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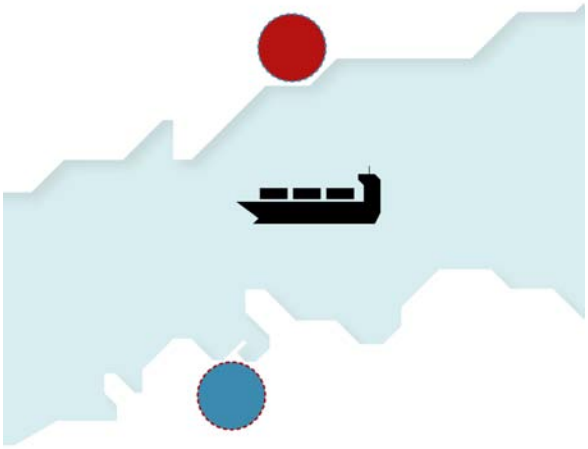

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H-TTransPlan

EUROPEAN UNION
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CENTRAL BALTIC
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FOREWORD

It is broadly accepted that the metropolitan regions generate wealth and well-being which have a positive effect on the whole country. A question is that could Helsinki and Tallinn together be stronger than alone. This report is made as a part of the Helsinki-Tallinn Transport and Planning Scenarios project, also called H-TTransPlan, which is an ERDF project funded by Southern Finland-Estonia sub-programme of INTERREG IV A 2007–2013 Programme. The H-TTransPlan project studies development needs of the Helsinki-Tallinn region in the viewpoint of logistics and regional planning. The project includes a mobility study focusing on mobility of people and goods in the region.

During last decades there has been constant growth in cargo volumes between Helsinki and Tallinn. In this study the Helsinki-Tallinn cargo route is examined comprehensively for the first time using statistical analysis and interviews in order to reveal the importance of the route for the Finnish and Estonian foreign trade. This report handles the mobility of goods and it provides analysis of transport and cargo flows for regional and local planners. It gives an analysis on the present cargo flows on the Helsinki-Tallinn route, the current volume and structure of the flows and estimations how the cargo flows will develop in the future and the determinants behind the flows. Special interest is put on the hinterland flows, in other words in the cargo flows between Finland and other countries than Estonia using the Helsinki-Tallinn route.

The report is made by research experts Pekka Sundberg and Antti Posti supervised by professor Ulla Tapaninen. Writers are working in the Maritime Logistics Research unit of the Centre for Maritime Studies, University of Turku. The unit is part of the Merikotka Research Centre in Kotka. The Centre for Maritime Studies (CMS) of the University of Turku expresses its gratitude to all those who took part in the interviews. The CMS also would like to thank Johanna Yliskylä-Peuralahti and Reima Helminen for reviewing the report and other parties who have contributed to the drawing up of this report.

Kotka 10th October, 2011

Ulla Tapaninen
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ABSTRACT

The twin-city model has found to increase economical activity and well-being. The similar economical, social and cultural background of Finland and Estonia as well as the EU integration give good preconditions to create a twin-city of Helsinki and Tallinn. The relatively long distance between Helsinki and Tallinn is challenging. Therefore, good transport infrastructure and functioning connections are required to form a twin-city of Helsinki and Tallinn. The connections between these cities can be considered also in broader perspective than only from the viewpoint of the twin-city concept. New markets areas have been emerged in Europe due to collapse of planned economy and integration of Europe. Also the transport routes to the markets are changing. The Helsinki-Tallinn sea route can be considered as a fast route to the new markets in the Central and Eastern Europe. The Helsinki-Tallinn sea route is also a potential route to the Western European markets.

This study provides an analysis of transport and cargo flows between Finland and Estonia for regional and local planners. The main purpose of the study is to clarify the present situation of the seaborne cargo flows on the Helsinki-Tallinn route and how the cargo flows will develop in the future. The study focuses on the following thematic entities: the Finnish and Estonian seaborne transport system and cargo flows, the structure and volume of the cargo flows on the Helsinki-Tallinn route, the hinterland cargo flows on the Helsinki-Tallinn route and the transport methods used on the Helsinki-Tallinn route. The study was carried out as a desk research, a statistical analysis and an interview study during the spring–autumn 2011.

The study reveals that during the period 2002–2010 the volume of the seaborne cargo traffic between Finland and Estonia has increased significantly while the trend of the trade volume between Finland and Estonia has remained nearly constant. This indicates that the route via Estonia is increasingly used in the Finnish foreign trade. Because the ports of Helsinki and Tallinn are the main ports in the cargo traffic between Finland and Estonia, the role of the Helsinki-Tallinn route as a sea leg in the hinterland connections of Finland has increased. The growth of the cargo volume on the Helsinki-Tallinn route was estimated to continue on the annual level of 10 % during the next couple of years. In the long run the growth of the cargo volumes depends on the economical and industrial development of the former Eastern European countries. If the IMO's sulphur regulations will come in force, the Helsinki-Tallinn route will become one of the main routes also to the Western European markets, besides of the route via Sweden.

The study also shows that the fast and reliable connections year round on the Helsinki-Tallinn route have made it possible for service and logistics companies to reconsider their logistics strategies in a new way in the both side of the Gulf of Finland. Anyway, the ropax concept is seen as the only economical profitable solution on the Helsinki-Tallinn route because cargo and passenger traffic are supporting each other. The trucks (vehicle combinations) will remain the main mode of transport on the Helsinki-Tallinn route because general cargo is the main commodity on the route. IMO's sulphur regulations and the changes in the structure of the Finnish industry may create prerequisites for rail road transport in the hinterland connections of Finland.

TIIVISTELMÄ

Kaksoiskaupunkimallin on todettu lisäävän taloudellista toimintaa ja hyvinvointia. Viron ja Suomen samankaltainen taloudellinen, sosiaalinen ja kulttuurinen tausta sekä EU:n integraatio muodostavat hyvät edellytykset Helsingin ja Tallinnan kaksoiskaupungin luomiseen. Helsingin ja Tallinnan välillä on suhteellisen pitkä etäisyys, minkä takia kaksoiskaupungin muodostaminen edellyttää hyvää liikenneinfrastruktuuria ja toimivia yhteyksiä. Helsingin ja Tallinnan välisiä yhteyksiä on tarkasteltava myös laajemmasta kuin ainoastaan kaksoiskaupungin näkökulmasta. Suunnitelmatalouden romahtamisen ja EU:n integraation myötä Eurooppaan on syntynyt uusia markkina-alueita. Myös kuljetusreitit markkinoille ovat muuttumassa. Helsingin ja Tallinnan välinen merireitti on nopea reitti Keski- ja Itä-Euroopan uusille markkinoille. Se on myös potentiaalinen reitti Länsi-Euroopan markkinoille.

Tämä tutkimus tarjoaa alue- ja kaupunkisuunnittelijoiden työn tueksi kuljetusvirta-analyysin Suomen ja Viron välisistä tavarankuljetuksista. Tutkimuksen tarkoituksena on selvittää Helsingin ja Tallinnan välisen reitin merikuljetusvirtojen nykyistä tilannetta ja tulevaisuuden kehitysnäkymiä. Tutkimus keskittyy seuraaviin aihekokonaisuuksiin: Suomen ja Viron välinen kuljetusjärjestelmä ja tavarankuljetusvirrat, Helsingin ja Tallinnan välisen reitin tavaravirtojen rakenne ja määrä, Helsingin ja Tallinnan välisen reitin takamaan tavaravirrat sekä Helsingin ja Tallinnan välisellä reitillä käytettävät kuljetustavat. Tutkimus on toteutettu kirjoituspöytätutkimuksena, tilastoanalyysinä ja haastattelututkimuksena vuoden 2011 kevään ja syksyn välisenä aikana.

Tutkimuksen tulokset osoittavat, että vuosien 2002–2010 välisenä aikana meritse tapahtuvan Suomen ja Viron välisen tavaraliikenteen määrä on kasvanut merkittävästi, kun taas maiden välisen ulkomaankaupan määrän trendi on säilynyt lähes muuttumattomana. Tämä tarkoittaa sitä, että Viron kautta kulkevaa reittiä käytetään kasvavassa määrin Suomen ulkomaankaupan kuljetuksissa. Koska Helsinki ja Tallinna ovat Suomen ja Viron välisen tavaraliikenteen pääsatamat, kaupunkien välisen reitin rooli Suomen takamaayhteyksien meriosuutena on kasvanut. Tutkimuksessa haastatellut asiantuntijat arvioivat Helsingin ja Tallinnan välisen reitin tavaraliikenteen kasvun jatkuvan 10 % vuositasolla seuraavan pari vuoden ajan. Pitkällä aikavälillä tavaramäärien kasvu riippuu entisten Itä-Euroopan maiden talouden ja teollisuuden kehityksestä. Jos IMO:n rikkipäästöpäätös astuu voimaan, Helsingin ja Tallinnan välisestä reitistä tulee asiantuntijoiden mukaan yksi pääreiteistä myös Länsi-Euroopan markkinoille Ruotsin kautta kulkevan reitin ohella.

