



Analyzing reasons for shortage of export containers in Finland

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Masterarbete / Master's Thesis
International Business Management
2015

MASTER'S THESIS	
Arcada	
Degree Programme:	International Business Management
Identification number:	16141
Author:	Virve Hyytiäinen
Title:	Analyzing reasons for shortage of export containers in Finland
Supervisor (Arcada):	Sveinn Eldon
Commissioned by:	Maersk Finland Oy
<p>Abstract:</p> <p>There is an old saying that Finland is an island. This statement is still very true as about 80 percent of the Finnish foreign trade takes place by sea. In order to make a container shipment an empty container is required which – if not available – needs to be repositioned to the export location. The repositioning helps to absorb the transport imbalance by moving empty containers from surplus to deficit areas. The aim of this thesis is to find and analyze reasons to the shortage of export containers in Finland, propose a solution to the situation and to raise awareness of other emerging risks. The research is an action research where the primary sources of information were interviews, personal knowledge and observation. Secondary sources include online articles, database and books. The theoretical part discusses how the market influences the shipping industry and what risk mitigation actions the shipping industry has taken in order to run a successful business. The research shows that there was a huge dip in export container availability in the second quarter in 2015 but the situation is in the third quarter already improved to feeble but under control. The key reason to the absence of export containers is the decay of import volumes to Russia. Five future emerging risks for container shipments to and from Finland were identified.</p>	
Keywords:	Container, shipping line, empty positioning, Maersk Finland
Number of pages:	66+1
Language:	English
Date of acceptance:	

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FOREWORD

This thesis is written as completion to the Master's Degree Programme in International Business Management, at the Arcada University of Applied Sciences. The master program focuses on marketing, leadership and the Nordic market.

The subject of the thesis, analyzing reasons for shortage of export containers in Finland, was selected in co-operation with Maersk Finland. Maersk Line is the world's largest container shipping company with 374 offices in 116 countries, 7100 seafarers and 25500 land-based employees and it operates 619 container vessels.

I would like to thank my supervisor Senior Lecturer Mr. Sveinn Eldon and the Managing Director of Maersk Finland Mr. Michael Enberg for giving me valuable advice and support always when needed. Other important persons considering my thesis are Mr. Tapio Mattila, Mr. Tommi Sievers, Mr. Taneli Antikainen, Mrs. Outi Nietola, Mr. Janne Raappana, and Mrs. Reetta Tiittanen, whom I like to give my special thanks for giving me an opportunity to share their knowledge.

Finally I would like to thank my family for their constant support during the time I studied.

Helsinki, October 2015

Virve Hyytiäinen

1 INTRODUCTION

This chapter presents a general background of container shipping industry. It also introduces the research aims and objectives, the research method and outline of the thesis.

1.1 Background

Historically most of the globally transported goods have been shipped by sea. Today it is generally accepted that more than 90 percent of global trade is carried by sea. (Maritime Knowledge Center p. 7)

Maritime shipping represents the most ancient global transportation, holding a unique role in geographical discovery, communication of cultures and development of economy throughout history (Yang, X.J. et al 2011 p.3). After World War II, the trade liberalization led to increased participation from developed and developing countries in international trade and drove the growth of maritime shipping. Globalization in the 1990s then brought about a large expansion of world trade and shipping (Yang, X.J. et al 2011 p.7).

Notteboom writes how the container shipping has a rather short history as the first container ship Ideal X was launched in 1956. The development was fast because of the adoption of standard container sizes in the mid-1960s. Also the industry players were well aware of the advantages and cost savings coming from faster vessel turnaround times in ports, a reduction in the level of damages and associated insurance fees, and integration with inland transport modes such as trucks, barges and trains (Notteboom 2012 p. 230 f.). Yap describes in his doctoral thesis how later the growth of containerization kept its pace thanks to developments in container-handling technology and supply chain management which made consolidation and distribution of merchandise products regular, reliable, efficient and safe. The developments enabled the costs to be kept down, global sourcing and distribution patterns to be developed and sustained and led to the increasing penetration of containerization across different trade routes. There are some grounds e.g. port congestion, trade imbalances, environmental constraints, rising oil prices and complex security issues that could add risk to the supply chain and thereby diminish the rate of growth for containerized shipping (Yap, W 2009 p. 3&29).

According to Notteboom the container shipping industry consists of shipping companies whose core activity is transportation of containerized goods over sea via regular liner services. A liner service is “a fleet of ships, with a common ownership or management, which provide a fixed service, at regular intervals, between named ports, and offer transport to any goods in the catchment area served by those ports and ready for transit by their sailing dates” (Notteboom 2012 p. 230). Figure 1 shows the 2007 global shipping routes based on actual itineraries. It reveals that the largest trades are on the East -West routes: Transpacific, Transatlantic, Europe - Far East, Europe - Mid East, North America - Mid East, and Far East - Mid East. These routes provide employment for over half of the container ship capacity and uses the biggest container ships (Stopford M 2009 p. 524 ff.).

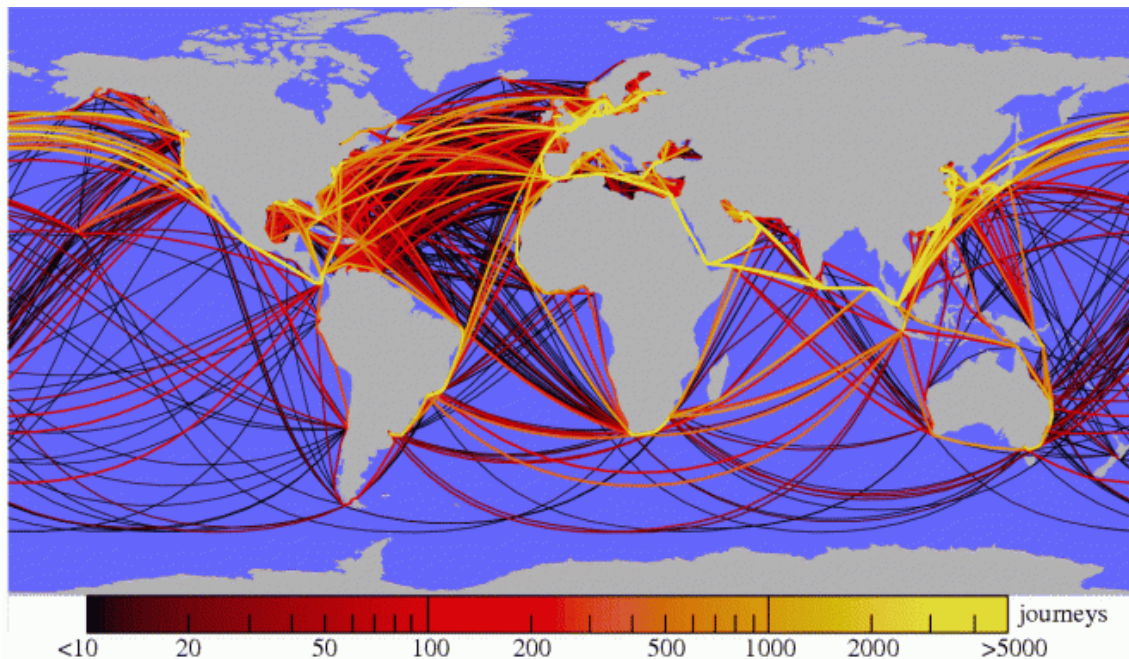


Figure 1. Map of global shipping routes based on actual itineraries (Kaluza et al. 2010)

Container liner services are specifically focused on the transport of a limited range of standardized unit loads: the twenty-foot dry-cargo container or TEU and the forty-foot dry-cargo container or FEU. Increasingly, slightly diverging container units are also loaded on container vessels, such as tank, open-top, flat rack containers and 45foot containers. Break Bulk is non-containerized cargo that needs to be shipped on multiple flat rack containers put together to accommodate the very large size or weight (Maersk Line). Container shipping can be characterized as a business with customers who have

generally different transport requirements and it involves carrying a wide variety of goods e.g. consumer items, industrial products, foodstuff, and even agricultural commodities and primary produce (Yap, W 2009 p. 25).

The growth of container shipping has been remarkable. The global container traffic, the absolute number of containers being carried by sea, increased from 28.7 million TEU in 1990 to 152 million TEU in 2008 or an average annual increase of 9.5 per cent (Ducruet & Notteboom p.2). Shipping is not immune to economic downturns. In 2009 when the world witnessed the worst global recession in over seven decades and the sharpest decline in the volume of global merchandise trade, international seaborne trade volumes contracted by 4,5 percent. However seaborne trade bounced back in 2010 and grew by an estimated 7 percent (Maritime knowledge center p. 7). Global container traffic grew by 4,6 percent in 2013 taking total volumes to 160 million TEUs (UNCTAD p.7). Wolff et al writes how trade in Europe has been strongly influenced by containerization for the past decades. In 2007 and 2008 the development reached its peak to date with a turnover of circa 70 million TEU in European ports. The containerization has been particularly strong in the Baltic Sea Region exceeding the EU average. One reason has been the growing demand for containerized goods in Russia. Furthermore traditional bulk and break bulk cargo such as pulp, paper and sawn wood have moved to containers in Finland and Sweden. (Wolff, Herz & Flämig, 2011, p 3-4)

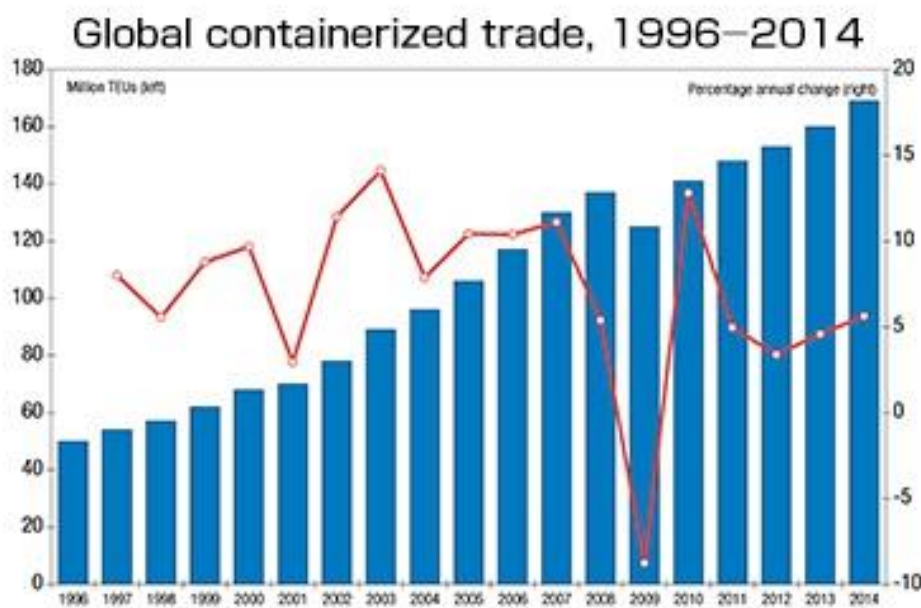


Figure 2. Global containerized trade, 1996-2014 (UNCTAD p.17)

1.2 Purpose of the study

Since the beginning of 1990's Finland has enjoyed an easy access to export containers thanks to the Russian imports. However, today container shipping line representatives in Finland are in a situation where there are only few containers available for export customers. The purpose of the study is to find out why there are so few containers available.

1.3 Research aims and objectives

The aim of this thesis is to answer the question “Why so few containers?”. The research objectives are:

- (i) find and analyze reasons to the shortage of containers in Finland
- (ii) propose a solution to the situation
- (iii) raise awareness of other emerging risks

The subject is close to heart for the author as she has been working in the shipping industry for almost a decade. Starting with a few years in customer service with a RoRo shipping line before moving to customer service with a container liner agency and later on to sales. The limited amount of containers in Finland affect the author's everyday job very much as the lack of containers creates challenges to fulfill the sales targets.

1.4 Research methods

This research is done as an action research. McNiff & Whitehead describes action research as a way to investigate and evaluate one's own work by asking “What am I doing? What do I need to improve? How do I improve it?”. Distinctive for action research is that it is all done by practitioners themselves rather than a professional researcher who does research on practitioners. Action researchers sees themselves as a part of the situation they investigate (McNiff & Whitehead 2006 p.7). According to McNiff & Whitehead traditional researchers tend to believe that knowledge is certain and assume there is an answer to everything. Action researchers tend to assume

- there is no single answer; a question may have many answers

- knowledge is created usually with a process of trial and error and the answer and process are always open to critic
- any answer is tentative and open to modification.

Action researchers do not look for a fixed outcome that can be applied everywhere, but rather produce their personal theories to show what they are learning and to invite others to learn with them. (McNiff & Whitehead 2006 p. 27 ff.)

Action research is often done in a cyclic process. There are many ways of describing the cycles. Kemmis and McTaggart, for example, describe each as having four elements: plan, act, observe and reflect. The important characteristic of each cycle is that the researcher plans before acting, and reflects on the findings and the method after acting. There are cycles within cycles: if one is using interviews for data collection, each interview is a cycle. The sequence of interviews forms another cycle, as do the other forms of data-collection one uses. In turn, they are part of the still larger cycle of the overall project. (Dick 1995 p. 5 ff.)

The stages in this research are:

- The first step in the process was to formulate a broad question to identify the problem: “Why so few containers?” The following step was to decide who to ask, and how to ask them. (This step is “plan”.)
- A study of the relevant literature of container shipping and risk management in container shipping was executed. To learn more about the container situation in Finland today a series of semi-structured interviews were conducted. (This is the “act” component.) Semi-structured interviewing is guided only by an interview guide that provides a framework for the interview (Gillham 2005 p. 70 ff).
- The information collected was then checked and interpreted. At that time a reflection of the adequacy of participants and the way of collecting information took place. (These steps are part of reflection.)

