect short-sea shipping to a larger extent than deep-sea shipping as short-sea shipping mainly operates in areas close to the shore. Many of these areas are emission control areas (ECA) which is where the regulation is applicable. There is a risk that the new regulation will be counterproductive to the aims of shifting cargoes off the road as the increased costs that short-sea shipping will incur due to this may reduce the modes competitiveness. (Lloyds List, 2008)

4.2.2. Scandinavian maritime transport policy

Scandinavian transport policy, in this case Norwegian and Swedish, does not differ very much from the overall European maritime transport policies. The similarities and differences will not be discussed further, the purpose is merely to present under which policy directives Norwegian and Swedish short-sea operators operate on a national level.

4.2.2.1 Norwegian maritime transport policy

The new National Transport Plan 2010 – 2019 (NTP) features the intended development of transport infrastructure in Norway over the coming ten years. Focus is put on sustainable development and on strengthening Norwegian industrial and commercial competitiveness. The most important areas identified for improvement that relate to shipping are: improving port efficiency and improving the safety and navigability in Norwegian waters. Compared to the previous transport plan the maritime cluster receives an increase in funding by 77 % in the 2010 plan, which demonstrates that maritime transport is considered a focus area. The most important priorities in the transport plan deal with the following in relation to shipping and maritime transport: hinterland connections, more ferry capacity and improved services, modernization of maritime traffic centers, improvement schemes for fairways, and

abolishment of coastal fees and annual fee for port security. (Norwegian Ministry of Transport and Communications, 2009)

As the North Sea is one of the busiest short-sea areas in the EU-27, counting for almost 30 % of all short-sea transports in the Union (Eurocean, 2010), it is no wonder the Norwegian government realizes the need to promote maritime transport and a modal shift from road to rail and sea. In addition the maritime sector is extremely important to the Norwegian economy and substantial amounts are to be invested in the maritime infrastructure. (Norwegian Ministry of Transport and Communications, 2009) A Norwegian Maritime Strategy named “Stø kurs” was launched in 2007 and during the first two years of the strategy has had positive results. Norway is despite its size one of the largest actors on the international maritime market, and aim to stay one of the market leaders on innovative and sustainable solutions within the maritime sector. The “Stø kurs” strategy has several focus areas and short-sea shipping can be found among those. Accordingly, the objective is to make short-sea shipping more environmentally friendly and competitive. To strengthen the competitiveness certain fees related to shipping need to be abolished. Short-sea would then be more competitive with land-based transport. (Norwegian Ministry of Trade and Industry, 2009) There is no specific focus on RoRo short-sea shipping in the maritime strategy; however, in the NTP it is mentioned that more ferry services and improved such services is a priority (Norwegian Ministry of Transport and Communications, 2009). In the 2010 national budget approved 100 million NoK for follow-up of the maritime strategy “Stø kurs”, of these 70 million NoK shall strengthen short-sea shipping, maritime research and innovation. At the same time the government propose an increase the NO_x and CO₂ fees with 1, 8 % each. (Norwegian Shipowners Association, 2009) The increase in such fees can be seen as contradictory to the statement of the Norwegian Ministry of Trade and Industry (2009). Although the importance of working to lower emissions from transportation, also short-sea shipping, must be recognized and such a goal may be reached by implementing emission fees.

4.2.2.2 Swedish maritime transport policy

The Swedish transport policy and its objectives date back to 1998, and still apply. The overall objective of the policy is “*.../ to ensure socially, economically efficient and long-term sustainable transport resources for the public and industry throughout Sweden*” (SIKA, p. 6, 2001). Five subsidiary objectives follow.

- Accessible transport system; satisfy the basic needs of both the public and the industry.
- High transport quality; ensure that the design and operation of the transport system allow for quality transports.
- Safe traffic; the objective is that no one should be injured or killed in traffic incidents, the design of the transport system must be adapted to this vision.
- Good environment; the transport system will be designed to be sustainable and environmentally friendly.
- Positive regional development; the transport system will promote regional development by e.g. counteracting disadvantages of long-distance transports. (SIKA, 2001)

In 2001 SIKA (Swedish Institute for Transport and Communications Analysis) conducted an analysis on how these policy objectives are being met and what can be expected in the future. According to the SIKA report shipping did increase in the 1990s however has remained pretty much unchanged up to 2001. In relative terms, Swedish shipping has fallen during this time. Nevertheless, it was expected that freight of goods by sea will increase by 20 % in total between 1997 and 2010. (SIKA, 2001)

On maritime transport, the policy objectives from 1998 not specified. There is lack of policy objectives relating to each mode transport. However, in a (2) 2010 publication on transport, infrastructure and IT-politics the Swedish Ministry of Enterprise, Energy and Communications briefly features the issue of climate and emissions in regard to maritime transport, and the creation of green shipping links in the Baltic as a part of the Swedish Baltic Strategy. ((2) Swedish Ministry of Enterprise, Energy and Communications, 2010) In addition, a Swedish maritime policy with the objective to provide the Swedish merchant fleet reasonable competitive conditions was adopted by the government in 1996. This is realized by implementing the so called “Maritime Support”, a financial aid to ship operators. In 2001 this support was expanded to also include ferry operators and changed to comprehend more taxes and fees. Many Swedish shipowners have long promoted tonnage tax in the shipping sector. A tonnage tax would be supportive to the shipping sector and could encourage shipping companies to re-register their vessel under the Swedish flag. After having investigated the tonnage tax possibilities, the government decided in 2009 that no such tax will be introduced during the current term of office. (Swedish Maritime Administration, 2010) Given the fact that the tonnage tax was successfully introduced in Norway, the Swedish government has been questioned by shipping companies who see no other solution than to flag their vessels by convenience to get better competitive conditions. Marlow & Mitroussi (2008) suggest that the Swedish government should thoroughly consider implement the tonnage tax to encourage the development of short-sea shipping.

A new national plan for the Swedish transport system was presented by the Swedish Ministry of Enterprise, Energy and Communications in early (1) 2010 and the plan spans from 2010 – 2021. Substantial amounts are going to be spent on improvement and maintenance on infrastructure for rail and road however nothing is specified in regard to the maritime infrastructure. ((1) Swedish Ministry of Enterprise, Energy and Communications, 2010)

4.3 Transport mode choice theory

The carrier and mode selection process is important to any company as the performance of the carrier and the mode affect costs, lead-time, customer service level, marketing and company image, and so forth. The total logistics costs comprise various costs, of which the cost for transport is substantial. Although the cost for transportation is dependent on variables such as shipment size and characteristics, shipper often use their personal judgment when selecting among modes and carriers. (Caputo, Fratocchi & Pelagagge, 2006) If the performance of the mode and the carrier is not satisfactory in the eye of the customer/final receiver of the cargo this reflects on the shipper/supplier of e.g. materials, although the transport was performed by

someone else e.g. a RoRo short-sea operator. Based on such experiences the shipper will make his mode decision in the future, even if e.g. *not* choosing RoRo short-sea could be a suboptimal decision (Caputo, Fratocchi & Pelagagge, 2006). It is therefore crucial for a transport service provider such as a RoRo short-sea operator to be knowledgeable about purchasing- theory and processes as well as mode and carrier selection processes, and on what criteria the final choice is made. Only then will they be able to provide state of the art services to their customers. Accordingly, purchasing theory, mode and carrier selection and service qualities valued by shippers will be dealt with in the following subchapters.

4.3.1 Purchasing theory

Purchasing is an important part in supply chain- and value chain management. The value chain illustrated in Figure 4-5 consists of various value-creating activities that achieve a certain margin. Porter (1985; Van Weele, 2005) distinguish between support activities and primary activities. Meanwhile primary activities are concerned with the physical handling and transformation of the produced product, support activities enable these activities. The primary activities of highest relevance in this thesis in relation to the transport mode selection and transport service purchase are *outbound logistics* and *marketing and sales*. Outbound logistics are concerned with collecting, storing, and physically distributing goods and can include e.g. vehicle planning. Marketing and sales on the other hands are associated with promotion and advertising as well as sales, distribution, channel selection, management of channel relations and pricing. (Van Weele, 2005) The most relevant support activity to mention here is procurement as it can be related to the procurement of a transport service. According to Van Weele (2005) procurement relates to purchasing of inputs into the firm's value chain. Inputs can be consumables such as raw materials and other supplies, and could very well also be a transport service that becomes input in the value chain through outbound logistics and marketing and sales. The procurement function should be related to the operations of the firm (Van Weele, 2005), which is the case in procurement of a transport service as e.g. the distribution of manufactured goods is most relevant for the logistics-, marketing-, and sales functions. Logistics purchasing decisions are normally taken on the basis of economic, quality and environmental performance of the freight transport chain (Ramstedt & Woxenius 2006).

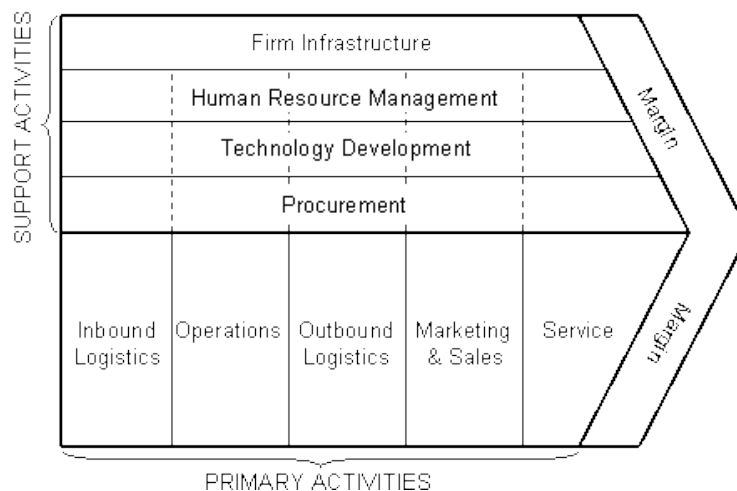


Figure 4-5: Purchasing in the value chain. Source: Van Weele (2005), redrawn from Porter (1985)

Selecting a supplier of consumables or services is a crucial step in the procurement process, a purchaser/procurer must make sure that the supplier can deliver what has been promised and in addition on time (Van Weele, 2005). A ship operator is not exempted from this notion in supplying a transport service. Purchasing transport- and distribution services is a strategic decision (Van Weele, 2005), thus short-sea shipping must be able to accomplish a service offer that match the strategic needs of its customers. In transport procurement there are certain distinct characteristics according to Brusset (2005); many suppliers and short-term contracts to ensure flexibility and availability of transport services when needed. That short-term contracts are preferred holds true for short-sea shipping, which should put pressure on the transport supplier as the relationship with the customer is in no way “secured” by a long-term agreement.

4.3.2 Mode and carrier selection and service qualities

The performance of a transport carrier influences the effectiveness of the entire logistics function of a company. The process of selecting the appropriate transport carrier is therefore an important business decision (Pedersen and Gray, 1998). Studies of transport selection criteria such as Cook (1967) found cost to be the most important criterion. However as awareness of logistics trade-offs increase transport costs are not perceived as that important anymore (McGinnis, 1989).

The carrier selection is done mainly in two ways; either the transport manager contracts a carrier such as a road hauler, rail operator etc. first hand or he/she contracts a service logistics provider. In the latter case, the transport manager often leaves the responsibility of choosing mode and carrier with the logistics service provider. No matter who makes the mode and carrier selection, the in-house transport manager or the logistics service provider, a number of factors are evaluated in order to select the mode and the carrier which can best perform the desired transport service. Each mode offer different qualities and different inherent advantages regarding cost and service. (Coyle, Bardi & Novack, 2006) Transport quality has the possibility to differentiate one product from another, thus choosing the most suitable mode and carrier can provide competitive advantages in the marketplace. For some companies fast transportation may be the most important and for others safe transport to avoid damages is valued the most. A mode must offer advantages to the customer that will make them choose their service over someone else’s (Evers et. al. 1996). However, there is seldom one mode or carrier that can offer advantages in regard to all valued service qualities (Weber et al., 2000). The decision regarding mode and carrier has direct impact on companies’ costs and also the service they provide to their customers. According to Coyle, Bardi & Novack (2006) the mode selection process consist mainly of two steps: first what mode to use is decided and second the carrier to perform the transport. The mode is selected on the basis of cost and *general* service characteristics while the carrier is selected on the basis of cost and *specific* service characteristics. In addition both tangible and intangible service characteristics are considered when selection mode and carrier, and the shipper must decide how to weigh tangible versus intangible qualities together (Liberatore and Miller, 1995). Coyle, Bardi & Novack (2006) further state that the mode selection factors mainly include: cost, transit-time, timeliness, accessibility, capability and security. When a carrier is selected the factors used to evaluate the modes are often broken down into more specific measures. As accessibility and

capability is dealt with in the mode selection process the factors broken down and applied in the carrier selection process are mainly: cost, transit-time, timeliness, and security. According to Pedersen and Gray (1996), transport price is valued more than other transport selection criteria by a high proportion of Norwegian exporters. This is explained by the topography of the country, dispersed population and limited domestic competition. A study by Casaka & Marlow (2005) identified a ranking of service attributes in short-sea shipping, as seen in the list below.

1. Carrier's technical capabilities
2. Service quality
3. Carrier's information technology/
4. Information systems capabilities
5. Innovativeness
6. Pricing policy
7. Carrier's marketing activities

Lammgård (2007) propose a schematic model of the logistical decision-making process in a company, which is based on conclusions drawn in the study *“Environmental Perspectives on Marketing of Freight Transports – The intermodal Road-Rail case”*. The model begins to explain how the decision-making process is influenced by influential factors, such as the ones mentioned above by Casaka & Marlow (2005), these motivate how choices are made in the action stage. The outcome of motivation and action is the selection of a transport solution, as can be seen in Figure 4-6.

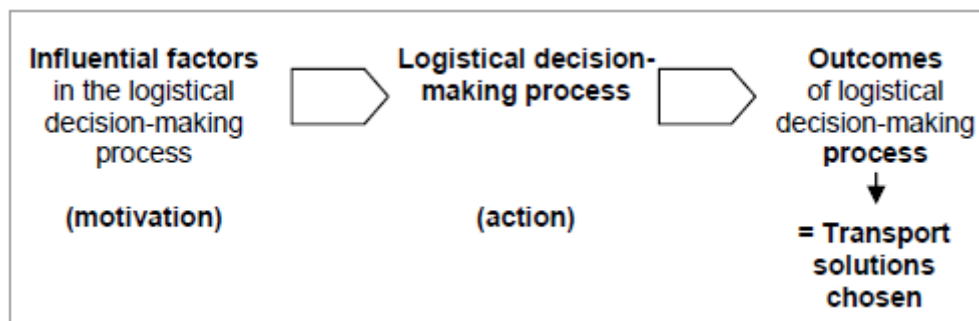


Figure 4-6: Schematic model of shippers' logistical decision-making process. Source: Lammgård (2007)

In relation to RoRo short-sea shipping the identified and ranked attributes (Casaka & Marlow, 2005) firstly implies that the mode must be sufficiently technically advanced and provide services with high quality to be selected in a transport solution. Secondly, the mode must have good image and reputation and the shipper must believe that the mode can deliver the type of service desired; thirdly the ship operator must be competitive compared to other ship operators on the most valued service attributes. The future potential of short-sea is dependent on whether or not operators can gain the confidence of shippers. (EC, 2001) Shipper's decision of using a particular transport mode and carrier is based at least partially on their perceptions of the services provided from the mode. Shippers' perceptions, whether or not realistic, are influenced by past experiences, common knowledge, expectations, advertisements, modal image, as well as misinformation, to name a few. Knowing this,

carriers should do their utmost to ensure that shipper perceptions of their mode reflect the actual situation. It will be considerably more difficult to sell a transport service to a shipper who has a negative view of the mode due to misinformation or the alike. (Evers et.al, 1996) The development of short-sea shipping also depends upon how shippers perceive the mode in relation to rail, road, and air. Short-sea shipping must thus be made efficient in the eyes of the customer in order to be competitive. The mode as such requires efficient, integrated, commercial services in order to manage to shift cargo of the roads. (EC, 2001)

Outsourcing of logistics activities such as transportation require substantial effort in relationship management both from the company which purchase the transport service and from the supplier of the same. Both parties in general benefit from having good relationships, the purchasing company can ensure that high-quality services are attained and the supplier secure a business opportunity by providing sufficient customer service. The buyer/seller relationships are managed in different ways and encompass more or less services and activities. Figure 4-7 illustrates the various relationships and their different levels of integration. A type III relationship is an example of vertical integration or a joint venture, meaning that the buyer and the seller have a long-term commitment to one another, types II and I relationships also involve substantial commitment however, the parties invest less in each other than in a type III relationship. An arm’s length relationship is a temporary commitment for a one type transaction. (Coyle, Bardi & Novack, 2006) For these reasons, it might be argued that RoRo ship operators should focus more on relationships I, II and III and less on arm’s length relationships as these provide less future potential in terms of revenues.

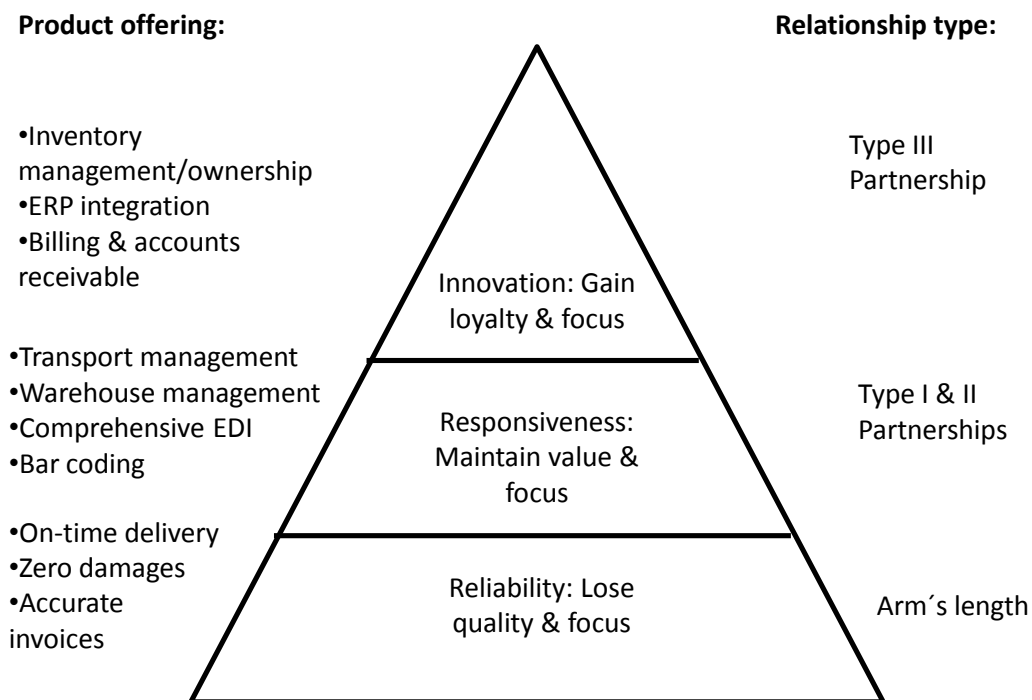


Figure 4-7: Third-party logistics product offerings and relationship type. Source: Coyle, Bardi & Novack (2006)

However, short-sea operators lack knowledge regarding their customers' needs. This has prevented the development of stable, long-term buyer-supplier relationships. This in turn results in less loyal customers. Ship operators has limited contact with its actual customer, as those are often represented by a logistics service provider, which poses as a threat as it provides limited possibility to gain sufficient knowledge of shippers actual needs. As a result, the intermediaries are provided the power to design distribution channels according to their needs, which might not benefit short-sea shipping. This could partly explain the importance of road transport in cargo movement. (Casaka & Marlow, 2005)

4.4 Marketing theory

Marketing is a managerial process as well as a social process; companies market their products to potential customer and potential customer are made aware of the existence of the product. A value is created when an exchange of e.g. product-money is facilitated by the marketing activity. Both the marketing company and the potential customer make use of marketing to attain what they want and need. In marketing the company presents a value proposition which contains set of benefits which they promise will satisfy the needs of the customer. The customer evaluates value propositions to various products and finally chooses the product that he/she believes is most likely to satisfy their needs. There are many products and value propositions available in the market, therefore companies try to differentiate their marketing of their products in order for potential customers to believe that their product will be the one to satisfy their needs. The key to retain a customer is to create customer value which can be defines as the value of owning the products less the cost of buying it. (Kotler et al, 2005) Customer value must be created in order to achieve customer satisfaction, which in turn results in a positive customer experience which might make the customer purchase the company's services of products again. Customer value is crucial in strategies aimed at establishing long-term customer relationships that will generate revenue for the company over time. (Strauss et al, 2005) Competitive advantage is dependent on the ability to provide superior value to the customer compared to other service providers within the same segment. This can be achieved by implementing customer relationship management (CRM), which is an approach to marketing than encompass much more than one single marketing effort. Instead, CRM is a business strategy that aims to develop long-term, profitable relationships to loyal customers by understanding the customer and nurturing the relationship by providing the customer with value in addition to the value in the purchased product or service. Such value-adding services are all customer service activities like sales, after sales service and information sharing. (Ravald & Gronroos, 1996)

Marketing is an activity that requires strategies on how to achieve a desired goal e.g. reach a target population. In order to get the chance to provide customer value/superior value to any customer, the company must identify the potential customer and find a way to attract the same. Aaker (2001) presented a framework, namely *strategic market management*, which can be applied to identify appropriate marketing strategies. The analysis consists of two parts, an external as well as internal analysis. The external analysis analyses the market through looking at customers, competitors, the market, and the environment in which the company act.

By conducting an external analysis market trends, threats, opportunities as well as uncertainties can be identified. The external analysis is complemented by the internal analysis which focuses on the company itself by looking into the strategic strengths and weaknesses of the company and its products and operations, problems, constraints and finally uncertainties. Once thorough analysis has been carried out the company should be able to apply the knowledge gained and identify possible strategies to then go ahead and select the strategy deemed the most suitable. Aaker's (2001) framework for strategic market management provides a proactive, contemporary approach to strategy selection, suitable and adaptable to different companies with different product/service offerings. An overview of the framework is given in Figure 4-8.