Tutkimuksen mukaan Helsingin ja Tallinnan välisen reitin nopeat ja luotettavat ympärivuotiset yhteydet ovat tehneet palvelu- ja logistiikkayrityksille mahdolliseksi pohtia logistiikkastrategioitaan uudella tavalla molemmin puolin Suomenlahtea. Rahdin ja matkustajat yhdistävä ropax-konsepti nähdään kuitenkin ainoana taloudellisesti kannattavana ratkaisuna Helsingin ja Tallinnan välisellä reitillä, sillä tavara- ja matkustajaliikenne tukevat toinen toisiaan. Koska suurin osa reitillä kuljetettavasta rahdista on kappaletavaraa, rekka-autot säilyttävät asiantuntijoiden mukaan asemansa pääasiallisena kuljetusmuotona reitillä. IMO:n rikkipäästöpäätös ja Suomen teollisuuden rakenteen muutokset saattavat luoda edellytyksiä Suomen takamaayhteyksien rautatiekuljetuksille.

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LIST OF TERMS

Block train	A railway train in which all the wagons contain the goods of one customer, and are shipped from the same origin to the same destination, without being split up or stored en route. Synonym of full train.
Container	A standardized reusable steel box used for storage and movement of materials and products. The container can be moved from one mode of transport to another without unloading and reloading. Container capacity is often expressed in twenty-foot equivalent units (TEU) which is a unit of capacity equal to one standard 20 × 8 ft (6.10 × 2.44 m) (length × width) container.
Full trailer	The US term for a freight trailer supported by front and rear axles.
Full trailer load	A large consignment or several combined consignments in a trailer, which is transported from door to door.
Full train	See block train.
General cargo	All cargo transported in containers, trailers, trucks, rail wagons and other transport vehicles by type cannot be specified. These loads in the statistics are classified as "general cargo". Consumer goods, food supplies and machines are typical examples of general cargo. Also paper and sawn wood can be classified as “general cargo”, if they have not categorised in their own commodity groups.
Huckepack	A transportation arrangement in which truck trailers with their loads are moved by train to a destination.
IMO	The International Maritime Organization. IMO is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships.
Intermodal transportation	The movement of goods in one and the same loading unit or road vehicle, using successively two or more modes of transport without handling the goods themselves in changing modes.
Lorry	A vehicle manufactured for the transport of goods. Gross weight in excess of 3,500 kg.

MAFI trailer	A type of roll trailer used for moving containers onto roll-on/roll-off ferries.
Northeast Passage	The Northern sea route between Europe and Asia.
Partial trailer load	A consignment that fills only a part of the whole cargo space of a trailer.
Rail Baltica	One of the priority projects of the European Union's Trans-European Transport Networks (TEN-T). The project aims to link Finland, the Baltic States and Poland and also improve the connection between Central and Eastern Europe and Germany by creating a continuous rail link from Tallinn (Estonia), to Warsaw (Poland), going via Riga of Latvia and Kaunas of Lithuania.
Ro-Ro vessel	A vessel type that is designed to carry wheeled cargo (e.g. automobiles, trucks, semi-trailer trucks, trailers and railroad cars). Ro-Ro (roll on/roll off) cargoes are driven on and off the vessels on their own wheels.
Ropax vessel	A vessel type that is designed to carry both Ro-Ro cargo and passengers.
SECA	Sulphur Emission Control Areas. In the SECA-area certtain IMO-regulations concerning the limits the sulphur content of marine fuel oil must be obeyed. The SECA-area includes the Baltic Sea, the Nort Sea and the English Channel.
Semi-trailer	A trailer without a front axle. A semi-trailer is normally equipped with legs, called "landing gear", which can be lowered to support it when it is uncoupled.
TEU	Twenty foot Equivalent Unit. It is a standard unit for counting containers of various capacities and for describing the capacities of container ships or terminals. One 20 foot ISO container equals 1 TEU.
Trailer	A motorless wheeled vehicle used as a cargo space and towed by a tractor unit.
Trailer lorry	A vehicle combination with a tractor unit and a semi-trailer.

Transit traffic	Transporting goods between two states through the territory of a third state. Transit goods are not purchased to the transit country or cleared in the transit country's customs and they do not appear in the foreign trade statistics of the transit country.
Transport hub	A place where passengers and cargo are exchanged between vehicles or between transport modes. Public transport hubs include train stations, rapid transit stations, bus stops, tram stop, airports and ferry slips. Freight hubs include classification yards, seaports and truck terminals, or combinations of these. Transport hub is also called transport interchange.
Tractor unit	A heavy-duty road vehicle. The tractor unit serves as a method of moving trailers (most often semi-trailers).
Traffic Separation Scheme (TSS)	A traffic-management route-system, where the traffic-lanes indicate the general direction of the ships in that zone; ships navigating within a TSS all sail in the same direction or they cross the lane in an angle as close to 90 degrees as possible.
Unitised cargo	Cargo transported by vessels in large units such as containers, trailers, mafi trailers and rail wagons.
Via Baltica	E-road (European route E 67) running from Estonia's capital Tallinn to Poland's capital Warsaw passing through Latvia and Lithuania.

1 INTRODUCTION

1.1 Background

It is broadly accepted that the metropolitan regions generate wealth and well-being which have a positive effect on the whole country. Metropolitan regions have also an important role when the competitiveness and infrastructure are being developed in the whole Baltic Sea Area. When the Gulf of Finland region is analysed, it can be noted that St. Petersburg is the main node in the area but it has not yet become the driving force of the whole area. To enforce the importance of the Gulf of Finland focus must also be put on the other nodes in the area, namely Helsinki and Tallinn. Because of the similar economical, social and cultural background and due to the EU integration, there are good preconditions to increase the border-crossing cooperation between Helsinki and Tallinn. The most intensive mode of cooperation is to create a twin-city.

There are many examples around the world where the twin-city model has increased economical activity and well-being. Finland and Estonia are relatively small nations. Both countries have quite strong and large metropolitan area compared to the size of the nation. Strengthening of the metropolitan areas inside the nations might cause regional conflicts, which can be avoided by using cross-border twin-city model.

When considering Helsinki and Tallinn as a potential twin-city, one key issue is the distance between these two metropolitan areas, especially when the distance is reviewed using the time concept. Maritime transport is the only direct surface transport mode between Finland and Estonia. Although ferry connections are fast, seaborne transport cannot compete with road or even with rail transport in speed. Good transport infrastructure and functioning connections can be seen as a precondition for a twin-city. This report describes these preconditions from the viewpoint of cargo transport.

The Helsinki-Tallinn sea route has to be considered also in broader perspective than only from the viewpoint of the twin-city concept. New markets have been emerged due to collapse of planned economy and integration of Europe. Also the routes to the markets are changing. The Helsinki-Tallinn sea route can be considered as a fast route to the new markets in the Central and Eastern Europe. The Helsinki-Tallinn route might be also an important route to the traditional Finnish markets in Western Europe if logistical cost of seaborne transport will become more expensive due to the environmental restrictions. When transport routes are considered in general, it must also be noted that the industrial structure of Finland has changed but transport needs remain. For example, if the Finnish mining cluster will develop according to the expectations, large transport volumes might emerge.

There are not comprehensive studies related to the Helsinki-Tallinn cargo route. Cargo flow studies in the Gulf of Finland have been focused on the east-west traffic to/from Russian ports because of the importance of Russian foreign trade. There are a lot of studies of port development in Vuosaari (Helsinki) and in Muuga (Tallinn) but the focus of these studies has not been on the Helsinki-Tallinn route. In this study the Helsinki-Tallinn cargo route is examined comprehensively for the first time using statistical

analysis and interviews in order to reveal the importance of the route for the Finnish and Estonian foreign trade.

This study is made as a part of the Helsinki-Tallinn Transport and Planning Scenarios project, also called H-TTransPlan, which is an ERDF project funded by Southern Finland-Estonia sub-programme of INTERREG IV A 2007–2013 Programme. The H-TTransPlan project studies development needs of the Helsinki-Tallinn region in the viewpoint of logistics and regional planning. The project includes a mobility study which aims to produce information of mobility of people and goods in the region. This report handles the mobility of goods.

The publication reflects the views of the authors. The Managing Authority of the INTERREG Central Baltic IV A Programme cannot be held liable for the information published in this report.

1.2 Purpose of the study

This study provides an analysis of transport and cargo flows between Finland and Estonia for regional and local planners. The results of the study will be used in the H-TTransplan project to create 2–3 scenarios on the most feasible transport systems and modes of transport between the twin cities of Helsinki and Tallinn in order to increase the competitiveness of the twin-city region. The report can be used as a source of information on cargo transport in the other phases of the project as well.