The action research method is best suited for this study because the author is in the middle of this situation at work. Studying what can be done to improve the situation may also improve the likelihoods of reaching sales goals. To ensure reasonable validity and reliability, action researchers should avoid relying on any single source of data. It is recommended that researchers use a process called triangulation to enhance the validity

and reliability of their findings. Essentially, triangulation means using multiple independent sources of data to answer one's questions.

1.5 Structure of the thesis

This thesis includes five chapters. The rest of the thesis is organized in the following way. Chapter two continues the literature review and describes what risks are and what kind of market risks there are in container shipping - then moving on to risk management and risk mitigation strategies in container shipping. In chapter three there is a more detailed description of the current container availability situation in Finland and how it emerged. There is also a suggestion what can be done to mitigate the problem. Finally a look into the future and what emerging risks can be seen for the container shipping in Finland. Chapter four is a summary and a discussion of the findings and chapter five has conclusions and recommendations.

1.6 Study limitations

There are numerous different kind of risks in shipping: maritime safety, cargo safety, accidents in the workplace, natural disasters, legal risks, business practices, failures in projects, credit risk or the security and storage of data and records. These are too many and too far apart topics to discuss in one thesis. Therefore the literature review for this study is limited to market risk in shipping and risk mitigation strategies from a financial point of view. The scope of the study is the current export container availability in Finnish ports and how the situation emerged.

2 MARKET RISKS IN CONTAINER SHIPPING

2.1 What is a risk?

Risks are a part of our lives. We make choices every day without knowing if the choice will have a positive or negative outcome. It is an unstructured activity based on common sense, related knowledge, experience and instinct. (Kuusela & Ollikainen p. 16 f.)

Merna & Al-Thani writes about the origin of the word “risk”. It is thought to have its origin in either the Arabic word *risq* or the Latin word *riscum*. The Arabic *risq* meaning “anything that has been given to you (by God) and from which you draw profit” and suggesting a positive outcome. The Latin *riscum* initially referred to the challenge a barrier reef is to a sailor and implies either a fortunate or unfortunate end (Merna & Al-Thani 2005 p. 9). Cleary & Mallaret points out that today most Western minds think risk means exposure to danger or hazard but for example the Chinese symbol for risk is composed of the symbol for threat and opportunity. A possible outcome of a risk is a reward. (Cleary & Mallaret 2007 p. xiii). Rausand defines a risk as a future potential event that is possible to analyze and manage. (Rausand, M, 2011 p. 3-5)

Ilmonen et al explains how an overall risk management in the business world aims at identifying, evaluating, prioritizing and controlling the risks hindering a company reaching its goals. By categorizing risks they will be more commensurate and they can be better compared. Categorizing risks also raises risk awareness in the company and improves the understanding of the relation between the risks. One of the most common ways of categorizing risks is to set them in four types: strategic, financial, operative and accident risks as shown in Figure 3. The risks are categorized by source and type. The source can be internal (e.g. related to the organizations internal operations, events or choices) or external (e.g. clients, markets, legislation). (Ilmonen, I et al., 2013 p. 64)

Strategic risks		Financial risks		Operative risks		Accidental risk	
1.	Risks related to business development	1.	Liquidity risk	1.	Risks related to the organization and management	1.	Risks related to occupational health and safety at work
2.	Risks related to business environment	2.	Interest risk	2.	Risks related to information technology	2.	Human resource risk
3.	Market risk	3.	Currency risk	3.	Risks related to information security	3.	Environmental risk
4.	Technology risk	4.	Counterparty risk	4.	Risks related to production, operation process and efficiency	4.	Damage risk
5.	Risks related to political, economic and cultural development	5.	Country risk	5.	Risks related to business interruption	5.	Risks related to natural disaster
6.	Regulatory risks	6.	Contract risk	6.	Productivity risk	6.	Risks related to operational safety
7.	Risks related to global phenomenon (e.g. climate, environment)	7.	Tax risk	7.	Risks related to project activities		
8.	Risks related to communication	8.	Risks related to accounting and financial reporting	8.	Contract and responsibility risk		
9.	Risks related to merger and acquisition	9.	Risks related to capital structure	9.	Risks related to crisis situations		
				10.	Criminal risk		

Figure 3. Risk categories (Ilmonen, I et al., 2013 p. 64)

Ilmonen et al elaborates how strategic risks are the risks involved in a company's long term strategic goals. When planning an organizations five year strategic goals there are numerous internal and external uncertainty factors to consider. External factors could be changes in the business environment, customer behavior, regulatory changes and new technology. Internal factors could be that the development portfolio, product or service range does not support the strategic goals, a lack of knowledge in the crucial business areas or inability to recognize the customers' needs. Risks related to merger and fusion are crucial internal strategic risks. Fusions, mergers and outsourcing an activity are almost

without exception very complicated change management projects. Nevertheless a lost business opportunity is also a risk. Financial risks are risks threatening the company's monetary process such as a customer's inability to pay his debt leading to a cash flow problem for the company. Operative risks are the direct and indirect risks in a company's daily operations. They could come from insufficient or unsuccessful internal processes, human resources, systems or external events. Accidental risks are usually best perceived because they are most familiar to the general public. Many of the risks in different categories are very similar and can be consequences of the same event but on different levels e.g. strategic and operative. Categorizing risks will facilitate the analysis of the risks and the detection of interrelations between risks. (Ilmonen, I et al., 2013 p. 66-69)

2.2 Market risks in container shipping

A general definition of a market risk is: market risk is the exposure to potential loss that would result from changes in market prices or rates (Lam 2014 p. 209 ff & FINRA). Shipping has made and destroyed millionaires over the years. Rates and prices in shipping industry are changing in cycles. Shipping markets can be characterized as being capital intensive, cyclical, volatile, and seasonal, while shipping companies are exposed to the international business environment (Kavussanos & Visvikis 2006 p. 233 ff).

Figure 4 shows the basic elements of the business model of the container liner industry, according to Stopford, with the market place for container transport in the center and the competitive process divided into two parts. Part (a) describes the market variables which set the tone of the market in which the container companies operate and identifies three factors which determine the market environment: the degree of rivalry between the liner companies, barrier to entry and the availability of substitutes such as air freight. Part (b) is concerned with strategic variables over which container companies have some influence: the bargaining power with suppliers, the bargaining power with customers, and the extent to which the company can differentiate its services and strengths in competitive position. (Stopford 2009 p. 535 f)

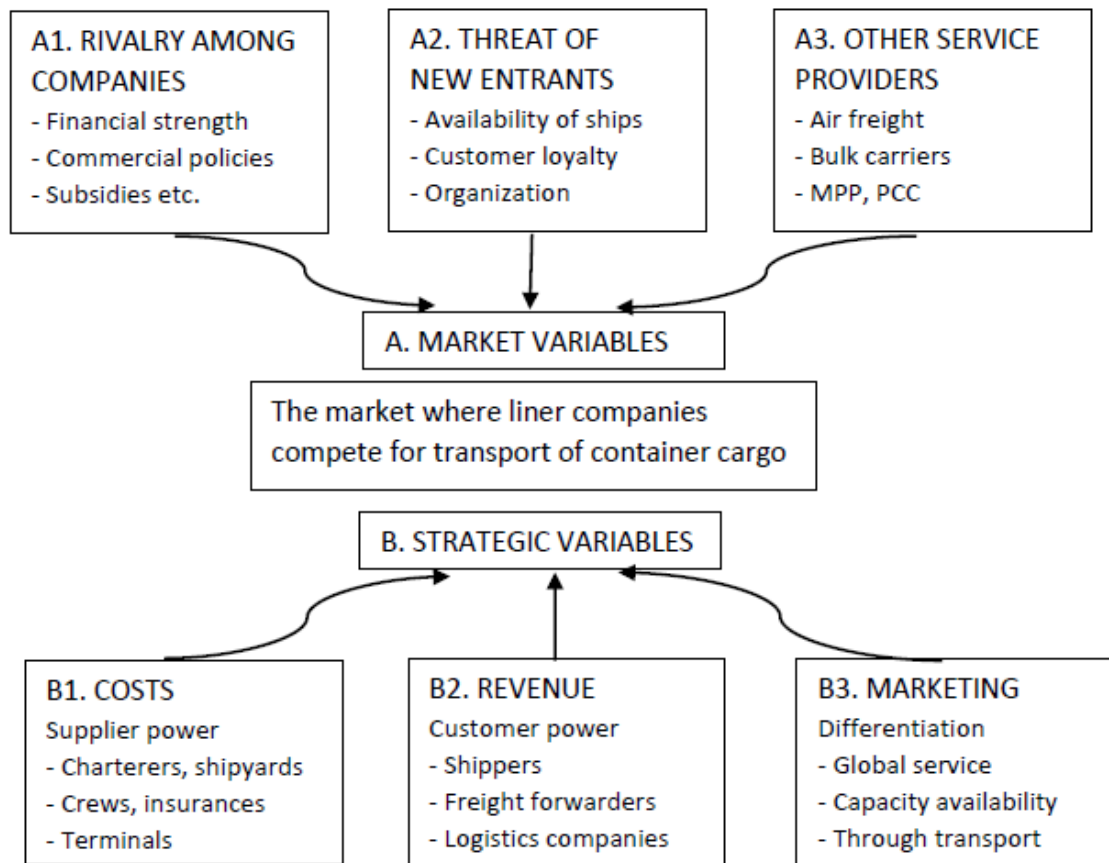


Figure 4. Liner industry business model (Stopford 2009 p. 535)

Both Stopford and Konsta write about shipping cycles. The shipping cycle is an economic concept that explains how shipping companies and freight charges respond to supply and demand. There are four distinctive stages in shipping cycles: a market trough is followed by a recovery leading to a market peak, followed by a collapse. An example is showed in Figure 5. In the trough stage there is a surplus of shipping capacity and freight rates fall to operating costs, the long continued low freight rates and light credit create negative cash flow. In the recovery stage there is a balance of supply and demand leading to an increase in freight rates towards operation costs. There are fewer laid-up ships and the order books are increasing. In the peak stage demand meets supply and freight rates are two or three times higher than operating costs. Ship-owners become very liquid and keen to lend, public floatation of shipping companies and the order books expand. In the collapse stage the demand of shipping services is lower than the supply of ships and the freights fall, liquidity remains high, vessels are laid up. A market can collapse due to business cycles, global economy and financial crisis. There is no simple formula to predict

the next stage or the next cycle. Troughs may last six months or six years, peaks may last a month or a year and sometimes the market can get stuck in the middle between trough and recession (Konsta 2014 p.27-30 & Stopford 2009 p. 96 ff.). One of the toughest risks to manage in container shipping is the market risk. A statistician at the British Chamber of Shipping called Isserlis was the first to thoroughly analyze the shipping market. He analyzed rates from 1869-1936 based on a carefully constructed rate index. His conclusions on the predictability of rates remain true today: “The fact remains that it is comparatively easy to find explanations for the various stages of a trade cycle that is past, and that it is impossible to predict correctly the occurrence of the successive phases of a cycle which is in progress, and still more so in the case of a cycle that has yet to commence” (Heaver 2012 p 19 ff).

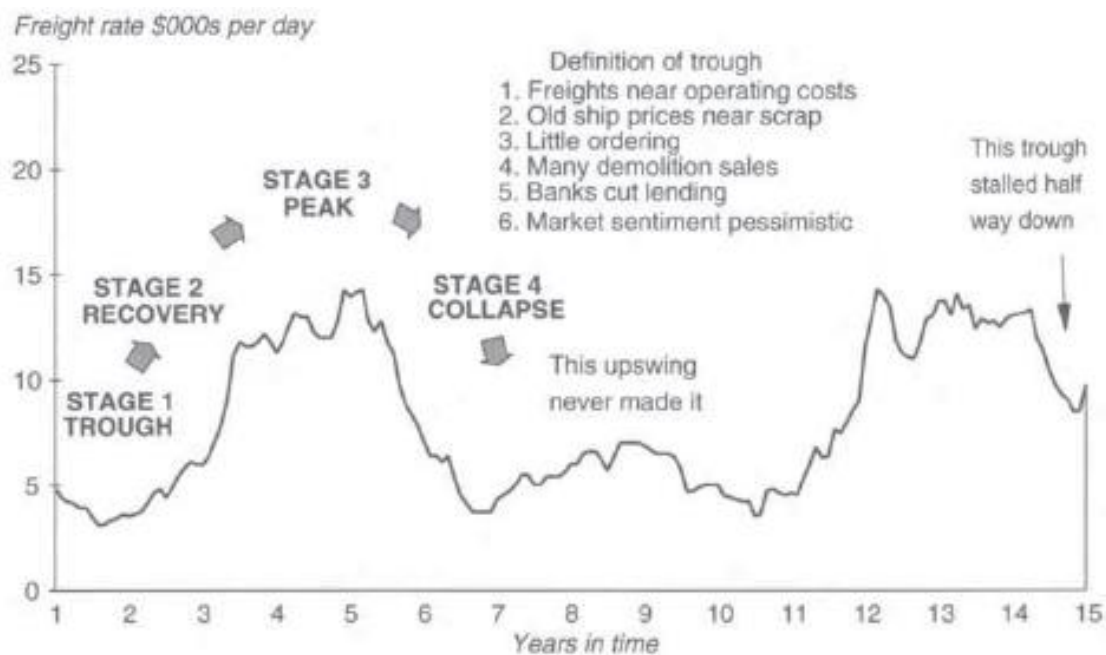


Figure 5. Stages in a typical dry cargo shipping market cycle (Stopford 2009 p. 97)