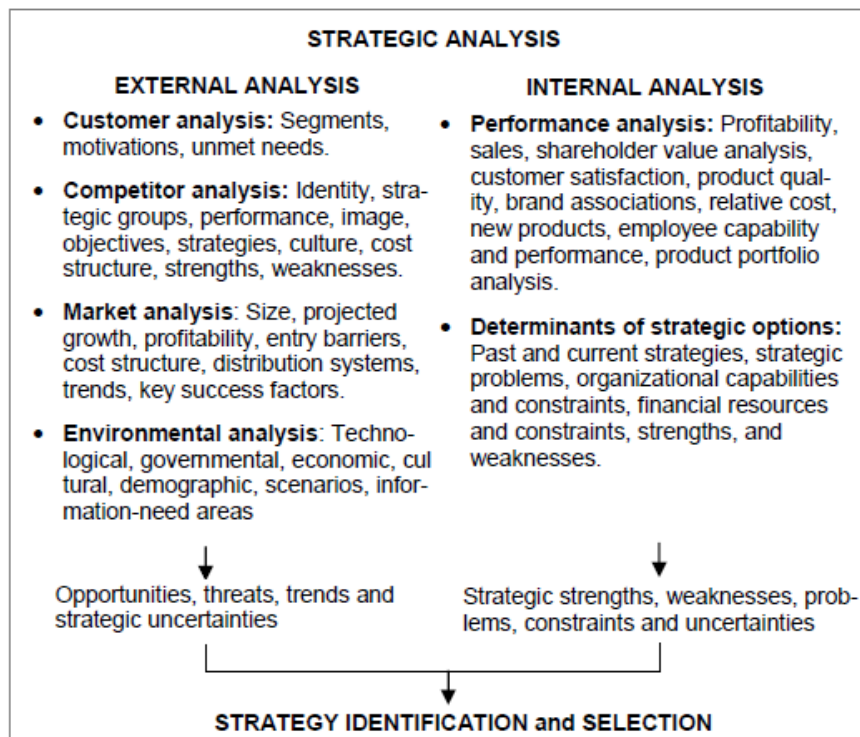


Figure 4-8: Brief overview of strategic market management. Source: Aaker (2001); Lammgård (2007)

4.4.1 Marketing of transport services

To get and retain customers is based on the notion on customer value as a consumer choose the product or service that he/she knows or believe will provide them with the greatest overall value. In order to be able to provide a service that will result in superior value for the customer the service provider must learn about and understand the customers need and purchasing processes better than competitors. (Kotler et.al, 2005) In the transport industry competitive advantage can be achieved through offering customer value through lower prices, shorter lead-times, timeliness, etc. For short-sea shipping this is a challenge and Casaka (2005) suggests the implantation of relationship marketing aiming at inter-organizational relationships that endorse a collaborative attitude instead of a competitive one. Collaboration could lead to increased benefits for both parties and in the long run also the customer. Relationship marketing management is a useful approach towards both existing and potential customer since the building of a solid relationship sustains the logistics and transport service

itself. In general the shipping industry has suffered from poor brand image derived from insufficient marketing management. This disadvantage has been noted for short-sea shipping in particular, which has decreased its competitiveness with road transport further. The industry is considered slow-moving and offering a narrow scope of business compared to its alert competitors such as road transport. (Casaka & Marlow, 2005)

According to Nash & Ulrich (2007), the transport market model is of a complex structure, but it can be simplified significantly with the assumption that customers want to minimize the travel time; all other factors ignored. This certainly holds true today when JIT and Lean strategies are applied in many manufacturing, retailing, and etc. industries. Nash and Ulrich (2007) agree with Gilmour (2007), and emphasize that service quality attributes are defined along more dimensions than just lead-time. Single transport suppliers can take advantage of the variation in valued service qualities and develop a market niche of their own. Nash & Weidmann (2007) have identified four marketing niches within the transport industry:

1. Time/lead-time niches.
2. Premium service niches. Value-added services might be more valuable than the time aspect.
3. Pricing niche. Customers are attracted to prices lower than that of competitors.
4. Alternative activity niches. Other activities can be performed meanwhile transport is undertaken.

Gilmour (2007) put forward the idea that a shipper's need is to minimize disutility in regard to place and time as the main purpose of a transport service is to create utility i.e. transport the cargo to the right place at the right time. In addition costs should be minimized, and costs related to damages of any kind should be avoided.

4.4.1.1 An environmental perspective on transport service marketing

An increased focus on environmental issues has contributed to a rise in the demand for environmentally friendly products and services (EFS). More and more adapt their marketing strategies current environmental concerns and try to tailor-design solutions to meet customer's specific requirements for EFS (Day, 2005). Environmental marketing is to view the company as integrated with its products and services, and their overall impact on the environment. It consists of a balanced approach where social, technological, economic and physical aspects are taken into account. RoRo short-sea shipping has less environmental impact than e.g. road, shown in Figure 4-9, which can be used as a selling point i.e. environmental marketing. An environmental marketing strategy can be implemented to differentiate a company and its services before a potential target group. Environmental strategies in regard to freight transport often focus on lowering fuel consumption and emissions. Various stakeholders such as politicians and the public are interested in minimizing negative environmental effects from freight transport, which indicate that marketing strategies based on environmental selling points can be successful. (Peattie, 1995)

The maritime transport sector pollutes little in relation to its cargo capacity, which is vast enough to be able to help reduce the road congestion in Europe and short-sea shipping is thought to be a sustainability mode. As vessels consume less fuel than trucks and trains, due

to its lower speed, shipping has a cost advantage. (Mulligan & Lombardo, 2006) Martínez de Osés & Castells (2009) declared that an intermodal option to pure road transport hardly provides external cost savings. The road legs in intermodal chains are often too long, which lead to the poor environmental image of intermodal transport as well as high operational cost due to fuel consumption. RoRo short-sea shipping may be encouraged as part of the solution, which the emissions in grams per tonne-km in Figure 4-9 support.

Pollutant	Truck	Trains	Marine
CO	0.5	0.2	0.04
CO ₂	98	28	15
HC	0.2	0.1	0.01
NOX	1	0.5	0.3
SO ₂	0.03	0.04	0.3
Particulates	0.08	0.03	0.006

Figure 4-9: Air Emission factor ranges for Truck, Rail, and Marine, in g/tonne-km. Source: OECD (2001)

4.5 Logistics theory

There is no single definition of logistics due to its border-crossing nature however the term logistics may be defined as the process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services, and related information from point the of origin to the point of consumption (Rushton, Croucher & Baker, 2006). Gourdin (2001) believes that the core of logistics is to satisfy the customer, and in order to be able to fulfill their requirements the management has to understand those before developing and implementing a logistics strategy. Besides the transporting of goods include the logistics value concept (Gourdin, 2001) concern timing, supporting services etc. In other word, logistics is all about meeting the needs of every specific customer and meeting those needs means providing benefits and the goods in the right quantity and condition at the right time and place. The following sections will deal with supply chain management (SCM), marketing of transport services and an environmental perspective on marketing of transport services.

4.5.1 Supply chain management

SCM is a concept that goes beyond that of logistics. SCM involves management of all upstream and downstream flows; these flows can be materials, information, other resources and so forth. Throughout all the activities in a supply chain a value is created in the final product of service. The supply chain consists of a complex networks of suppliers and customers, thus the careful management of the chain the flows throughout it is crucial in order to create value for suppliers as well as customers. (Mangan, Lalwani & Butcher, 2008).

Logistical competency, according to Bowersox & Closs (1996) is achieved by coordinating (1) network design, (2) information, (3) transportation, (4) inventory and (5) warehousing, material handling and packaging. When analyzing the freight transport system logistics competency is necessary to take into consideration since well managed logistics is needed to ensure an efficient supply in a quick delivery chain and thus keep stock levels and costs down

(Holweg & Miemczyk, 2003). According to Holweg & Miemczyk (2003) short-sea transport is a common way to transport both for example new and used cars as the costs are low and the damages are less compared to truck transport. Although the lead-times are longer, in regard to car transport the benefits off-set this aspect.

Within the automotive supply chain short-sea shipping play a significant role as cars that arrive from overseas in hub-ports are distributed further throughout Europe with short-sea RoRo feeder vessels. In regard to supply chain management, short-sea shipping can become more efficient by integrating itself more into the chain and not only focus on port-to-port operations. A higher level of integration can be achieved by e.g. synchronization with land transport operations. (Holweg & Miemczyk, 2003)

4.5.2 The role of the port

The port is an essential part in the maritime supply chain and the performance of maritime transport is dependent of the performance of the port. The port is an important interface between the sea-based and the land-based modes, and it thus enables door-to-door services (Branch, 2007). The role of the port have changed over the years from being a facility for cargo transfers and brokering activities to being advanced intermodal logistical centers with an important role in the global supply chain. At present, ports are hubs incremental to efficient freight distribution into the hinterland. More and more ports involve in the development of logistical chains and freight corridors and focus not only on the maritime transportation. In decisions processes regarding where to locate logistical centers, warehouses, and etc. ports nowadays take on an active role as they realize their influence and importance. (OECD, 2000) Sthyre (2009) claim that the port-vessel interface is not always sufficiently efficient as some ports do not provide adequate services such as e.g. around-the-clock services to enable e.g. short through-put times. This has a direct effect on a ship operator's competitiveness. In short-sea shipping it affects the modes competitiveness compared to land-based transportation negatively. Trujillo & Tovar (2007) claim that in order to achieve the EU goal on integrating short-sea shipping fully in TEN-T, a reliable and efficient port industry must be in place. An adequate port infrastructure with efficient operations will help the EU to achieve its overall transport policy objective of shifting cargo flows from land to sea. In regard to increased port productivity, Sauri (2006) state that increased port productivity can result in a reduction of logistics cost, however, it could be increased if port productivity is reduced. Tongzon & Heng (2006) concluded that port efficiency can be positively affected by private sector participation in port organization and operations partly because private investments demand greater return on investments than investments made by government. However, they also came to the conclusion that full privatization will not result in maximum efficiency and therefore recommend that private investments are introduced only to a certain degree and that the state remain as regulators. (Tongzon & Heng, 2006) The liberalization, and thus privatization, of port services such as piloting and cargo handling has been proposed by the Commission twice, however, social concerns from the member states has resulted in rejections of the proposals. (Steer Davies Gleave, 2009)

Ports are important interfaces, particularly for the integration of short-sea shipping with other transport modes. In an intermodal chain ports are major transshipment points at which road,

rail and river and sea traffic all meet. (Papadimitriou, 2001) The sea-shore interfaces i.e. the port, influence vessel capacity utilization and to reach adequate levels of capacity utilization, around the clock port services are required. Short turnaround time in port and sufficient hinterland infrastructure could further make short-sea shipping more efficient (Styhre, 2009). Short turnaround can save fuel (Notteboom & Vernimmen, 2008) as well as result in an increased number of round trips on a liner route (Evans & Marlow, 1990).

Maritime transport is known as a slow transport mode, an image that works in favor for road and rail, but the time lost in shipping is highly related to time spent in port. Calling a port can involve waiting for a berth, waiting for stevedores, etc. which means that a great deal of the time spent in port is actually not related to actual cargo handling activities. On average approximately 50 % of the time a short-sea vessel spends in port can be related to other than cargo handling activities. Cargo shipments are often further delayed by the slow transit time through the port facilities, which strengthen the image of short-sea as being a slow mode. (Zachcial, 2001) The time-consumed in port can be sharply reduced by implementing efficient port handling according to Martinez & Olivella (2005), also warehousing facilities and the cargo transit times through the port may be reduced by improving transfer facilities and the hinterland connections. There must be an efficient interface between shipping and other transport modes, or roads for that matter in the case of cargo discharged from a RoRo vessel. The lagging development of efficient sea-land interfaces, including inland waterways, is considered a main obstacle in the development of short-sea shipping (Notteboom & Rodrigue, 2005).

Port charges are items over which ship operators have little control, since they vary from port to port and the port service is something a ship operator cannot refuse. Port charges are most often based on the vessel's tonnage, thus a larger vessel pays more and a smaller less. (Stopford, 2009) Then time-consuming port activities and port operational costs in short-sea shipping make it difficult to be competitive compared to road transport however, RoRo short-sea shipping is advantaged by its simple loading and discharging activities. Labor costs, port taxes, port congestion, etc. add to the costs of calling a port. As a result, port productivity and port costs are usually argued as problems in developing short-sea shipping. (Sauri, 2006)

4.5.3 Capacity utilization

The capacity of a RoRo vessel is measured in lane meters, where one lane meter is an area one meter long and one lane wide. Capacity utilization is thus the relationship between used lane meters and the total amount of lane meters available on the vessel. A certain amount of unutilized capacity has to be accepted in liner shipping and shipping with liner shipping characteristics, e.g. many RoRo short-sea shipping services, due to the characteristics of the business as such. Figure 4-10 provides a visualization of capacity utilization over time. (Fusillo, 2003 & Styhre, 2009) These characteristics include for example time schedules that need to be kept; the vessel cannot refuse to leave port because there is available capacity. Short-sea liner shipping operators are often very sensitive to market fluctuations and changes in demand and their sensitivity is, among other factors, due to the difficulties of achieving economies of scale. The fierce competition within the segment, the high fixed costs, small margins and consistent unutilized capacity pushes prices down to equal the short-run marginal

costs (Sthyre, 2009). This hampers the long-term sustainable development within these companies as operators struggle to cover operating costs in the short-term (Sthyre, 2009) and have little possibility to reinvest profit in the long-term development of the business and its services. Nevertheless, to keep some capacity unutilized is also a strategic choice; important as the ship operator then has the possibility to serve their loyal customers well also in peaks in demand and to serve customers that occasionally buy the service. (Sthyre, 2009) However, the effect of excess capacity on carriers is likely to reduce profits, a situation which is easier to cope with in deep-sea liner shipping as it may benefit from economies of scale to a greater extent. As a result, strategies to balance the interests of shippers and carrier are necessary to avoid elimination of the economic viability of short-sea shipping. (Fusillo, 2003) Moreover, enhancement of capacity utilization can result not only in significant improvements in revenue but also reduction of environmental impact from the transport industry (Sthyre, 2009).

As the market for freight transport is in many senses governed by manufacturing industries (Sthyre, 2009) there is no wonder that RoRo short-sea shipping has experienced a very difficult time following the worldwide economic crisis 2008-ongoing. Stopford (2002; Sthyre, 2009) establish that benefits in economical terms from more capacity is the largest for small vessels. Sthyre (2009) adds that vessel capacity need to be in balance according to the customers' requirements regarding e.g. departure frequency and the different levels of economies of scale possible to achieve in different situations.

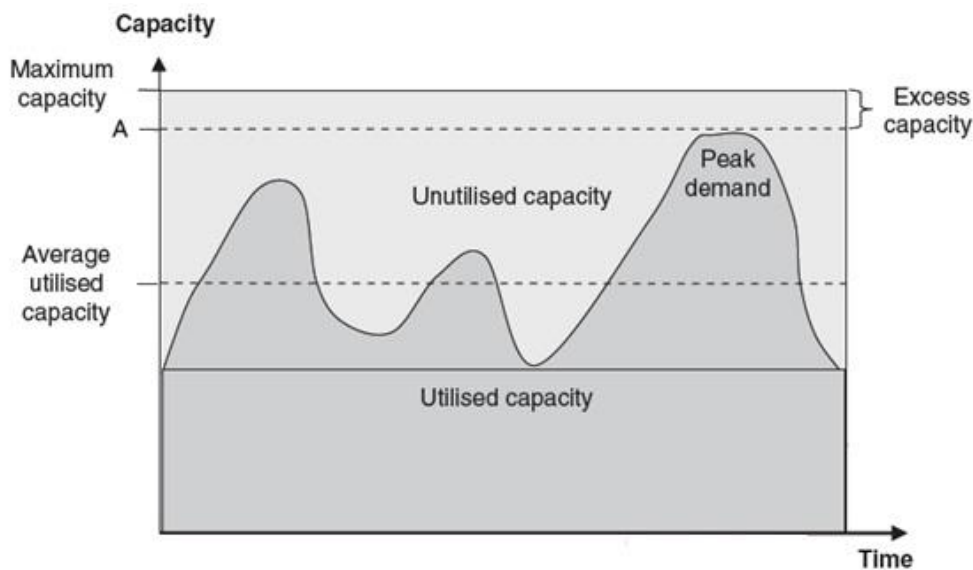


Figure 4-10: Illustration of capacity utilization and over a time period when fluctuations in demand are present. Source: Sthyre (2009)

Sthyre (2009) suggests that to cope with the challenges of a fluctuating market and levels of capacity utilization ship operators need to develop a better understanding of their market and their current as well as potential customers. Measures that prevent destructive competition between the ship operators and increase profitability include: alliances, mergers or co-operation through formal agreements. Co-operation will increase both parties' flexibility and market power. To enhance the capacity utilization Sthyre (2009) put forward the *Cut Peaks*

strategy which means to on purpose carry unutilized capacity and cut peaks in volumes to increase the average capacity utilization thus increasing the short-term proceeds. This strategy is the most appropriate according to Sthyre (2009) for ship operators that experience severe competition, large imbalances in trade patterns and fluctuations in demand as well as low freight rates. This holds true for the RoRo short-sea market however, the RoRo short-sea market is also a growing market that need to learn to adapt its services to time sensitive cargoes and learn to build long-term customer relationships, the latter which according to Casaka (2005) is lacking. In such a situation Sthyre (2009) on the other hand suggest the *Never say no strategy* which mean that a higher level of unutilized capacity is accepted in order to enable flexibility, growth possibilities in the market place, and a higher service level by never saying no to an assignment. Based on these notions, the best strategy for RoRo short-sea shipping may be to adapt a strategy that combines the *Cut Peaks strategy* and the *Never say no strategy*.

4.6 Short-sea shipping economies

Economies of scale are extremely important within the shipping sector however, short-sea operators have difficulties achieving the necessary economies of scale to be competitive price-wise. The term economies of scale describe a relationship between output and input: economies of scale are achieved when the cost for producing one more unit decreases as the produced volumes increase. (Mankiw, 2008)

The economy of short-sea shipping is highly dependent on the achieved capacity utilization (Sthyre, 2009). The nature of a short-sea service in terms of schedules and ship size provide challenges to accomplish economies of scale (Casaka & Marlow, 2005). Although this poses as a challenge, the economies of scope might be an alternative to explore within the short-sea industry. Economies of scope are achieved when producing several different services or products provides together lower costs compared to producing only one single product or service at the time (Hirschey, 2009). This implies that broadening the service scope might be an option in RoRo short-sea shipping. As the cost structure has strong implications for the competitiveness of RoRo short-sea shipping the following section addresses this issue.

4.6.1 Cost structure

Cost structures in general consist of two main variables; fixed and variable costs. Thus the cost structure in shipping can also be defined in terms of these two types of costs. Fixed costs in a shipping company involve the following: interest and depreciation of fixed assets, operating costs such as wages and maintenance. Meanwhile voyage costs, including costs for fuel and supplies, port dues and other fees are variable costs. (UNCTAD, 2004) In short-sea shipping the overall costs for one voyage are large compared to the revenues and the margins are small. Grosso et. al. (2009) concludes that fuel cost is the largest cost in a transport service, thus it influence the pricing policies of short-sea shipping services greatly. The freight rates are also an important part of the cost structure in a shipping company, as those must cover the expenses for fuel, crew, insurance, port fees, to name a few.

Consequently, the competitiveness of short-sea shipping is essentially based on the economies of scale in ship and port productivity. Moreover, contemporary regulation and the monopolies in port industry eliminate the possibility of increased port productivity generating lower port costs for shipping companies. (Sauri, 2006) These facts pose as problems in the economies of short-sea shipping due to rather low capacity utilization and more frequent port calls.

Short-sea shipping share many characteristics with deep-sea liner shipping in regard to cost structure, which consists mainly of high fixed costs and low marginal costs. Economies of scale in shipping are derived from larger ships (Sthyre, 2009) however, in short-sea shipping where smaller vessels are required for the same this statement is contradictory. According to Stopford (2009), vessel size can be thought of in an economic dimension as some costs do not increase proportionally with the transport capacity of the ship. The fuel consumption is such an example; the consumption increase less than increase in vessel length due to the physics of hydrodynamics. This is also valid for the following costs:

- *The operating costs* as crew and shore-based administration do no increase in proportion to vessel size increase. Although, insurance and maintenance costs increase.
- *Capital costs* are subject to economies of scale.

4.7 Conceptual model for analysis

The conceptual model is based on the literature review, and thus it provides a link between the different research fields addressed in the review and the topic of this thesis. It is a purpose-made model that aims to consolidate the research highlighted in the literature review and combine it with the specific research areas covered in the thesis hence, the model will be helpful in analyzing the empirical results from the four case studies in such a way that it can identify deviations and similarities as well as provide a basis for strategic recommendations.

The growth of RoRo short-sea shipping in the European freight market is dependent on all aspects dealt with throughout the literature review; these aspects are merged and connected to the thesis topic in Figure 4-11. The conceptual model should be understood by first ascertaining the political environment and the market conditions since these forces in many ways govern the market and stipulate the conditions in the playing field. The political environment and basic demand-supply relationships will provide the basic setting in which RoRo short-sea operators act. This is illustrated by the location of the political environment and basic market conditions “outside” the core of the model. Secondly, shippers’ mode selection process and the influence on this from the mode image, customer value and the mode’s competitiveness is illustrated. The mode’s image is stated to depend heavily on aspects related to marketing, while customer value is created from the service proposition including service qualities and the buyer-supplier relationship. The mode’s competitiveness is influenced by integrated SCM, or more appropriately; to what extent the mode is in fact integrated into networks and the supply chain. Porter’s five forces is a way to analyze the

modes competitive position. The core of the model is the growth of RoRo short-sea as a freight mode.

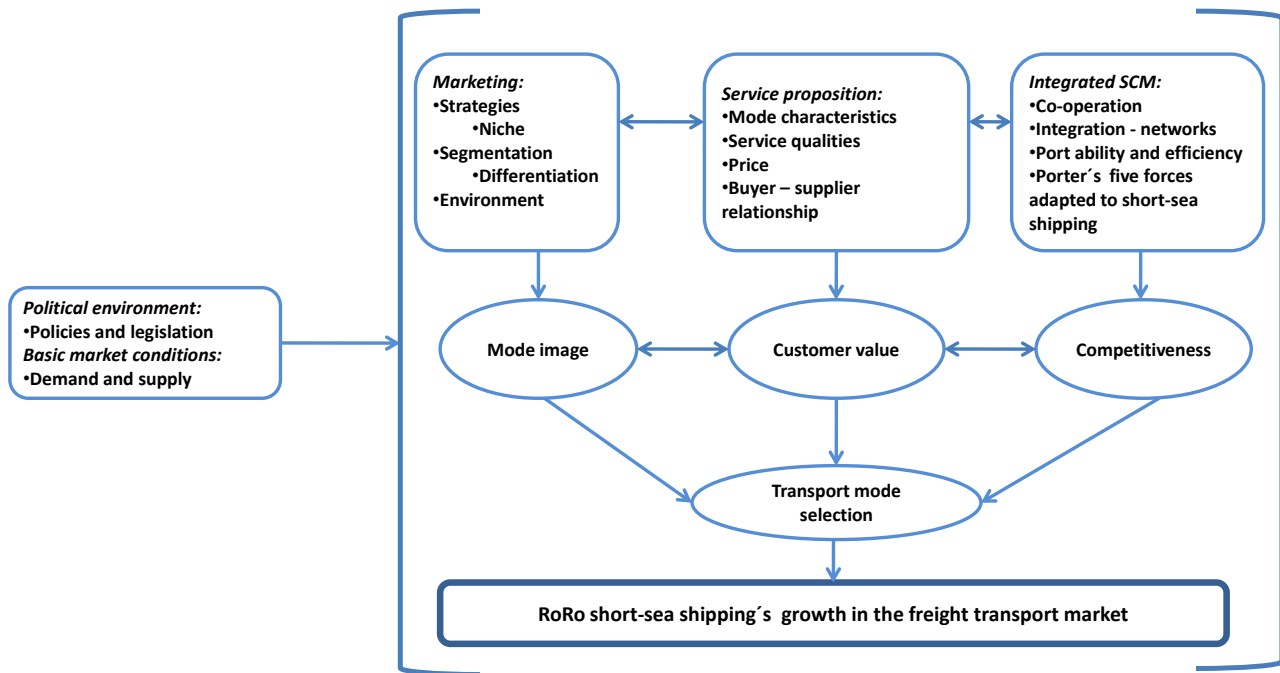


Figure 4-11: Conceptual model based on reviewed theory.