The main purpose of the study is to clarify the present situation of the seaborne cargo flows on the Helsinki-Tallinn route and how the cargo flows will develop in the future. The study focuses on the following thematic entities:

- What is the structure of the Finnish and Estonian seaborne transport system and cargo flows?
- What is the structure and volume of the cargo flows on the Helsinki-Tallinn route? The hinterland cargo flows, in the other words the cargo flows between Finland and third countries (other countries than Estonia) transported through the Helsinki-Tallinn route are of particular interest.
- How the volume and structure of the cargo flows on the Helsinki-Tallinn route will develop in the future and what are the determinants behind the present and future transport flows?
- What are the methods of transport and cargo handling on the Helsinki-Tallinn route and how they will develop in the future? This includes also the bottlenecks of the route associated with the different transport methods.
- Flows and transport methods on the Helsinki-Tallinn route are also engaged of the question how Rail Baltica railway connection is seen as an alternative land transport solution in hinterland traffic?

The study is concentrated on unitised cargo on the Helsinki-Tallinn route. In this study unitised cargo means cargo transported by vessels in large units such as containers, trailers, mafi trailers and rail wagons. Most of the cargo between Helsinki and Tallinn is

transported as Ro-Ro traffic. Ro-Ro cargo is wheeled cargo such as trucks and trailers that are driven on and off the vessel on their own wheels.

1.3 Methodology of the study

The study was carried out as a desk research, a statistical analysis and an interview study. The purpose of the *desk research* was to make a review of the Finnish and Estonian maritime transport and ports as well as the Helsinki-Tallinn sea route and related ports. The desk research was mainly based on electronic sources (e.g. the websites of the ports of Helsinki and Tallinn) but also some other literature and statistics were used in the review. The aim of *statistical analysis* was to clarify how the foreign trade and seaborne cargo traffic volumes between Finland and Estonia and especially on the Helsinki-Tallinn route have been developed in the 1990s and in the first decade of 2000s. In addition, the statistics on foreign trade and maritime cargo were compared in order to find out the importance of hinterland connections in the traffic between Finland and Estonia. Statistical analysis was mainly based on the statistics of the Finnish Transport Agency and the Finnish Customs. The methodology of statistical analysis is described in detail in the chapter 3.

The interview study was made to complement the picture obtained in the desk research and the statistical analysis. The interview study in the form of semi-structural and thematic interviews was conducted in the Helsinki metropolitan region in the spring 2011. The interviews were restricted to shipping companies carrying cargo on the Helsinki-Tallinn route. In addition, one transport and logistics company was also included in the study. Altogether four companies and six persons were interviewed (Appendix 1). Results of the interviews were gathered together and organised by themes. The themes of the interviews are presented in Appendix 2.

1.4 Limitations of the study

There are some limitations concerning the use of the statistical data of Finnish-Estonian trade and cargo flows and interpretation of the results gained from the statistical analysis. The statistics of produced by the Finnish Transport Agency and the Finnish Customs differ from one another concerning the methods of data acquisition and classifications of goods. The main difference is related to cargo weight: the Finnish Transport Agency uses gross weight and the Finnish Customs net weight. For example the weight of pallets and transport packages are included in the gross weight but not in the net weight. However, the weight of empty transport equipment (e.g. container, trailer) is not included in gross weight. Also the classification of goods differs. When considering the sea transport statistics, the Finnish transport agency is using the classification, which is based on general classification for transport called NST/R (Standard goods classification transport statistics). However, the classification has been modified to respond the requirements of seaborne cargo transport (Finnish Transport Agency, 2011a). The Finnish Customs, in turn, has several different classifications for the compilation of foreign

trade statistics. In this study a SITC classification (the Standard International Trade Classification) is used.

Due to the differences in the Finnish Customs' trade and the Finnish Transport Agency's transport statistics, the comparison of the statistics gives only indicative results. Due to the differences in the Finnish Customs' trade and the Finnish Transport Agency's transport statistics, the comparison of the statistics gives only indicative results and the results must be read cautiously

There are also some minor shortages concerning the statistics used in this study. Firstly, there is not official statistical data on number of vans and on cargo transported in vans on the Helsinki-Tallinn route. Vans are included in cars and only number of cars is published in the statistics provided by the Finnish Transport Agency. Secondly, some goods, such as laundry, transported in the foreign cargo traffic are not considered as foreign trade in the statistics of the Finnish Customs. The amount of laundry can be estimated in the intra-EU trade but the statistics include only the data from the large companies, which are obliged to submit an Intrastat declaration. Commodity code 60 in the Intrastat system (Goods sent for or returned after repair) includes laundry. For example in the year 2010, the total amount of the goods included in the commodity code 60 was in export from Finland to Estonia 320 tonnes and in import from Estonia to Finland only 34 tonnes according to the preliminary data of the Finnish Customs (Pohjansaari, 2011).

The interviews conducted as a part of the study were restricted to shipping companies carrying cargo on the Helsinki-Tallinn route. All the shipping companies carrying cargo on the Helsinki-Tallinn route were interviewed in the study. The number of shipping companies is limited on the route but the interviews were made comprehensively. In addition, a representative of an international transport and logistics company was interviewed in order to get more precise information about the hinterland traffic and the structure of goods transported on the route. To get a more precise picture of the hinterland flows, a survey among the lorry drivers should have been done in order to get information on destinations and commodities transported in specific lorry.

1.5 Structure of the report

The structure of the report is as follows. In the chapter 2 Finnish and Estonian maritime transport industry and ports are described. Above all the ports of Helsinki and Tallinn are in the focus. Statistical analysis of trade and maritime cargo traffic between Finland and Estonia is provided in the chapter 3. Special attention is paid on comparison of trade and transport statistics. Almost all unitised cargo between Finland and Estonia are transported via the Helsinki-Tallinn route. Therefore, statistical analysis of the route is included in this chapter. The results of the expert interviews are presented in chapter 4. In the end of the report conclusions are described.

2 RESULTS OF THE DESK RESEARCH

2.1 Finnish maritime transport and ports

Finland is very dependent on maritime transportation. Over 80 % of Finnish foreign trade is transported by sea (Finnish Customs, 2011a). The amount of the Finnish seaborne foreign cargo traffic including transit cargo has almost tripled from 33 million to 93 million tonnes over the period of 40 years, from 1970 to 2010 (Figure 2.1). The highest figures of cargo flows have so far been recorded in the years 2007 and 2008 when about 102 million tonnes of foreign cargo traffic was handled in Finnish ports annually. In 2009, Finland's foreign seaborne traffic fell by nearly 20 million tonnes mainly due to global recession. In 2010, the cargo traffic volume started to grow again and by the end of the year the total volume of cargo handled in the Finnish ports amounted to 93 million tonnes. The development of Finnish own import and export sea transportations (transit cargoes excluded) has been quite similar over the viewed period. However, the amount of import has been almost every year larger than the amount of export. In the top year 2007, Finnish seaborne import amounted to 54 million tonnes and seaborne export to 41 million tonnes. The global recession had a bigger effect on import volumes than export volumes – the import fell by almost 11 million tonnes and export approximately 7 million tonnes in the year 2009 compared to the previous year. In 2010, both import and export was returned to growth (Finnish Transport Agency, 2011a).

The annual share of transit traffic of the total international seaborne cargo volumes in the Finnish ports has varied between 2–9 % over the period 1978–2010. In the year 2010, the corresponding figure was around 8 %. The amount of seaborne transit traffic has grown steadily in the viewed period: seaborne transit amounted to over 2 million tonnes in 1980, over 5 million tonnes in 1990 and totalled 8.4 million tonnes in the top year 2008. Mainly due to global recession, transit traffic via Finland decreased by over 2 million tonnes in the year 2009 compared to the previous year. In 2010, the transit traffic returned to growth and by the end of the year approximately 7.4 million tonnes of transit goods were handled in the Finnish ports (Finnish Transport Agency, 2011a). Finland has been the main route for transporting high-value goods from the European Union to Russia (Lautso et al., 2005). For example in the year 2008, the total value of eastbound transit through Finland was about 31 billion euros amounting up to 15 % of the total value of Russian import (Finnish Customs, 2009; Federal customs service, 2009). Even though the share of transit traffic from total international seaborne cargo volumes in Finnish ports is much smaller than, for example, the equivalent share in Estonia (see chapter 2.2), the transit traffic has a significant role for Finland. It is estimated that in the top year in 2007, the economic revenues of the transit traffic in Finland were about 380 million euros while the expenses were only about 30 million euros. The employment impact of transit traffic was estimated to be up to 3,000 man-years (Ministry of Transport and Communications Finland, 2010).