Rodrigue argues that since containerization is simultaneously a technological and a management practice, it has a life cycle. Which means there are phases of introduction, followed by growth which is usually followed by a phase of maturity where a paradigm reaches its optimal market potential and thus its growth rate slows down significantly. There is increasing evidence that containerization is entering a phase of maturity, implying that its future growth potential is more limited and likely linked to niche market

opportunities. (Rodrigue 2010 p. 17) Notteboom and Rodrigue et al agrees that the only additional demand can come from low value products which will only be shipped overseas if freight rates are very low (e.g. the market for waste paper and metal scrap). These temporary markets tend to disappear once the freight rate is above a threshold level no longer allowing a profit on trading these products overseas. (Notteboom 2012 p. 238-241 & Rodrigue, Comtois, Slack 2013)

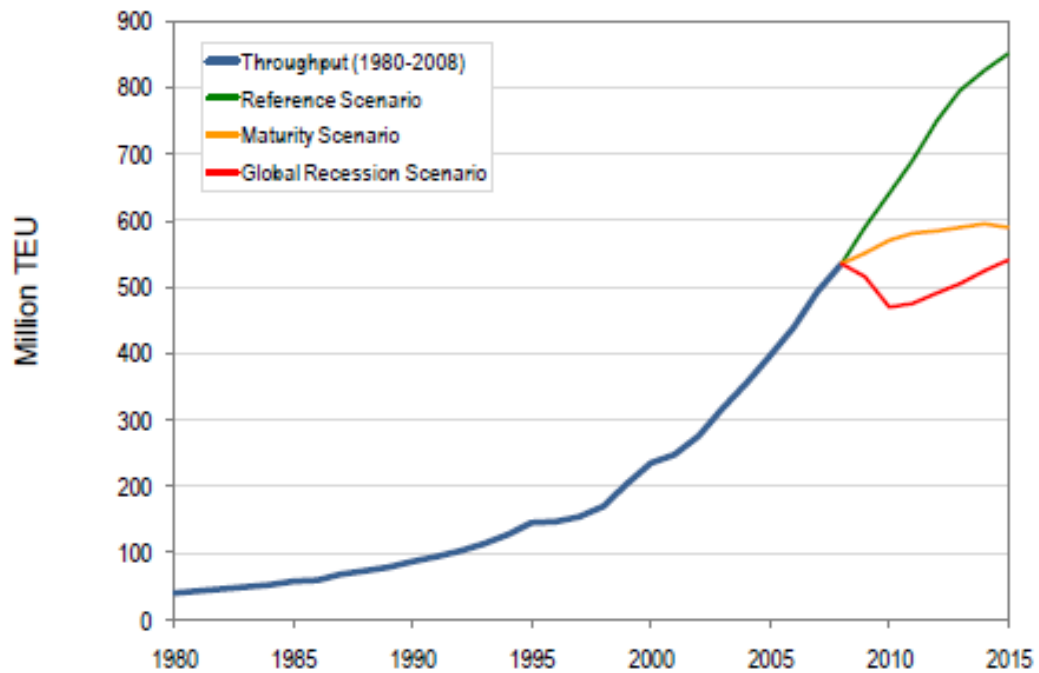


Figure 6. Global container port throughput, 1980-2008, and projection scenarios for 2015 (Rodrigue 2010 p. 17)

Rodrigue explains in Figure 6 that the shape of the growth curve leads to assume that future throughput would follow the reference scenario, which expects traffic to double between 2005 and 2015. Such a perception prevailed within the industry up to late 2008. The maturity scenario shows that throughput would be leveling off by 2015. It assumes that the process of globalization slows down and that most comparative advantages in manufacturing have been exploited. The global recession scenario is reflecting the financial crisis that began to unfold in 2008 and it takes into account the global recession impacting international trade and consequently the container flows. (Rodrigue 2010 p. 17)

The changes in the global GDP and exports and imports affect shipping demand and flow of traffic. Shipping is hit among the first industries when an economic downturn start (Lorange & Fjeldstad 2012 p. 263 ff). This is why economists are looking at the maritime trade for information about the health of the global economy and where it's headed (VanderMey 2014). The high level of freight rate volatility means that shipping is perceived as a high risk industry by investors and lenders. Shipping is a very dynamic industry with strong up and down movements, high profits and remarkable losses. The shipping market depends on variables that affect demand and supply. Demand is affected by world economy, seaborne commodity trades, average haul, politics, and transport costs. Supply again is affected by the world fleet, fleet production, shipbuilding production, scrapping and losses and freight rates (Konsta 2014 p.24-27 & Lorange & Fjeldstad 2012 p. 263 ff). Most industries can distinguish between business risk and market risk, shipping belongs to the industries that cannot distinguish between the two. Financial results in shipping are directly affected by movements in the world's freight rate market. One could claim ship-owners are in the business of managing shipping risks affecting a portfolio of physical assets, rather than simply managing a fleet of vessels (FreightMetrics slide 16).

Stopford points out how managers of container liner companies are “between a rock and a hard place” in trying to meet varying needs of a varied customer base whilst operating regular schedules with relatively inflexible strings and at the same time cover a sizable administrative cost. It is to produce volatile revenues in free market trade cycles, seasonal cycles and trade imbalances while living with a volatile cash flow (Stopford 2009 p. 556 f).

2.3 Risk management

According to Ilmonen et al the aims of risk management are to secure the continuation of a company's activities, to protect the investments made in it and to fulfill the required rate of return. Business is always about taking risks. The owners are willingly taking a risk when starting a business i.e. investing their own wealth in the company and accepting the possibility of losing it. The management might not risk losing their own wealth but they put their job on the line when making big decisions. Thus the owners and the management

have a joint interest to agree on rules for business risks. When the rules have been set, the actual risk management can begin. Risk management is directly linked to the company's strategy and values, it is not a disconnected process or a separate procedure. Even social values from outside the company can effect risk management. For example a very low tolerance for risks towards children must be taken into consideration if the company produces children's' toys. In a dynamic ever-changing world also the risk management is dynamic. For instance if the ownership of the company changes its values, thus effecting the risk management.

(Ilmonen, J et al, 2013 p. 30-31)

For Aven a risk analysis is a systematic use of available information to identify initializing events and to draw the contributing and consequence picture. A risk analysis is always proactive as it looks only at potential future events. One analyses risks to establish a risk picture like Figure 7 which is a simplified bow-tie model. (Aven T, 2008 p. 3-4)

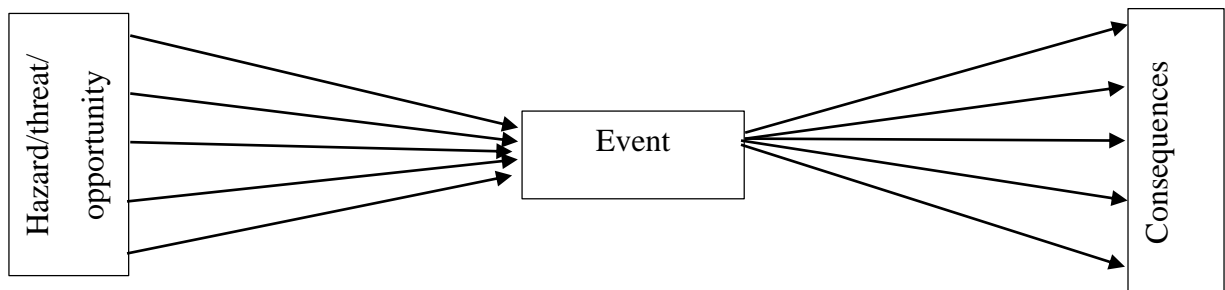


Figure 7. Simplified bow-tie model (Rausand. M, 2011 p. 6)

Rausand defines risk analysis to be an answer to three questions: 1) What can go wrong? 2) What is the likelihood of that happening? 3) What are the consequences? (Rausand. M, 2011 p. 33-37). When risk analysis is completed a risk evaluation takes place. Risk evaluation is a process where judgements are made on the tolerability of the risks from a risk analysis. Rausand strongly recommends that the risk analyst is also involved in the risk evaluation in order to avoid errors and communication problems. When risk analysis and risk evaluation are conducted in a joint process it is called a risk assessment. Then adding identification and implementation of risk-reducing actions and a follow up on how the risks change over time one, is conducting risk management as illustrated in Figure 8 (Rausand. M, 2011 p. 7-12).

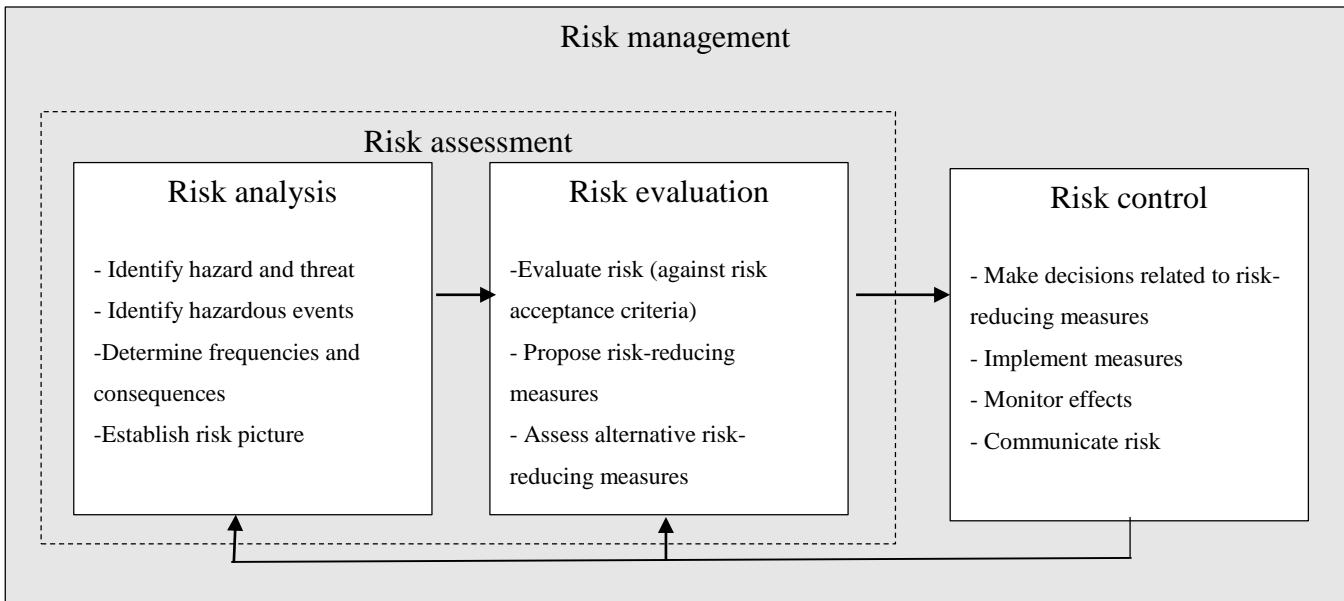


Figure 8. Risk analysis, evaluation, assessment and management (Rausand, M, 2011 p. 10)

2.4 Risk mitigation strategies in container shipping

Part of a formal risk assessment process according to Marchetti involves ranking risks based on impact and the likelihood of occurrence. To begin the risks will be placed into one of four risk response categories. These categories are:

1. Risk avoidance. If an activity has a high likelihood of loss and significant financial impact, it is usually recommended to completely avoid the activity.
2. Risk acceptance. Management accepts certain risks because it operates a business.
3. Risk mitigation. “Mitigation” by definition involves minimizing risk. Therefore, if management determines that a risk should be mitigated, it is looking for a solution that will reduce either the likelihood or the impact of that incident or event. In other words, management is seeking to limit exposure. This response includes management control systems to reduce the risk of loss.
4. Risk transfer. This solution involves moving risk from one entity to another. It often means movement of a risk to an external party, but it may also result in shifting risk to a different part of the same entity or subsidiary. The two most common forms of risk

transfer include the purchase of various types of insurance and derivative product transactions, such as futures or options. (Marchetti 2012 p. 29 ff)

Chang describes characteristics of container shipping to be following:

Container shipping

- needs huge capital investment
- is easily impacted by global economy
- earns unstable income which is impacted by world fuel price and exchange rate
- is limited by inflexible supply of container ships
- is impacted by the degree of government support
- has fixed freight, which is because of the upward trend in sizes of container ships
- has to bear the cost of empty container transportation
- has to follow international regulations

From the characteristics above one can draw the conclusion that container shipping is associated with a wide range of risk sources in a complex international environment. Container shipping is often a part of a longer supply chain where other parties are involved including consignee, consignor, ports, terminal operators, agencies, inland transportation haulers and forwarders. The operations within and between the parties and the long physical distance may generate various risks. (Chang, C-H p.2-3)

The mandatory components of risk assessment management in shipping according to Konsta relate to the following:

- International Safety Management Code Implicit. The purpose of the ISM Code is to provide an international standard for the safe management and operation of ships and for pollution prevention.
- European Union regulations
- IMO – International Maritime Organization. The most important conventions being: International Convention for the Safety of Life at Sea (SOLAS), 1974, International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto and by the Protocol of 1997(MARPOL), International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) as amended, including the 1995 and 2010 Manila Amendments

- Flag requirements. Flag states have certain rules and requirements for vessels that fly their flags. Major requirements include crew nationality, crew composition, ship owner citizenship and ship building requirements.
- Industry Best Practice e.g. TMSA (Tanker Management and Self-Assessment)

Once risks are identified a plan to minimize or eliminate the impact of negative events will be created. Common risks that are possible to eliminate are for example accidents in the workplace or fire, tornadoes, earthquakes and other natural disasters. It can also include legal risks like fraud, theft and sexual harassment lawsuits. Risks can also relate to business practices, uncertainty in financial markets, failures in projects, credit risk, or the security and storage of data and records. (Konsta 2014 p.35-42)

The container market has been challenged by structural changes within the industry: mergers and acquisitions, increasing concentration, and changes in regulation, among others by banning the conference system in Europe. Container shipping companies are also exposed to a variety of risks such as the long term business cycle, high seasonal variability, trade imbalances, and highly variable bunker fuel costs. Within this environment, container shipping companies have to manage the operational inflexibility of service offerings that require high levels of fixed cost, while offering what many shippers perceive as a standardized service. (Kang et al. 2015)

The shipping business requires huge amounts of capital investment because of high levels of fixed cost. Shipping companies that used to, before the financial crisis 2009, rely greatly on banks for capital now experience funding difficulty. The large capital investment may still be available to varying degrees by financing through shipping commercial banks. Recently shipping companies have increasingly entered stock markets as an alternative source of finance to avoid too much debt exposure. The shipping industry is highly capital intensive and is exposed to multiple financial and operating risks rising from the volatility in interest rates, currency exchange, operating expenses and vessel charter rates. Shipping companies today not only need to achieve better performance, in order to attract investors, but also are obligated to provide shareholders meaningful information for their decision making. One of the motives of shipping companies is to continuously search for competitive advantage through improved performance through financial risk strategies and operational choices such as ship size, age, and ownership.