All fields in the conceptual model interconnect with one another as marketing affects the service proposition in the sense that marketing forms the proposition, while the service proposition is built on e.g. service qualities which influence marketing and marketing strategies. The service proposition is dependent on the performance of the mode in an intermodal supply chain, i.e. how well integrated the mode is in logistics and transport networks, and this in turn has implications on the type of service proposition that can be offered to shippers. Meanwhile, the integrated SCM is somewhat dependent on the quality of the service proposition and the marketing.

In conclusion, the company image, perceived customer value, as well as the overall competitiveness in an intermodal supply chain, are influenced by marketing, the service proposition and integrated SCM. In turn, the image etc. will have implications for the transport mode selection made by shippers. The outcome will either obstruct or assist the possibility for RoRo short-sea shipping to gain market shares in the European freight transport market.

The model can be used to analyze what ship operators can do become more attractive to shippers, making them inclined to choose RoRo short-sea shipping as a single mode, or in a transport solution. In this thesis, the model is used to analyze the empirical findings and is helpful in establishing what ship operators may do to influence their situation and the enable growth in RoRo short-sea shipping in European freight transports.

Chapter 5 - Results

This chapter features the results from the case studies that have been conducted to learn about why RoRo short-sea shipping is not more used in freight transports within Europe as well as the potential of the mode to be able to answer of research question “*What can ship operators do to become more attractive to cargo owners and logistics service providers and realize the unreached potential of RoRo short-sea shipping to create more business opportunities?*”. The results from each case study will be elaborated upon separately to finally be summarized in key findings. The summary aims to highlight the most important similarities and differences between the results from the four case studies. The key findings provide a base for further analysis of the results on their own as well as in relation to the conceptual model in 4.6.

5.1 Case studies

Four case studies have been carried out for the purpose of understanding the RoRo short-sea shipping market, its service providers and their customers, to understand how RoRo short-sea operators can work to increase their attractiveness in the European freight market. In two of the case studies line operators with similar businesses are compiled. The remaining two case studies consist of logistics service providers and related industry actors.

There are distinct differences between the companies in the four case studies. However they all have in common that they either provide services within RoRo short-sea shipping partly or entirely within Europe or purchase such services as a 3/4pl or perform supportive activities to maritime transport. By compiling actors with similar services or scope of business into one case study the results from each study are easier to interpret and relate to the results from the other case studies. The case studies illuminate the topic of the thesis from the perspectives of different maritime industry actors, which contribute to rich and comprehensive information sufficient to provide dynamic answers to the research questions. Due to the participants will to remain anonymous the results are presented by denoting the participants Company A – I. The four case studies are illustrated by Figure 5-1.

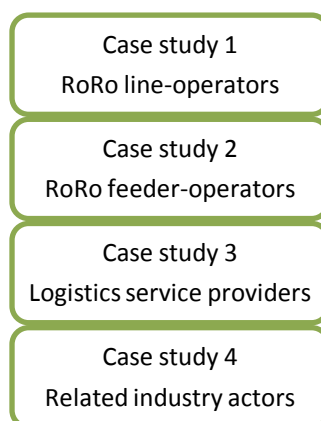


Figure 5-1: Case studies

5.2 Case study 1 – RoRo short-sea line operators

The first case study comprises three ship operators involved in RoRo short-sea shipping in Europe. In the following these ship operators will be denoted Company A, B and C. Company A operates RoRo vessels in European short-sea trade and is a sales and marketing organization within its mother group. The company is one of the world's largest ferry operators for freight and passengers. The company has access to a vast route network, linking key ports and offering RoRo freight services across the whole of Northern Europe. Company B offers similar services across Europe and the Baltic region, and with their extensive logistics network, including sea and land-based services, a differentiated portfolio of transport solutions is available. The route network for Company A and B includes both RoRo and RoPax routes. The fleets of Company A and B consist of RoRo, RoPax, as well as multipurpose vessels. Company C is Belgium-based and its RoRo short-sea division consists of vessels specifically designed for RoRo short-sea trade. The company operates between the UK, Scandinavia and Continental Europe. Company B and C mainly focuses on carrying freight on board, whereas Company A also transports passengers.

5.2.1 Valued service qualities

Reliability, frequency and price act as three main determinants in the shippers' choice of their service according to all three companies. Company A proposes that their customers value the reliability of the vessels and the fleet capacity. Their vast fleet is an advantage as it makes it possible to swap vessels from one route to another hence the capacity can be deployed where best needed to satisfy service demand. Frequency is an important quality parameter in short-sea shipping, more so than on long sea leg transports, according to Company A. Moreover, Company A mentions accessibility as being important service parameter besides reliability, capacity, and frequency. Company A exploits these features to attract customers. The strategic location of the company's facilities which provide the customers easy access to their selected markets is also a reason believes Company A as to why shippers choose their service. Company B states that their customers demand just-in-time transport services, which do not mean high-speed shipping services, but they have to be able to deliver the cargo when the customers need it.

Company A is of the opinion that price and lead-time are factors less important than reliability and frequency, however not unimportant. Lead-times are becoming less important in the eyes of the shippers as ships gets bigger and economies of scales lead to lower freight rates which off-set the negative aspects of longer lead-times. Larger vessels often mean that departure frequency decrease as the loading and discharging activities require longer time. During the current economic downturn the acceptance of longer lead-time has increased among customers, probably due to the low freight rates says Company A.

According to all three companies, it is common for all of their customers to have environmental concern as the reason to choose short-sea shipping. Company A emphasizes that compared to logistics service providers, industrial companies which have the logistics function in-house show more interest in environmental impact in their transport mode decision process. However, Company B experienced environmental concerns to be an

additional valued service quality to price and frequency since few shippers are prepared to pay higher freight rates for a more environmentally friendly transport service.

5.2.2 Marketing

All three companies highlight the importance of marketing their freight transport services. In Company A there are marketing and sales plans for each region and all services are marketed; each of the sales representatives has sales portfolio which he/she is responsible for and then will follow up route by route on a monthly basis. As a result, the sales representatives can immediately take action if there is any deviation in sales and investigate what the reason is for e.g. a customer leaving. Hence, Company A mainly conducts B2B marketing and does not spend much money in branding since they experience their brand as very strong. Company A, put very high emphasis on direct contact with shippers since they consider themselves as a transport consulting company rather than a company that merely sell transport services.

Similar to Company A, Company B believes regular communication with customers is important as a marketing strategy. In addition they gain knowledge on what the shippers' businesses require and need to support their activities which in turn supports the future development of the supplier/buyer relationship. Company B advertises itself through exhibitions, specific magazines, and other sources of media. Company B finds it rather difficult to attract new customers since they experience many shippers look for a transport solution on a long-term basis, meaning that it is difficult to win over new customers from other RoRo short-sea shipping operators. Shippers need stable and reliable relationship with its transport supplier, and according to Company B it takes time to establish relationships with new customers. Compared to Company A and B, Company C applies uncomplicated marketing strategies, namely almost solely B2B marketing, and basically try to fill the vessels. The company states that the number of customers who need to use their transport service is quite limited and Company C seeks potential customers and contacts them whenever they think there is a need to expand the market.

All three ship operators' believe in maintaining long-term, reliable and stable relationship with both industrial customers and logistics service providers. Company A said that they always talk to their customers directly, and also have direct contact with the industry in order to let the customers know what they are doing. Moreover, Company A gain information on what their customers and the transport industry in general think regarding the market. Company C thinks that they have very good relationships with all of their customers as well as the peers in the industry. Further, they consider themselves to have efficient, close relationships with land based freight transport suppliers.

5.2.3 Supply chain and logistics management

The three ship operators offer similar services but still also have different roles in the supply chain. Company A, offers RoRo services for both freight and passengers, and are not involved in any other parts of the supply chain than the sea transport. They offer so called "gate to gate" services without any responsibilities of pre-carriage or on-carriage transport. However, different from Company A, Company B and C both act as logistics service providers in the supply chain and offer additional services to sea transport. Company C offers management of

three solutions for transportation of rolling materials across Continental Europe, which are rail, road and inland waterways; whereas Company B in many senses is 3rd party logistics services provider whose service touches upon activities throughout the whole supply chain, which in their point of view, is a very different business strategy compared to other shipping companies who only focus on sea leg transport.

Company B and C have ownership of some of the ports in their route network, where they own not only the facilities and the stevedores but also the rail and road connections to ensure efficient port operations and intermodal transport services. Besides, value adding services, 3/4pl services, required by the customers can be conducted in their own port facilities, which they see as an advantage. Company A uses an advanced IT system for freight operation, booking, e-invoicing, cargo reservations etc.

According to Company A, normally the contract signed between them and the customers is for one calendar year, as customer enjoy the flexibility of shorter contracts and it is also easier for the company to run the contract in that way. Most of Company B's customers have contracts on long-term basis, especially contracts signed with industrial customers. The long-term contract is preferred because once an industrial customer chooses Company B the scope of services incorporate more than just the transport service and is thus an investment on behalf of both parties. Company B has several tailor-made solutions for industrial customers which have required investments in dedicated systems, which mean that both parties are tied to one another in something similar to a joint venture. According to Company C, the contracts with their major customer spans over 15 years, and the relationship has thus been deep with big investments from both sides. Company C has invested huge amounts of money in building purposed-built vessels to suit the transport needs of their customer. Other investments related to this joint venture include dedicated railways, purposed designed cassettes, shore ramps and other things to support the requirements from the customer and the operations of Company C in relation to the dedicated services provided.

5.2.4 Strengths and weaknesses of RoRo

5.2.4.1 Economical

Regarding the economical strengths of short-sea shipping, the three ship operators mention different aspects. Company A states that short-sea shipping provides low but stable returns on investment. The company is presently trying to combine freight with passenger transport in order to be able to balance the revenues. Ship operators should be able to utilize the RoRo short-sea shipping vessels better as they have the ability to achieve short turnarounds, says Company B. Provided that RoRo short-sea vessels and container vessels are operated on the same route, the RoRo operator might only have to operate one vessel to achieve satisfactory frequency while the container operator might have to operate two vessels to achieve the same frequency as the container vessels have longer turnaround time in port.

Company C believes that RoRo short-sea shipping is a much cheaper solution to transport trucks and trailer rather than have them on the road. Company C also mentioned that RoRo short-sea can be disadvantaged by its comparatively slower speed than road transport.

However Company C experience that the companies, who choose RoRo short-sea shipping, accept longer lead-time due to lower costs from using RoRo short-sea transport services.

The three interviewees describe the cost structure of RoRo short-sea shipping in similar ways. The biggest part is the investment and the maintenance of the vessels, which is followed by the fuel consumptions. The cost for crewing and organization/administration should be taken into consideration but constitute a rather small part of the total cost compared with the other three factors. Company B, says that the port fees for RoRo short-sea shipping vessels is more expensive in relative terms compared to other type of vessels since RoRo vessels cannot utilize its capacity to the same extent as e.g. a bulk carrier and it thus earns less revenue per volume unit which in turn make port fees a relatively bigger expense.

The profit margins vary between the different ship operators. Company A states that their profit margin is around 5% to 10%. Company B's experience is that the profit margin can be very different between markets and market conditions. For instance, on the route between the UK and the continent through the English Channel, the competition is immense; it is next to impossible to make a profit as the price pressure is great. Even so, according to Company B, it is still possible to make money out of RoRo short-sea shipping and the risk of losing money when freight rates go down can be coped with.

5.2.4.2 Practical

According to Company A, one benefit of using RoRo short-sea shipping is the gain in flexibility compared with a bridge. A bridge cannot suddenly change destination but short-sea shipping vessels are moveable. Company A can distribute capacity over its route network as well as increase the number of voyages when required. According to Company B, quick turnaround time in port is one of the advantages of RoRo short-sea shipping, the ship operators can lower the operational cost as well as increase voyage frequency compared to e.g. a container ship operator. RoRo short-sea shipping does not experience congestion problems to the same extent as road and rail transport, says Company B. The mode is more flexible as well as reliable and customers can benefit from lower cost. Moreover, a vessel has more capacity than a truck, thus using RoRo short-sea shipping provides benefits from consolidating. Company C also mentions that when a customer uses RoRo short-sea they can drop off their trailers in the port and then pick them up once they have arrived at their destination which saves the customer tires, maintenance and driver wages.

Company C said that a practical weakness in RoRo short-sea shipping is the ability of vessels to cope with extreme weather conditions however, a vessel can handle very windy conditions and are normally not laid up until winds reach hurricane strengths.

5.2.5 Political initiatives

All three ship operators agreed that the EU policies, such as Motorways of the Sea, Marco Polo support the development of short-sea shipping. According to Company A the European policy initiatives have had a small affect on some routes. Company A criticizes the poor follow up of funded projects; the results are seldom thoroughly measured. According to Company A, some projects have collapsed after a very short while; in addition this type of funding could also distort the competition.

Company B have been involved in two Marco Polo projects, however due to the recent economic downturn neither of the projects were realized. Firstly, Company B is of the opinion that if short-sea shipping can be further promoted by internalizing the external costs in transportation. That way the road transport services can be prized properly. Secondly, society must be made aware of the benefits of seaborne transport and national governments as well as the EU should play important roles in getting the word out.

5.2.6 Competition and competitiveness

According to all three ship operators the competition within RoRo short-sea shipping is extremely high and they are all competing against each other to some extent. According to Company A, the economic crisis has resulted in over-capacity in the RoRo short-sea segment, which resulted in lower freight rates. Company B and C state that they also face strong competition from land-based transport service providers.

Moreover, Company B highlighted that the economic recession did increase the competition in RoRo short-sea shipping but that they could maintain their competitive position even though it was a tough time. According to Company B's experience, a few smaller short-sea shipping companies disappeared from the market during the recession. At the same time many manufacturing companies who previously managed their own transports and fleets of trucks or vessels, decided to outsource transport and logistics functions due to the high costs of management and fixed assets. Company B believes this new trend will help them to gain new volumes in the long-run and they also stated that the company is stronger at present than it was before the crisis. Company A, B and C were all affected by the influences of the global financial crisis to some extent. Freight volumes decreased substantially and Company A claim that they experienced a drop in volumes of 20 % in 2009, also Company C experienced a similar drop, whereas Company B experienced a decline of 10 % in the RoRo freight market in Northern Europe. Presently, the freight volumes have almost recovered to what they were before the recession.

5.2.7 Future potential

All the participants in case study 1 are of the opinion that shipping is a business which is very traditional and that the business could benefit from a new mindset. In order to become more competitive in European freight transports, all involved parties in the chain need to communicate better, the RoRo short-sea shipping segment not exempted. Case study 1 indicates that ship operators experience a lack of interaction between modes and actors in the supply chain. Company A believes that the lack of cooperation among transport services providers as well as the lack of integration of different segments within the supply chain can negatively affect the development of short-sea shipping.

Company A experiences lead-time and frequency as major concerns for RoRo short-sea shipping. These disadvantages may explain why RoRo short-sea shipping does not constitute a greater part of European freight transport today.

Company B believes that the Russian market will expand over the coming year and that RoRo short-sea shipping has a potential in that market. The Russian market is huge and the potential for Scandinavian RoRo short-sea shipping can be deemed to be good as there are not many

active Russian short-sea operators. According to Company A, the Swedish market has a very high dependency on base industry, for instance paper. This is partly a risk as industrial companies begin to develop their own transport solution in-house.

Company A believes that RoRo short-sea shipping has bright future as the trend is to shift cargo from road to sea. Increased intermodality also facilitates the growth RoRo short-sea shipping. Moreover, according to Company B, a positive aspect for the development of RoRo short-sea shipping is road taxes, in Germany this has been implemented already and the trend is spreading throughout Europe. If road transport becomes more expensive, RoRo short-sea can benefit as it become economical to shift cargo from road to sea. Besides, RoRo short-sea shipping can take advantage of congestion problems on road- and rail networks to attract customer. Company A mentioned that the negative environmental impact from road transport is in favor of the future development of RoRo short-sea shipping.

Company C mentioned that ship operators should have higher frequency of departures, but not by increasing the speed as that result in higher fuel costs, consumption and more emissions. Better frequency might lead to higher acceptance among customers in regard to longer transport time as their lead-times when using RoRo short-sea shipping will not increase that much due to the frequency of departures. Such an approach might generate larger cargo flows to RoRo short-sea shipping.

According to Company A, close collaboration between ship operators, ports and transport service providers have established to facilitate RoRo short-sea shipping. The entire transport industry must take part in the development of short-sea shipping. The transport and logistics market is too segmented according to Company A, which further stated that The EC should support the unified development of short-sea shipping across the supply chain. Company A believes that intermodal transport projects within the EU should be narrower in scope, thus easier to control and achieve specific improvements within specific areas. The development of RoRo short-sea shipping could benefit from projects being governed in that way according to Company A.

Company B suggests improving the port operational abilities and handling capacity in order to increase the efficiency of RoRo short-sea shipping. The port is very important for the reliability and flexibility of the mode.

5.3 Case Study 2- RoRo short-sea feeder operators

The second case study consists of two RoRo short-sea feeder operators, denoted as Company D and E respectively. Company D offers mainly port-to-port solutions throughout the European market and carries a variety of cargoes such as new and used cars, commercial vehicles, and high & heavy cargoes such as machinery or other equipment. In addition Company D has a RoRo ferry service for trailer and trucks. Company E provides worldwide RoRo vehicle transportation services, including both deep-sea shipping and RoRo short-sea feeder services. This case study only deals with the RoRo short-sea feeder segment within company E. They offer mainly port-to-port transportation. Company E and D both serve mainly major automotive- and machinery/equipment manufacturers around the world. Their route networks cover the vast majority of European ports.

5.3.1 Valued services qualities

Reliability and price are very important service features according to both Company D and E. Ship operators have to be cheap to attract cargo volumes, according to the experience of Company D, and Company E claimed that price is the key factor in the competition in the freight transport market. Other service qualities are also important but much less compared to price. Moreover, Company E mentioned that terms and conditions of contracts are also important to their customers. The agreement of course has to suit their needs. When company E makes agreements with customers they experience that customers focus approximately 80 % on price, and 10 % on frequency/transit-time and contractual terms, respectively.

In regard to environment Company D feel that their customers value environmentally friendly transport and sustainability. However, Company D is of the opinion that environmental concerns does not seem to affect the customer's transport decision. Price is always the most important factor in the choice of transport mode and carrier prior to time, flexibility, quality, safety and so forth. Environmental aspects are far down on the list of valued service qualities evaluated in the transport decision.

5.3.2 Marketing

Strengthening personal relationships and reinforce networking within the industry is the most important marketing strategy, says Company D, customer relationship management (CRM) is an effective way to get the customers attention and a base to begin to develop a long-term relationship. As a matter of fact, Company D does not invest much in marketing instead their marketing activities rely mainly on CRM. Moreover, Company D would have to focus more on marketing if they would like to expand their market. Company E focus mostly on B2B marketing by the use of sales personnel and by advertising in branch related magazines. Moreover, Company B believes that they have a strong brand and is well known in the markets they are interested in. According to Company B, lowering prices is an effective way of attracting new customers.

5.3.3 Supply chain and logistics management

Company D provides forwarding and terminal activities to high & heavy cargoes, besides the sea transport. However, these services are only provided to the high & heavy segment and account for very small part of their business. When such a door-to-door service is provided

Company D sub-contracts others to take care of activities other than the sea transport. It happens that some type of intermodal transport arrangement is made, but this is on an irregular basis and in that case it is regulated by the bill of lading/contract. Company D have considered developing into a 3/4PL service provider, however, the company decided to focus on their core competence, which is sea transport. Nevertheless, Company D employs its own stevedore company in some ports. Company E, operates a port-to-port business and are involved in the supply chain through sea transport solely. Company D is of the meaning that their relationships with logistics service providers are stable and well established. However, Company D experiences it differently a few years back when integration just began, then the competition between sea- and land-based transport service providers was more evident and they considered each other only as competitors instead of complements. By having good relationships and maintaining cooperation, all parties involved in the supply chain benefit, at the same time the customers can be given the best logistical solution. In the coming future, more joint services and consortiums will appear according to Company D, but clearer strategies are necessary prerequisites in order to manage more integrated supply chain activities.

Company D have time based, often short-time, rate agreements with its customers. Most of the agreements are on a non-exclusive basis mainly because the shipper rarely wants an exclusive agreement as it would be an unnecessary business risk to be tied to one shipping company. According to Company E, the contractual terms are often discussed mainly in relation to limitation of liability clauses. Company E mainly has contracts on a one-year basis with their customers. The contracts are non-exclusive rate agreements that give the shipper an agreed rate on everything they ship with Company E. In a non-exclusive agreement, the rate is not as low as in an exclusive one; customers who promise to freight all their cargoes with one company of course receive a better price.

5.3.4 Strengths and weaknesses of RoRo

5.3.4.1 Economical

Vessel cost is the largest cost in RoRo short sea shipping says Company D, which corresponds with the results in case study 1. The cost for the crew is also a rather big expenditure however it depends on the nationality of the seafarers as European seafarers require higher wages than e.g. Asian seafarers. Fairway dues are also a big expense, as are the costs for calling the port, contracting stevedores, linesmen and so forth. Company D also mentions that short-sea carriers normally incur large overhead costs due to the frequent port calls caused by the nature of short-sea shipping.

According to Company D, it is rather difficult to make money from trailers/trucks in the RoRo segment. The situation is different for car carriers. Company D experiences a profit margin of approximately 36% on some of their feeder routes. Company E claims that the recession hit RoRo short-sea shipping hard and as a result many operators in the segment have major problems with profitability. Approximately 80% of the freight rates in short-sea shipping consist of fixed costs. As a result, RoRo short-sea shipping cannot penetrate the freight market further and compete with road transports by merely lowering prices. Company

E states that there are many costs which are difficult to lower in RoRo short-sea shipping, RoPax services has the benefit of passengers who consume food, beverages, and tax free onboard.

5.3.4.2 Practical

Company D claims that RoRo shipping has fewer damages on cargoes than road transport, which is an advantage of the mode. When cars are transported on road they are often carried on uncovered trailers and thus suffer damages from flying gravel and so forth. Moreover, a pure ferry service can function as a bridge substitute; the drivers can have their rest while they are carried by ferries. Company E mentions the possibility of transporting trailer with or without driver, depending on the length of the sea voyage. Either the trailer is left in the port of origin and picked up at the destination or the driver accompanies the truck onboard and can rest during the sea voyage.

Flexibility, frequency, voyage time, loading operations and inefficient port operations are aspects that sometimes are weaknesses in short-sea shipping as it delays the delivery of the cargo to the receiver. Company D believes this can hinder the growth of RoRo short-sea.

5.3.5 Political initiatives

The EU initiatives do not effectively promote the development of RoRo short-sea shipping, according to Company D while Company E is of no opinion in regard to this. Company D highlighted that a healthy market promotes the “survival of the fittest” principle, where profitable companies survive and others do not. The principle is conducive to create market balance; thus subsidizing short-sea shipping companies distort the competition and is unbeneficial says Company D. Company D also experience an increase in fairway dues as well as port fees in Europe, which is rather inconsistent with the aim of the EU to promote RoRo short-sea shipping. Company D further claims that national government support is not enough supportive of the RoRo short-sea growth.