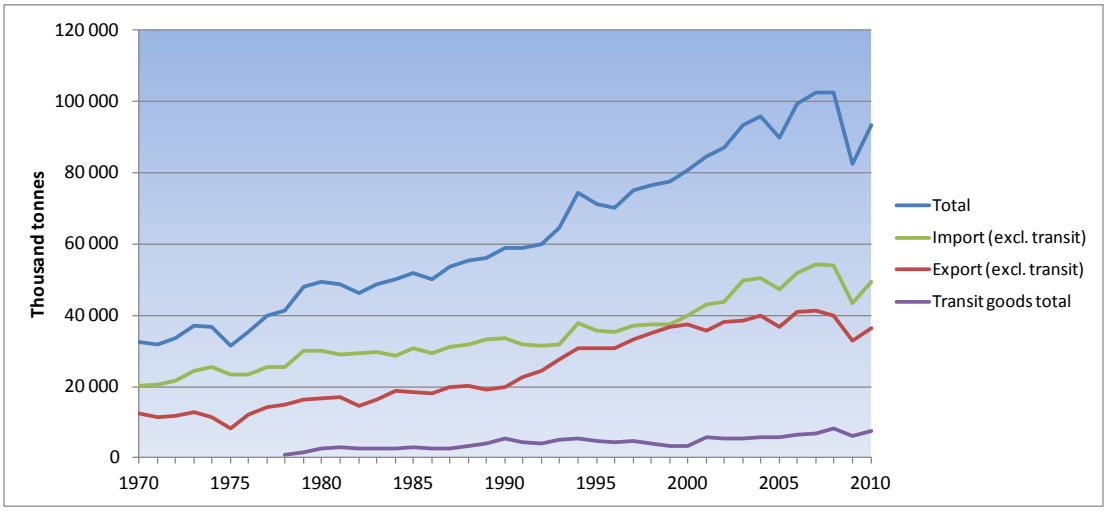


Figure 2.1. Finnish international seaborne cargo traffic in the years 1970–2010. (Finnish Transport Agency, 2011a)

Figure 2.2 presents the development of unitised cargo transports in Finnish international seaborne traffic in 1993–2010. The amount of unitised cargo has over doubled from 10.3 to 22.5 million tonnes during the viewed period. Especially, the volumes of trucks and containers have increased. In turn, the volume of rail wagons has decreased. The top year for unitised cargo has so far been the year 2007 when over 26 million tonnes of international unitised cargo was transported through Finnish ports. Mainly because of the global recession, the unitised cargo volume fell by almost 6 million tonnes in the year 2009 compared to the year 2008. In 2010, the unitised cargo traffic was returned to growth and by the end of the year approximately 22.5 million tonnes of unitised cargo was handled in the Finnish ports. The annual share of unitised cargo from the total Finnish international seaborne cargo traffic has varied between 16 and 26 % in the period 1993–2010 (Finnish Transport Agency, 2011b).

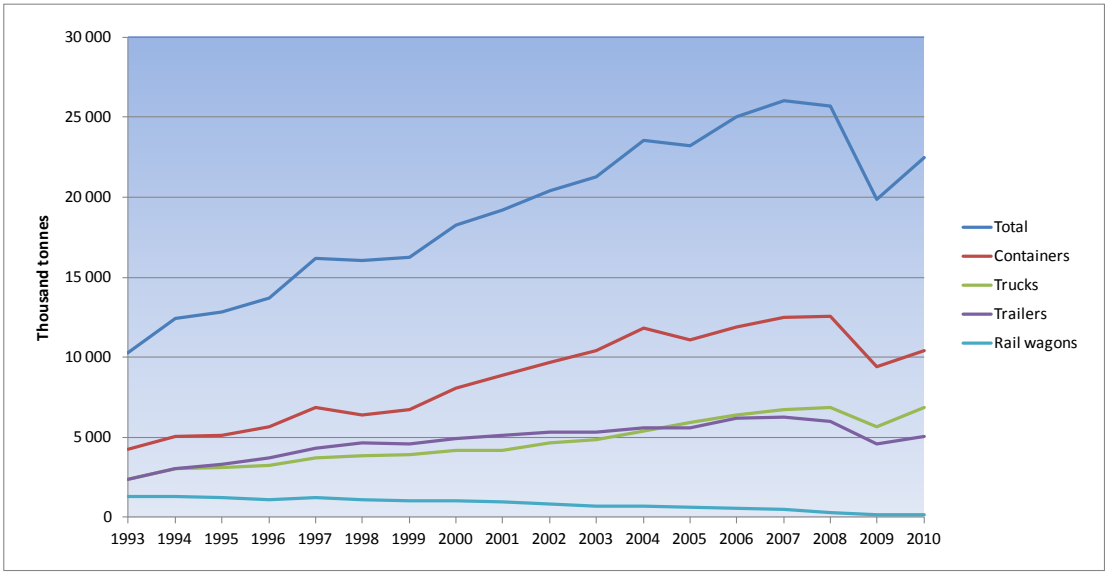


Figure 2.2. Unitised cargo volumes in the Finnish international seaborne cargo traffic in the years 1993–2010. (Finnish Transport Agency, 2011b)

Majority of the international cargo traffic handled in the Finnish ports in the year 2010 consists of general cargo (Table 2.1). Crude oil, oil products, ores and concentrates, and paper and paperboard are the other main groups of cargo imported via the Finnish ports. These commodity groups altogether amounted to around 57 % of the total cargo turn-over in the Finnish ports in the year 2010. The main part of exports consisted of paper and paperboard, oil products and general cargo, and the most imported cargoes were crude oil, general cargo and coal and coke. Transit traffic via Finnish ports was mainly comprised of westbound transit of ores and concentrates and chemicals, and of east-bound transit of general cargo and metals and metal products (Finnish Transport Agency, 2011a).

Table 2.1. Cargo transported through Finnish ports by commodity groups in 2010, thousand tonnes. (Finnish Transport Agency, 2011a)

Commodity group	Import (excl. transit)	Export (excl. transit)	Transit goods	Total
General cargo	6,638	5,656	1,708	14,002
Crude oil	10,341	0	0	10,341
Oil products	3,071	6,760	68	9,899
Ores and concentrates	5,943	1,410	2,510	9,863
Paper and paperboard	217	8,349	294	8,860
Crude minerals and cement	5,396	951	272	6,619
Coal and coke	6,362	3	0	6,366
Chemicals	2,786	1,750	1,730	6,266
Metals and metal manufactures	1,368	2,987	437	4,792
Timber	3,928	412	2	4,342
Other merchandise	2,560	1,191	58	3,808
Sawn wood	31	2,999	45	3,074
Wood pulp	421	2,109	40	2,569
Fertilizers	234	790	232	1,257
Cereals	77	689	0	766
Veneers and plywood	60	382	7	449
Total	**49,434**	**36,437**	**7,403**	**93,274**

In the year 2010, around 72 % of the Finnish seaborne international transports were originated from or destinated to EU countries, 19 % from/to other European countries, 4 % from/to United States and Canada, 3 % from/to Asia, 1 % from/to Africa, 0.5 % from/to Central and South America, and 0.5 % from/to Australia and other countries. The main trade partners for Finland measured by international seaborne cargo volumes were Sweden, Germany and Russia whose share of the total cargo volumes was almost 50 %. Large volumes of cargo were also transported with Netherlands, Estonia, Belgium, Britain, Lithuania, Norway and Poland. Main part of the imports originated from Russia, Sweden and Germany were the Finland's biggest partners, whereas in exports Germany, Sweden and Netherlands were Finland's biggest partners (Table 2.2) (Finnish Transport Agency, 2011a). It should be kept in mind that the figures shown in the table below do not reflect the foreign trade of Finland in total. Instead the figures indicate the amount of seaborne cargo transported via the Finnish ports. As an example, Germany is

an important transit country for the Finnish exports and a significant amount of cargo transported from Finland to Germany continues to other Western European countries by road or to Asia by sea.

Table 2.2. The 10 most important countries in Finnish seaborne international import and export in the year 2010. (Finnish Transport Agency, 2011a)

Import, countries	**Th. tonnes**	**Share (%)**	***Export, countries***	**Th. tonnes**	**Share (%)**
Russia	14,372	27.9	Germany	8,853	21.2
Sweden	9,300	18.1	Sweden	6,745	16.1
Germany	5,773	11.2	Netherlands	4,700	11.2
Latvia	3,237	6.3	Britain	3,189	7.6
Netherlands	3,204	6.2	Belgium	3,013	7.2
Estonia	3,063	5.9	Estonia	2,632	6.3
Norway	2,488	4.8	China	1,808	4.3
Belgium	1,949	3.8	United States	1,465	3.5
Poland	1,167	2.3	Poland	1,350	3.2
Britain	1,126	2.2	Denmark	1,155	2.8
Total (incl. others)	**51,488**	**100**	**Total (incl. others)**	**41,786**	**100**

When the unitised cargo volumes in Finnish ports in 2010 are viewed, it can be seen that around 39 % of the Finnish seaborne international unitised cargo traffic was originated from or destinated to Germany, 21 % from/to Sweden, 12 % from/to Estonia, 11 % from/to Belgium and 10 % from/to Netherlands. These countries altogether amounted to 92 % of the total Finnish seaborne unitised cargo traffic. In import Germany, Sweden and Estonia were the top 3 countries, and in export Germany, Sweden and Belgium were the top 3 countries (Table 2.3). Tallinn, Hamburg, Antwerp, Stockholm, Travemünde, Kappelskär, Rotterdam, Bremerhaven, Lübeck and Rostock were the most important foreign ports for the Finnish seaborne unitised cargo traffic by cargo volumes. About 89 % of the total international unitised cargo traffic in Finland was transported via these ports (Finnish Transport Agency, 2011b).