Financial risks in the shipping industry are broadly categorized as liquidity, default, financial, credit and market risks. Liquidity risk refers to how easily a firm can turn its assets into cash. Default risk refers to the possibility that a firm will not be able to make payments to honor its obligations on time. Financial risk refers to how dependent a firm is on borrowing or financial leverage. Credit risk predicts whether the counterparties of business will fulfill their agreement. Market risk emphasizes the impact of a company's performance on the rest of the stock market. Shipping companies can manage their risk-taking behavior through risk assessment tools and financing/investment decision involved. (Kang et al. 2015 & Wang et al. 2014 & Albertijn et al. 2011)

Notteboom writes how in the container shipping industry some assets are owned and others leased and there is a wide variability in cost bases. To be successful a container liner needs to have a good asset management. Common asset management decisions for shipping lines include management of the equipment to reduce downtime and operating costs, increase the useful service life and outstanding value of vessels, increase equipment safety and reduce potential liabilities, and reduce costs through better capacity management. Fleet capacity management is challenging because of the inflexible nature of vessel capacity in the short run due to fixed timetables, seasonality effects and cargo imbalance on trade routes. Container shipping lines also have to make large investments in their container fleet. (Notteboom 2012 p. 233-238)

Ng identifies three major trends to find cost savings can be seen in the recent development in container shipping industry: economies of scale, re-structuring and differentiation. By the turn of the century the development of mega-sized vessels had become a common practice among major shipping lines. Figure 9 shows the evolution of the largest containerships: from 4538 TEU in 1988 to 18270 TEU in 2013. The size has quadrupled during past 25 years. (Ng 2012 p.7)

Evolution of the largest containerships : 1988-2013

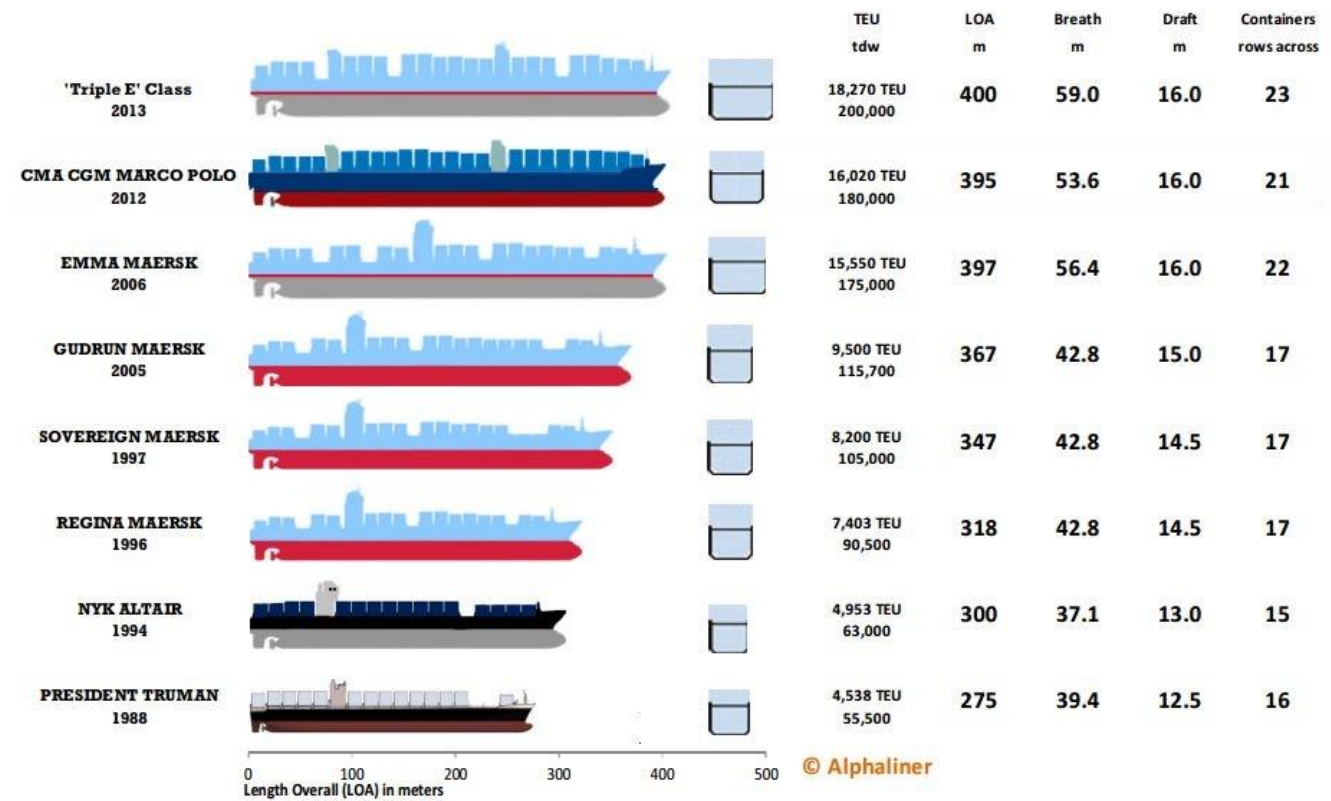


Figure 9. Evolution of the largest containerships: 1988-2013 (Alphasiner)

Rodrigue et al explain how larger containerships have lower operating costs, often measured as the cost per TEU per day. Depending on the distances at which containers are carried this will result in different total shipping costs. The Singapore - Rotterdam route is often used as a frame of reference in container shipping costs. Figure 10 assumes normal operating speeds and shows that through the recognized principle of economies of scale, operating costs per TEU are reduced with the usage of larger ship classes (Rodrigue, Comtois, Slack. 2013).

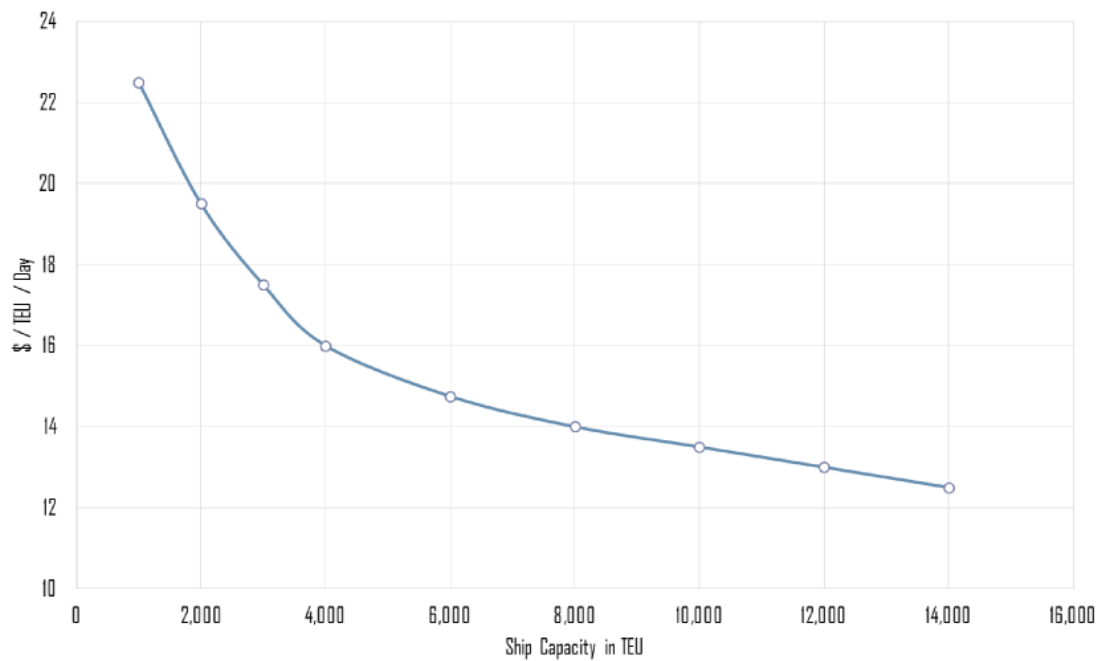


Figure 10. Daily Operating Expenses for Containerships per TEU (Rodrigue, Comtois, Slack. 2013)

The global economic downturn in 2008 hit the shipping industry hard and shipping lines were struggling to gather enough cargo to fill up mega-sized vessels. During this time the global container carrying capacity fell 15 percent and different measures were implemented to reduce operational costs such as re-routing, withdrawal of services from certain markets, and laying up vessels. Part of the overcapacity could be used when shipping lines started slow steaming (Ng 2012 p.9 & Notteboom p.242 ff). Malonia et al clarifies full speed for a container ship might typically be 24 knots (generally 85 - 90 percent of engine capacity). Reducing vessel speed to 21 knots represents slow steaming with 18 knots defined as extra slow and 15 knots as super slow. Fuel can exceed half of overall operating costs for container ships, and consequently, changes in fuel prices will have significant impacts on per TEU transport costs. By slow steaming the shipping lines could make considerable savings. Another slow steaming benefit, is that the reduced fuel consumption directly corresponds with lower levels of greenhouse gas emissions, namely CO₂. Reduced vessel speeds and longer transit times also enable greater carrier flexibility to adjust speeds to overcome delays, allowing better schedule timeliness (Malonia et al. 2013). Wackett points out there was a demand from shippers to stop slow steaming when the oil price dropped dramatically in 2014, but it is not something shipping lines plan to do. The change in speed would require fundamental changes in shipping lines' networks

and be costly and complex. Also around seven percent of the world’s container fleet are employed due to the requirement for extra ships in service loops to compensate for longer transit times (Wackett 2015).

Strengthening the scale of operation, the container shipping industry also saw some horizontal integration which included acquisitions, mergers and the establishment of strategic shipping alliances. Figure 11 illustrates the alliances in July 2015. The advantages for rationalization were the protection of market shares, cost reduction through slot re-arrangements, better market perception through efficient information exchange, opportunities to enter new markets, wider geographical coverage, new technologies and stronger bargaining position against ports. Through the rationalization measures shipping lines aimed at increasing control in the decision-making process, combining financial power to expand and sharing of financial risks. (Ng 2012 p.12 & Notteboom p.251 ff)

APL	G6 alliance	M2	Maersk
Hapag-Lloyd (incl merged CSAV)			Mediterranean Shipping Company S.A. (MSC)
Hyundai Merchant Marine			CMA CGM
Mitsui O.S.K. Lines		Ocean Three	China Shipping Container Lines
NYK Line			United Arab Shipping Co. (UASC)
Orient Overseas Container Line (OOCL)			COSCO
			K-Line
	CKYHE	Yang Ming	
		Hanjin	
		Evergreen	

Figure 11. Container shipping line alliances in July 2015

The economic crisis late 2008 seemed to have increased diversity among the shipping lines’ long term strategies. Some shipping lines decided to focus on the core business of liner shipping e.g. Hapag-Lloyd. Some shipping lines like APL, NYK and OOCL established logistical branches, or fully owned logistics subsidiaries, with the aim to provide a total logistical solutions to their customers. Japanese and Korean lines increasingly rely on their roles within large shipping conglomerates for example NYK and MOL have only 40 percent of their business in shipping thus spreading the risk (Ng

2012 p.13 f & Notteboom p.255 ff). Maersk Line tried to offer a differentiated product, by giving to customers guaranteed delivery times in return for higher freight rates and Daily Maersk was launched in September 2011. Daily cut-offs were offered, meaning that cargo could be shipped immediately after production without the need for storage, with Maersk Line promising agreed pick-up times and offering compensation, should customers' containers not arrive on time. Daily Maersk was withdrawn in the beginning of 2015 due to customers were not willing to pay a higher price for better service. This reflects the fact that the big east-west trades have become highly commoditized, with lines finding it almost impossible to offer a differentiated product on these routes (Porter 2015c). The success of the different strategies depend on how the shipping lines overcome some difficulties, including whether additional savings could cover the extra costs triggered, possible reduction in flexibility due to higher switching costs, the possibility of longer and more complicated decision-making process, and the possible organizational complexity and different management cultures between different firms and transport modes (Ng 2012 p.13 f & Notteboom p.255 ff).