5.3.6 Competition and competitiveness

Both companies D and E experience competition as high and according to Company D, short-sea shipping experiences a massive profitability pressure. The profitability pressure is transferred down through the supply chain; however, a RoRo ship operator cannot transfer the pressure down to their suppliers, such as port, in the same way. This is explained by the competitive position of ports as shipping companies are dependent on the ports to be able to discharge of cargo at the correct destination. The fierce price competition results in small profit margin. Company E agrees that the high port fees pose as problem in short-sea shipping price competitiveness. According to Company E, it is not necessarily difficult to attract new customers; a decrease in freight rates helps.

Company D is owned by several large shipping companies; hence this can strengthen but also weaken their competitiveness in the market. It is a strengthening factor since the owner companies are large, knowledgeable companies who can offer good support, at the same time, it can be a weakening factor if company D is viewed by other short-sea operators as being a threat.

Company E mentioned that the financial crisis has resulted in vast vessel overcapacity, but in early 2008 it still was difficult to book short-sea capacity. As a result, RoRo short-sea operators' activities have changed correspondingly to become efficient sales organizations from being solely receivers of reservations. Today, one must sell the services actively and work proactively and to understand and respond to the market. The recession has brought huge changes; the competition is higher and margins are smaller.

5.3.7 Future potential

Both interviewees emphasized the expensive port fees and the low profitability as being two major threats to the growth of RoRo short-sea shipping. Moreover, Company D believes that tonnage overcapacity, long lead-time, and freight rates may hamper the growth. The short-sea shipping market is very tough, says Company D, as rail, road, and air transport are additional competitors to other RoRo short-sea operators. The short sea shipping market is highly fragmented and needs to be consolidated in the view of Company D. Intermodal transports solutions including both RoRo short-sea- and road transport needs to be receive greater focus to achieve future development and growth in RoRo short-sea shipping.

There are certain factors that might explain why RoRo short-sea shipping is not used more in European freight transports and that could limit the future development of RoRo short sea shipping. Company D highlighted the cost structure of short sea in comparison to road as being one such factor. Road transport will probably continue to be cheaper than short-sea shipping and the modal shift will probably remain small or at least somewhat limited until the socioeconomic costs of road transport will be included in freight rates. Charging taxes for cargo transports on road is essential in further stimulating a modal shift that can benefit the growth of RoRo short-sea shipping. Company E agrees with this and means that local, national and international authorities must introduce actions to create a transport market where competition is fair. Economic incentives must be implemented to obtain a change.

Company D claims that peoples and businesses' negative attitudes towards, and limited awareness regarding RoRo short-sea and the benefits from using RoRo short-sea to transport goods is an important factor that partly explain why RoRo short-sea does not constitute a larger part of European freight transports today. Company E means that the difficulty in achieving economies of scale in short-sea shipping might also be a hindrance for growth and development. A decrease in port fees could contribute making RoRo short-sea shipping more attractive says Company E, and Company D is of the same opinion.

According to Company D ship operators have to create dedicated services which are more reliable, timely, frequent and cost-efficient and adapted to each customer's needs to be able to grow in the European freight transport market. An additional alternative to stimulate the growth is to increase RoRo short-sea services on long-haul European routes. Company E suggests that long-haul sea transport from e.g. Italy to northern Europe can have great future potential; presently trucks are often driven all the way through Europe but by using RoRo short-sea they would avoid the congestion in the Pyrenees and Germany.

5.4 Case study 3 – logistics service providers

Three logistics service providers have participated in the study. Hereinafter they are referred to as companies F, G and H. Each of these has slightly different scopes of business. Company F is a pure 4pl specialized in transport of beverages and alcohol, whereas the other two offers all types of services from 3/4pl to truly dedicated services tailored to suit the need of the customer precisely, for all types of cargoes. Trucking is constitutes the main parts of their businesses, however companies G and H also have substantial business within rail, air and maritime transport. All three companies are large players in the market and operate in Scandinavia as well as the rest of Europe.

5.4.1 Transport mode selection and valued service qualities

5.4.1.1 Mode selection

Through the interviews a rather coherent picture of the transport mode selection emerges. In Company F the customer is not at all involved in choosing transport mode and the company purchases all its transport services from independent operators, mainly within the road segment. In companies H and G the transport mode choice is commonly taken by the companies themselves if not otherwise requested by the customer. Both companies operate a fleet of their own but also purchase transport services from other operators. All three companies communicate that most customers appreciate to not be involved in the transport and logistics activities and that they want to focus on their core business instead. The transport mode selection itself is based on how a mode performs in regard to certain valued service qualities. Such service qualities are derived mainly from the demand from the customers of the logistics service providers. Further, in most cases the different transport modes are employed on the routes/distances where they are respectively the most efficient claims Company G.

5.4.1.2 Valued service qualities

The service qualities valued by shippers is fairly coherent. Generally, the most important aspect for the customer seems to be to have the goods delivered at the right time and at the right place. Of course, the goods should also be delivered in an acceptable status. Further, both companies F, G and H mention the price of the service as being an important service quality and feature that highly influence the transport mode choice. All three service logistics providers state that price is almost always the final determinant in the mode choice process.

According to Company H their customers are rarely concerned with how their goods are transported as long as they get the service at the lowest possible price. Both Companies F and G perceive the same attitude, to a varying degree, among their customers however, Company H seem to experience this attitude more often among its customers. The qualities valued the most by Company G and their customers in a transport mode is the quality of equipment, price, lead-time, quick response, track-and-trace possibilities, information sharing, and environmental performance. Company H asserts that price, flexibility, lead-time, on time service, and sufficient information are features valued by customers that are considered in the evaluation of what mode to use. In addition environmental performance is taken into account however, only if not too expensive. Lead-time, price, information and environmental

performance are aspects that were mentioned by both Company G and H. Moreover, the value of the goods transported is an influencing factor in the transport mode decision according to Company H. High-value goods is often required to arrive at its destination quickly, thus such transports are often undertaken purely by road transport. The same applies to company G.

Company F differs from companies G and H by purchasing all its transport services from third parties. As Company F's customers are neither involved in the transport mode selection nor the procurement, Company F cannot specify what qualities their customers appreciate in a transport service besides price and on time delivery. However, in the mode selection process, Company F itself takes several aspects into consideration. Price is the most important consideration, but aspects such as the reputation of the carrier, the network of the carrier, and the carrier's capacity to deliver what it has promised to, are also evaluated before making a decision. The importance of the lead-time is nevertheless confirmed by Company F whose customers are concerned with the aspects of tied-up capital during transportation. Environmental aspects are not considered; instead Company F believes that as the regulatory and legislative frameworks are rather coherent within Europe this ensures an acceptable standard. Company G on the other hand works extensively to lower the environmental impact from their business, and which mode that is selected for what route is an important part of this work. According to Company G it is not always easy to be environmentally friendly and still competitive, as the competition is not truly fair when there are "dirty" logistics service providers in the market that offer services with considerably lower price but also considerably higher environmental impact. From experience Company G know that many producing companies simply want their goods transported from A to B in the cheapest way possible, without regard to the overall logistics- or environmental perspective. On the other hand, Company H experience that some customer indeed want to minimize their negative environmental impact and specifically ask for the most environmentally solution, or at least prohibit the use of road transport unless for when there is no other option. In respect to environmental concerns all three interviewees mentioned that seaborne transportation is preferred and that RoRo short-sea shipping can contribute to solving issues of pollution and congestion.

All three logistics service providers either cares or would like to care about the environmental impact from transportation. However, all three interviewees experience that customers are not willing to pay for the increased costs that are associated with always choosing the transport mode with the lowest environmental impact on the route(s) in question. Company F declares that their customers are very price-oriented and that they are forced to keep prices low to remain competitive. Company G confirms this in regard to some producing companies and Company H claims that it is "all about the money". Nevertheless, Company G chose RoRo short-sea shipping for environmental reasons, in addition to suitable cost and lead-time.

5.4.1.3 RoRo short-sea shipping

All interviewees emphasize that no matter how the supply chain is designed transport by truck is required on some parts in order to provide a door-to-door service. Company G further states that even when truck can be considered as the main transport mode, RoRo short-sea shipping is often also used for some part(s) of the journey. This applies especially on journeys from

southern to northern Europe and vice versa. When Company G freights cargo by truck to/from Sweden and Norway they always use the Helsingborg - Helsingör ferries instead of taking the Öresund-bridge. This choice is in line with Company G's environmental commitment in addition to being the most economical. On routes Sweden – Germany and Sweden – Belgium Company G also freights most of its trailers on RoRo vessels. Cargo with destination east Europe is often transported across the Baltic Sea by ferry. Company H freights most of its domestic goods from Sweden bound for Great Britain via RoRo short-sea and Trelleborg is the gateway to southern Europe through where all goods bound for the continent pass through. Goods bound for Denmark is transported on the Helsingborg – Helsingör ferries. According to Company F the majority of their contracted carriers use RoRo ferries between Germany – Sweden or Poland – Sweden, or at least some part of the journey from origin to destination. This activity is however not administered nor required by Company F which state that RoRo short-sea shipping is only used as a bridge-substitute when that proves to be the best available solution.

Two of the interviewed companies, G and H, have contractual relationships on freight rates with different RoRo short-sea operators. Company F on the other hand leaves that issue with the carriers they contract to perform the transport. Both companies G and H have short-term contracts, ranging from only one month for Company H to one year for Company G, and the general trend is to have contracts no longer than one year. Company G's customers do not want contracts longer than one year with Company G thus there is no reason for the company to have longer contracts with its transport suppliers. The business risk of having long-term contracts is experienced to be too big by both companies H and G. However, regardless of the duration of the contract Company H says that the market's extreme flexibility forces them to accept customers terminating contracts in advance. Having only one-month contracts with transport suppliers is a proactive approach to the market within Company H.

5.4.2 Image of RoRo short-sea shipping

Company G believes that the shipping industry in general is very traditional and could benefit from paying more attention to market activities and image and Company H agree. Many of their big customers are concerned with their environmental performance and Company H has to comply with their demands in order to be the preferred logistics service provider. Accordingly, short-sea shipping must not only comply with such standards but also build an image as being a good choice from an environmental perspective. Company G is of the meaning that RoRo short-sea shipping should market their services more actively and especially focus on environmental benefits. Company F was alone in mentioning strikes and lockouts in ports as having a negative influence on the image of shipping in general.

5.4.3 Supply chain and logistics management

Both companies G and H are of the opinion that RoRo short-sea operators lack an overall perspective of the supply chain and could benefit greatly by incorporating supply chain- and logistics management in their activities. Desirable according to Company G would be a broader focus than just port-to-port. Company G also emphasize that they experience that logistics and supply chain management is rarely a part of their customers' corporate strategies, which has great impact on how these, mainly producing companies, regard

transport and logistics as activities. According to Company G, transport is not viewed as a value adding activity by these companies; rather it is a necessary evil that should take the goods from origin to destination to the lowest possible cost. Company G believes that the higher logistical activities are ranked in a company the bigger the chance other transport solutions than only truck, such as RoRo short-sea, will be used in trans-European transportation.

5.4.4 Strengths and weaknesses of RoRo

5.4.4.1 Economical

The handling costs in shipping in general are larger than for land based transport, a reason to avoid short-sea shipping says Company H. However, these types of handling costs are less, bordering to nothing, in the case of RoRo short-sea-shipping which itself promote the mode. In general Company H does not use RoRo short-sea shipping unless it acts as a bridge-substitute or for special set-ups for e.g. paper or wood shipments. Also companies F and G confirm that RoRo short-sea is often used as a bridge-substitute. As paper and wood are low-value commodities where short transport duration is rarely required, RoRo short-sea shipping is deemed to be a feasible mode. Company H transports less than 5 % by RoRo short-sea, the domestic freight to Great Britain and ferry transports exempted. Both companies H and G partly choose RoRo short-sea due to the price of using the Öresund-bridge. Company H would very much like to use RoRo short-sea shipping to a greater extent, and then not only as a bridge-substitute, as it can reflect positively on their image from an environmental perspective. However, as of today Company H means that the price is not right, and neither is the lead-time nor the frequency. Instead, the company focus on shifting as much of their cargo volumes as possible to rail. On the other hand, Company G transports thousands of trailers by RoRo short-sea each year and benefit from both lower costs as well as lower negative environmental impact. Company F is also of the meaning that one can sometimes benefit from lower costs by using RoRo short-sea, and of course the environmental impact is less.

An economical, as well as practical, advantage of the mode is that the driver of the truck can sleep while still being under way, which can save both time and money says Company F. On the other hand, the cost of the truck and its driver must be added to the price for the RoRo freight rate, a drawback according to Company H. Company F experience that container shipping is generally a more cost efficient alternative than RoRo.

5.4.4.2 Practical

Company H experiences the document handling in shipping to be too complex, a fact that may hamper and will continue to hamper the development of RoRo short-sea shipping. Further, Company H experiences that the procedures surrounding e.g. transportation of dangerous goods is more complex in shipping than in trucking, providing a reason to transport such goods solely by truck. According to Company G neither the document handling nor the contracts in RoRo short-sea shipping and multimodal transport is very complex as it is governed by the NSAB 2000, thus RoRo short-sea should not be disadvantaged by any such aspect. As the trailers/trucks onboard a RoRo vessel is driven onto the vessel, the transport is regulated by the NSAB 2000 also during the sea voyage, which according to Company G

becomes an advantage of RoRo short-sea shipping as the entire transport can be regulated by the same rules no matter e.g. the length of the transport by short-sea. Liability issues can of course always occur in any case, however that is not a bigger issue within RoRo short-sea transport than any other mode according to Company G.

RoRo short-sea shipping is according to all three interviews disadvantaged by the lead-time aspect. As was mentioned by Company F a longer duration of transport has implications for the opportunity cost of having capital tied-up. Company G states that in 95 % of the cases where RoRo short-sea is not chosen it is due to the time-aspect. The lead-time is both an economical and practical problem depending from which angle it is viewed. RoRo short-sea shipping need to become a faster and more flexible mode to be able to compete with rail and road says Company H, and Company F agree that the mode is less flexible than truck. In addition the low frequency of departures is considered to be a considerable drawback by Company H. According to Company G the flexibility of a RoRo vessel is outstanding. The quick cargo handling in port with a RoRo vessel is an advantage compared to a LoLo vessels says Company F. RoRo is also a suitable mode for sensitive cargoes such as bottled and canned beverages, which is transported by Company F.

5.4.5 Future potential

In the view of Company F, the reason as to why RoRo short-sea shipping does not constitute a larger part of European freight transports is mainly geographical; the European continent is one mass of land with extensive road networks. Europe is characterized by its dependency on road transports, moreover; Company F cannot identify any need for more RoRo short-sea shipping in Europe. Company H is also of the meaning that the existing services are enough, however, that more value-adding services should be developed in addition to the basic transport service. RoRo short-sea shipping operators must develop the scope of their services to remain competitive in the future, especially as the extensive European rail network will provide fierce competition to RoRo short-sea shipping in the future according to Company H. Vast infrastructure investments are made in the rail sector, it is e.g. since a few years possible to transport goods from Holland to Italy by train without reloading. Company G is also of the opinion that the existing RoRo short-sea services in Europe are in accordance with the demand in the market. Accordingly, both companies G and H recommend that RoRo short-sea operators provide more differentiated and flexible services in addition to frequent departures. Company G is also of the opinion that to realize the vision of more frequent departures smaller vessels are a must however, the size of the vessel is of great importance as economies of scale are a condition for profitability in the segment today. As calls to more destinations would also be preferred according to Company G, the numbers do not match when summing up; the economies of RoRo short-sea shipping makes it almost impossible to provide the type of services that would make it a more dominant mode.

Moreover, both Companies G and H believe shipping companies need to work closer to their markets in a proactive manner to cope with the fierce competition from other transport modes. All the same, company H thinks RoRo short-sea shipping might be able to benefit from increasing gasoline and diesel prices in the future as well as the implementation of road taxes in more European countries. Of course, rail will probably be a strong competitor also in that

case. Nevertheless, the environmental benefits from integrating RoRo short-sea in the supply chain can become a future selling point that the business should take advantage of. Even so, there is much work still to be done in regard to environment and sustainability within RoRo short-sea shipping. It is both a prerequisite to stay competitive in the future as well as an economic future advantage to be in the forefront in these issues according to Company G.

In line with increasing environmental awareness the trend moves towards local production and local/regional distribution, thus lessening the need for long-haul transports. Company G means that this gives rise to a need for differently managed logistics, which could include more extensive use of short-sea shipping in general.

The future in short-sea shipping lies with the container segment according to Company F due to higher profit margins, more simple handling and possibilities to distribute the containers via inland waterways. Company G seems to agree with this assumption stating that short-sea container shipping is becoming increasingly popular, which might impede the development of RoRo short-sea shipping. Had it not been for the quick development of containers and container vessels Company G believes that RoRo short-sea would have had even better development opportunities.

5.5 Case study 4 – Related industry actors

To broaden the perspective of the thesis a small case study involving related industry actors was conducted. One port and one organization was interviewed, both located in Norway but also part of the Scandinavian and European freight transport market. These actors are referred to as companies I and J, respectively, hereafter. Both parties were included in the study due to their good general knowledge of maritime transport in general and Scandinavian short-sea shipping specifically. The organization works for the common interests of logistics and transport operators in the Norwegian market.

The port handles a wide range of cargoes such as dry and wet bulk, general cargo, containers and motor vehicles, the latter being the most common cargo. In addition to being a multipurpose port it is also a niche port in regard to its experience in motor vehicle logistics. The port is an important hub for the south of Norway, and short-sea services to Immingham, Rotterdam and Bremerhaven etc. are accessible through the port.

5.5.1 Transport mode selection and valued service qualities

5.5.1.1 Mode selection

Company J is of the impression that the logistics service provider makes the decision regarding transport mode etc. most of the time. Customers focus on their core competence instead. Company I's scope of business does not encompass dealing with the mode selection dilemma.

5.5.1.2 Valued service qualities

Price and delivery as agreed are the most important factors, these make out as much as 95 % of the valued qualities according to Company J, the importance of price is also put forward by Company I. There is also some concern for the environmental impact from transportation. However, environment is not a key aspect when making the transport mode decision, in addition only a few are prepared to pay more to lessen the environmental impact from transportation by using sea transport says Company I. Accordingly, to be competitive RoRo short-sea shipping must be able to compete, with first and foremost road, on the following factors: frequency, price, timeliness, lead-time, efficient intermodal connections, supply chain management and safety. Though not necessarily in the order presented.

5.5.1.3 RoRo short-sea shipping

In Norway the majority of short-sea activities are by feeder vessels to/from large European hubs according to Company J. RoRo in Norway is concerned with mainly large, heavy, bulky, low-cost goods. Much of the consumables with higher value are transported and distributed via truck. Norway's vast exports of fish are mainly transported on trucks since it is a perishable foodstuff, thus the characteristics of the transported commodity determines if it is suitable with RoRo short-sea or not. Company J emphasizes the extreme importance of the fish reaching its destination quick not to lessen its monetary value.

According to Company I, almost all vessels that call the port are short-sea feeder vessels since Norway is a rather small market. Short-sea shipping within Scandinavia is in general not that common. The majority of goods from other parts of Scandinavia or Europe is transported to

Norway by truck through Sweden states Company I. Further, the competitiveness of short-sea is dependent on the ports functioning well; the throughput and the loading/discharging activities must be effective and efficient.

5.5.2 Image of RoRo short-sea shipping

Ship operators need to become more visible, marketing efforts are needed. Cargo owners as well as logistics providers need to be made aware that RoRo short-sea can provide an efficient and effective transport solution. There is too little knowledge on shipping in general according to Company J. Also Company I share this opinion, stating that shipper must be made aware of the benefits with RoRo short-sea shipping. Ship operators need to become more visible, work proactively towards the market as well as work on their image to become attractive to shippers and logistics service providers. On the other hand, Company J has not experienced any indications that shippers are unsatisfied with the services offered by RoRo short-sea operators.

Personal meetings with relevant actors in the business are of great importance according to Company I, and so is close cooperation with relevant authorities as these govern e.g. transport policies. Company J also believes ship operators should work more politically to influence their situation. Shipping is a traditional business in need of a new mindset.

5.5.3 Supply chain and logistics management

There is a growing demand for supply chain management according to Company J, and thus more comprehensive services from RoRo short-sea operators. In general, this applies to every part of the supply chain. Integration and cooperation are keywords. There is definitely a need for better cooperation between the different modes of transportation. A way to achieve greater integration is for e.g. RoRo short-sea operators to take more ownership in the supply chain i.e. own stocks in a logistics service provider, road hauler, etc. Company J believes this can lead to advantages such as being able to provide more integrated and differentiated logistics services to better prices. Company I agrees that mergers and acquisitions of equivalent carriers ashore is a way to become more integrated in the supply chain and gain a bigger market share in the European freight market.

RoRo short-sea must be better adapted to the needs of the customers says Company I. Price, frequency, and delivery at the right time are important in transportation in general and must be better in regard to RoRo short-sea shipping.

5.5.3.1 Port performance

Ports are a necessity in all maritime transport, and have huge influence on the efficiency and effectiveness of RoRo short-sea shipping. Company I is aware of their importance as a port. An efficient supply chain is essential and requires efficient and effective cargo handling in port as well as good hinterland connections. Cargo handling efficiency is extremely important in short-sea shipping in general if the mode should be able to compete with the lead-times in road transport. In addition the port should provide various value adding services, such as 3/4pl activities. To achieve a truly efficient supply chain a port must work closely to all its customers and relevant authorities.

Company I has small port fees in a European perspective. The gross-tonnage of the vessel determines the fee, which of course does not benefit RoRo short-sea operator as it is more difficult to fully utilize the space in a RoRo carrier compared to e.g. a bulk carrier, leaving the RoRo carrier earning less per weight unit transported.

5.5.4 Strengths and weaknesses of RoRo

5.5.4.1 Economical

When speed is not of great importance and neither lead-times RoRo short-sea is an economical mode, but today it is rarely a viable alternative when it comes to for instance perishable goods. In such a case the cost benefits from choosing RoRo short-sea is off-set by the lessening in value of the commodities, according to Company J.

The capacity of a RoRo vessel is very expensive, thus a rather large and frequent flow of goods is needed in order to make RoRo short-sea shipping a profitable business says Company J. The need for large volumes to make shipping profitable is a huge challenge for RoRo short-sea shipping agrees Company I. As a result, it might not be possible with more frequent departures, as it is only economical to consolidate cargo on fewer departures according to both companies.

5.5.4.2 Practical

There is no time- or money consuming cargo handling or reloading activities in RoRo shipping, which is a great advantage of the mode. However, Company J also believes that the mode is disadvantaged by not being able to offer more routes to its customers. In short-sea speed is crucial to compete with rail and road states Company I and the limited speed impede the mode's growth in the freight market.

5.5.5 Political initiatives

The EU's Marco Polo programmes, Motorways of the sea and so forth are very positive initiatives in the opinion of Company J. These initiatives probably affect short-sea in continental Europe more than in Scandinavia as Scandinavia do not have inland waterways to the same extent. Company J's experience is that Marco Polo and Motorway of the seas affect Norway to a very little extent, and Company I agree. Very few companies within the transport- and logistics sector show interest in Marco Polo says Company J, however, according to Company I two Norwegian projects recently got funding. One is Bring Logistics who operate a train pendulum between Oslo and Rotterdam, and the other one is Sea-Cargo who operates a short-sea route from Esbjerg to Rotterdam.