Table 2.3. The 10 most important countries and foreign ports in Finnish seaborne unitised cargo traffic by cargo volumes in the year 2010. (Finnish Transport Agency, 2011b)

Import, countries	**Th. tonnes**	**Share (%)**	***Export, countries***	**Th. tonnes**	**Share (%)**
Germany	3,971	37.3	Germany	4,732	39.9
Sweden	2,377	22.3	Sweden	2,314	19.5
Estonia	1,379	13.0	Belgium	1,395	11.8
Netherlands	1,050	9.9	Estonia	1,391	11.7
Belgium	1,042	9.8	Netherlands	1,128	9.5
Poland	312	2.9	Poland	342	2.9
United Kingdom	248	2.3	United Kingdom	283	2.4
Denmark	167	1.6	Denmark	202	1.7
France	38	0.4	Russia	54	0.5
Spain	28	0.3	Spain	9	0.1
Total (incl. others)	**10,636**	**100**	**Total (incl. others)**	**11,861**	**100**

Import, ports	**Th. tonnes**	**Share (%)**	***Export, ports***	**Th. tonnes**	**Share (%)**
Tallinn	1,379	13.0	Hamburg	1,423	12.0
Travemünde	1,188	11.2	Tallinn	1,391	11.7
Stockholm	1,095	10.3	Antwerp	1,229	10.4
Kappelskär	1,058	9.9	Stockholm	1,093	9.2
Antwerp	991	9.3	Rotterdam	1,070	9.0
Rotterdam	959	9.0	Bremerhaven	1,057	8.9
Hamburg	871	8.2	Kappelskär	1,035	8.7
Lübeck	782	7.3	Travemünde	977	8.2
Bremerhaven	584	5.5	Lübeck	665	5.6
Rostock	540	5.1	Rostock	602	5.1
Total (incl. others)	**10,637**	**100**	**Total (incl. others)**	**11 864**	**100**

In Ro-Ro cargo, when lorries and trailers are considered, the role of Estonia has become on the same level as Sweden and Germany. In the year 2010, about 276 000 trailers and lorries were transported between Finland and Germany. Between Finland and Sweden the corresponding figure was 274 000 units and between Finland and Estonia 237 000 units. Volumes between Finland and Estonia have multiplied during the period 1993–2010 (see more Appendix 3).

Finland has altogether about 50 ports handling foreign trade transports. About ten of these ports are inland ports located in the lake Saimaa and others are sea ports on the Finnish coast. The Finland's aim is to secure all year-round services to 23 winter ports (Finnish Maritime Society, 2011). Finnish foreign trade is geographically concentrated in the largest ports and to certain logistics routes (Yliskylä-Peuralahti et al., 2011). The five largest ports handled over half of the total Finnish foreign trade and the 10 largest ports approximately 75 % of the total volumes in the year 2010. The biggest Finnish ports and their cargo volumes in the year 2010 are presented in Figure 2.3. As the figure shows, the five largest Finnish ports by total cargo volume were Kilpilahti (20.5 million tonnes), Kotka (11.3 million tonnes), Helsinki (10.9 million tonnes), Naantali (8.1 million tonnes) and Kokkola (6.3 million tonnes) (Finnish Transport Agency, 2011a). It should be noted that the port of Hamina and the port of Kotka have merged together and since 1st of May 2011 they have been operating as a joint port of HaminaKotka. Since the unification, the Port of HaminaKotka has been Finland's largest general cargo and export port (Port of HaminaKotka, 2011).

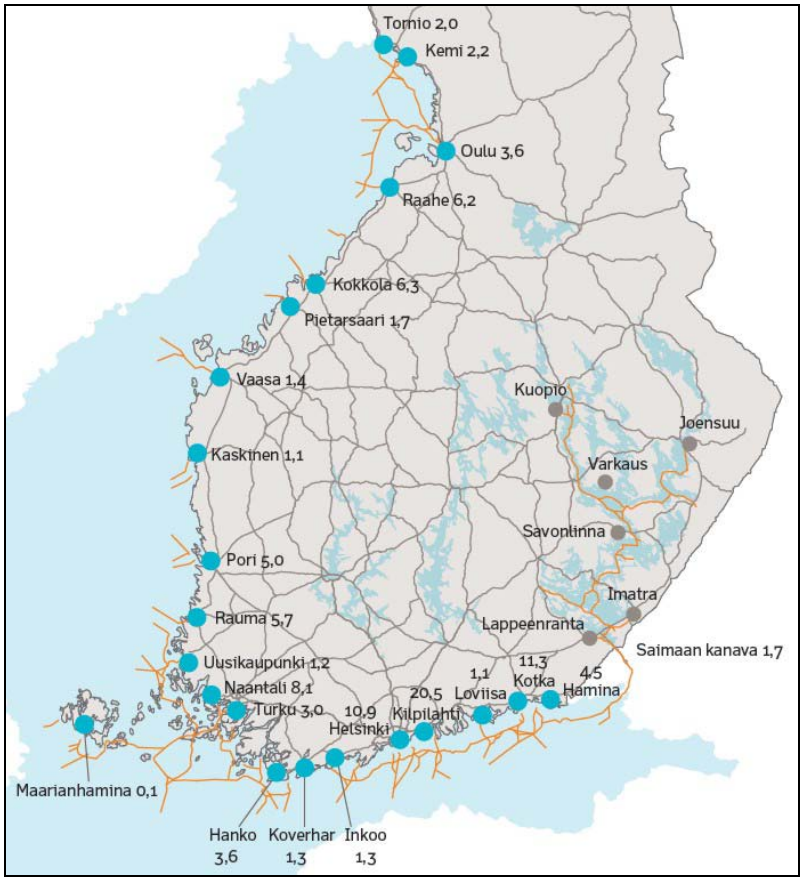


Figure 2.3. The biggest Finnish ports and their cargo volumes (million tonnes) in the year 2010. (Finnish Transport Agency, 2011a)

Finnish ports are typically specialized in handling a limited number of cargo types such as oil, bulk, break bulk (e.g. paper), cargo in vehicles or containerized cargo (SPC Finland, 2011). For example, the port of Kilpilahti, the biggest Finnish port by cargo volumes, is concentrated on handling of crude oil, oil products and chemicals; the port of Helsinki is specialized in unitised cargo; the port of HaminaKotka is concentrated on export, general, container and transit traffic; the port of Kokkola is concentrated on handling of ore and other dry bulk cargoes, and so on (Finnish Transport Agency, 2011a). As said before, this report concentrates on unitised cargo traffic (e.g. trucks and trailers) and therefore less attention is paid to other cargo types (e.g. bulk).

Unitised cargo was handled in 18 Finnish ports in the year 2010. The 10 ports with largest unitized cargo traffic were Helsinki, Kotka, Turku, Naantali, Hanko, Rauma, Oulu, Hamina, Kemi and Tornio. These ports handled over 90 % of the total unitised cargo volumes of Finnish ports' foreign traffic. As Table 2.4 shows, Helsinki was clearly the number one port in the handling of unitised cargo in the year 2010 and port of Kotka was undeniably the second in volumes. When the unitised cargo traffic is viewed in the transport unit level, it can be seen that *truck traffic* is concentrated in the ports of Helsinki, Naantali, Turku and Vaasa, *trailer traffic* in the ports of Helsinki, Hanko, Turku and Hamina, *container traffic* in the ports of Kotka, Helsinki, Rauma and Hamina, and

rail wagon traffic in the port of Turku. *Other transport equipment* was transported mainly via the ports of Oulu, Kemi and Kotka (Finnish Transport Agency, 2011a).