Despite challenging times and low freight rates, Baker writes the first quarter 2015 was the most profitable in four years with an estimated operating margin of eight percent. However the average unit revenue was down six percent year on year and the unit cost fell by eleven percent. Offsetting the decline in revenue per TEU is the falling oil price that will bring down operating costs for the carriers. A total of 37 ships of 13800 - 20000 TEU have been delivered so far in 2015, all of which have been deployed to the Far East - North Europe route. Another 13 ships within this size range are due to be delivered by December, all bound for the same trade. The pressure to fill those new ships and maintain market share will continue to squeeze freight rates through the remainder of the year (Baker 2015). For the first six months 2015 Maersk Line's profits were up 22 percent at \$1,2 billion, while return on invested capital reached 12,2 percent. "I am satisfied with our first half-year result and return on invested capital. Our strong financial performance is the result of our cost leadership strategy. It has proven to be the right strategy, especially at a time with very tough competition, falling rates and stagnating demand," Maersk Line chief executive Søren Skou says (Maersk Line). With the general trend in rates continuing to be down, Maersk is focusing instead on cost reduction. To gain economies of scale the line has ordered a new series of Triple-E ships for the Far East - Europe trade. Maersk

Line's \$220 million increase in first-half profits was achieved through lower costs and despite a fall in average freight rates of 8,1 percent compared with the opening six months of 2014. A 42 percent reduction in bunker costs down to an average \$335 per ton and the appreciation of the US dollar against most of the currencies where ship disbursements are paid were the main reasons for the positive result (Porter 2015a).

Figure 12 shows how there has been several attempts by container shipping lines to implement general rate increases (GRI) throughout 2015 but they have all failed. Due to the low global fuel prices and oversupply of vessel capacity (vessel utilization was approximately 90 percent in Q2 2015) shipping companies have found it difficult to justify rate increases (Nightingale 2015b). Hapag-Lloyd CEO Rolf Habben Jansen describes in August 2015 several positive indicators within the next 18 months: all four major shipping line alliances have now announced that they will pull capacity from the routes between the Far East and Europe, and a general increase in the volume of scrapped vessels following the opening of the new and expanded Panama Canal in 2016. Almost overnight the Panamax class of container ships, 20 percent of the fleet, will become unnecessary: not just because of their size, but also their design, which will make them unprofitable (Andersen 2015b). The average fleet in Asia – Australia trade has been 4300 TEU for years. This might change in 2016 when a new container port in Melbourne is opened. The new port can handle vessels of 8000 TEU while today the five largest container ports can currently handle ships of max 5500 TEU. The advantages of upgrading to bigger ships from Asia to Australia relate to bunker consumption, which would decline by close to 30 percent, according to the SeaIntel analyst agency's calculations. (Raun 2015)

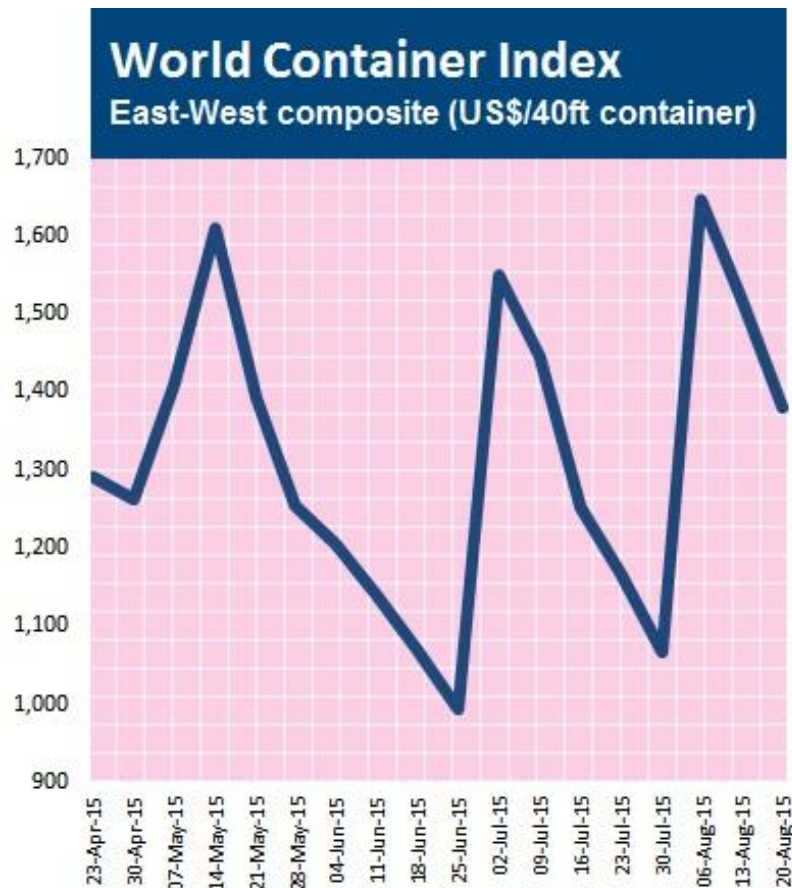


Figure 12. The World Container Index describes the container freight rates from actual market prices. (<http://ciw.drewry.co.uk/>)

The core of the problem in the container shipping industry identified by Notteboom is in a combination of the capital-intensive operations and high risks associated with the revenues due to a combination of volatile markets and inflexible capacity in the short run. On top of this, the pricing strategies of container lines have only a marginal impact on total trade volumes. The particularities of the market have urged shipping lines to develop capacity management strategies aimed at reducing the cost per TEU carried. Shocks in demand due to global economy in combination with the vessel order strategies of shipping lines mean that the container shipping industry regularly faces long periods of vessel oversupply and rate erosion. Capacity management proves to be a very difficult issue in periods of shrinking demand, as the carriers which decide to cut capacity might see other shipping lines freeriding on the resulting rate restoration. The economic crisis challenges shipping lines to carry out a comprehensive review of their business models. Recent declines in global trade and container flows were unprecedented. Shipping lines incurred

massive losses and have no other option than to seek recovery in total revenue streams up to a level where carriers may achieve mid-cycle margins and returns. Rate restoration will remain vulnerable as long as postponed deliveries and idle ships are not fully absorbed by growth in demand. (Notteboom 2012 p. 259-260)

3 SHORTAGE OF CONTAINERS

3.1 Introduction

Figure 13 demonstrates a basic container flow by Ng: after vessel arrival laden containers are picked up by importers and emptied and returned. This has to be done during the agreed free unloading time or demurrage and/or detention charges will arise. Once back in the depot the empty container must be surveyed and repaired before it can be released to an exporter. If the damage to the container is extensive and it is located in a country with high labor cost it is likely to be moved empty to a low labor cost, export oriented country e.g. from USA to China (Ng, A S-F 2012 p.34).

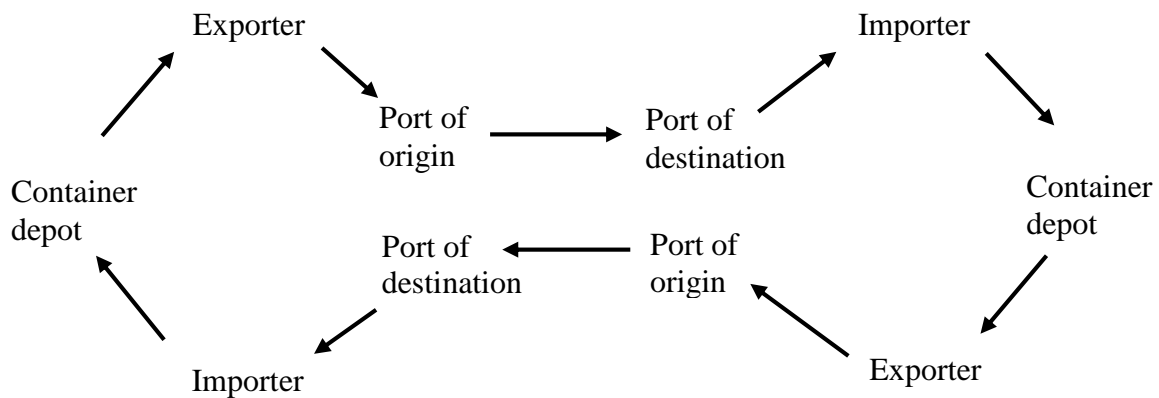


Figure 13. Basic container flow (Ng, A S-F 2012 p.34)

The total number of containers around the world increased from 16 million TEUs in 2001 to 27,1 million TEUs in 2009 (Ng, A S-F 2012 p.30). And according to the World Shipping Council the fleet was approximately 34,5 million TEU in 2013. As a rule of thumb each TEU of container ship capacity requires three additional container units – one for each end of the landside calls and one for the sea voyage. However, the container-to-slot operating ratio is today closer to 2:1 as carriers cut their capital expenditure. Container shipping lines and container leasing companies spent about \$4,2 billion on new containers in 2014, an increase of 13 percent on the previous year, but still some 35 percent down on the 2011 spending. Approximately 1,6 million TEU are added to the container fleet each year with the container lease industry accounting for most expansion and container shipping lines ordering a minority share of new containers (Barnard 2015).

In 2014 approximately \$10 billion was spent on new containership orders totaling 1,06 million TEU worth of capacity. Maersk Line signed in July a \$1,1 billion order for nine 14000 teu vessels as part of Maersk Line’s USD 15 billion investment in new-buildings, retrofitting, containers and other equipment. (Container Insight 2015b).

Affordable and efficient international container shipping enable companies to set up their manufacturing plants in countries where the labor cost is low and the overall business environment is more favorable for manufacturing. Subsequently some countries, particularly developing countries in Asia, become the world’s manufacturing centers. The imports of these countries are mainly raw materials, which are commonly transported as bulk cargo while the exports is manufactured products in containers. The manufactured products are shipped to major consumption markets such as America and Europe (Ng, A S-F 2012 p.31 ff)

Year	Transpacific		Europe Asia		Transatlantic	
	Asia-North America	North America-Asia	Asia-Europe	Europe-Asia	Europe-North America	North America-Europe
2009	10,6	6,1	11,5	5,5	2,8	2,5
2010	12,3	6,5	13,3	5,7	3,2	2,7
2011	12,4	6,6	14,1	6,2	3,4	2,8
2012	13,1	6,9	13,7	6,3	3,6	2,7
2013	13,8	7,4	14,1	6,4	3,8	2,8

Figure 14. Estimated containerized cargo flows on major East–West container trade routes, 2009–2013 (Millions of TEUs) (UNCTAD p.18)

Figure 14 shows cargo flows in the world’s three main East - West container trade routes, which link the industrial Asia with North America and Europe. In the Transpacific route there were 13,8 million TEUs shipped eastward in 2013 whereas there were only half of the volume, 7,4 million TEUs, shipped westward. A similar trend can be seen in the Asia–Europe route; there were 14,1 million TEUs moving from Asia to Europe, compared with only 6,4 million TEUs moving from Europe to Asia, in 2013 (UNCTAD p.18). Europe can also be a surplus area but for different container types and in other seasons e.g. reefers in citrus season (Flapper, van Nunen, Van Wassenhove p. 65). In order to make a container shipment an empty container is required which – if not available – needs to be repositioned to the export location. The repositioning helps to absorb the transport

imbalance by moving empty containers from surplus to deficit areas. As can be understood from cargo flows in Figure 14 the amount of empty repositioning is substantial: every fifth seaborne container and 40 percent of all containers transported over land are empty (Jahn, C et al 2014 p.502). Carriers had a cost of USD 16 billion in 2011 empty logistics which equals to 15 percent of operating expenses (Rodrigue, Comtois, Slack 2013). Container repositioning is a complex problem and it is hard for container lines to achieve cost minimization and profit maximization. The need to reposition empty containers globally increases the inventory and operational cost to the shipping lines, and raises their working capital due to a larger investment in containers. Ng describes how shipping lines reduce the impact of empty container repositioning by improving their liner network design and vessel fleet size planning at the strategic level and on the landside container dispatching and global empty container repositioning at the operational level. Shipping lines also use solutions that involve other parties, including collaboration with other supply chain partners, deployment of innovative technology such as foldable containers, and investigation of new markets for empty containers. (Ng 2012 p. 45 ff)

3.2 Description of the current container situation in Finland

There is an old saying that Finland is an island. This statement is still very true as about 80 percent of the Finnish foreign trade takes place by sea. The shipments related to Finnish foreign trade plummeted in 2009 and recovered only in 2013. The Russian economy and the traffic flow to and from Russia affect greatly also the volumes to and from Finland as some of the Russian shipments are shipped thru Finnish ports. (Ministry of Transport and Communications, Transport Policy Department 2014 p. 2&10)

Baltic container ports are almost exclusively served by feeders and not directly connected with deep sea ports. This is the hub-and-spoke network where deep sea cargo is transshipped in hub ports in Belgium, the Netherlands or Germany. (Wolff, Herz & Flämig, 2011, p 11 f)

In order to find out what is the current container situation in Finland a series of interviews took place. The interviewees were:

- Mr. Tapio Mattila, Senior Vice President Marketing and Sales at Steveco. Steveco produces, among other, stevedoring services in Helsinki and Kotka port.
- Mr. Tommi Sievers, Sales and Marketing Manager at Port Of HaminaKotka Ltd
- Mr. Taneli Antikainen, Senior Transport Economist at the Finnish Transport Agency
- Mrs. Outi Nietola, Logistics Manager at Finnish Forest Industries Federation (FFIF). The value of forest industry exports accounted for approximately 20 percent of all Finnish exports. 90 percent of Finnish forest industry products are exported and 90 percent of them by sea.
- Mr. Janne Raappana, General Manager of Sales for Finland and Baltics at Unifeeder A/S. Unifeeder is a logistics company with the largest feeder and shortsea network in Northern Europe.
- Mrs. Reetta Tiittanen, Sea freight Manager at Kuehne + Nagel Finland. Kuehne + Nagel International AG is a global transportation and logistics company.
- Mr. Michael Enberg, Managing Director at Maersk Finland Oy. Maersk Line is today the world's largest container shipping company. Maersk Line is a part of the Maersk Group, headquartered in Copenhagen, Denmark and had a revenue of USD 47 billion in 2013.