There is need from more action from authorities in order to develop the RoRo short-sea network throughout Europe according to Company J. If the EU really wants to realize the modal shift, Company I mean that economic means of control must be put to use.

5.5.6 Future potential

According to company J there is a definite potential in RoRo short-sea shipping, but more in the rest of Europe than in Scandinavia. Company I believe that if there is a market for a short-sea route somewhere, someone will most certainly exploit that opportunity, such are the

economic mechanisms. The lack of inland waterways and small dispersed, populations over require small volumes to be transported to many destinations, resulting in difficulty to make RoRo short-sea shipping economically feasible says Company J. Also Company I recognize the required volumes to make the mode profitable is a challenge to RoRo short-sea in Scandinavia, and especially Norway. There are certain other factors that also limit the future potential of RoRo short-sea shipping according to Company J, such as demand from customers in terms of price, flexibility, lead-time, cargo handling and reloading activities, costs and time. It is a well-known fact claims Company J that the lead-time is often longer when short-sea is used. Producing industries are at present often focused on JIT or lean supply chain strategies which Company J experience result in planning for transportation activities being little prioritized. The flexibility of road transportation is of course unbeatable in such cases, but a higher frequency of RoRo short-sea departures could increase the attractiveness of the mode. RoRo shipping would then be considered a more flexible mode, which is needed in today's market according to Company I. Frequency, timeliness and lead-time are key words that must be kept in mind says Company I. If RoRo short-sea operators can deliver services that entail these aspects there is definitely a potential to shift cargo of the roads.

One option to overcome the increased lead-time are high-speed RoRo vessels, on the other hand these consume substantially more fuel and are more expensive to operate in general. Nevertheless it could compete with road transport in regard to time. In any case, cargo-handling activities in port can increase costs of sea transport however, Company J, emphasizes the advantage with RoRo compared to LoLo as trailers can roll on and off the carrier thus lessening the need for such cost-increasing activities.

Company J highlights the importance of politics for the future development of RoRo short-sea shipping: Are there rules and regulations that promote the mode and its long-term sustainable development? Incentives from local, national and international authorities are important to promote short-sea shipping in general. RoRo short-sea shipping must be made more economically viable, especially in comparison to road transport. This can be achieved partly by road taxes thinks Company J. In Norway the authorities are not working enough to promote short-sea according to Company J, nevertheless Oslo and Drammen ports are today much better adapted for RoRo shipping than previously. Yet, Company J is uncertain if there is room for more RoRo short-sea in the market today. To be able to compete with other mode RoRo short-sea operators need to become more focused on supply chain management and offer more differentiated services.

Routes of transportation will become shorter as we realize the negative effects from road transportation, as well as transportation in general of course. The trend is more local production and distribution. The fear for terrorism is costly and problematic and puts many constraints on transportation, especially long-haul, which Company J believes in turn open new doors for short-sea shipping. Whatever is done, focus must be on profitability as shipping is a capital intensive business with huge investments emphasizes Company J. Today there are seldom neither economic nor environmental reasons that drive the choice of RoRo short-sea. To Company J it is clear that RoRo short-sea shipping must be commercially viable and profitable in order to develop sustainably.

5.6 Summary of key findings

The transport mode selection is commonly taken by a logistics service provider, if one such is contracted by the actual cargo owner. The empirical results imply that a majority of cargo owners prefer to focus on their core competencies, and let a logistics service provider handle the transport and transport mode selection as that is their core competence. The logistics service providers say make the decision unless otherwise specifically requested by the customers. The transport mode selection is based on a set of valued service qualities, derived from the requirements of the customers' businesses. Hence, the results from the case studies indicate that logistics service providers have much power in regard to supply chain design and transport mode selection.

Ship operators, logistics service providers and the related industry actors in general have somewhat coherent experience in regard to what service qualities are valued by shippers. Price stands out as being the single most important determinant in choosing transport mode and carrier among all interviewed companies. However, price does not alone act as a determinant in the mode selection process, even though price often governs the final decision. Other identified key determinants are reliability, frequency, lead-time, flexibility, sufficient information, just-in-time services, and fleet capacity as well as and environmental concerns, not necessarily in that order. Environmental concerns are however ranked lowest among determinants as it is experienced that very few shippers are prepared to pay for higher environmental performance. Nevertheless it is argued to act as a determinant among others in the choice of RoRo short-sea shipping. One ship operator experiences that their customers value price and lead-time less than reliability and frequency. It seems that a longer lead-time is accepted if the price is low enough to off-set the negative aspects of increased lead-time. The logistics services providers and the related industry actors argue that the service qualities most valued by shippers also include delivery of the goods at the right time and right place in an acceptable condition.

The logistics services providers and related industry actors highlighted that the shipping industry is in general a very traditional business and it is believed that the business can benefit from a more modern mindset. In regard to marketing, the results show that ship operators need to become more visible to customers. Marketing and customer relations need to be put in focus in the RoRo short-sea shipping businesses. Even so, the ship operators emphasized the importance of strategic marketing in e.g. industry related media. In principal, all interviewed ship operators do marketing in some sense, some more than others, and are well aware of the need to be able to attract the attention of potential customers. However, the logistics service providers and the related industry actors experience that RoRo short-sea shipping needs to be made more visible thorough marketing activities. This implies that even though ship operators at present have the knowledge of the importance of marketing, their efforts in this regard may not be sufficient. Further, several of the ship operators drew attention to the importance of long-term, stable and reliable personal relationships, such and networking in relation to marketing efforts and increasing their visibility and raise awareness of the mode and its benefits. One ship operators say they work with CRM while the remaining mainly work with B2B sales, or other. According to the results, RoRo short-sea shipping must

market to build an image as a reliable, frequent, flexible, and cheap mode with acceptable lead-times, according to logistics service providers and related industry actors. Ship operators are recommended to work proactively towards their markets and also to promote themselves more actively in the political arena to ensure as favorable market conditions as possible. RoRo short-sea shipping is friendlier to the environment than road transport, which is suggested can be used as a selling point.

It can be concluded that demand for supply chain management and more comprehensive services is growing. Both logistics service providers and the related industry actors mentioned that RoRo short-sea shipping lack an overall perspective of the supply chain and its management and that a greater focus on this might make the mode more attractive hence make shippers consider using it in freight transports. SCM could result in more integrated and differentiated services to better prices. RoRo short-sea shipping need to become better adapted to customers' needs by fulfilling the requirements regarding price, frequency, lead-time etc. The port and port operation and efficiency are crucial to the performance of RoRo short-sea shipping in the supply chain. Among the five ship operators, two are involved the supply chain through solely the sea transport, while the other three offer additional logistical services but to a varying degree and to different market segments. Short-term, non-exclusive contacts/freight agreements are common between the ship operators and their customers however, several ship operators have long-term relationships with industrial customer with contracts spanning over as much as 15 years. Long-term contracts seem to be most common in joint venture-situations and the alike. However, joint ventures with industrial customers are governed by long-term agreements. Logistics service providers and their customers are more willing to sign contracts/agreement on short-term basis to avoid unnecessary business risks.

Regarding economical strengths and weaknesses in RoRo short-sea shipping, a rather consistent view was communicated throughout the case studies, and they include the following strengths: comparatively low price, short turnaround time in port, low cargo handling costs, truck drivers can rest onboard while still being underway, in general stable returns, possible to combine with passenger transport to increase profitability, and economical when lead-time is not of importance. It also includes the following weaknesses: high operational costs for e.g. maintenance and crew, comparatively high price, subjected to various fees (port fees, fairway dues, stevedores, linesmen), large overhead- and fixed costs (approximately 80 % of freight rates consist of such), low returns, long lead-times (implication for customers costs for tied-up capital), and in addition RoRo capacity is expensive and require reliable, large and frequent cargo flows. A negative economic aspect of having trucks on a RoRo vessel is that cost for the driver has to be added onto the short-sea freight rate.

The costs structure in RoRo short sea shipping consists mainly of the investments in, and the maintenance of, the vessels, which is followed by the fuel consumption. In comparison, the cost for crewing and the shore-based organization comprise a rather small part.

Practical strengths and weaknesses in RoRo short-sea shipping were described with some coherence in the case studies and are identified to include the following strengths: short

turnaround time in port, less congestion problems than road and rail, large capacity, suitable in special set-ups for e.g. paper or wood, flexibility, low damage rates, easy and quick cargo handling and no required reloading, feasible as a bridge-substitute, rather simple administrative procedures (NSAB 2000) and in addition a road hauler saves maintenance on the trucks by transporting them on a RoRo vessel part of the journey. And the following **weaknesses**: comparatively long lead-time, low speed, difficulty to compete with rail especially as rail infrastructure is improved, low departure frequency, limited available routes at present, complex administrative procedures, inefficient port operations,

The **political initiatives**, being e.g. transport policy and projects such as the Marco Polo, promotes short-sea shipping throughout Europe however the case studies communicate that ship operators as well as the related industry actors experience that Marco Polo and Motorways of the sea do not in reality change the market conditions and promote short-sea shipping, although the initiatives are very positive. Several interviewees stated that there is need for more actions from authorities, including the EU, in order to truly promote the growth and development of short-sea shipping. Such actions could include taxing cargo off the roads.

All ship operators stated that the **competition** in the RoRo short-sea market is extremely high. In addition the competition against land-based transportation is fierce. RoRo short-sea shipping experiences a massive profitability pressure, and in such tough market it is not easy to attract new customers by lowering freight rates. All interviewed ship operators were affected by the global financial crisis, presently there is still an overcapacity in the market and freight rates are low. Shipping volumes have decreased substantially and to survive ship operators have implemented various strategies including re-organizing the company, merging routes, freeing up or charter out vessels, reducing number of departures and so forth. The **competitiveness** of these ship operators could nevertheless be maintained due to their initial financial stability. The many fees in shipping/RoRo short-sea shipping are a problem for the modes price competitiveness and the mode struggles with its competitiveness against land-based transports.

The realization of the future potential of RoRo short-sea shipping requires the following: improved departure frequency, shorter lead-times, lower port fees and fairway dues, and increased port operational ability and efficiency. In addition it is emphasized throughout the case studies that more dedicated, differentiated and flexible, value-adding services have great potential to increase the attractiveness of RoRo short-sea shipping in the future. Better integration into, and communication with, the supply chain is also considered a key component in the growth of the mode. The low returns, the high overhead costs, and the dependency on reliable and frequent cargo flows impede the present growth and development of RoRo short-sea shipping. Further, the RoRo short-sea market is highly fragmented which is highlighted to be a problem that hinders the business growth in the freight market. The development of rail infrastructure throughout Europe, and Europe's dependency on road transports, also poses as a possible threat to the growth in RoRo short-sea shipping.

Especially the logistics services providers and related industry actors Experience the shipping industry as a very traditional business, and believe ship operators need to develop new

mindsets to handle the dynamic market. Ship operators must also become more visible to both present and potential customers, and proactive marketing efforts are required. Peoples and businesses attitudes towards, and awareness of, the mode are crucial aspects in development as limited awareness, or negative attitude towards, the mode constrain shippers' view in the transport modes selection. Therefore, ship operators should work to improve their image and raise the awareness of the benefits with RoRo short-sea shipping. The environmental friendliness of the mode could be a selling point in the marketing of RoRo short-sea transport services.

The case studies reflect that political initiatives, in addition to those present today, are required to encourage shifting cargo from road- to sea transport. Implementation of road taxes/higher road taxes are a necessary step in the development to internalize the external costs from transportation and create a market where road and sea compete on fair conditions.

The increasing use of intermodal transport solutions in freight transports is likely to increase the usage of RoRo short-sea shipping, according to ship operators and logistics service providers. However, in an intermodal chain communication between the modes is important to facilitate the growth of RoRo short-sea shipping. Moreover, the contemporary trend of localizing production and distribution decreases the need for long-haul transports, which will alter transportation needs, which in turn may open new doors for RoRo short-sea shipping believes Company J. Company H believe that as e.g. manufacturing companies begin to integrate logistics and transport activities into their overall corporate strategy, they will plan transport activities well in advance and thus become less sensitive to long lead-times, a development that RoRo short-sea shipping can benefit from.

Chapter 6 - Analysis

In the analysis, empirical findings from the four case studies will be discussed and analyzed in accordance with the conceptual model, Figure 6-1, which was created based upon various research fields addressed in the literature review. The structure of this chapter is based on the conceptual model; however also incorporates the structures of the literature review as well as the results to ensure coherence that may simplify for the reader. Section 6.1 deals with mode image, herein broken down to company image while section 6.2 addresses the issue of customer value. In section 6.3 integrated supply chain management and its implications on competitiveness is discussed. Section 6.4 tackle issues related to the surrounding environment, e.g. political aspects, and finally, section 6.5 discusses the transport mode selection and its dependency on issues dealt with in sections 6.1 through 6.4.

Similarities as well as deviations between previous theoretical literature studies and findings on business practice through the empirical study in regard to RoRo short-sea shipping will be elaborated upon in the analysis. Correspondingly, the authors will throughout the analysis provide strategic suggestions directed at RoRo short-sea operators in regard to which measures can be taken to increase RoRo short-sea shipping’s attractiveness to shippers. The analysis is followed by Chapter 7 – Conclusions, where suggestions and recommendations will be discussed and summarized.

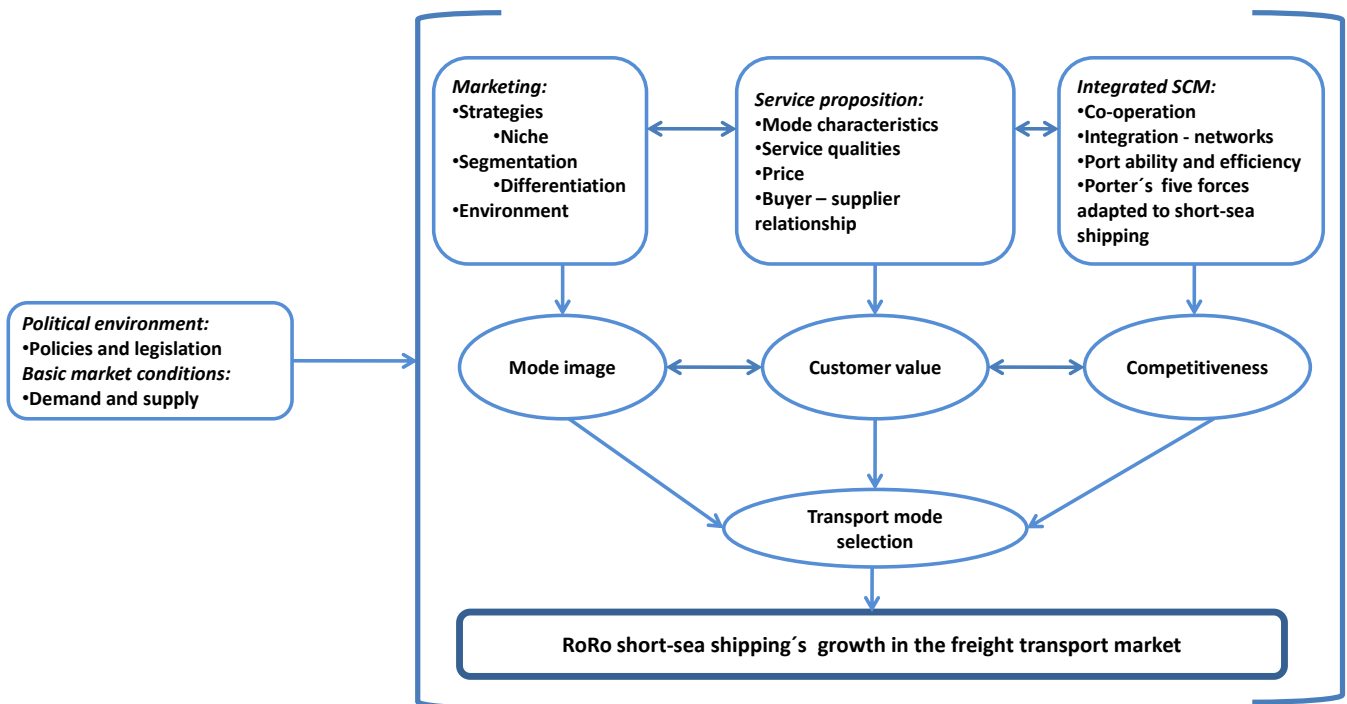


Figure 6-1: Conceptual model identical to Figure 4-11

6.1 Company image

The image of any company can be related to its marketing efforts and its choice of marketing strategies. The reviewed literature throughout section 4.4 argue that European short-sea operators focus too little on marketing activities and moreover describe the mode as having a rather disadvantageous image in regard to speed, costs and administrative matters. In addition the empirical results show that most of the participating RoRo ship operators focus little effort, as well as budget, on marketing activities and the dominating marketing strategy seem to be B2B sales, when required. RoRo short-sea operators need to focus more on marketing activities according to logistics service providers and related industry actors. Such activities should also be aligned with marketing strategies aimed at creating an image of the mode that appeal to shippers. The literature review stipulated that a shippers modal choice is not always based on logical reasoning but rather personal judgment based on previous experiences, beliefs etc. which indicate the importance of RoRo short-sea shipping's image in order for the mode to be preferred in a transport solution. The conceptual model puts marketing and its influence on mode image as one of three focus aspects that create conditions that will make shippers choose RoRo short-sea shipping. Figure 6-1 illustrates that the growth of the mode in the freight transport market is enabled, when the conditions are such that the modal choice falls on RoRo short-sea shipping. The model puts forward mode image as one of three important factors that affect the growth of RoRo short-sea shipping, and thus in the following sections marketing and strategies will be discussed in relation to RoRo short-sea shipping.

6.1.1 Marketing

From the empirical results it can be concluded that logistics service providers have great influence on the modal choice, which have implications for what marketing and which marketing strategies should be implemented by a RoRo short-sea operator. The marketing activities will have to be strategically directed towards this segment, in addition to the cargo owners, in order to strengthen the image of RoRo short-sea shipping among logistics service providers and hence also the modes competitiveness in modal choice situations. The case studies reveal that although all five shipping companies have marketing activities of some kind, most of them focus relatively little effort on marketing. On the other hand, the brands of most of the ship operators in this study are very well known, hence they see no urgent need to e.g. advertise more extensively in addition to adverts in industry related magazines. Casaka & Marlow (2005) identified that a carrier's marketing activities ranked seventh among service attributes in short-sea shipping, which indicate that the empirical results from this study are valid when stating that marketing is an important aspect for the success of the RoRo short-sea shipping business, and that the lack of marketing activities is seen as a weakness among shippers.

Aaker (2001) presented a framework for strategic market management, as seen in Figure 4-8, which could be useful for RoRo short-sea operators in identifying suitable marketing strategies to reach the target population. By conducting an external analysis on customers, competitors, market, and the environment the RoRo operator can identify opportunities, threats, trends and strategic uncertainties related to these aspects. The internal analysis is related to the strengths and weaknesses of the company and identifies problems, constraints

and uncertainties. A thorough internal and external analysis could be beneficial to RoRo short-sea operators in identifying e.g. customer needs in order to be able to segment the market and differentiate the services accordingly, as is further discussed in 6.1.2. In regard to market trends, growing environmental concern among shippers is a trend that could be identified and explored through applying the strategic market management framework. As maritime transport is a comparatively fuel efficient mode which emit less than most road vehicles in relation to capacity, the increasing environmental concern poses as an opportunity for RoRo short-sea operators to exploit their “environmental advantage” to attract shippers. The environmental perspective on marketing will be dealt with further in section 6.1.4.

6.1.2 Market segmentation and service differentiation

Market segmentation can prove important to enable the forming of better strategies, more likely to attract the desired customers within desired market segments. Aaker’s (2001) strategic market management framework was presented in section 4.4 and indicates that segmentation of the market and the customers is an important part of the external analysis in the overall strategic analysis.

In the conceptual model, Figure 6-1, mode image (denoted as company image in 6.1) and customer value are two main aspects that relate to marketing on the one hand and to the service proposition on the other. These two aspects can be used in the differentiation of transport services. If the differentiation is done on the basis of the service proposition different transport services i.e. transport services with different value propositions/service qualities will be offered to different segments of customers. The customer segmentation in such a case will be based on customer needs and requirements and the service offer will be designed thereafter. Certain shippers might value reliability and security while others value frequency and speed. A RoRo short-sea operator can either focus on one specific segment and offer, and market, a specific service to only that segment, or he/she can focus on several different segments thus offering several services differentiated from each other.

If the segmentation is based on marketing, the marketing strategies aimed at each segment focus on other aspects than specific service qualities, such as feelings, previous experiences and perceptions. The marketing is thus niched towards each target segment. Wiedmann (2007) presented four marketing niches for the transport industry, as dealt with in section 4.4.1, and according to this a transport service provider can focus on marketing its services as premium services/value-adding services, services with lower prices, shorter lead-times or with possibilities for alternative activities. Several examples in regard to RoRo short-sea shipping can be derived from the empirical results. Premium services can be provided to certain customers however, the results from the case studies indicate that many shippers are not necessarily concerned with how their goods are transported as long as they are transported from and to the right place, on time and in an acceptable condition. Garberg (2001) found that RoRo operators should focus on offering basic transport services and premium services to only those customers who require such. On the other hand the results in this thesis points out a growing demand for more comprehensive logistics services, and Garberg’s study is nine years old by now indicating that the situation might have changed radically during that time. Moreover, logistics service providers also emphasized the demand among shippers for value

adding services. Thus there should be an explicit potential in the premium service niche for RoRo short-sea operators. Moreover, the price niche strategy seems to have huge potential and the empirical results state that price is *the* most important determinant in the modal choice. As a matter of fact, several of the ship operators interviewed mentioned that they are constantly under a severe price pressure from the shippers, and thus they have to have competitive (low) prices in order to be attractive. Hence the pricing niche strategy is in many senses used widely today by RoRo short-sea operators already. Although it should be emphasized that as the margins in RoRo short-sea shipping are small, from a profit perspective it might not be an optimal strategy.

The case studies showed that ship operators experienced many of the shippers as being very focused on lead-time, this was confirmed by the logistics service providers; they as well as their customers consider lead-time an important feature of a transport service. Also the related industry actors mentioned lead-time as a seemingly important aspect. A marketing niche focused on such an aspect is then likely to attract a rather large segment of shippers. However, what also became evident through the empirical study was the ship operators' difficulty to compete with land-based transport modes on lead-time, which can become a problem if focusing on a lead-time niche. This issue could be mitigated by employing HSVs or introducing more frequent departures however these "solutions" have their own problems and drawbacks, discussed later in the analysis.