Table 2.4. Finnish unitised cargo ports and their unitised cargo volumes in the year 2010. (Finnish Transport Agency, 2011a)

Port	**Trucks (1,000 t)**	**Trailers (1,000 t)**	**Containers**		**Rail wagons (1,000 t)**	**Other transport equipment (1,000 t)**	**Total (1,000 t)**
			1,000 t	**TEU**			
Helsinki	3,422	2,708	3,185	392,988	0	61	9,376
Kotka	0	52	3,344	394,814	0	402	3,798
Turku	1,145	589	146	13,826	162	25	2,066
Naantali	1,990	63	0	0	0	2	2,055
Hanko	57	1,322	422	56,668	0	4	1,805
Rauma	1	47	1,411	160,582	0	23	1,483
Oulu	0	22	339	29,041	0	952	1,313
Hamina	4	250	822	114,151	0	0	1,076
Kemi	0	1	54	4,565	0	562	617
Tornio	0	0	237	13,634	0	10	247
Vaasa	179	0	0	2	0	60	239
Pori	0	0	220	21,413	0	0	220
Kokkola	0	0	155	12,154	0	0	155
Raahe	0	0	70	4,703	0	1	72
Maarianhamina	41	2	0	0	0	0	44
Eckerö	28	0	0	0	0	0	28
Pietarsaari	0	0	8	1,034	0	0	8
Långnäs	1	0	0	0	0	0	1
Total (incl. others)	**6,868**	**5,057**	**10,413**	**1,219,575**	**163**	**2,102**	**24,603**

2.2 Estonian maritime transport and ports

Estonian seaborne cargo traffic has increased rapidly in the late 1990s (Figure 2.4). The total amount of the traffic was only 16 million tonnes in the year 1995, and in the year 2000 it was grown to 40 million tonnes. Since the beginning of 2000s, Estonian seaborne cargo traffic has been growing but at a slower pace. The highest figures have so far been recorded in 2006 when almost 50 million tonnes of cargo was transported through Estonian ports. During the years 2007 and 2008, the volume of the cargo traffic (mostly transit traffic) transported through Estonian ports was significantly declined. The main reason for the decrease was the statue dispute between Russia and Estonia. As a result of the dispute Russia transferred its foreign trade transports from Estonian ports to its own ports (Posti et al., 2009). In the years 2009 and 2010, Estonian seaborne cargo traffic was returned to growth, despite of global recession. (Statistics Estonia, 2011)

Typically a large amount of transit cargo traffic has been transported through Estonian ports. During the period of 1993–2009, the annual share of the transit traffic of the total Estonian seaborne cargo traffic has varied between 63 and 78 %. Therefore, the total cargo volumes and transit cargo volumes followed closely each other, as it can be seen in Figure 2.4. The amount of westbound transit traffic (via Estonia to west) has almost every year been manifold compared to the eastbound transit traffic (via Estonia to east). The peak year in Estonian transit cargo traffic has so far been the year 2006 when the westbound transit traffic reached 37 million tonnes and the eastbound transit traffic 2 million tonnes, respectively. When only the cargo volumes are viewed, Estonian own exports and imports have had a minor role in the total Estonian seaborne cargo traffic. In the top year 2003, Estonian export and import seaborne cargo traffic together reached 14 tonnes of which export accounted for 10 million tonnes and import 4 million tonnes. Towards the end of the first decade of the 21th century, the amount of Estonian own seaborne foreign cargo traffic has stayed almost at the same level but the gap between export and import has slightly diminished (Statistics Estonia, 2011).

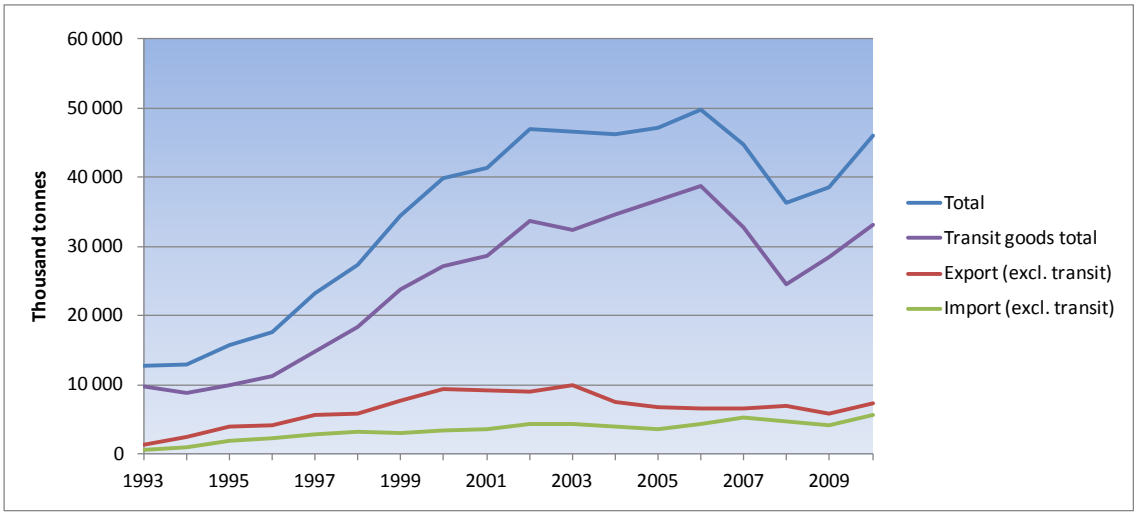


Figure 2.4. Estonian seaborne cargo traffic 1993–2010. (Statistics Estonia, 2011)

In the year 2010, Estonian ports handled over 46 million tonnes of cargo in total (Table 2.5). Around 28 million tonnes (60 %) of the total traffic was comprised of coke and refined petroleum products. Nearly all of the volumes of these commodities were transported as transit traffic via Estonian ports. Estonian ports also handle small amounts of crude petroleum, natural gas, chemicals, chemical products, and coal and lignite as transit goods. Estonian own export and import seaborne trade included a variety of different types of cargo.

Table 2.5. Cargo volumes through Estonian ports by commodity groups in the year 2010, thousand tonnes. (Statistics Estonia, 2011)

Commodity group	Export (excl. transit)	Import (excl. transit)	Transit goods	Total
Coke and refined petroleum products	412	308	27,059	27,802
Grouped goods: a mixture of types of goods which are transported together	1,898	1,975	81	3,953
Metal ores and other mining and quarrying products; peat; uranium and thorium	1,181	1,967	83	3,243
Chemicals, chemical products and man-made fibres; rubber and plastic products	7	108	2,448	2,563
Coal and lignite, crude petroleum and natural gas, oil shale	0	56	2,330	2,386
Products of agriculture, hunting, and forestry; fish and other fishing products	1,709	4	320	2,037
Products of wood, cork and plaits; pulp, paper products; prints, recorded media	1,230	49	114	1,393
Other kind of goods	871	1,105	744	2,724
Total	**7,307**	**5,572**	**33,179**	**46,101**

Estonia has altogether 31 ports providing operations related to international merchant marine. Public ports are operated by two public limited companies, the Port of Tallinn and Saarte Liinid AS. The state of Estonia is the sole shareholder of these two companies (Ojala et al., 2005). *The Port of Tallinn* is the biggest port authority in Estonia, and it consists of five constituent harbours: Old City Harbour / Vanasadam (including Old City Marina), Muuga Harbour, Paldiski South Harbour, Paljassaare Harbour and Saaremaa Harbour. The port of Tallinn handles both cargo and passenger traffic (Port of Tallinn, 2011a). The port of Tallinn is described in more detail in the section 2.3.3. *Saarte Liinid AS* operates 15 Estonian ports of which 13 are sea ports located in Western Estonia (e.g. Roomassaare and Virtsu) and 2 are inland ports located in the Lake Peipsi in the Eastern Estonia. The larger ones of these ports have conditions for handling cargo traffic (Saarte Liinid, 2011). There are also some *privately owned ports* in Estonia. The largest of these ports are the ports of Sillamäe, Kunda, Pärnu (partly owned by a private company) and Paldiski Northern Port all of which are concentrated on cargo traffic (Ojala et al., 2005; Paldiski Northern Port, 2011; Särkijärvi et al., 2010; Zachcial et al., 2006). The major Estonian ports and their locations are shown in Figure 2.5.

Figure 2.5. The major ports in Estonia. (adapted from Särkijärvi et al., 2010)

Figure 2.6 presents the largest Estonian ports measured by their cargo volumes in the year 2009. Muuga Harbour dominated the Estonian cargo traffic with a share of 65 % of the total cargo volumes in the country (Särkijärvi et al., 2010). Muuga Harbour handles nearly 80% of the total cargo volumes of the port of Tallinn and approximately 90% of the transit cargo volume passing through Estonia. Nearly 75 % of the cargo loaded in Muuga Harbour includes crude oil and oil products but also dry bulk and other types of cargo are handled there (Port of Tallinn, 2011a). The port of Tallinn handled altogether approximately 82 % of the total Estonian seaborne cargo traffic in the year 2009. The ports of Sillamäe, Kunda and Pärnu in this order were next in rank among Estonian ports when measured by their cargo volumes in the year 2009. They together handled approximately 13 % of the total Estonian seaborne cargo traffic. The port of Sillamäe handles primarily oil and oil products and other liquid bulk, and ports of Kunda and Pärnu predominantly different types of dry bulk. The share of the other ports of the total Estonian seaborne cargo traffic was only around 5 % (Särkijärvi et al., 2010).