There were some variation in the answers. According to Mr. Mattila (Steveco) there was at the time of the interview in June a lack of some 2000-4000 export containers per month. Mrs. Nietola (FFIF) was reading minutes from a workshop she lead a few years ago and at that time no participants had mentioned a shortage of export containers in Southern Finland but the participants had expressed a shortage in Northern Finland's ports. Mrs. Tiittanen (Kuehne + Nagel) said there had been a period from April to June when there had been a lack of export container from ocean carriers but the problems had faded by August. Mrs. Nietola (FFIF) questioned whether a lack of containers would be something the FFIF members would report to the federation as it's mainly linked to the member organizations' own operations. Mr. Raappana (Unifeeder) says they have not noticed a big lack of export containers in their shortsea traffic and Mrs. Tiittanen (Kuehne + Nagel) confirms the same. Mr. Antikainen (Finnish Transport Agency) said he had heard there

is currently a lack of export containers in Finland. The Finnish export volumes have been as long as Mr. Enberg (Maersk) can remember greater than the import volumes. The Finnish import volumes have not changed notably in the past years but the Finnish export volumes have increased some like shown in Figure 17. The demand for export containers in Finland was catered during 2010-2014 with empty positioning from Russian ports in Saint Petersburg area. Mr. Enberg (Maersk) explains that the shipping lines operating their own feeder traffic could optimize the cargo flows and create cost savings by routing laden containers from a hub port in Europe to Saint Petersburg, in Saint Petersburg load the feeder vessel with empty containers to KotkaHamina, and fill up the feeder with laden containers from KotkaHamina back to the European hub port. At the time there was barely no export out of Saint Petersburg so the feeder vessels would have had to come to Finland anyway to pick up laden containers. The shipping lines could calculate a zero cost for the empty positioning from Saint Petersburg to KotkaHamina. In 2015 the importing to Russia vanished almost overnight. Thus according to Mr. Enberg (Maersk) the export container availability in September is feeble but under control.

Mr. Antikainen (Finnish Transport Agency), as well as Mrs. Nietola (FFIF), talked about the imbalance of import and export between different ports in Finland. Figure 15 demonstrates how HaminaKotka port has a larger export in full containers than import and is forced to import empty containers in order to satisfy the exporters' needs. In Figure 17 we can see HaminaKotka port has over 40 000 TEU in empty imports in January-April 2015 while the port's total empty imports was a little over 80 000 TEU in a full year of 2014. If the current situation continues, empty container import in HaminaKotka will increase by 50 percent. Port of Helsinki's full import and export is almost in balance. Port of Rauma's full import is less than a third of what the full export requires. There is no certainty that the full import will be of the container type the export requires, though Mr. Enberg (Maersk) says Helsinki does today receive from its own import approximately the containers needed for export. Mr. Enberg (Maersk) points out that Helsinki to this day has differentiated from the other ports in not having the forestry industry shipping out of Helsinki. This will however change in 2017 when the Äänekoski pulp factory will start operations. The pulp mill's estimated containerized export volumes are 31000 TEU per year, increasing Port of Helsinki's container volumes with a total of 62000 TEU (Tervonen, Juha 2015).

Jussi Sarvika, SVP Logistics at UPM-Kymmene Oyj, voices the need to reduce the amount of ports along the Finnish coast. The decreased cargo flows cannot endure higher costs if the Finnish exporters wish to stay competitive in the global market (Arola 2015). Mr. Enberg (Maersk) sees the future of Finnish ports in a similar way: shipping lines are constantly looking for ways of diminishing costs and one way is to call fewer ports with larger vessels. Mr. Enberg (Maersk) points out that all Finnish container traffic could volume wise be handled in Helsinki and HaminaKotka ports. Mrs. Nietola (FFIF) pointed out the lack of export containers in Northern Finland. Mr. Enberg (Maersk) suggests these cargoes could also be handled through Southern Finland ports if only the rail connection would be priced reasonably. Today some large exporters in forestry and mining industry have to keep requesting empty export containers to Northern Finland in order to keep cost under control.

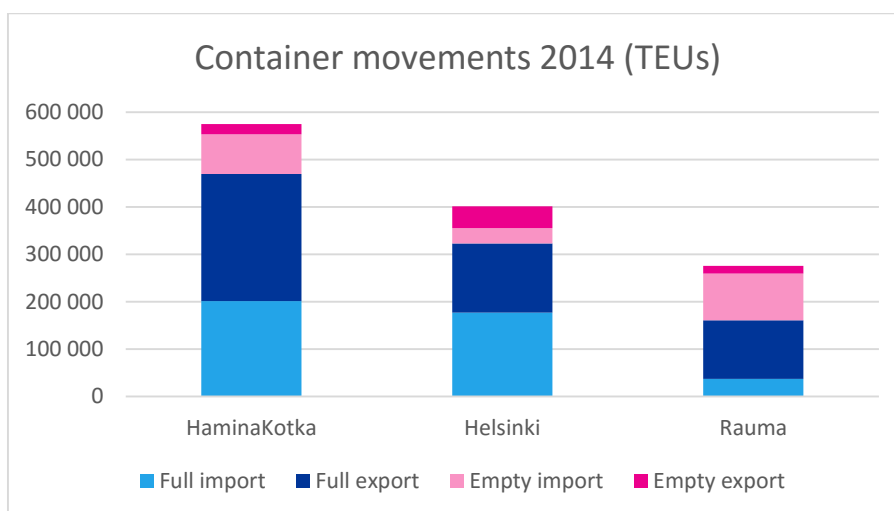


Figure 15. Container movements in main container ports in Finland 2014 (Finnish Transport Agency statistics)

Mr. Mattila (Steveco) and Mr. Antikainen (Finnish Transport Agency) drew parallels between today and the beginning of 1990's when the Russian transito shipments begun. Mr. Enberg (Maersk) explained even before the Russian transito traffic the Finnish container export was larger than the import and there was a constant empty container flow from Germany to Finland. When the Russian transito volumes started flowing thru Finland there was no longer a need to position empty containers from the European continent. At the same time the Finnish industry started to ship more in containers. The

Russian transito flows subsided during the economic crises in 2009 and since then the containers have been empty positioned from Saint Petersburg. In Figure 17 can be seen the increase of empty units brought into HaminaKotka port. Mr. Enberg (Maersk) goes on saying he now uses the term “old normal” to describe the situation today. Mr. Mattila (Steveco) pondered if this is actually the standard and the period from beginning 1990s until 2014 was a richness.

The financial impact of the situation is significant. Mr. Mattila tells Steveco faces heavy direct financial impacts as an estimated 45 percent of the normal volume is missing. The containers unloaded in HaminaKotka port with final destination in Russia brings in significant amount of Steveco’s revenue. They are also paying a higher terminal handling charge and more yard rent than most full export containers. Steveco’s work force is calculated according to previous year’s volumes and the work force cost is some 40 percent of the turnover. According to Mr. Sievers (Port Of HaminaKotka) there is a risk of the Finnish exporters losing their market shares to competitors due to not being able to deliver products according to agreed schedule, and the loss will affect the entire Finnish economy. Mr. Antikainen (Finnish Transport Agency) and Mrs. Nietola (FFIF) find there will be increases in costs for looking for alternative logistics solutions. Mrs Tiittanen (Kuehne + Nagel) confirms their clients, the real exporters, suffered from higher costs, especially in quarter two 2015, as Kuehne + Nagel had to book the containers with shipping lines with whom they do not have negotiated special freights. Some ocean shipping lines debited additional surcharges such as peak season and equipment imbalance surcharge. Mr. Enberg (Maersk) explains these are surcharges some shipping lines, Maersk excluded, debited to cover costs from positioning empty containers to Finland. The surcharges could only be added on the spot bookings, not to annual contracts. The situation also caused delays in shipments and the real exporters were according to Mrs. Tiittanen (Kuehne + Nagel) concerned their clients would change to suppliers located closer. The situation caused additional work also for Kuehne + Nagel’s export department as they had to turn every stone to find empty containers for their customers. The task was not made easier by ocean shipping lines informing in the last minute that they actually did not have the promised containers available. Mr. Enberg (Maersk) describes how Maersk Finland had to absorb substantial costs from using extra loaders to bring in empty containers from United Kingdom in order not to violate annual

contracts. He further figures the Finnish exporter might have had to pay a higher freight rate, received some penalties if the shipment was delayed and in such cases also storage costs at the port might have arisen. The container situation remains unbalanced so Maersk Finland will have to continue to absorb costs in order not to violate annual contracts. Mr. Enberg (Maersk) says the cost for bringing an empty container from Bremerhaven with a commercial feeder such as Unifeeder costs approximately USD 150 excluding the lift to and from the vessel.

Most of the Finnish imports in 2014 originated in Europe as Figure 16 demonstrates. According to Mr. Enberg (Maersk) some 75 percent of Maersk Finland’s import volumes originate in the Far East. The other trades e.g. the Americas, Europe, Middle East or Africa, are two to ten percent each. Mr. Enberg (Maersk) confirms most of the Russian import to Saint Petersburg are originating also from the Far East. It means whatever happens on the Far East – North Europe trade has a great significance for the Finnish container situation.

Imports by groups of countries in 2014

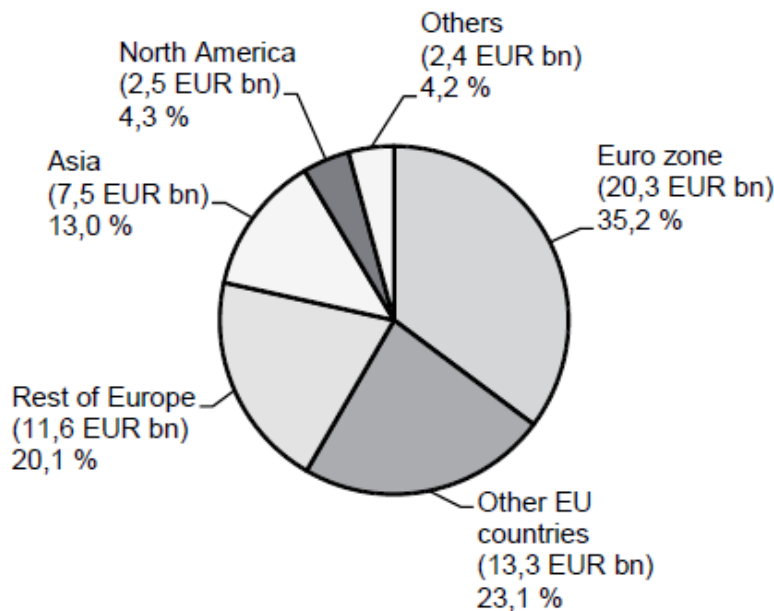
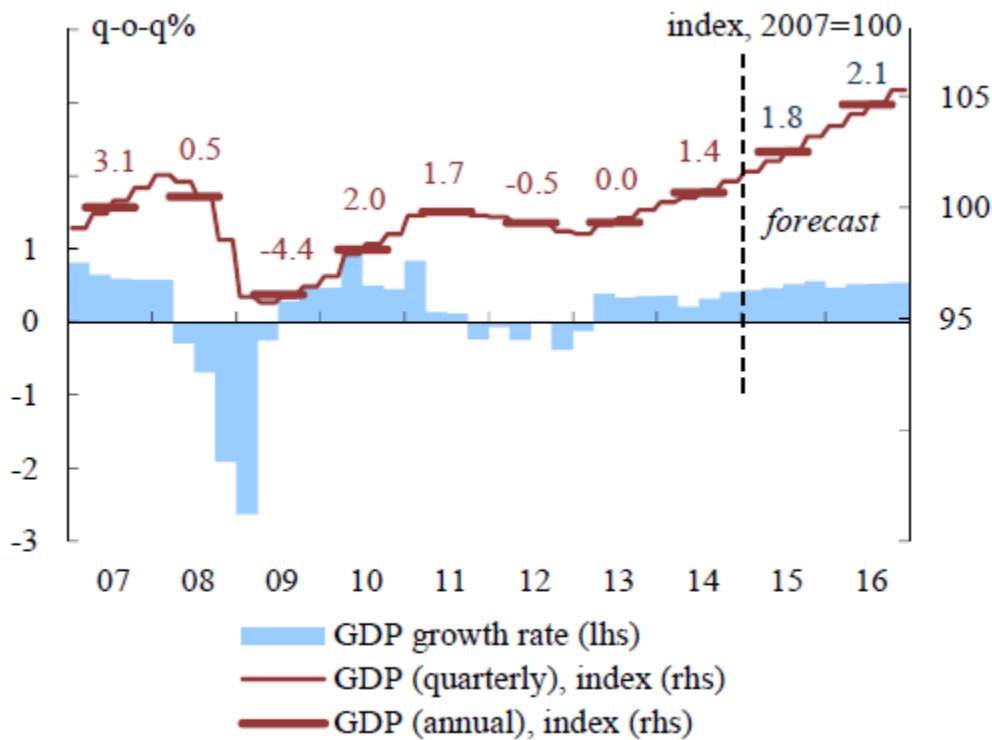


Figure 16. Imports by group of countries to Finland 2014 (Finnish Customs)

3.3 How did the situation emerge?

In chapter two it was argued that the demand for shipping services derives from the global economic growth and from the need to carry international trade. In 2009 the global economy was in the midst of its deepest and most widespread recession in the post-war era. The EU economy was not spared. The intensification of the financial crisis in the autumn of 2008 prompted a global economic downturn which, in turn, further weakened the financial sector. Ambitious policy actions were taken by governments and central banks to prevent a systemic financial meltdown (European Commission 2009 p.1). In 2009 the international seaborne trade volumes contracted by 4,5 percent as Figure 2 (page 9) well illustrates. In spring 2010 recovery was underway in the EU, even if a gradual one. Real GDP started to grow again in the third quarter of 2009 ending the longest and deepest recession in the EU's history (European Commission 2010 p.1). In spring 2011 the economic recovery in the EU continued to make headway, despite persistent volatility and tensions in financial markets and the emergence of new risks that have made the external environment more challenging (European Commission 2011 p.1). After the recession that marked the year 2012, the EU economy stabilized slowly in the course of the first half of 2013 (European Commission 2013 p.1 f). Growth turned positive in a large majority of Member States over the course of 2013 and the outlook improved even in the more vulnerable ones (European Commission 2014 p.1 f). In spring 2015 the outlook for the EU economy looked brighter than it had at any time since the deep economic and financial crisis of 2008-09. The recovery from the crisis and the double-dip recession were long and tiresome, marked by numerous setbacks, but in May 2015 there were clear indications that a cyclical upswing is underway, supported by economic tailwinds. (European Commission 2015 p. 9)

The Far East - Europe container volumes have remained below 2014 volumes from January to April 2015 with a 3,4 percent fall with a drop of 22 percent year on year in March. The bend in February – March is a usual slowdown post-Chinese New Year (Nightingale 2015a). Only three countries in North Europe in April imported more goods from Asia than they did a year ago and these were the very marginal markets of Iceland, Ireland and Hungary (Container Insight 2015a).