The alternative activity niche also deserves some attention here. By implementing this niche strategy emphasis will be put on the added-value a shipper will gain from the possibility to carry out other activities during transportation. "*A practical advantage of the mode is that the driver of the truck can sleep while still being under way, which can save both time and money*" say Company F. As truck driver have to rest at certain times and need to have one long rest for sleep according to legislation, RoRo short-sea transport may have the potential to shorten lead-times and decrease costs as the truck is underway while the driver get his/hers rest. "*On the other hand, the cost of the truck and its driver must be added to the price for the RoRo freight rate*" a drawback according to Company H. This is an implication that the trade-off between various costs related to freight rates, lead-time, personnel etc. is interesting and should be studied in more detail in order to establish when RoRo short-sea will in fact be a viable alternative. However, this is not done here. Even so, the alternative activity niche could be one of great potential and could provide an opportunity to compete on lead-time. One might then argue that the lead-time in using only truck will still be shorter as it is possible to employ two drivers, but on the other hand that means that there are two drivers salaries that need to be paid, and in that case perhaps the cost for one driver plus the short-sea freight rate will be less than the cost for two driver? If this is the case RoRo short-sea shipping will perhaps be able to implement the alternative activity niche strategy and appear as a cheap and fast mode. A differentiated marketing strategy focuses on the needs and preferences of the targeted segment, and of course a combination of the two differentiation methods (marketing related or service offering related as seen in Figure 6-1) is possible, and perhaps even desirable depending on the needs as well as preferences of the target segment. §

6.1.3 Customer relationship marketing

Company D mentioned that CRM is their main strategy to handle marketing as well as customer relationships. CRM is more of a business strategy than solely a marketing strategy (Ravald & Gronroos, 1996), and thus could be an appropriate choice of strategy to build long-lasting profitable customer relationships. However, as Company D and their customer commonly apply short-term, non-exclusive, rate agreements since long-term, exclusive agreements is too big a risk for both parties, it could be questioned whether or not CRM is the optimal strategy for their marketing? On the other hand, as CRM is a strategy often employed to gain loyal customers, it might be just the right strategy as a RoRo short-sea operator in today's market with mainly short-term agreements is more than ever dependent on gaining loyal customers in order to be selected for a new agreement once last year's agreement has run out. An important aspect of CRM is the after-sales behavior and its implications on future sales and revenues. RoRo ship operators should focus not only on selling but also on after-sales service to ensure loyal customers. To what extent the ship operators in this study focus on after-sales behavior is not known.

The current market situation is characterized by an excess supply of RoRo short-sea capacity. RoRo short-sea operators are under extreme price pressure from shippers and the empirical results support the notion that shippers are not reluctant to shift from one transport service provider to another if a lower freight rate can be attained. CRM hence poses as a suitable marketing strategy in order to attract new customers as well as to retain existing customers. The step from B2B and networking marketing (strategies currently applied by most ship operators in the study) does not need to be huge, thus the efforts and investments required to establish a CRM system could result in long-term profits that greatly exceeds this. A CRM approach to customer relations and marketing is likely to give shippers reason to become reluctant towards shifting transport supplier only to attain a lower price.

6.1.4 Environmental perspective on marketing

In regard to the aspect of being environmentally friendly, the nature of this study must be taken into consideration. The companies that participated in this study may have had reasons to portray themselves as being more environmentally friendly than they actually are, as they during the interviews also faced a situation that provided a marketing opportunity. Although, this is of course not necessarily the case but nevertheless an aspect to keep in mind. It can be argued that the contemporary importance of environmental issues encourages such behavior, and that it is of course an important selling point to state that one's operations are of high environmental standards. In section 6.1.1 it was briefly mentioned that RoRo short-sea shipping should exploit the modes environmental competitive advantage in line with current market trends. On the other hand, ship operators, service logistics providers and related industry actors shared the opinion that shippers are rarely prepared to pay more for a transport service with less environmental impact. Nevertheless, they want to be seen as being concerned with these issues, the empirical results shows that at least one interviewed company finds it difficult to not work with CSR in any way today. All the same, the price is in the end the determinant that rules the transport decision. The results strongly indicate that even though shippers are rarely willing to pay more for less environmental impact, they have

realized the importance of being concerned with such issues. It may be argued that it is not accepted to *not* seem to care for the environment.

The participants in the case studies are all significant players in the transport market, which might explain why they experience a requirement to do what they can to be as environmentally friendly as possible, even though many of their customers/possible customers may not be prepared to pay for it. Never the less, as it is important to be politically correct, RoRo short-sea operators need to actively market the mode as being environmentally friendly, in addition to flexible, convenient and cheap.

6.2 Customer value

In Figure 6-1 emphasis is put on customer value, how it is influenced by the service proposition, and in turn the implications of customer value on the transport mode selection. Gourdin (2001) argues that the core of logistic is to satisfy the customers' needs and requirements, which is in line with the idea behind the conceptual model. Section 4.3 in the literature review focus partly on the importance of the service qualities/attributes in the modal choice as these are directly linked to customer value in the sense that certain valued service qualities must be provided to the shipper to create customer value. The notion of customer value is a central element to the modal choice and will greatly influence the success and growth of RoRo short-sea shipping.

Customer value is created through the service proposition and fulfillment of it, the proposition itself is dependent on the basic mode characteristics, in the case of RoRo short-sea shipping the basic conditions for a transport service thus naturally differ from e.g. road and rail. The service proposition also comprises, and is based on, certain service qualities that contribute to creating customer value. The key is to provide the customers with service qualities that create customer value for each particular customer. Hence, the discussion will be continued and deepened in the following sections in regard to service qualities and the buyer-supplier relationship. The relationship between the buyer and the supplier is a crucial part of the service proposition and especially of the execution and fulfillment of the same. Casaka & Marlow (2005) have argued that short-sea operators lack knowledge of their customers' needs which prevent the development of stable, long-term buyer-supplier relationships. This suggests that customer value and the buyer-supplier relationship are linked and influence each other.

6.2.1 Valued service qualities

Price was the service quality mentioned the most frequent during the interviews. The literature reviewed in chapter 4 implies that as awareness of logistics trade-offs increase transport costs are not perceived as equally important anymore (McGinnis, 1989), in a practical business situation however, price is still the dominating factor influencing transport mode selection. According to findings in this study the freight transport market is under immense price pressure, hence it is a highly competitive marketplace; new customers are not easily attracted, unless preferable prices can be offered. Some ship operators find it difficult to

compete price-wise in the intermodal freight market as margins in RoRo short-sea shipping is low and according to the empirical results the freight rates are already too low. In chapter 5.4 Company H claim that RoRo short-sea is too expensive while Company G claims that they save money by using the same. However, Company G also discards RoRo short-sea sometimes due to cost-reasons. In conclusion, sometimes RoRo short-sea is the most efficient as well as cheapest solution and sometimes it is not. All the same, it seems as though some shippers that lack knowledge about the actual costs and effects from using RoRo short-sea shipping. This imply that ship operators must make the market aware of the actual costs as well as benefits and possibilities related to the use RoRo short-sea shipping in a transport solution. The awareness among shippers can be increased by marketing efforts as discussed in 6.1. Further, in regard to price, it can be established that although environmental concern increases among customers, the findings from case studies indicate that this concern is limited since it implies a higher freight rate to comply with; which the shippers are in general not willing to pay. Hence, industrial shippers involved in joint ventures etc. with a RoRo operator are more willing to invest in solutions that contribute to less environmental impact since the cost of complying with high environmental standards is small compared to the overall investment.

The case studies indicate that some companies consider RoRo short-sea shipping as a viable transport mode whereas others do not. Company B, C, D and E were of the opinion that their customers choose RoRo short-sea shipping since they commonly need to transport large volumes of cargoes, such as paper and wood products as well as new or used vehicles. These goods, due to their characteristics, are better suited to be transported by sea. However, others who do not prefer short-sea shipping are cargo owners or logistics providers of “time sensitive” and “high value” goods. The empirical results reflects that in regard to transport modes selection, different transport modes are employed on the routes/goods type/value where they are perceived to be the most efficient, which transport mode is used can enhance shippers’ businesses competitive advantages in the market. Which is why it important to make shippers aware of the true advantages of RoRo short-sea shipping in an intermodal supply chain and enable optimal, and not suboptimal, transport mode selection. No matter if it RoRo short-sea shipping is included in the optimal solution or not.

The empirical results prove that for some companies fast transport is more important however, others perceive safe transport to avoid damages as most important. Further the results as well as the literature review reveal that RoRo short-sea shipping is experienced as a slow mode, of which usage will have negative impact on the overall supply chain performance. The speed of a RoRo or RoPax vessel is not comparable with that of a truck, however Company G suggests that when proactive logistical planning is implemented by more shippers, the usage of RoRo short-sea shipping is likely to benefit in terms of increased freight volumes. RoRo short-sea shipping could be an economic transport mode if goods are not of high value and transport time does not fall into customers’ major concerns. Besides price and lead-time, other service qualities are considered in the transport mode selection such as; flexibility, capacity, efficient hinterland connections, and supply chain management to name a few. In order to increase the usage of RoRo short-sea shipping ship operators must be

able to better appreciate customers' requirements and create an efficient, integrated transport mode as to create and maintain competitive advantages that can be exploited in the freight transport market. RoRo short-sea operators must be able to offer frequent departures from and to strategic locations in order to increase the modes attractiveness. Hence, market adaptation is vital to the future growth of the RoRo short-sea business.

The empirical study has, consequently, identified a gap between required service qualities and actual provided services as the requirements in regard to lead-time and frequency is not fulfilled by RoRo short-sea operators. This result implies that shippers are not satisfied with the service qualities that are valued the most, besides price, which in turn has implications on the perceived customer value which in turn have impact on the mode selection and RoRo short-sea shipping's competitiveness in the mode selection process. This fact is a back for RoRo short-sea shipping however, as these drawbacks are identified it also provides ship operators with an opportunity to take action to eliminate, or at least limit, those drawbacks. It further provides an opportunity for ship operators to identify their main competitive advantages and to market those advantages in a competitive manner towards shippers as to convince them that using RoRo short-sea shipping has more positive than negative aspects. Customer value must be created with the means available, the service proposition needs to be adapted to the target populations and of course this has to be marketed in an appropriate way, as discussed in 6.1.

Both the theoretical and empirical findings prove that, short-sea operators need to focus on offering more dedicated high-quality services in order to keep long, stable relationship customers. Large investments in supporting transport system could be a risk but, on the other hand, by having sophisticated system and value-adding services, it could help to secure long-term contract customers and correspondingly increase the possibilities to attract more cargos and new customers in the future.

6.2.2 Buyer – supplier relationship

Long-term relationships with industrial customers require extensive investments from both parties and what can be noted is that such transport and logistics solutions seem to be much more focused on sustainability issues than others in connection to short-term or temporary buyer/supplier relationships. This becomes evident through case studies 1 and 2 and one explanation as to why sustainability issues are addressed more in such buyer-supplier relationships could be that once such extensive investments are being done, the cost for implementing sustainable and environmentally friendly solutions are small in the overall perspective. In order to support a long-term contract, substantial efforts are needed to meet customers' strategic requirements as such as special designed vessels and equipment, dedicated routes, port facilities, warehousing, trace and tracking systems and so forth. Even though, large investments are done, according to Company B and C, they provide good returns and provide for a win-win situation for buyer and supplier. Meanwhile, for a shipper who only sporadically buys a transport service from the same RoRo short-sea operator, and has many different transport suppliers to choose among, price becomes more important. Hence they are more reluctant to "invest" more money than necessary in the transport service

as this service is considered not as a value-adding activity but merely as a necessary transport from A to B.

According to the empirical findings short-term contracts, or so-called “Arm’s length” (see Figure 4-7) relationship type contracts are in general preferred since it allow more flexibility for both parties. The ship operators often have such short-term rate agreement with e.g. logistics service providers. On the other hand, such relationships may also pose as a problem since customers are not tied by a long term commitment, hence long-term revenues cannot be secured. It may be argued that RoRo ship operators could benefit from establishing deeper customer relationships. The buyer-supplier relationship influence how the shipper perceives the quality of the service, hence the quality may be experienced as better if the relationship to the supplier is good. Of course a shallow relationship can be good, but a deeper relationship where both parties can benefit in the long-term perspective must in most cases be seen as the most desirable.

The buyer-supplier relationship is identified in the conceptual model to be an aspect which influence perceived customer value, and thus also company image. The buyer-supplier relationship is important both in terms of the service proposition and marketing. As the growth of RoRo short-sea shipping is dependent on creation of customer value and customer image, the buyer-supplier relationship is a crucial component in RoRo short-sea shipping’s further development, a fact which must be recognized by ship operators. A buyer-supplier relationship could add value to the purchased transport service, and as both the theoretical and empirical findings indicate a growing demand for value-adding services, the importance of the buyer-supplier relationship cannot be enough emphasized.

6.3 Integrated supply chain management

Holweg & Miemczyk (2003) claim that short-sea shipping can become more efficient by integrating itself into the supply chain to a greater extent, the EU has evidently also realized this and work with e.g. Motorways of the sea to integrate especially RoRo short-sea shipping into TEN-T. Casaka and Marlow (2007) also highlighted the importance of integrating short-sea shipping in European transport networks in regard to mode competitiveness. From the empirical results it can be concluded that there is a growing demand for services that go beyond the port-to-port transport, in addition the related industry actors as well as the logistics service providers is of the opinion that ship operators lack an overall supply chain management perspective, which is considered a drawback. Among the five RoRo operators, two focus only on port-to-port operations while the other three are to a greater or lesser extent involved in other parts of the supply chain. In the conceptual model integrated supply chain management is argued to have an influence on the competitiveness of RoRo short-sea shipping. The better integrated the mode is in supply chains, logistical- and transport networks and the European initiative TEN-T, the more likely will the mode be chosen by shippers, since integration mean that: sea-land interfaces are more efficient - no “broken” supply chain; it will likely not be experienced as complicated to use RoRo short-sea shipping; better/deeper

co-operation and integration with land-based transport modes enable quick hinterland distribution.

RoRo short-sea shipping and land-based transport modes are competitors, but more importantly they are complements to one another in an intermodal supply chain. Hence, integration is dependent on co-operation between land-based modes and RoRo short-sea shipping. Due to the nature of RoRo shipping and its cargo it should be evident to both parties (ship operators and e.g. truck operators) that co-operation have potential to create synergies that will provide the shippers with a better transport service, perhaps also at a better price. In addition both the ship- and truck operators can benefit from e.g. lower operational costs and/or higher revenues. The ship operators can benefit through increased capacity utilization as agreements with road operators secure cargo flows, and the truck operator through less wear and tear on the vehicles and lower fuel costs. The empirical results show that capacity utilization is a critical aspect in RoRo short-sea shipping. By establishing co-operation such as partnerships and joint ventures, or by acquiring e.g. a logistics/transport company involved in transportation on land, RoRo short-sea operators are likely to increase cargo volumes. Increased volumes might enable higher frequency of departures, as demanded by many shippers, since the need for e.g. weekly departures to consolidate the “few” cargo available to make the journey profitable, may not be necessary anymore. Hence, stable and rather large cargo flows can be realized through co-operation. The capacity utilization drawbacks of a RoRo vessel compared to e.g. a bulk carrier is off-set its nevertheless comparably large capacity compared to a truck and its ability to interact smoothly in intermodal transport networks.

The sea-land interface is a decisive component in the supply chain, and it has influence on the performance, or at least the by shippers experienced performance, of short-sea shipping. In the conceptual model, port ability and efficiency is assumed to have a strong influence on the competitiveness of the mode, the literature review also indicate the necessity of efficient sea-land interfaces in order for the mode to be able to take on and maintain a competitive position. The results from case study four, with the related industry actors, indicate that ports probably very well understand how meaningful they are in regard to maritime transport, its performance, image and competitiveness. According to Company I efficient cargo handling, short throughput times and good hinterland connections are a necessity and they see it as their responsibility to work closely with both customers and relevant authorities to enable this. To further enable favorable conditions in the market, such as in port operations, Company I believe that ship operators must become more politically active.

6.3.1 Competition

In the empirical study, ship operators emphasized that the RoRo short-sea market is extremely competitive and in addition to the competition within the short-sea segment, RoRo short-sea operators need to cope with the fierce competition with land-based transport modes. As have been mentioned throughout the analysis, RoRo short-sea shipping has problems competing with road as well as rail in regard to transport time, lead-time, accessibility and price. The EC's promotion of the mode seem to have affected the market to a subtle extent so far, and RoRo short-sea operators experience the competition with land-based modes to be on unequal

conditions and would appreciate market based measures from the EC that have potential to result in market conditions that promote fair competition.

To mitigate these experienced market based problems, RoRo short-sea operators need to work closely with the freight transport market and proactively investigate customers' needs to be able to adapt services thereafter to increase their opportunities in the market despite unfair conditions. The European continent has extensive road networks and is characterized by its dependency on road transports states to one logistics service provider. The geography cannot be changed and neither can the freight transport market, nor the can the competitors' performance. Hence RoRo short-sea shipping must make the most of the situation they are in and adapt to the competition in the market the best they can.

Short-sea shipping is according to Casaka and Marlow (2005; adapted from Porter, 1980) Figure 4-4 subjected to the five basic forces of competition, for example the bargaining power of suppliers. Due to the cost structure in RoRo short-sea shipping, freight rates are highly dependent on fuel price hence operators are influenced by fluctuations in fuel prices and the power of the suppliers of this commodity. Fuel surcharges on freight rates partly mitigate this issue and lessen the risk for RoRo short-sea operators. It is argued by Company A, B and D that maritime administration fees such as fairway dues and port fees exert an economic pressure on short-sea operators. The bargaining power of a port or a maritime authority is huge, and the many fees and the ship operators' inability to change those worsen their competitive position in the intermodal transport market. The bargaining power of short-sea buyers is vast according to the empirical results. As RoRo short-sea shipping struggle to compete price-wise with land based modes, the price pressure from shipper is experienced to be problematic as the freight rates have to be set lower than reasonable in a profitability perspective, to attract shippers. Important customers who ship large volumes have the greatest bargaining power. Road, rail and bridges are possible substitutes to RoRo short-sea shipping. Especially bridges can be considered a distinct substitute as it allows cargoes to be transported over water instead of on water. However, Company B and C emphasized the importance of having long-term, stable relationships with customers, as this may make them more reluctant to switch transport supplier as the switching cost incurred will be larger than if the buyer-supplier relationship was of the Arm's length type (Figure 4-7). Last but not least, it becomes evident through the case studies that the rivalry existing among short-sea companies is extremely high. The current market situation with excess capacity, resulting from the recession, increases the rivalry among RoRo short-sea operators. RoRo short-sea operators need to be able to adapt to the market and have a proactive business strategy in order to cope with this. Marketing and marketing strategies as discussed 6.1.1 and 6.1.2 is extremely important in positioning a company in the marketplace, and is an elementary must to manage intense rivalry. An important aspect of rivalry is that RoRo short-sea companies are forced to become both better and cheaper to survive, which the shippers benefit from in terms of better services and lower prices. It may be that the intense competition within the segment is a positive aspect in the development of RoRo short-sea shipping; companies are forced to become more competitive within their own segment which is likely to also increase their competitiveness in the intermodal market.

6.3.2 Competitiveness

A consistent view of RoRo short-sea's competitive advantages was gained throughout the case studies. The mode is considered to be one of low price, beneficial capacity, short turnaround time in port, low cargo handling costs, low damage rates, as well as low environmental impact. Hence, RoRo short-sea shipping has several competitive advantages that can be exploited. In regard to capacity, the mode has an evident superior position to road and rail, and in case study 2 it was mentioned by Company D that the damage rate is experienced to be lower in RoRo short-sea shipping than road transport in regard to vehicle transports. The empirical results indicate that even though the mode faces many threats and constraints it also has many advantages and hence also opportunities to become more competitive in the freight transport market. As discussed in 6.2.1, RoRo short-sea shipping presently face challenges in satisfying shippers' needs in regard to some aspects, however there are ways to mitigate the problems and RoRo short-sea operators should hence have no severe difficulty to in the future fulfill shippers' requirements to a greater extent.

The case studies evidence that lead time and frequency are the two major factors which stop shippers from choosing RoRo short-sea however, both Company A and C were of the opinion that the lead-time concern is becoming less important in the eyes of customers if lower freight rates can be offered which off-set the negative aspects of longer lead-time. Further, the results imply that more frequent departures would lead to higher acceptance among shippers in regard to transport time as the lead-times when using RoRo short-sea will seemingly be affected by more frequent departures since shippers in that case do not need to wait for e.g. the one weekly departure to ship their goods but instead may only wait one day.

The theoretical findings suggest that deploying HSVs in short-sea shipping poses a potential to overcome long lead-time problem (OECD, 2001), thus increase the competitiveness of the mode, only if the cost is not of importance to the customers if a minimum of lead time can be offered (Castells & Martinez de Oses, 2006). However, Becker (2004) says the need for high speed vessels in short-sea shipping is not necessary. Results from case studies show that ship operators consider HSVs as non feasible since it consumes substantially more fuel, requires more operation cost and also increases emission whereas interviewees from relate industry field claim that high-speed RoRo vessels is an option to overcome the increased lead-time problem. Introducing high-speed vessels may not be applicable in reality as "price-sensitive" shippers may abandon the mode as the freight rates go up due to increased fuel consumption related to higher speed. In addition, the increased emissions from increased fuel consumption have potential to corrupt the image of RoRo short-sea shipping as an environmentally friendly mode. The modes environmental benefits are explored in regard to marketing in 6.1.4 as being a possible selling point for the mode, having this in mind HSV's are perhaps not the way to go to lower transport time and perceived lead-time. Customers' satisfactions can instead be fulfilled by frequent departures, on-time deliveries and flexible services but not necessarily by having shorter transport time. Even though more frequent departures seem to be a key aspect in increasing the competitiveness of RoRo short-sea shipping in the freight market it must be recognized that economic constraints hinder ship operators from implementing such.

RoRo short-sea shipping's competitiveness could also be increased by trying to achieve better collaboration with other transport modes and hence through collaboration and synergies there from offer more integrated logistics and transport services to shippers. The ship operators' possibilities to offer dedicated services that add value to the basic transport service can be increased as collaborations with other modes and transport suppliers enable e.g. smooth door-to-door solutions. Short-sea shipping is rarely, next to never, chosen as unimodal transport, of course, due to the nature of RoRo, the vessels are designed to transport rolling cargoes such as trucks that drive to, onboard, of and from the vessel by themselves. Hence, RoRo short-sea shipping has to be combined with road to be able to deliver a door-to-door transport service. Achieving integration would increase the competitive edge for RoRo short-sea shipping as valued-adding services are demanded more and more. RoRo short-sea operators have been lacking cooperation with other transport modes, according to both ship operators themselves as well as the related industry actors. In a sense the lack of collaboration and integration has impeded the growth of the mode and has prevented it to develop into a highly competitive mode in European intermodal transport networks. The empirical results show that the ship operators in this study experience their relationships with other actors in the supply chain as good, which is also probably the case. What must be considered here is the ship operators interviewed for the purpose of this study, they are large actors in the market and in general offer their customers a wide range of services already and have since long had collaborations with logistics transport suppliers. Due to their size and market power it may be both easier and more natural for those RoRo operators to establish collaborations and integrate somewhat more in the supply chain than a small RoRo operator have the possibility to do. Nevertheless, the related industry actors believe that RoRo short-sea ship operators overall must focus considerably more on integration and collaboration and the empirical results indicate that that collaboration and integration may be two critical success factors in RoRo short-sea shipping.

6.3.3 Short-sea shipping in the intermodal freight market

The information gained from both theoretical and empirical findings consent that RoRo short-sea shipping is an important part of intermodal transport chain, and definitely has growth potential for being able to alleviate the current problem of congestion and for its energy efficiency as well as less environmental impact than road transport. However, the case studies as well as the reviewed literature indicate that short-sea shipping does not constitute a large share of the market. All interviewed companies provide the reasons for this as being longer lead-time and low departure frequency in addition to large operating costs and inefficient port operations. Moreover, being somewhat isolated from land-based transport networks and not collaborating with other modes are additional factors which impede the development of RoRo short-sea shipping.