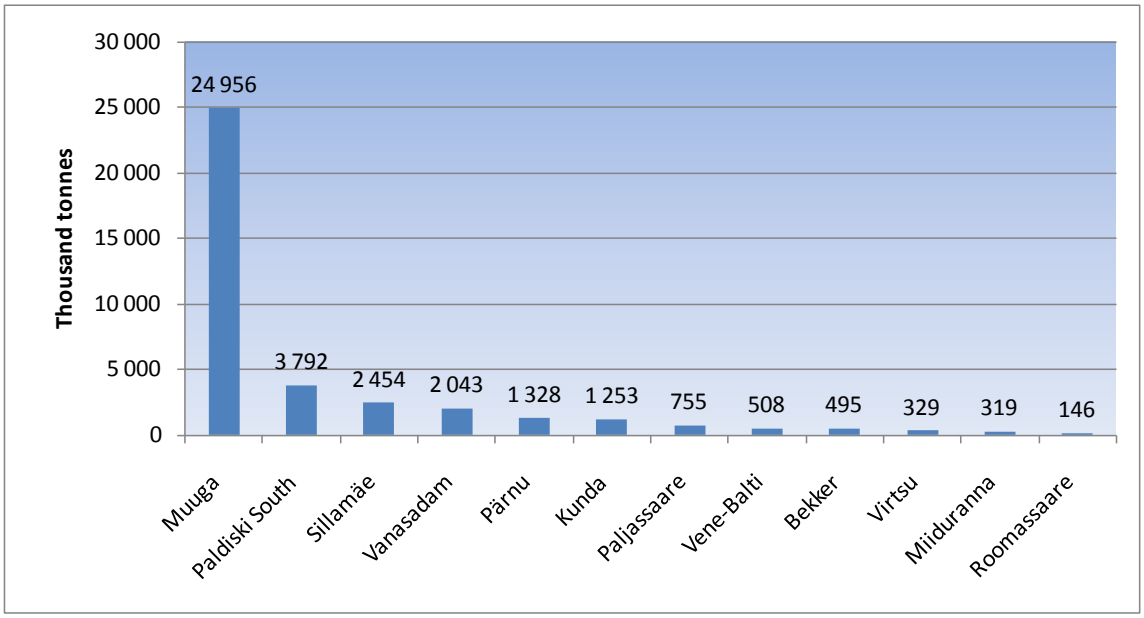


Figure 2.6. The largest Estonian ports by cargo volumes in the year 2009. (Särkijärvi et al., 2010)

All of the unitised cargo that was transported via Estonian ports in the year 2009 was handled in the harbours of Muuga, Paldiski South and Vanasadam owned by the Port of Tallinn, and in the port of Sillamäe (Table 2.6). Around 131 000 TEUs of containers were transported through Estonian ports in the year 2009, almost all of them via the harbour of Muuga. The amount of trucks and trailers that went through Estonian ports in the year 2009 was over 230,000 pieces. They were transported mainly through the harbour of Vanasadam but small amounts of trucks and trailers were handled in the harbours of Paldiski South and Muuga as well. Train wagons (25,400 pieces) were handled solely in the port of Sillamäe (Särkijärvi et al., 2010).

Table 2.6. Unitised cargo in Estonian ports in 2009[1]. (Särkijärvi et al., 2010)

Port	Containers (TEU)	Trucks and trailers (pcs)	Train wagons (pcs)
Muuga	130,800	15,700	0
Paldiski South	300	24,200	0
Sillamäe	0	0	25,400
Vanasadam	0	190,300	0
Total	**131,100**	**230,200**	**25,400**

[1] Unitized cargo is also handled in the Paldiski North port but the volumes are not available.

2.3 Helsinki-Tallinn sea route

2.3.1 Overview of the route

The distance between Helsinki and Tallinn is around 80 kilometres or 44 nautical miles (Distancefromto.net, 2011). The Gulf of Finland is a sea area, where the maritime traffic is one of the heaviest in the whole Europe. Therefore, a mandatory ship reporting system GOFREP has been established in the Gulf of Finland. The GOFREP area covers the international waters in the Gulf of Finland east of the Western Reporting Line. In addition, Estonia and Finland have implemented mandatory ship reporting systems in their territorial waters outside their VTS areas. Helsinki-Tallinn route crosses the GOFREP area. A vessel must give a report to the GOFREP system, when it departures from the ports in the Gulf of Finland or at the latest when it enters the GOFREP area (Finnish Transport Agency, 2011c).

There are 3 fairways leading to Helsinki: 11 meter deep channel to West Harbour, 9.6 metre channel to South Harbour and Katajanokka and 11 meter channel to Vuosaari. Channels to these harbours are long, and they start from open sea and go through an archipelago. For example, the channel to Vuosaari harbour is 17.2 nautical miles. The archipelago shelters harbours from the winds but in some cases also the islands also interfere navigation, as in the narrow passage of Kustaanmiekka with a 9.6 metre channel. In Vuosaari channel overtaking is partly restricted because of a one-way section (Finnish Transport Agency, 2011d). Icebreakers keep the harbours open all year round. Government icebreakers assist vessels from the open sea to the harbour when necessary (National Geospatial-Intelligence Agency, 2011).

In Tallinn the approaches to the port are deep and clear and the channels to the harbours are short. Strong northern winds may interfere vessels. From mid-January through March, the port is kept open by icebreakers (National Geospatial-Intelligence Agency, 2011). In traffic to the Old City Harbour a traffic-management route-system, the Traffic Separation Schemes (TSS), is used. In the system the traffic-lanes indicate the general direction of the ships in that zone. The westbound traffic to Muuga intersects with dense north-southbound traffic to Tallinn (Finnish Maritime Administration, 2003). In Muuga even with only moderate winds from the north, dangerous surges may be experienced at the berths (National Geospatial-Intelligence Agency, 2011). The Muuga Harbour is one of the deepest (up to 18 metres) and most modern ports in the Baltic Sea region (Port of Tallinn, 2011a). The depth of the channel to the Muuga Harbour allows all the vessels that can pass through the Danish Straits to call in the harbour (World Port Source, 2011a).

Currently, there are three ferry companies operating on the Helsinki-Tallinn sea route carrying both cargo and passengers: Eckerö Line, Tallink Silja and Viking Line (Table 2.7). The traffic is based on ropax/car ferry concept where passengers and cargo are transported in the same vessels. Eckerö Line has also a ferry, which carries only cargo.

Table 2.7. Liner ferry companies carrying cargo on the Helsinki-Tallinn route. (Eckerö Line, 2011; Tallink Silja, 2011; Viking Line, 2011)

Ferry company	Vessels			
	Name	Type	Lane meters	Speed (knots)
Eckerö Line	M/s Nordlandia	Car ferry	750 m	20
	M/s Translandia	Cargo ferry	750 m	19
Tallink Silja	M/s Star	Ropax	2,000 m	27
	M/s Superstar	Ropax	1,930 m	27.5
	M/s Baltic Princess	Ropax	1,300 m	22
Viking Line	M/s Viking XPRS	Ropax	1,000 m	25

Depending on a vessel and its sailing schedule the journey from Helsinki to Tallinn and vice versa takes 2 to 4 hours. At the night there are some sailings which are operated with a slower schedule. During the winter season travel time is the same as in the summer (Eckerö Line, 2011; Tallink Silja, 2011; Viking Line, 2011). Eckerö Line has 4 and Viking Line has 2 daily departures in both directions (Eckerö Line, 2011; Viking Line, 2011). Tallink Silja has 8 daily departures from Helsinki and 7 from Tallinn (Tallink Silja, 2011).

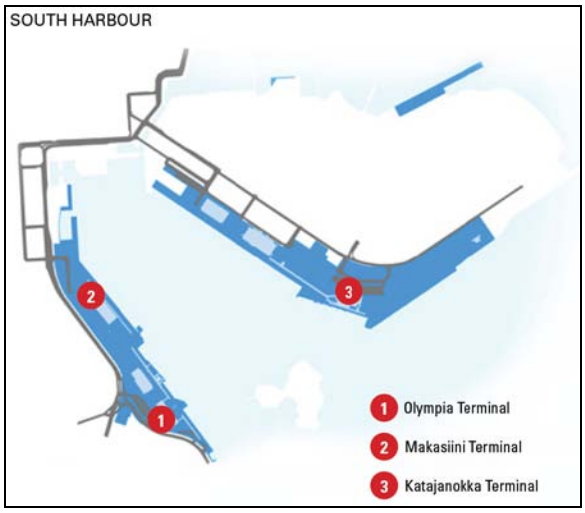
2.3.2 The Port of Helsinki

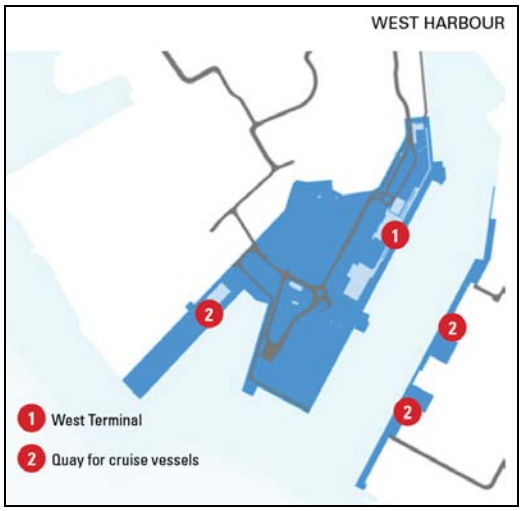
The port of Helsinki is located in Southern Finland on the northern shores of the Gulf of Finland around 300 kilometres from St. Petersburg in Russia to the west and around 80 kilometres from the port of Tallinn in Estonia to the north (see Figure 2.3 in the section 2.1) (World Port Source, 2011b). The port of Helsinki is Finland's main port providing the highest frequency of scheduled departures to all major Western, Central and Northern European ports (Port of Helsinki, 2011a). It is specialized mainly in line passenger traffic and cruise traffic as well as in unitised cargo traffic including containers, trucks, trailers and similar units. In the passenger traffic, Helsinki is Finland's busiest port by handling over 10.4 million passengers in the year 2010 (Finnish Transport Agency, 2011a; Port of Helsinki, 2011b). The port of Helsinki has connections, for example, to Gdynia, Rostock, St. Petersburg, Stockholm, Tallinn and Travemünde (Port of Helsinki, 2011b). Cargo traffic in the port of Helsinki is composed mainly of Finnish foreign trade imports and exports. Import transports consist primarily of consumer goods, semi-finished products and capital investment goods, while export transports include especially products from the paper and metal industries (Port of Helsinki, 2011b).