Figures above horizontal bars are annual growth rates.

Figure 18. Real GDP, EU (European Commission 2015 p. 9)

The Russian economy and the traffic flow to and from Russia effect greatly also volumes to and from Finland as some of the Russian shipments are shipped thru Finnish ports. (Ministry of Transport and Communications, Transport Policy Department 2014 p. 2&10) Russian economic growth has slowed for three years in a row, due to declining growth in the available labor force, capital and productivity. In addition, a decline in export prices, the Ukraine crisis, US and EU sanctions, Russia's counter-sanctions and increase in uncertainty, slowed Russian GDP growth to just over half a percent in 2014. According to a forecast by the Bank of Finland, Russian GDP will contract by over four percent in 2015. Russian exports should benefit from a recovery in world trade but will increase only very slowly. Energy exports, in particular, which constitute over 60 percent of total export income, will remain relatively unchanged according to estimates by the Russian authorities. The weakness of the ruble may bolster exports of some basic goods as long as there is capacity. Import volumes declined by seven percent in 2014 and have now been in decline for one and a half years. Russian imports is estimated to fall by a fifth in 2015, partly dragged down by the economic contraction. Figure 19 shows how import

volumes declined by 30 percent when GDP fell by eight percent during the recession of 2009. Today the real exchange rate of the ruble has depreciated much more than in 2009: it is a quarter weaker than the average rate for 2014. In 2016–2017, global economic growth and world trade is estimated to pick up, and it is assumed the oil price will rise some. The Russian economy is expected to continue slightly downward, before a slow recovery in 2017. Export volumes will grow at a very subdued pace and imports are expected to recover after 2016. (Bank of Finland 2015)

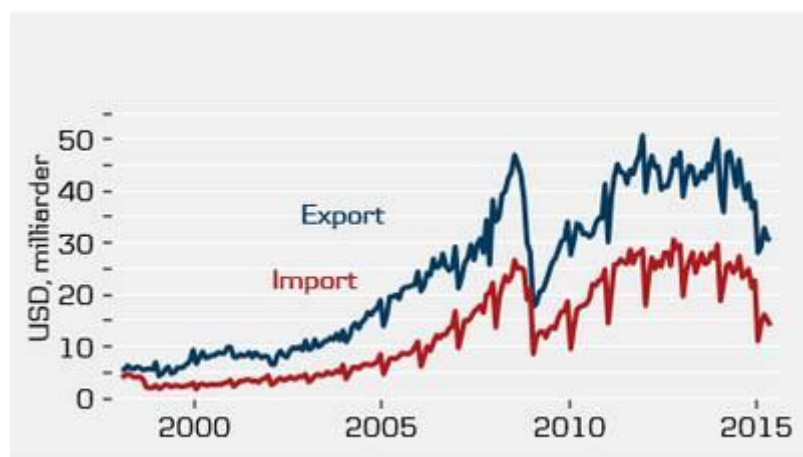


Figure 19. Russia export and import in USD (Andersen 2015)

Container volumes at the Russian national seaports plummeted 20 percent year-over-year between January and April compared to the same period in 2014. Saint Petersburg, which handled nearly half of the country’s maritime container volume, suffered the biggest decline when traffic fell 28.2 percent year-over-year to 431,000 TEUs (Gerden 2015a). The much weakened ruble and the imposition of trade sanctions have heavily impacted on consumer spending in the country. Russia’s main import commodities in 2014 were capital goods such as machinery, electronic equipment, vehicles, clothing, foodstuffs and pharmaceuticals (Gerden 2015a). Russia is not usually considered one of the key markets in the Far East – Europe trade – in 2014 its imports accounted for only six and a half percent of the overall volumes – but since the trade now lost the 50000 TEU or so between January and March the overall results for the first quarter showed no growth for container shipping lines (Container Insight 2015a). Containerization level remains very low in Russia: 42 TEUs per thousand capita in 2013, compared to 135 TEUs in Europe and 90 TEUs world average (Global Ports 2014). There is significant potential for further

containerization in Russian export flows (Global Ports 2014). In a case where Russia's containerized export continues to grow and utilize the containers available from imports there will be no containers available for empty positioning to Finland.

Mr. Mattila (Steveco) and Mrs. Tiittanen (Kuehne + Nagel) talk about the increased Russian container exports as a result of the weak ruble especially commodities like paper, plywood, ferroalloys, metal, fertilizers. As can be seen in Figure 17 the Saint Petersburg full import is over 13 000 TEU less than the export. In 2014 the full export was over 100 000 TEU less than the full import and in 2013 the gap was over 240 000. The past years container shipping lines could cost-effectively move empty containers from Saint Petersburg to Helsinki and HaminaKotka ports to fulfill the Finnish export customers' needs. Today this is not an option as there are no empty containers available in Saint Petersburg (Mattila 2015, Antikainen 2015, Raappana 2015, Enberg 2015). Mr. Mattila (Steveco) further goes on explaining that the Finnish exporters are now in competition with the Russian exporters who might get empty containers from mainland Europe. Chernov writes in his article "Playing with boxes" how the Euro's devaluation against the dollar (20 percent within a short period) boosted exports from Northern Europe and increased the demand for export containers. Finnish and Russian ports are in the end of the container 'queue' them being at the end of a feeder link. This situation causes imminent growth of export freight rates. Porter writes in her article "Russian exporters running on empty" that the annual growth in Russian containerized export was in the end of August some one to two percent but in the summer months the export volumes had seen a surge, with growth levels nearer annual rates of ten to fifteen percent. Porter goes on describing an unforeseen scene where export freights from Russia are higher than import freights to Russia. Mr. Enberg (Maersk) confirms it used to be so that import freights on Far East – North Europe route were three to four times the export freights. In 2015 the Shanghai Containerized Freight Index has seen its lowest ever level and the import and export freight level are almost the same to/from Finland.

Mrs. Tiittanen (Kuehne + Nagel) had been told the container shipping lines had moved a large portion of the empty containers to Far East in the beginning of 2015 in order to fulfill the needs of peaks season exports. However the peak season rush never came at the end of February and so Central Europe saw a lack of export containers in April, May and

Mr. Enberg (Maersk) does not believe the US West Coast port congestion (originating in contract negotiations between dockworkers and port management) had a significant, if any, impact on the container availability in North Europe.

3.4 What can be done to mitigate the problem?

When asking the interviewees how the container shortage problem could be solved most suggested alternative ways of shipping. Mr. Sievers (Port Of HaminaKotka) considers RoRo (=Roll-on/roll-off) or LoLo (=Lift-on/lift-off) shipments. Mr. Mattila (Steveco), Mr. Antikainen (Finnish Transport Agency) converses about moving cargo shipped in containers to break bulk ships (ship designed to carry packaged un-unitized shipments of all shapes, sizes, and weights). The challenge with break bulk ships is the availability of the right kind e.g. with ice classification, the amount delivered at once (25-45 thousand tons), the discharge port, the on-carriage to the final destination and to find some cargo to bring back to Europe. Mrs. Nietola (FFIF) tells how Finnish sawmills have for years played with the idea of shared sailings. This would mean a number of shippers, who cannot necessarily fill a break bulk ship on their own would together charter a break bulk ship to deliver their goods. Mrs. Nietola's (FFIF) personal opinion is that in such a case the cargo should be exported from a limited amount of ports. Mr. Mattila (Steveco), Mrs. Nietola (FFIF) and Mrs. Tiittanen (Kuehne + Nagel) explicates that one solution could be to truck the products to Central-European ports, stuff them into containers there and then ship overseas. The challenge here is to find a cost effective way of doing it as it could easily multiply the loading costs. Mr. Enberg (Maersk) makes plain that the most cost efficient way of shipping is with a container from a Finnish port to a destination port and is a preferred mode of shipment amongst large exporters. Exporters will use other options e.g. break bulk when containers are not available. Some 25 percent of pulp is shipped today from Finland to China with break bulk vessels and paper to Philadelphia has been traditionally shipped break bulk. Mr. Enberg (Maersk) points out that the plan to truck cargo down to European main ports would require that there would be containers available, which was not the case this spring.

Mr. Mattila (Steveco) and Mr. Raappana (Unifeeder) both bring up the empty positioning option: to bring in empty containers from other nearby ports. This is also the solution Mr.

Enberg (Maersk) believes in. Mr. Mattila (Steveco) even suggests to bring an ocean vessel full of empty containers directly from the Far East. According to Mrs. Tiittanen (Kuehne + Nagel) ocean shipping lines brought in empty containers from Central Europe, the United Kingdom, even from the United States and Far East. Mr. Enberg (Maersk) confirms Maersk Finland also moved empty containers from all nearby ports where some were available and had to use extra loaders to bring empty containers from Felixstow in United Kingdom.

One of Mr. Mattila's (Steveco) suggestions is for container shipping lines to open a discussion with main exporters in Finland whether it would be possible to make an agreement where the liner would supply empty containers for a freight rate that would make the extra service interesting for the shipping line. For a shipping line this is a balance between service and costs like Mr. Raappana (Unifeeder) explains: on one hand the container liners strive to offer a good service to customers but on the other hand they must look at the costs linked to the empty positioning such as handling and transshipping at the terminal, empty warehousing while waiting to be repositioned, maritime repositioning and the cost of not being able to use the container. Mr. Enberg (Maersk) agrees with Mr. Raappana (Unifeeder) and speaks about the constant negotiation he has with the customers what is the freight level all parties can operate with.

There is no certain answer when the container situation will be back to normal, if ever. The Bank of Finland forecasts the Russian import to recover after 2016 but at the same time the sanctions are assumed to remain unchanged for a relatively long period. Containerization in Russian export can grow and leave no containers available to be moved empty to Finland.

3.5 What future emerging risks are there?

Mr. Mattila (Steveco) expresses his concern that forestry industry would move their production to other countries as shipping from Finland is deemed demanding or that container shipping lines would find the market too problematic compared with the amount of profit gained that they will stop offering services to and from Finnish ports. Mr. Sievers

(Port Of HaminaKotka) is worried about the overall declining environment in traditional Finnish export product markets.

Mr. Antikainen (Finnish Transport Agency), Mrs. Nietola (FFIF) and Mr. Raappana discuss the future environmental legislation. New legislations such as the European Union's sulphur directive which limits sulphur emissions from commercial shipping to 0,1 percent, in a zone that extends from the English Channel to the Baltic Sea will push the logistics costs up and deteriorate Finnish competitiveness. Mrs. Nietola (FFIF) accepts the possibility of new environmental legislation but feels the new laws should apply all, not only a restricted area like the European Union's sulphur directive. Mr. Raappana (Unifeeder) agrees with Mrs. Nietola (FFIF) and he finds the positive aspect that the new legislations will force the technology to develop faster.

Mrs. Tiittanen (Kuehne + Nagel) mentions stevedores strike as a risk for the Finnish export.

Russia signed in May a \$400 billion energy deal with China, its second-largest trade partner. Chinese government highlights the growing economic cooperation between the two countries. According to Russia's Ministry of Industry and Trade the share of traffic through Far East basin ports will increase from the current 23 percent to between 35 percent and 40 percent by 2020. About 60 percent of Russian container volume flows through Saint Petersburg and other Northwest Basin ports. \$100 million expansion of Russian port of Zarubino should be completed in 2018. Russia is currently investing in the Far East basin ports such as Vladivostok and Vostochny, aiming at transferring parts of the container flow thru those ports instead of the Baltic basin ports e.g. Saint Petersburg or HaminaKotka. Mr. Tonny Lin, Vice General Manager at Ningbo Renfeng International Freight Forwarding Co. Ltd., tells me the transit-time from Ningbo-Vladivostok is approximately ten to twelve days via direct call service. The transit-time from Vladivostok to Moscow by full rail service is about 15-18 days and is subject to the container waiting time at Vladivostok rail station and transshipment customs declaration process. The transit-time from Ningbo to HaminaKotka is approximately 40 days with container shipping lines and the trucking from HaminaKotka to Moscow is three to four days. Thus the route via Far East basin ports is ten to fifteen days faster than via Baltic

basin ports. When asked about the freight level on the two different routes Mr. Lin explains that the freight on the route via Far East basin ports is more stable, it is adjusted only according to rail capacity. Past years the sea freight for cargo shipped via Baltic basin ports have changed monthly if not weekly. The trucking fee from Baltic basin ports to Moscow is stable with the exception of fuel cost. The most cost effective route changes according to the sea freight. Mr. Lin chooses the routing based on the Russian import customer's decision which is based on total transportation cost and the cost for import duty and value added tax. According to Mr. Lin also the customs conditions at Vladivostok, the required transit time and the availability of railcars affect the routing decision. Mr. Lin stresses that the Russian customers in general are mostly interested in the transportation cost and the cost for import duty and value added tax. Some Russian inland locations and cities in Siberia require the use of rail service and in such cases the Far East basin ports are favored. Mr. Lin describes how the Chinese government is pushing the "One Belt, One Road" thinking and the rail links from China to Central Asia, Russia, Poland and Germany.