The position of RoRo short-sea shipping in the intermodal freight market is a little weak, however as have been discussed so far in the analysis there is vast potential to develop the mode. In order to enable RoRo short-sea shipping's competitiveness in the intermodal perspective the weaknesses of short-sea shipping have to be reduced and advantages should be correspondingly strengthened.

6.3.4 Short-sea shipping economies

The empirical study and the literature review, section 4.6, portray short-sea shipping and its economies in similar ways. The overhead operational costs are large, the margins small and it is difficult to achieve economies of scale. It becomes evident that the interviewed ship operators agreed on the cost structure of RoRo short-sea as consists mainly of the investments in and maintenance of the vessels, which is followed by the fuel consumption. Port handling costs are in general a large expense in short-sea shipping however, these types of handling costs are less, bordering to nothing, in the case of RoRo short-sea-shipment. The truck and/or trailer is driven onto the vessel and the goods can be transported in an efficient and environmentally friendly way in an integrated supply chain with door-to-door service without breakage or reloading. It may be claimed by that there is no meaning to use RoRo short-sea shipping since “truck has to be used on some parts of the journey anyway”, but it is this fact that is the key point in such a discussion: in an integrated European supply chain RoRo short-sea shipping is the perfect complement to road transport as the truck itself can “drive” all the way from origin to destination, through the cargo hold of a RoRo vessel - while incurring a minimum of cargo handling costs. Besides costs related to activities in port, overhead costs also include port fees, fairway dues, etc. This poses as a serious problem in RoRo short-sea shipping as it on the one side contribute to small revenues and on the other side makes it difficult for the ship operators to offer e.g. frequent departures as a certain amount of cargo must be consolidated in order to cover the expenses for operating the vessel.

The difficulty to achieve economies of scale is inherent in the nature of RoRo short-sea liner shipping however, this problem may be possible to mitigate by implementing measures related to marketing as well as deep co-operation with other modes, as well as logistics service providers, and a higher extent of integration into intermodal transport networks. The rationale for this is first of all that marketing activities, as discussed in 6.1.1, have potential to change the image of the mode and make it a more attractive modal choice for shipper. Secondly co-operation with other modes, mainly truck, will integrate RoRo short-sea shipping to a larger extent than today into transport- and logistical networks thus enabling seamless door-to-door transport solutions, which may also influence shippers’ perceptions of the mode in a positive direction, making them more inclined than before to select RoRo short-sea shipping. Thirdly, co-operation with other modes and logistics service providers can involve agreements that provide the ship operator with a certain guaranteed amount of cargo volumes per week or so. The truck operators or logistics service provider hence agree to transport some of its trucks by RoRo short-sea, at a favorable freight rate. This could enable a constant, rather large cargo flow, which in turn will help mitigate the profitability problem that RoRo short-sea liner shipping experience. In the above discussion co-operation is meant as follows: a long-term relationship where both parties benefit through synergies, as describe in 6.3.1. This type of co-operation thus goes much further than a regular freight rate agreement that is currently used by several of the ship operators in the case studies.

6.4 Surrounding environment

The environment that RoRo short-sea shipping operates in consists of political aspects as well as basic market conditions. The surroundings influence how short-sea operator can and will operate their business and provide both constraints and possibilities in terms of business opportunities. The conceptual model in Figure 6-1 does not focus on the surrounding environment but on the other hand it is given the role as the overall influence that in some sense govern all else.

6.4.1 Political

The case studies show that most of the interviewed companies think EU policies and initiatives on supporting short-sea shipping development are positive. Two ship operators in the case studies have participated in EU projects related to modal shift actions and promotion of short-sea shipping, which indicate that some of the ship operators work actively in taking part in the measures to try to increase their competitiveness in the intermodal freight market. However, most interviewees were of the opinion that even though short-sea shipping and RoRo short-sea shipping is promoted, not many measures have been taken that actually change market conditions and enable the modal shift. The empirical results indicate that RoRo operators in general are not much affected by EU policies in favor of short-sea shipping. The EU is criticized for the poor follow-up of funded projects within the scope of Marco Polo or Motorways of sea. In the empirical study it becomes evident that RoRo short-sea operators in general, even though aware of the funding projects, carry on with their business and do not experience much effect from current short-sea shipping projects. These findings in turn reflect that under the current market situation, the goal of achieving a modal shift from road to rail has not been achieved. However, it may be argued that RoRo short-sea operators must engage in the political sphere and begin to use policies and such in their favor. Policies may provide many opportunities if explored and exploited.

RoRo short-sea companies, have to proactively engage in political discussions regarding policy making. The EU initiatives govern the freight transport market in a holistic way, shipping companies' input in policy making may create policies better adapted to current market conditions which make them more likely to be successful. RoRo short sea shipping's future lies in the efforts from both EU and the ship operators. Moreover, ship operators also need to focus on lobbyism activities on both a national and international level to ensure as favorable market condition as possible for RoRo short-sea shipping. It seems that under current market situation, even though ship operators are aware of EU initiatives, they seem to separate these initiatives from real business. However, perhaps further conduct and implementation of new EU initiatives will be impeded if there is insufficient response from short-sea shipping companies.

One ship operator during the interview claimed that they experienced an increase in fairway dues as well as port fees in Europe, which is rather inconsistent with the aim of the EU to promote RoRo short-sea shipping as what has been described in Maritime Transport Policy until 2008. Besides this, the forthcoming IMO agreement as of the requirement for fuels being

used in vessels with a sulphur content of no more than 1% in European's emission control areas (ECAs), will pose as a threat for RoRo short-sea shipping operators to a large extent since they mainly operate business in these areas. The new regulation's implementation will create a counterproductive effect. Shifting cargo from road to sea might not be realizable because the new regulation increases the fuel costs thus make short-sea shipping less competitive in compare with road transport, as a result cargos will be carried back to road for lower price offered.

6.4.2 Market

Current market conditions are characterized by extremely high competition and excess capacity in the light of the worldwide financial recession. RoRo short-sea operators experience immense price pressure, and land-based transport poses as a threat in regard to lead-times, frequency, flexibility, accessibility and price. The market conditions may not be favorable however the ship operators that took part in this study experience an increase in freight volumes and have positive expectations on the future. In regard to the market, the value of a proactive mindset is important to emphasize once again. The ship operator may not be able to change the relationship between supply and demand however they can try to be adaptable as the market is and will remain to be dynamic.

6.5 Transport mode selection

The transport mode selection is an essential aspect in the conceptual model since whether or not RoRo short-sea shipping is selected by shippers will determine if the mode will grow in the freight transport market or not. Up to this point in the analysis several aspects have been discussed and all these aspects are crucial in relation to transport mode choice and what mode will in fact be chosen and why.

Transport mode choice is important since it affects the performance of the supply chain and hence the company's performance on cost, lead-time, marketing and company image. The case studies indicate that the modal choice is made by the logistics service providers when one is contracted to represent the cargo owner, since the cargo owner/shipper wants to focus on their core business to maintain competitive advantages. However some industrial companies are of exception since they need to move large volume of goods, hence transport and logistics are crucial business activities to them, and thus they have direct contacts with transport operators such as the RoRo short-sea operators in this study. This in turn indicate that in order to be able to become more attractive to shippers and attract larger cargo flows, RoRo short sea operators, not only need to focus on becoming more attractive to cargo owners, but they also need to try to become a preferred mode to logistics service providers as they have great influence over the development and design of distribution channels. In representing cargo owners logistics service providers have power over which mode is used in both the unimodal and intermodal supply chain.

Transport mode and carrier selection can be considered as "purchasing input" into the company's value chain, Figure 4-5, according to Van Weele (2005). It becomes evident in

Chapter 6 – Analysis

case studies that logistics service providers purchase transport services from transport operators with the requirements that transport service suppliers have to deliver the goods at the right place, right time and also in an acceptable status. This in turn proves that transport operators in order to satisfy customers have to be able to offer dedicated services to match customers' strategic needs as well as further maintain stable business relationships. During the process of purchasing transport modes, either the actual cargo owner or the logistics service provider will weigh and evaluate various valued service qualities, as discussed in 6.2.1, which will guide them throughout every step of selecting transport mode and carriers.

Chapter 6 – Analysis

Chapter 7 - Conclusions

The conclusions drawn from the theoretical as well as empirical study are presented in this chapter. Chapter 6 – Analysis provides the base for the drawn conclusions and these conclusions will be presented by discussing the validity of assumptions given in section 2.5 and by answering the research questions that have guided the research. Finally recommendations to RoRo short-sea operators and suggestions for future research will be given.

7.1 Assumptions

The assumptions presented in section 2.5 are *first of all*, that it is assumed that one of the reasons that the potential of short-sea shipping is not realized is that ship operators lack information and knowledge about the decision makers for cargo transportation and the relevant qualities to focus on in order to attract cargo. *Secondly*, it is assumed that short-sea shipping services are not marketed in an appropriate way, or, to the extent needed, in order to attract potential customers. *Finally*, the political support and market conditions have implications for the development of RoRo short-sea shipping. The assumption is that political changes that influence the market conditions can favor a positive development within RoRo short-sea shipping. Thus ship operators should be more active politically.

With consideration given to assumption one, it is shown through the case studies that ship operators may lack knowledge in regard to some of the service qualities valued by shipper however, ship operators nevertheless seem to be aware of what shippers want and need to a large extent but are hindered to provide such services due to operational constraints. In section 6.2.1 it is identified that ship operators have difficulties providing services with short enough lead-time and high enough frequency in the eyes of the shippers. Nonetheless, ship operators are aware of this weakness but are constraint by operational/economical inflexibility. The second assumption seem to be valid, both the empirical and theoretical findings support the assumption that RoRo short-sea operators do not market enough, or in the optimal way. In regard to the third assumption it is evident that transport policy and other political incentives have the possibility to influence the growth in RoRo short-sea shipping however to achieve this modal shift more needs to be done by both national and international authorities as well as ship operators.

7.2 Research questions

One initial conclusion in relation to the potential of RoRo short-sea shipping is that the mode is a viable transport alternative and increased usage over longer distances will contribute to more sustainable freight transport in Europe. The mode has a bright future partly due to its ability to alleviate road congestion and environmental impacts of economic growth as is in line with political goal within Europe. The potential for RoRo short-sea shipping in European

freight transport can be deemed to be vast, nevertheless, as the analysis highlights there are several weaknesses that the mode needs to overcome in order to reach its full potential. In the analysis several areas that ship operators need to focus on in their business was pointed out. The importance of marketing and marketing strategies in a highly competitive intermodal transport market was strongly emphasized, as was customer value and perceived customer value and the buyer-supplier relationships influence on the same. Mitigation of mode weaknesses was also discussed, as well as political engagement/lobbyism in order for ship operators to be able to affect their situation and current market conditions more.

The over-gripping research question, below, will now be answered by answering each sub question previously stated in chapter 2.4.

What can ship operators do to become more attractive to cargo owners and logistics service providers and realize the unreached potential of RoRo short-sea shipping to create more business opportunities?

What qualities are considered by shippers? Who makes the transport decision (3/4pl, cargo owner)?

The transport mode selection is commonly taken by logistics service providers, who are contracted with the actual cargo owners. However, cargo owners with large volume cargo are experienced to have direct contact with shippers and make transport decision themselves. The transport mode selection is based on a set of valued service qualities, derived from the requirements of customers. Ship operators, logistics service providers and the related industry actors in general have somewhat coherent opinion that price stands out as being the most important determinant. Other experienced key determinants are reliability, frequency, lead-time, flexibility, sufficient information, just-in-time services and fleet capacity as well as environmental concerns, not necessarily in that order.

Are ship operators visible enough for potential customers? Do ship operators need to focus more on marketing activities?

The ship operators are visible, but perhaps not enough, for potential customers. RoRo short-sea operators need to focus more on marketing activities to promote their service and strengthen their competitiveness. Strategic marketing of transport services will become increasingly important as the intermodal market, where RoRo short-sea shipping integrate more and more, is highly competitive. It should also be emphasized that the mode need to integrate more into European logistics and transport networks and need to collaborate closer with land-based transport. Short-sea operators are in many senses aware of what their customers want and how freight forwarders etc work, however, RoRo short-sea operators need to develop suitable marketing strategies to make their services more visible to

customers. Market segmentation and service differentiation are important aspect to adapt the marketing efforts to the customers.

What are the main advantages and disadvantages of RoRo short-sea shipping and how can advantages be enhanced while disadvantages eliminated?

A consistent view of RoRo short-sea's competitive advantages was given throughout the case studies; low price, less congestion, large capacity, short turnaround time in port, and low environmental impact. However, the empirical findings also show that longer lead-time, lower frequent departures as well as difficulties in achieving economies of scale are the main factors disadvantaging short-sea shipping. Ship operators in order to maintain competitive could try to mitigate short-sea shipping's weaknesses by offer services more adapted to customers' needs and integrate with other transport modes to provide efficient and just-in-time services. As weaknesses are mitigated, advantages should be correspondingly strengthened and promoted to shippers. It must be considered that as illustrated in Figure 2-2 there are certain weaknesses that are inherent and not possible for ship operators themselves to change however, it is equally important to remember that several weaknesses can be overcome by organizational changes, technological improvements and changes in management style and strategies.

How can ship operators use the existing transport policy and political initiatives to develop their RoRo short-sea shipping services?

RoRo short-sea operators should work proactively with the EU initiatives, which include participating in EU projects, and increase organizational awareness of EU policy and so forth. It is necessary for RoRo short-sea operators to be involved in the EU projects and try to apply the initiatives in their business. By doing so, short-sea operators can be able to better market their services and at the same time strengthen the competitive advantages. Political lobbyism is a venue worth exploring by RoRo short-sea operators, as to ensure more favorable market conditions for the mode in the future.

Does the increasing environmental awareness have positive implications for the development of RoRo short-sea shipping?

The RoRo short-sea operators in this study pay effort to improve their environmental performance by deploying environmentally friendly vessels, utilizing low sulphur content (1%) fuel, lowering emissions as well as conducting various projects to improve environment images and so forth. A credible environmental image will be a selling point for RoRo short-sea shipping in the future as ship operators market their services. Shippers are well aware of the environmental issues in freight transport and indeed want to minimize their negative environmental impacts in regard to transport, but they are reluctant to pay for the increased price incurred by introducing environmental friendly transport solutions. Hence, even though shippers are very price sensitive the increasing environmental awareness will likely have positive implications for the growth in RoRo short-sea shipping further on.

In conclusion, in order to remain competitive and attract more business to RoRo short-sea shipping, ship operators need to first of all become more aware of customers' requirements and adapt their shipping services to customers' needs. In addition ship operators need to increase their visibility to potential customers. Second to that, short-sea shipping needs to be integrated with other transport modes rather than being a somewhat isolated outsider in the intermodal chain. Further, ship operators need to work to mitigate short-sea shipping's disadvantages while strengthening the advantages. Moreover, ship operators also need to work closely with the EU as well as national authorities to create favorable market conditions that increase the modes competitiveness and thus generate more business opportunities. Last but not least, continual efforts should be paid in improving short-sea shipping's good environmental image so that the selling point is secured in comparison to road transport in the future.

However, short-sea shipping's future potential does not only lie in the above mentioned improvements. Changes in other aspects are also needed: first of all, road taxes in European countries are needed to achieve a modal shift from road to sea. And, the tougher the policies the more successful will the modal shift from road to sea be. Second to that, complex administration fee schemes of short sea shipping should be considered being changed. There are many fees, include fairway dues, port fees etc which make the price of RoRo short-sea less competitive, authorities could introduce more favorable pricing systems and thus eliminate some barriers in relation to cost structure to support the development of RoRo short-sea shipping. Finally, better logistically designed ports that are able to ensure smooth and quick throughput is a condition to unleash the potential of RoRo short-sea shipping. Port performance can leave a direct effect on a ship operator's competitiveness compared to land-based competitors, if it is able to provide efficient cargo handling, adequate around-the-clock services, good hinterland connections and sufficient logistics services. In a word, in order to support short-sea shipping development in the future, ports also need to be developed into more efficient and customer oriented advanced intermodal logistical centers.

7.3 Recommendations

The authors have after both theoretical and practical studies in the research topic been able to analyze these two sets of information and have also answered the research questions. The following recommendations are based on the research presented throughout the thesis and will hopefully be helpful in some way to RoRo short-sea operators operating in the European region.

RoRo short-sea operators should consider adopting a new organizational mindset as the business is viewed as very traditional and conventional. The contemporary conditions in the marketplace should be evaluated and thereafter organizational strategies may be developed and implemented. RoRo short-sea shipping must adapt to the modern freight transport market and the needs of shippers in an agile, international supply chain. Consequently, new and wider ways of thinking in the shipping business could help RoRo short-sea operators reach the future potential of growth in the business. Moreover, RoRo short-sea operators should focus

more on marketing their transport services towards potential customers. A framework such as the *strategic market management* one presented in chapter 4 may be helpful in indentifying market segments and their different needs and hence also appropriate marketing strategies. Integration with other transport modes in the intermodal supply chain, better communication and collaboration with different transport service operators, as well as offering more value-adding services are all important aspects for ship operators to work on to increase their competitiveness. Besides this, RoRo short-sea operators need to proactively work with the national as well as international political initiatives in order to ensure favorable future market conditions and to make society aware of RoRo short-sea shipping's strengths in intermodal transports and hence its viability as a transport alternative. Short-sea shipping operators may actively work with political lobbyism and participate in initiatives such as the Motorways of the sea to further improve their competitiveness compared to other transport modes. Marketing, collaboration and integration throughout the supply chain are identified as key success factors in RoRo short-sea shipping.

7.4 Further research

This study has applied a holistic approach, thus the suggestions for further research are to conduct more narrow research on only one or a few aspects to gain a deeper understanding of short-sea shipping industry in specific areas. These aspects could include research in regard to short-sea shipping's economic feasibility, vessel development, and marketing strategies, etc. Both qualitative and quantitative studies could be suitable for the following suggested further research. The suggestions for further research are presented in a numerical list to distinguish the different suggestions from one another.

1. Identify routes where RoRo short-sea shipping has potential to compete with land-based transport and significantly alleviate transport networks ashore.
2. How can short-sea shipping be better promoted in the European freight transport market?
3. How can integration in the supply chain, by taking on ownership in various parts thereof, strengthen the competitiveness of RoRo short-sea shipping?
4. How can ship operators achieve better frequency and higher capacity utilization while satisfying customers and be profitable at the same time? Is it economically feasible for RoRo short sea shipping operators to operate small vessels to achieve better frequency?
5. The impact of the "Fehmarn Belt bridge" on the North European RoRo short-sea shipping market.
6. The effectiveness of e.g. Motorways of the sea in enabling increased usage of RoRo short-sea shipping.

Chapter 7 – Conclusions

List of abbreviations

B2B	Business to Business
CC	Car Carrier
CO ₂	Carbon dioxide
CSR	Corporate Social Responsibility
CRM	Customer Relationship Management
CTP	Common Transport Policy
DG-Tren	Directorate General for Transport and Energy
DNV	Det Norske Veritas
EC	European Commission
ECAs	Emission Control Areas
EEA	European Environment Agency
EFS	Environmentally Friendly products and Services
ESN	European Short-sea Network
EU	European Union
GAO	United States Government Accountability Office
GHG	Greenhouse gases
HSV	High Speed Vessel
IMO	International Maritime Organization
JIT	Just-in-time
LoLo	Lift-on/Lift-off
MARPOL	International Convention for the Prevention of Pollution from Ships
NO _x	Nitrogen Oxides
NSAB	Nordiskt Speditörförbunds Allmänna Bestämmelser
NTP	National Transport Plan
OCD	Organization for Economic Co-operation and Development
PCTC	Pure Car and Truck Carrier

PM	Particle Matter
RoPax	Roll-on/Roll-off passenger ferry
RoRo	Roll-on/Roll-off
SCM	Supply Chain Management
SIKA	Swedish Institute for Transport and Communications Analysis
SOx	Sulphur Oxides
TEN-T	Trans-European Transport Network
3/4pl	Third/fourth party logistics provider

References

All references used in the work with this thesis are presented below. Primary sources are concerned with the interviews and the information is gathered through case studies.