China first announced the "One Belt, One Road" (OBOR) initiative in 2013. The OBOR has two key modules: New Silk Road Economic Belt that links China and Europe, through Central and Western Asia and Maritime Silk Road that will connect China and Southeast Asian countries, Africa and Europe. Since 2013 China has committed money into the new Asian Infrastructure Investment Bank (AIIB), the New Silk Road Fund (NSRF) and the Shanghai Cooperation Organization (SCO), as well as bilateral arrangements with countries. These investments, loans, and grants will be spread to create a network of infrastructure — including roads and rail lines, energy pipelines, power stations, and coastal ports — that is envisioned to extend west to Europe via the Silk Road Economic Belt, and downwards into Southeast Asia via the Maritime Silk Road. Besides its political objectives, OBOR brings a strategic focus to the government's "go out" initiative, which encourages Chinese firms to go abroad in search of new markets or investment opportunities. The OBOR push is being led from the highest levels of the government, and involvement will run across several ministries. Its initial stated emphasis will be on regional connectivity projects. OBOR will cover nearly two-thirds of the world's population and one-third of global GDP. (The Economist Intelligence Unit 2015)

3.6 Emerging risks in a matrix

Probability/ Consequence	Improbable	Remote	Rare but possible	Occasional, happens now and then	Fairly normal
Catastrophic		II.			
Severe loss					
Major damage				IV.	
Damage			I.		
Minor damage	V.			III.	

Low	Acceptable - only ALARP (as low as reasonably practicable) actions considered
Moderate	Acceptable - use the ALARP principle and consider further analysis
High	Not acceptable - risk reduction required

- I. Forestry industry would move their production to other countries
- II. Container shipping lines would find the market too challenging / unprofitable and stops calls
- III. Future environmental legislation
- IV. Stevedoring strikes
- V. Traffic through Far East basin ports instead of Northwest Basin ports, One Belt One Road initiative

Figure 20. Emerging risks entered into a risk matrix

Mr. Enberg (Maersk) feels the risk of Finnish forestry industry moving production abroad is possible and would cause damage as the export volumes out of Finland would decrease. He feels some ten to twenty percent of the production might move, but points out that the softwood that grows in the Nordics and Canada is required to make long fiber cellulose which in turn is essential to make durable paper and cardboard. Mr. Enberg explains it is unlikely the forest industry would completely re-locate closer to the market since it would mean shipping raw material instead of processed products.

The risk of container shipping lines finding the Finnish market too challenging or unprofitable and retreat is by Mr. Enberg (Maersk) remote and the consequences catastrophic. It would mean the Maersk Finland office would be shut down and an entire shipment option would be lost to the Finnish industry. One of Mr. Enberg's tasks is to negotiate with the shipping line what is a freight level that will keep the shipping line

accepting Finnish cargo onboard. “Let’s say the export freight level from Finland is on a lower level than from Bremerhaven, which is a hub port it would be very challenging to convince the shipping line to accept the Finnish cargo onboard a vessel.” says Mr. Enberg (Maersk). What he is referring to is that all Finnish ports are out ports, served by feeder vessels so the freight from Finland should be higher than from European hub ports especially if the container shipping line has to first empty position the container to Finland.

Future environmental legislation is according to Mr. Enberg (Maersk) occasional or fairly normal and causes minor damage. He feels the legislation is inevitable today’s world and all parties will adapt one way or another.

Mr. Enberg (Maersk) says stevedoring strikes are occasional and causes major damage. The costs of the strikes are dire. If Finland’s foreign export proceeds are distributed evenly throughout the year it’s about 100 million euros a day so that is how much a day’s stevedoring strike could cost.

Traffic through Far East basin ports instead of Northwest Basin ports and the Chinese initiative “One Belt One Road” are by Mr. Enberg (Maersk) improbable to occur and the damage is minor. He is a firm believer in that cargo is like water and will find its natural way passage where costs and resistance is the least. For example the existing rail links between China and Europe do not have the capacity to compete with ocean shipping.

4 DISCUSSION OF FINDINGS

4.1 Introduction

This chapter summarizes the findings of the study and the results to the research questions. Furthermore, it presents recommendations for the various parties involved.

4.2 Summary

(i) Find and analyze reasons to the shortage of containers in Finland

The study found that the availability of export containers in Finland had experienced a great dip in the second quarter 2015. The key reason to the absence of export containers is the decay of import volumes to Russia. Before 2015 Finland enjoyed a steady flow of empty containers from the port of Saint Petersburg to cover the imbalance between export and import. It might be that Russian container flows are going through a revolution which could mean there will no longer be empty containers in Saint Petersburg port to be moved to Finland. In such a situation Finland would go back to the old normal situation from pre 1990's when most of the containers were brought in empty from hub ports in Europe (e.g. Germany). The container shipping industry is going through a trough stage in the shipping cycle (Figure 5 p. 15) when there is surplus of shipping capacity and very low freight rates. The freights are further driven down by the shipping lines themselves competing for market share in a stagnating market. When a big shipping line's market share is low the vessel utilization is low and the slot costs surge. In an industry that is currently driven by cost savings it is not an option that is well looked upon. Another reason for shortage of export containers was that the container shipping lines had at the time moved large amounts of empty containers from European base ports to Far East base ports in order to cater for customer's yearly peak season needs. However in 2015 there was no peak season around the Chinese New Year and so there was a delay before empty containers were available again in European base ports.

(ii) Propose a solution to the situation

Container shipping lines can bring empty containers from other European ports as long as there are containers available in the ports and the freight the Finnish shippers are willing to pay is on a level that is acceptable for shipping lines. Alternatively shippers can truck or ship cargo to European base ports and do the stuffing there assuming there are containers available. For large exporters like the forestry industry there is the alternative of using break bulk vessels given that the correct kind is available. The containerized mode of shipment from a Finnish port to destination port is the most cost effective mode. Changing the supply chain structure is a costly solution. It would require further research

and calculations to find out the exact costs of each mode of transport to be able to compare them.

(iii) Raise awareness of other emerging risks

Five future emerging risks for container shipments to and from Finland were identified:

- Forestry industry would move their production to other countries
- Container shipping lines would find the market too challenging / unprofitable and stops calls
- Future environmental legislation
- Stevedoring strikes
- Traffic through Far East basin ports instead of Northwest Basin ports, One Belt One Road initiative

4.3 Recommendations

The author of the thesis urges shippers in Finland to be aware of the changes in the shipping market. Large exporters have their own transport departments and aim to decrease transportation costs. However, the author finds the shippers should be careful not to push freights so low that the shipping lines find it unattractive to deliver empty containers to Finland and allow laden containers on board ships. Shippers can choose to use the other service provider, as illustrated in Stopford's model (Figure 4, p 15), such as break bulk, RoRo or LoLo. The author deems altering the supply chain as a complicated change management project.

On the other side the author recommends the container shipping lines to actively inform their customers of changing circumstances. In the author's experience customers actually appreciate if the news, even bad ones, are delivered upfront.

The author recommends container lines to bring in empty containers to Finland in order to cater for export customer needs until and if the Russian import volumes return. Figure 17 (p 39) shows how all ports except Hamburg and Bremerhaven are showing a notable decrease of empty containers out which leads to the conclusion that there are not so many empty containers available to be moved to Finland in the other nearby ports. Since

Hamburg and Bremerhaven are two of the main transshipments ports for cargo in and out of Finland it is logical to bring in empty containers to Finland from them. Perhaps satisfactory cost structures can be found thru economies of scale by using larger feeder vessels between Germany and Finland in order to reduce the slot cost like demonstrated in Figure 10 (p 25).

One solution the author finds, to increase available export containers, is to increase import volumes to Finland. The import flow to the Finnish market has been quite stable according to Mr. Enberg and the European Commission's economic forecast do not promise a rapid economic growth that would increase the import volumes. The author recommends that the sales departments of the container shipping lines would purchase or look at the free of charge import statistics to see if there is any cargo that can be shifted from alternative transportation modes to containers. For instance some raw materials that are shipped break bulk or bulk or European cargo that is trucked to Finland today.

Some unprecedented events affecting the export container availability in Finland, have taken place in 2015: Russian export volumes have surpassed the import volumes and the westbound freights on the Far East – North Europe trade have plummeted so that the export and import freights were on level in June. The author recommends the container shipping lines to withdraw capacity and increase the freights. Increased freights would leave more profits and room to include sudden additional charges in the freight without the customer noticing. However, as Notteboom describes container shipping market regularly faces long periods of vessel oversupply and rate erosion and that shipping lines are reluctant to withdraw capacity in case a competitor would gain more from the rate restoration. Maersk Line is investing USD 15 billion in new-buildings, retrofitting, containers and other equipment perhaps aiming at pushing all but the largest carriers out of business. The author remembers discussions about small and medium sized shipping lines exiting the market since the slump in volumes in 2009. Yet only three mergers and acquisitions have taken place among the top 20 carriers in the past ten years.

The Finnish Maritime Administration was in 2010 moved to be a part of the Finnish Transport agency and Finnish Transport Safety Agency Trafi. The author notes that in a country where about 80 percent of the Finnish foreign trade takes place by sea there is no

maritime national board. The European Union's sulphur directive was widely covered by the press in 2012 and it was argued that it should have been stopped. In such situations and the one now at hand with a reduced container flow the author would see it beneficial to have a joint promotion of interests for shipping lines calling Finland. Such an organization could also discuss with the correct parties the unsatisfactory cargo services offered by the state owned Railway Company VR. Currently there is an intense discussion about improving the Finnish competitiveness and the author feels some cost-efficiency could be found through reducing the operating ports and improving the cargo services on rail.

5 CONCLUSION

The aim of this thesis is to find and analyze reasons to the shortage of export containers in Finland. The research gives a detailed insight to the current export container situation in Finland and provides explanation what events led to it. Similar researches where availability of export containers in Finland is discussed have been written, but the author of the thesis could not find any from recent years. For instance "Seaborne container transports in Finland" by Venäläinen is from 2008. Parts of the findings in chapter three were used as background information for a presentation Mr. Enberg (Maersk) delivered at the 19th Helsinki Port and Logistics Day event and for a presentation Mr. Matti Toivanen, MD Kuehne + Nagel Finland held at the local chamber of commerce regarding the container situation. The aim of this thesis is to answer the question "Why so few containers?". The research objectives are:

- (i) find and analyze reasons to the shortage of containers in Finland
- (ii) propose a solution to the situation
- (iii) raise awareness of other emerging risks

The research is an action research where the primary source of information was a series of seven interviews with professionals working in or closely related to the container shipping industry. Secondary sources include online articles, database and books. The theoretical part in chapter two discusses how the market influences the shipping industry and what risk mitigation actions the shipping industry has taken in order to run a successful business.

The main findings were:

- There had been a severe shortage of export containers in Finland in the second quarter 2015, but the situation had improved by September. The main reason was the plummeting Russian imports. A secondary reason was the lack of peak season before and after the Chinese New year.
- The most reliable way to solve the lack of containers is to position empty units to Finland from other nearby ports.
- Five emerging risks were identified. The probability of them happening varies from improbable to occasional and the consequences from minor damage to catastrophic.

The following recommendations for future research directions were identified during the study process:

- The challenges in using break bulk shipments: finding correct ships, changing the sender's and receiver's supply chain, finding cargo westbound
- Which is cost saving? To change the supply chain structure for large exporters like the forestry industry or to pay for the empty positioning of containers to Finland?
- Updating the Finnish state Railroad Company VR's services to match customer's needs.

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APPENDIX 1

Interview details

- Date: 4th June 2015
Location: Maersk Finland office, Helsinki, Finland
Length: 41m58s
Interviewee: Mr. Tapio Mattila, Senior Vice President Marketing and Sales at Steveco
Interviewer: Virve Hyytiäinen
- Date: 2nd June 2015
Mr. Tommi Sievers, Sales and Marketing Manager at Port Of HaminaKotka Ltd
Reply by e-mail
- Date: 10th June 2015
Location: Finnish Transport Agency's office, Helsinki, Finland
Length: 31m32s
Interviewee: Mr. Taneli Antikainen, Senior Transport Economist at the Finnish Transport Agency
Interviewer: Virve Hyytiäinen
- Date: 1st July 2015
Location: Finnish Forest Industries Federation office, Helsinki, Finland
Length: 60m 1s
Interviewee: Mrs. Outi Nietola, Logistics Manager at Finnish Forest Industries Federation
Interviewer: Virve Hyytiäinen
- Date: 28th July 2015
Location: Unifeeder Finland office, Helsinki, Finland
Length: 10m 47s
- Interviewee: Mr. Janne Raappana, General Manager of Sales for Finland and Baltics at Unifeeder A/S
Interviewer: Virve Hyytiäinen
- Date: 19th August 2015
Location: Kuehne + Nagel office, Helsinki, Finland
Length: 41m58s
Interviewee: Mrs. Reetta Tiittanen, Sea freight Manager at Kuehne + Nagel Finland
Interviewer: Virve Hyytiäinen
- Date: 8th September 2015
Location: Maersk Finland office, Helsinki, Finland
Length: 45m 09s
Interviewee: Mr. Michael Enberg, Managing Director at Maersk Finland Oy
Interviewer: Virve Hyytiäinen