Books, articles, scientific articles, and other publications

Aaker, David A (2001), *Strategic market management*, 6th edition, John Wiley & Sons, New York

Amerini, G (2008), *Statistics in focus: Short-sea Shipping of Goods 2000 – 2006*, Prepared for Eurostat and the European Communities, Available at:

http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-08-002/EN/KS-SF-08-002-EN.PDF

Becker, J., Burgess, A. & Henstra, D.A. (2004), “*No need for speed in short-sea shipping*”, Institute for Traffic and Transport, The Netherlands, published by Maritime Economics and Logistics, Vol. 6, pp. 236-251

Bergqvist, R & Esping, P (2002), “*The Potential of West European Sea-based Intermodal Systems*”, Master Thesis No 2002:34, Graduate Business School, School of Business, Economics and Law at Gothenburg University, Printed by Elanders Novum, Gothenburg

Blonk W. (1994), “*Prospects and challenges of Short-sea shipping: Proceedings from the second European research roundtable conference on short-sea shipping*”, Athens

Blumberg et al. (2008), “*Business Research Methods, Second European Edition*”, McGraw-Hill Higher Education, UK

Branch A. E. (2007), “*Elements of shipping*”, 8th edition, Routledge, England

Brooks, M.R. & Frost, J.D. (2004), “*Short-sea shipping: A Canadian perspective*”, Maritime Policy and Management, Vol. 31, no. 4, pp. 393-407

Bowersox & Closs (1996), “*Logistical management: the integrated supply chain process*”, McGraw-Hill Higher Education, UK

Brusset, X. (2005), “*The Impact of Information and Coordination on Transport Procurement*”, Universite Catholique de Louvain, Paper provided by EconWPA, Nr: 0504007, Available at: <http://129.3.20.41/eps/mic/papers/0504/0504007.pdf>

Caputo, A.C., Fratocchi, L. & Pelagagge, P.M. (2005), “*A framework for analysing long-range direct shipping logistics*”, Industrial Management & Data Systems, Vol. 105, No. 7, pp. 876-99

Casaka, A.P. & Marlow, P. (2007), “*The Impact of the Trans-European Transport Networks on the Development of Short sea shipping*”, Transport and Shipping Research Group, Cardiff

Business School, Cardiff, UK, Published by Maritime Economics & Logistics, Vol. 9, pp. 302-323

Casaka, A.P. & Marlow, P. (2005), "*The competitiveness of short-sea shipping in multimodal logistics supply chains: service attributes*", Transport and Shipping Research Group, Cardiff Business School, Cardiff, UK, published by Maritime Policy Management, Vol. 32, no.4, pp. 363-382

Castells M. & Martinez de Oses F.X (2006), "*Studies of suitability on short-sea shipping routes in SW Europe*", Journal of Maritime Research Vol. 3, No.2, pp. 43-52

Coyle, I.I., Bardi, E.J., & Novack, R.A. (2006), "*Management of Transportation*", Cincinnati: South-western College Publishing

Day, K.A. Ed. (2005), "*Chinas development and the challenge of sustainable development*", Columbia University, M.E. Sharpe Inc., New York

EC (2009), "*Strategic goals and recommendations for the EU's maritime transport policy until 2018*", Commission of the European Communities, Brussels, Available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0008:FIN:EN:PDF>

EC (1) (2007), "*Freight transport in Europe: new Commission initiatives aimed at achieving greater efficiency and sustainability*", Press release, Available at: <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1550&format=HTML&aged=1&language=en&guiLanguage=en>

EC (2) (2007), "*The Blue Book – An integrated maritime policy for the European Union*", Commission of the European Communities, Brussels

EC (1) (2006), "*Modernizing European Short-sea Shipping Links*", Motorways of The Sea, Commission of European Communities, Belgium

EC (2) (2006), "*The Green Paper – Towards a future maritime policy for the union: A European vision for the oceans and seas. COM (2006) 275 Final*", Office for Official Publications of the European Communities: Luxemburg

EC (2001), "*The White Paper – European transport policy for 2010: time to decide*", Commission of the European Communities, Brussels

EC & DG-Tren (2009), "*Road Freight Transport Vademecum*", Available at: http://ec.europa.eu/transport/road/haulage/doc/2009_road_freight_vademecum.pdf

EC & DG-Tren (1) (2006), "*Motorways of the sea: Modernizing European short-sea shipping links*", Belgium

EC & DG-Tren (2) (2006), "*Maritime transport policy*", Commission of European Communities, Belgium

EEA (2007), "*Air pollution in Europe 1990-2004*", EEA Report nr 2/2007, Copenhagen

ECORYS (2007), *Evaluation of the Marco Polo programme (2003-2006)*, Prepared for the EC – DG TREN, Brussels

Enarsson, L. (2006), "*Future logistics challenges*", 1st edition, Copenhagen Business School Press, Denmark

EUROSTAT (2009), "*In 2007, EU-27 Short-sea Shipping continued growing but at a slower rate*", EUROSTAT, Statistics in Focus, 58/2009, Available at: http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-09-058/EN/KS-SF-09-058-EN.PDF

EUROSTAT (2002), "*EU Intermodal Freight Transport - Key Statistical Data 1992-1999*" European Communities, Office for Official Publications of the European Communities, Luxembourg

Evangelista, P. & Morvillo, A. (1998), "*The role of training in developing entrepreneurship: The case of shipping in Italy*", Maritime Policy and Management 25, pp. 81-96

Evans, J. and Marlow P.B (1990), "*Quantitative Methods in Maritime Economies*", Fairplay, London

Evers, et.al (1996), "*The determinants of shipper perceptions of modes*", Transportation Journal, Vol. 36, No. 32, pp. 13-25

Fusillo, M. (2003), "*Excess capacity and entry deterrence: The case of ocean line shipping markets*", Maritime Economics and Logistics, Vol. 5, No.2, pp. 100-115

GAO (2005), "*FREIGHT TRANSPORTATION Short-sea Shipping Option Shows Importance of Systematic Approach to Public Investment Decisions*", Available at: <http://www.gao.gov/new.items/d05768.pdf>

Garberg, B (2001), "*Value adding services in Ro-Ro shipping*", Master Thesis, Graduate Business School at the School of Business and Commercial Law, Gothenburg University

Gilmour P. (2007), "*Marketing Transport Services: An Evaluation of the Marketing Strategy for Transportation Services*", Emerald Backfiles

Gourdin K. N. (2001), "*Global Logistics Management: a competitive advantage for the new millennium*", Blackwell Publishing, Ltd, pp. 2-3

Grosso M. et.al. (2009) "*Short Sea Shipping, intermodality and parameters influencing pricing policies: the Mediterranean case*" Netnomics, Springer Science + Business Media, Published online 04 June 2009

Handelns Utrednings Institut (HUI) (2008), "*Transporter och handel – viktigt för välståndet och miljön*", Stockholm

HELCOM (2006) “*Estimation of Atmospheric Nitrogen Deposition to the Baltic Sea in 2010 Based on Agreed Emission Ceilings under the EU NEC Directive and the Gothenburg Protocol*”, Norwegian Meteorological Institute, Oslo

Hirschey, M. (2009), “*Managerial Economics*” 12th edition, Cengage Learning Limited, USA

Holweg M. & Miemczyk J. (2003), “*Delivering the “3-day car” --- the strategic implications for automotive logistics operations*”, *Journal of Purchasing & Supply Management*, 2003, 9, 63-71

Horn Forlag AS (2009), “*Swedish Shipping*”, Available at <http://www.swedishshipping.com/images/div/editorial.pdf>

IMO (1998), “*Manual on Oil Pollution: Administrative Aspects of Oil Pollution Response, 1998 Edition*”, London, Chapter 2, Part 1, Available at <http://books.google.se/books?id=-YwaKXRwRIC&printsec=frontcover#v=onepage&q&f=false>

Jegou, I (2008), “*Hur påverkar internationell handel klimatet genom transporter?*”, Trade and Sustainable Development, National Board of Trade, Sweden, Available at: http://www.kommers.se/upload/Analysarkiv/Arbetsomr%C3%A5den/Handel%20och%20h%C3%A5llbar%20utveckling/Handel%20och%20milj%C3%B6%20och%20klimat/Hur_paverkar_internationell_handel_klimatet_genom_tranporter.pdf

Kotler P. et al. (2005), “*Principles of Marketing*”, 4th European edition, Prentice Hall Europe

Lammgård, C (2007) “*Environmental Perspectives on Marketing of Freight Transports – The intermodal Road-Rail case*”, Doctoral Thesis, School of Business, Economics and Law at Gothenburg University, Printed by BAS Publishing, Gothenburg

Liberatore, M.J. and Miller, T. (1995), “*A decision support approach for transport carrier and mode selection*”, *Journal of Business Logistics*, Vol.16, No.2, pp. 85-115

Lumsden, K & Sthyre, L (2003-2005), “*Utvärdering och analys av skandinaviska kontinentalförbindande godsfärjelinjer*”, Nordic Transportpolitical Network, Aalborg

Mangan, J., Lalwani, C. & Butcher, T. (2008), “*Global Logistics and Supply Chain Management*”, John Wiley & Sons, England

Mankiw, G.N. (2008), “*Principles of Economics*”, 5th edition, South-Western Cengage Learning, USA

Marintek (2009), “*LNG as fuel for ships in short-sea shipping: Review*”, Norwegian Marine Technology Research Institute, Norway, Available at: http://sintef.org/upload/MARINTEK/Review%202-2009/MR-2_2009.pdf

- Marlow P. & Mitroussi K. (2008), “*EU Shipping Taxation: The Comparative Position of Greek Shipping*”, *Maritime Economics & Logistics*, Vol. 10, pp. 185-207
- Martinez X.F. & Olivella J. (2005) “*Short-sea shipping opportunities for the Pyrenean cargo flows*”, *Journal of Maritime Research*, Vol. II, No 2, pp. 65-80
- Mulligan, R.F. & Lombardo, G. A. (2006), “*Short Sea Shipping: Alleviating the environmental impact of economic growth*”, *World Maritime University Journal of Maritime Affairs*, Vol. 5, No. 2, pp. 55-70
- Nash, A. & Weidmann, U. (2007), “*Applying niche marketing strategies to improve public transport service*”, *Vienna Transport Strategies and Institute of Transportation Planning and Systems*
- Nordic Freight Forwarders Association (1998), “*NSAB 2000*”, Available at: <http://www.bring.se/binary?id=9183>
- Norwegian Ministry of Transport and Communications (2009), “*National Transport Plan 2010– 2019*”, Publication number: N-0544 E, Print by: Impression 400, Oslo
- Norwegian Shipowners Association (2009), “*Statsbudsjettet for 2010 – Den maritime Politikken ligger fast*”, Communication to stakeholders 20091013, Oslo
- Norwegian Ministry of Trade and Industry (2009), “*Stø kurs – 2 år etter. Regjeringens maritime strategi - Rapport 2009*”, Available at: http://www.regjeringen.no/upload/NHD/Vedlegg/Rapporter%202009/Stoe_Kurs_2_aar_etter.pdf
- Notteboom, T.E. & Rodrigue, J.P. (2005), “*Port regionalization: towards a new phase in port development*”, *Maritime Policy & Management: The flagship journal of international shipping and port research*, Vol. 32, No. 3, pp. 297 – 313
- Notteboom, T.E. and Vernimmen, B. (2008), “*The effect of high fuel costs on liner service configuration in container shipping*”, *The Journal of Transport Geography* 17(5): 325-337
- OECD (2001), “*Short-sea shipping in Europe*”, European Conference of Ministers of Transport, OECD Publications Service, Paris
- OECD (2000), “*Short sea shipping: An alternative to European inland transport or a complementary mode*”, Adopted European Conference of Ministers of Transport at the Council of Ministers, Prague
- Papadimitriou S. (2001), “*Short Sea shipping in Europe: short sea shipping in Europe: Experience and prospects*”, European Conference of Ministers of Transport, OECD Publications Service, pp. 9-16
- Parantainen J. & Meriläinen A. (2007), “*The Baltic Sea motorway- recent development and outlook for the future*”, *Journal of Maritime Research*, Vol. 4, No. 2, pp. 21-30

- Peattie, K. (1992), "*Green marketing*", London, M & E
- Pedersen, E.L. & Gray, R (1998), "*The transport selection criteria of Norwegian exports*", International Journal of Physical Distribution and Logistics Management, Vol. 28, No. 2, pp. 108-120
- Petzoldta, T. & Uhlmann, D. (2006), "*Nitrogen emissions into freshwater ecosystems: is there a need for nitrate elimination in all wastewater treatment plants?*", Acta hydrochimica et hydrobiologica, Vol. 34. Issue 4, pp. 305-324
- Ramstedt, L. & Woxenius, J. (2006), "*Modelling approaches to operational decision making in freight transport chains*", Dep. of Systems and Software Engineering at Blekinge Institute of Technology and Div. of Logistics and Transportation at Chalmers University of Technology. Available at: http://www.hgu.gu.se/Files/foretagsekonomi/LoT/Johan/Publications/Reviewed_articles/2006_LR_JW_NOFOMA_Oslo.pdf
- Ravald, A. and Gronroos, C. (1996), "*The value concept and relationship marketing: Nordic perspective on relationship marketing*", European Journal of Marketing, 30 (2), pp. 19-30
- Rushton, Croucher & Baker (2006) "*The handbook of logistics and distribution management*" 3rd edition, Kogan Page Limited, Great Britain
- Sauri S. (2006), "*Cost Structure in a short-sea shipping line*", Journal of Maritime Research, 2006, Vol. 3, No.2, 53-66
- SIKA, the Swedish Institute for Transport and Communications Analysis (2001), "*Follow-up of the Swedish transport policy objectives*", Report 2001:4, Stockholm
- Silverman, D. (2010), "*Doing qualitative research*", 3rd edition, Sage Publications Ltd., London
- Steer Davies Gleave. (2009) "*Evaluation of the Common Transport Policy (CTP) of the EU from 2000 to 2008 and analysis of the evolution and structure of the European transport sector in the context of the long-term development of the CTP*", Prepared for the European Commission, Brussels
- Stena AB. (2008) "*Annual Review – Creating value by performance*", Stena AB Publications, Göteborg
- Stopford, M. (2009), "*Maritime Economics*", 3rd edition, Routledge, London
- Strauss J. et al. (2005), "*E-marketing*", 4th Edition, Prentice Hall, New Jersey
- Styhre L. (2009), "*Strategies for capacity utilization in short-sea shipping*", Maritime Economics & Logistics, 2009, Vol. 11, 4, 418-437

Swedish Ministry of Enterprise, Energy and Communications (2) (2010), “*Transport. Infrastruktur, IT-politik: Regeringens insatser 2006 -2010*”, No. N2010.01, Grafisk Service, Stockholm

Tenekecioglu, G. (2004), “*Increasing Intermodal Transportation in Europe through Realizing the Value of short sea Shipping*”, Master Thesis, Department of Ocean Engineering at Massachusetts Institute of Technology & Istanbul Technical University, Available at: <http://dspace.mit.edu/bitstream/handle/1721.1/33588/63761852.pdf?sequence=1>

Tongzon, JL and Heng, W. (2006) “*Port privatization, efficiency and competitiveness: Some empirical evidence from container ports (terminals)*” *Transportation Research, Part A* 39: 405–424.

Trujillo L. & Tovar B. (2007) “*The European Port Industry: An Analysis of its Economic Efficiency*” *Maritime Economics & Logistics*, Palgrave Macmillan Ltd, No. 9, pp. 148-171

Tsamboulas, D., Vrenken, H. & Lekka, A.M. (2006), “*Assessment of a transport policy potential for intermodal shift on a European scale*”, *Transportation Research Part A: Policy and Practice*, Vol. 41, Issue 8, pp. 715-733

UNCTAD (2009), “*Review of Maritime Transport 2009*”, Report by the UNCTAD secretariat, Geneva, Available at: http://www.unctad.org/en/docs/rmt2009_en.pdf

UNCTAD, (2004) *Assessment of a Seaport Land Interface: An Analytical Framework*. Reported by the UNCTAD secretariat

Weber, C.A., Current J. & Desai A. (2000), “*An optimization approach to determining the number of vendors to employ*”, *Supply Chain Management: An International Journal*, Vol.5, No.2, pp. 90-98

Xavier et.al (2009), “*Analysis of the external costs of selected short-sea shipping vessels against the road alternative*”, Secretary of academics, Nautical Science and Engineering department, Universitat Politècnica de Catalunya

Zachcial M. (2001), “*Short Sea shipping in Europe: Short sea shipping and intermodal transport*”, European Conference of Ministers of Transport, OECD Publications Service, pp. 23-33

Internet sources

Eagle Speak (2010) www.eaglespeak.us/2005_03_01_archive.html, Accessed: 20100513, Last modified: 20100513

EC, Mobility and Transport (2010), “*Short-sea Shipping*”, http://ec.europa.eu/transport/maritime/short_sea_shipping_en.htm Accessed 20100208, Last Modified: n d

Eurocean (2010), <http://www.eurocean.org/np4/125.html>, Accessed: 20100427, Last modified: 20100427

European Short-sea Network (2010), <http://www.shortsea.info/>, Accessed: 20100427, Last modified: 20100427

Lloyds List (2008), <http://www.lloydslist.com/ll/news/short-sea-shipping-at-risk-from-imo-sulphur-laws/20017521753.htm;jsessionid=6F7813E5CAA739395F7DC14529DBE235>, Accessed: 20100517, Last modified: 20100517

Logistics World, What is logistics? <http://www.logisticsworld.com/logistics.htm>, Accessed: 20100511, Last modified: n d

Logistikföreningen Plan (1), <http://de-0411.d.ipeer.se/content/tredjepartslogistik>, Accessed: 20100422, Last modified: n d

Logistikföreningen Plan (2), <http://www.plan.se/content/fjaerdepartsllogistik>, Accessed: 20100422, Last modified: n d

Nationalencyklopedin (2010), <http://www.ne.se/lang/forskning>, Accessed: 20100210, Last modified: n d

REALIZE (2010), <http://www.realise-sss.org/>, Accessed: 20100520, Last modified: n d

Short-sea Shipping Norway (2010), <http://www.shortseashipping.no/shortsea-network>, Accessed: 20100427, Last modified: 20100427

Short-sea Shipping Turkey, <http://www.shortsea.org.tr/eng/kmdtavantajlari.php>, Accessed: 20100211, Last modified: n d

Statistics Norway (1) (2010), <http://www.ssb.no/godsund/>, Accessed: 20100511, Last modified: 20100511

Statistics Norway (2) (2010), <http://www.ssb.no/muh/>, Accessed: 20100421, Last modified: 20100421

Swedish Maritime Administration (2010), <http://www.sjofartsverket.se/en/Maritime-Sector/Shipping-Policy/>, Accessed: 20100429, Last modified: 20100222

Swedish Ministry of Enterprise, Energy and Communications (1) (2010), <http://www.regeringen.se/sb/d/11181/a/142728>, Accessed: 20100429, Last modified: 20100429

Transportation – Logistics: Logistical way of life...(2010)
http://www.transportation-logistics.net/logistics/intermodal_and_multimodal_transport/,
Accessed: 20100510, Last modified: n a

Primary sources

Company A, Interview 20100415 in Gothenburg

Company B, Interview 20100326 & telephone interview 20100409 in Gothenburg

Company C, Interview 20100415 in Gothenburg

Company D, Interview 20100311 in Oslo

Company E, Interview 20100309 in Oslo and follow-up telephone inquiry 20100525
Gothenburg/Oslo

Company F, Telephone interview 20100414 in Gothenburg/Oslo

Company G, Interview 20100414 in Gothenburg

Company H, Interview 20100324 in Gothenburg

Company I, Interview 20100315 in Oslo

Company J, Telephone interview 20100415 in Gothenburg/Oslo

Appendices

A Interview guideline – Ship operators

B Interview guideline – Logistics service providers

C Interview guideline – Port

D Interview guideline – Branch organization

E Calculation of Norwegian imports and exports transported by sea

A Interview guideline – Ship operators

1. What different types of RoRo services does Company X offer its customers? Are you involved in other parts of the transport than the sea leg?
2. What qualities do your customers value the most in a transport service?
3. Who are your main customers and why do they choose your services?
4. Do you mainly have exclusive or non-exclusive transport contracts with your customers?
5. How does Company X market its freight transport services?
6. Is the competition within RoRo short-sea is low/medium/high? Has the economic crisis affected the competition in the market in any way?
7. How has Company X been effected by the financial crisis?
8. Are there market characteristics that either facilitate or hinder the development of RoRo short-sea shipping?
9. Describe Company Xs relationships with freight forwarders, 3/4PLs, and cargo owners?
10. What are the economical strengths and weaknesses in RoRo short-sea shipping? Compared to other transport modes?
11. What are the main costs in short-sea shipping? What are the profits margins?
12. What are the practical strengths and weaknesses in RoRo short-sea shipping? Compared to other transport modes?

The EU

13. The European Commission has in recent years launched various programs and policies (Marco Polo, Motorways of the sea, the White Paper) supporting short-sea shipping. How have these initiatives affected Company Xs business?
14. Do policies, such as Motorways of the Sea, support the development of short-sea shipping in reality in your opinion?

Environment

15. In what way does Company X work to improve the environmental performance of its transport service?
16. Are Company X's customers concerned with environmental impact? Do you believe it is one of the key factors influencing their transport decision?

To conclude

17. Why do you think RoRo short-sea does not constitute a larger part of European freight transports?
18. What do you think needs to be done to increase RoRo short-sea in freight transport? What can ship operators do?

B Interview guideline – Logistics service providers

1. Briefly describe how you see Company X's role as a service logistics provider and your range of services.
2. How is the transport decision taken? Who makes the transport mode decision, Company X or the customer, or both?
3. What factors/ qualities are valued the most in the choice of mode, by Company X as well as the customer? (E.g. price, flexibility, timeliness, geography, volumes, value adding services, environmental friendliness?)
4. Are environmental aspects acting as a determining factor when short-sea is chosen? Other important factors?
5. How would you rank environmental friendliness among other factors in the transport decision?
6. Why is RoRo short-sea shipping chosen/not chosen by Company X? Are your customers positive or reluctant towards short-sea?
7. Does Company X transport many goods by RoRo short-sea? Approximately how much of your freight volumes each year is transported on RoRo short-sea?
8. Are there any specific types of goods that are more commonly transported by RoRo short-sea?
9. When is RoRo short-sea considered as a viable alternative to road, rail, and air?
10. What would you say are the pros and cons with RoRo short-sea shipping? Practical as well as economical. Compared to other modes?
11. Would you say that RoRo short-sea shipping is disadvantaged by the complex contract structure inherent in shipping as well as multimodal transport?
12. In your opinion, are there any discrepancies between what services short-sea RoRo operators offer, and the services that the customers require?
13. Do you have any contracts/agreements with RoRo short-sea ship operators?
14. Why do you think it is that RoRo short-sea is not a more dominant mode in the European freight transport market today? What can RoRo operators do to attract more cargo?
15. Any concluding remarks?

C Interview guideline – Port

1. Describe Company X's position in the Scandinavian and European transport network?
2. What are the main competitive advantages of Company X?
3. Is short-sea maritime transport a common mode to call the port?
4. In what way does Company X work with short-sea shipping?
5. What are the most important features of a port in order to facilitate short-sea shipping?
6. What is Company X currently doing to improve its services in relation to short-sea shipping?
7. What would you say that Company X is good at already? What do you think needs to be improved?
8. Describe the ports importance, as you see in, to well functioning short-sea shipping? What is Company X's most important role in the development of Norwegian/Scandinavian short-sea shipping?
9. What do you think that ports in general, as well as Company X, can do in order to increase the usage of short-sea as a transport mode?
10. How does Company X market towards the short-sea segment?
11. What is the role of the port in organizing and/or facilitating the logistical handling of the cargo within the port as well as to/from the port?
12. Do short-sea shipping lines (your customers) differ in their service needs from deep sea shipping?
13. Hinterland connections are very important in short-sea in order to obtain fast and reliable transport services. How does Drammens Havn co-operate with e.g. road and rail to arrange favorable conditions for short-sea in this regard?
14. Have the EU policies, as well Norwegian initiatives, on short-sea shipping facilitated the development of short-sea?
15. In your opinion, what are the main difficulties that shipowners/operators need to overcome/mitigate in order to increase the usage of RoRo short-sea in freight transports?

D Interview guideline – Branch organization

1. Would you say there is an unreached potential in RoRo short-sea shipping?
2. What factors/ qualities are valued the most by the shipper in the choice of mode? (E.g. price, flexibility, timeliness, geography, volumes, value adding services, environmental friendliness?)
3. How do shippers rank environmental friendliness among other factors?
4. Who makes the transport mode decision; logistics service provider, the shipper, or both?
5. Are there any specific types of goods that are more commonly transported by RoRo short-sea?
6. When is RoRo short-sea considered as a viable alternative to road, rail, and air by the shipper?
7. What would you say are the pros and cons with RoRo short-sea shipping? Compared to other modes?
8. In your opinion, are there any discrepancies between what services short-sea RoRo operators offer, and the services that shippers want?
9. Why do you think it is that RoRo short-sea is not a more dominant mode in the freight transport market today?
10. What do you think needs to be done to increase RoRo short-sea in freight transport? What can ship operators do to make RoRo short-sea a more attractive mode?

The EU

11. The European Commission has in recent years launched various programs and policies (Marco Polo, Motorways of the sea, the White Paper) supporting short-sea shipping. How have these initiatives affected the RoRo short-sea business?
12. Do policies, such as Motorways of the sea, support the development of short-sea shipping in reality in your opinion?
16. Any concluding remarks?

E Calculation of imports and exports transported by sea to and from Norway

Sum of total – 2009	In tons		
	Imports	Exports	Totalt
Sea vessel, Norwegian	5 076 850	44 975 519	50 052 369
Sea vessel, foreign	15618 563	77 926 252	93 544 815
Truck on sea vessel	733 205	508 786	1 241 991
Trailer on sea vessel	353 937	256 189	610 126
Train on sea vessel	483	498	981
Road transport	6 277 312	4 153 124	10 430 436
Rail	913 835	365 706	1 279 541
Truck/trailer on rail	37 876	5 216	43 092
Electronic transaction	0	0	0
None-mobile installations	0	87 850 286	87 850 286
National waterways	0	0	0
Air	30 009	87 735	117 744
Mail	2 710	1 605	4 315
Other	20 529	7 728	28 257
Totalt	29065 309	216138 644	245203 953

Source: Statistics Norway, 2010. Available through: <http://www.ssb.no/muh/>

The calculation is based on the bold numbers in the above table.

$$((50\,052\,369 + 93\,544\,815) / 245\,203\,953) = 0,585623493 \longrightarrow 58.7 \%$$