The Port of Helsinki consists of three harbour sections: South Harbour, West Harbour and Vuosaari Harbour. Passenger traffic is concentrated in the South Harbour and the West Harbour. In addition, Hansa Terminal in Vuosaari serves cargo ships that carry passengers. In cargo traffic, Vuosaari Harbour serves container and Ro-Ro traffic, and South Harbour and West Harbour serve Ro-Ro traffic that is transported by passenger vessels (Port of Helsinki, 2011b).

The South Harbour and the West Harbour serve regular scheduled passenger ferry traffic. The passenger harbours are important ports for unitised goods as well since most of

the vessels carry significant number of trucks and trailers besides passengers. The South Harbour is Finland's largest passenger port – approximately five million passengers pass through it annually. It has regular scheduled sailings to both Stockholm and Tallinn twice a day and to St. Petersburg three times a week. In summertime, there are also many connections with high-speed vessels to Tallinn. There are three terminals (Olympia Terminal, Makasiini Terminal and Katajanokka Terminal) in the South Harbour. The West Harbour, in turn, serves Tallinn passenger traffic. It has 7–8 daily departures to Tallinn. Some five million passengers pass through the West Harbour's West Terminal every year (Port of Helsinki, 2011c). Figure 2.7 presents the layout and key features of the South Harbour and the West Harbour.



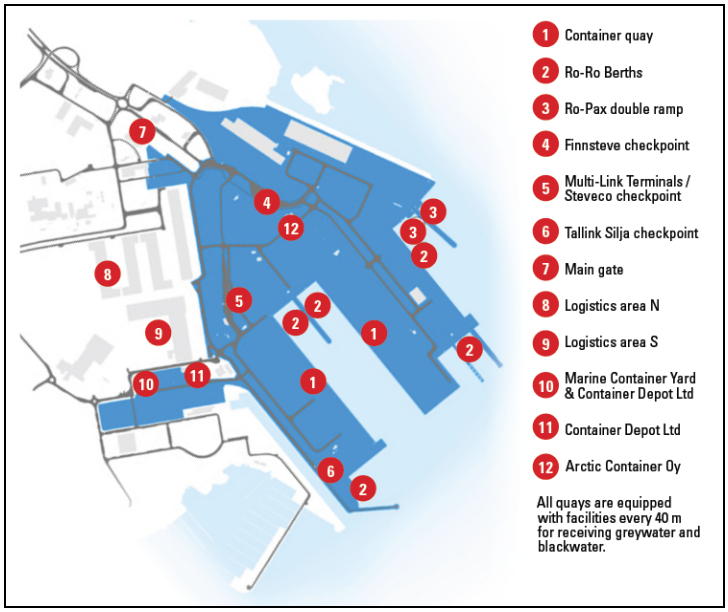


Key features of the South Harbour	
Depth of channels	6.9, 7.9, 9.1 and 9.3 m
Total land area	20.2 ha
Length of quays	2,450 m
Ferry berths	6
Storage areas	1.7 ha

Key features of the West Harbour	
Depth of channels	10.8 and 8.9 m
Total land area	22 ha
Length of quays	2,366 m
Ferry berths	6

Figure 2.7. Layout and key features of the South Harbour and the West Harbour. (Port of Helsinki, 2011c)

The Vuosaari Harbour is located in the district of Vuosaari, about 15 kilometres to the east from the Helsinki city centre where the South Harbour and the West Harbour are located. Building of Vuosaari Harbour was started in the beginning of the year 2003. The aim was to move the cargo harbours from the centre of Helsinki to Vuosaari in order to improve the flow of traffic and the conditions for cargo handling. The Vuosaari Harbour was opened for traffic in the year 2008 (Port of Helsinki, 2011d). The Vuosaari Harbour has been designed to serve unitised cargo including containers, trailers and trucks. It is capable of handling annually up to 1.2 million TEUs, and 800 000 trucks and trailers. The harbour also handles break bulk cargo shipments and special transports. The Vuosaari Harbour has direct traffic connections to the entire Finnish road and railway network (Port of Helsinki, 2011a). Figure 2.8 presents the layout and the key features of the Vuosaari Harbour.



Key features of the Vuosaari Harbour	
Harbour Centre	225 ha
Harbour area	150 ha
Total length of quays	5,043 m
Container quays	2 x 750 m
Ro-Ro Berths	15
Double ramps	2
Authorized depth of fairway	12.5 m

Figure 2.8. The layout and the key features of the Vuosaari Harbour. (Port of Helsinki, 2011c)

The international cargo volume in the port of Helsinki has increased approximately 42 % over the period 1993–2010 (Figure 2.9). Export volume has grown around 58 % and import volume 31 % during the period. The amount of import has almost every year been slightly greater than the amount of export. The top year has so far been the year 2007 when around 13.1 million tonnes of cargo was handled in the port of Helsinki. The global recession had quite a big effect on Helsinki's cargo volume – by the end of the year 2009 the Helsinki's cargo volume decreased by 3.4 million tonnes (-26 %) compared to level of the year 2007. In 2010, the international cargo traffic was returned to growth and by the end of the year the total cargo volume handled in the port of Helsinki was around 10.8 million tonnes of which 5.8 million tonnes was import and 5.0 million tonnes export. Approximately 2.5 % of these tonnes was transit traffic (Finnish Transport Agency, 2011b). In spite of the global recession, Helsinki was the second largest port in Finland and the 19th largest port in the Baltic Sea region by cargo volumes in the year 2009. Only the port of Kilpilahti exceeded the cargo volumes of Helsinki in 2009 (Särkijärvi et al., 2010). The annual share of Helsinki's cargo volumes of the total volumes of the Finnish seaborne cargo traffic has varied between 11 and 14 % over the period 1993–2010.

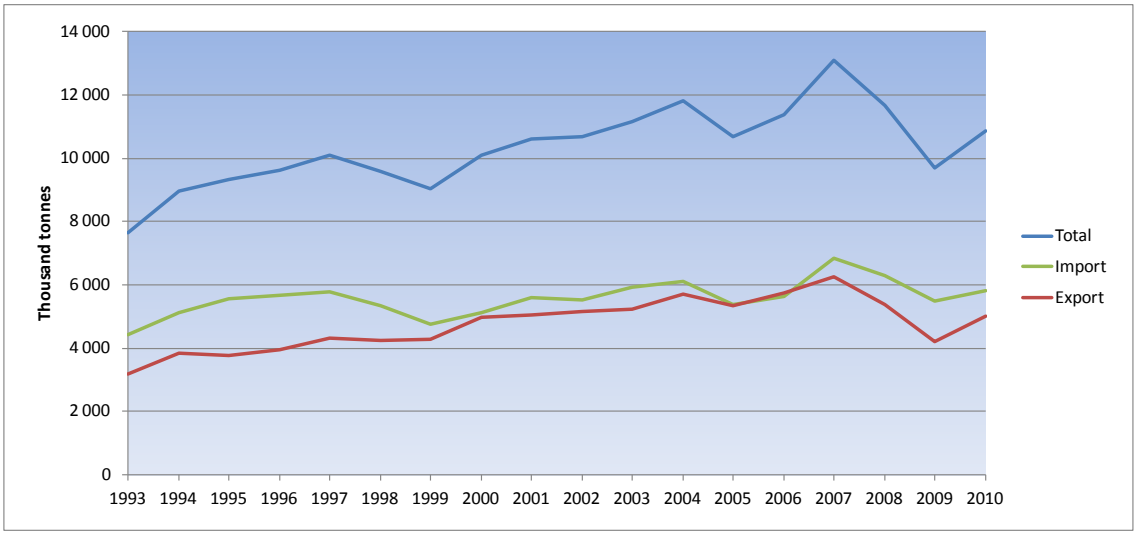


Figure 2.9. The port of Helsinki's international seaborne cargo traffic in the years 1993–2010. (Finnish Transport Agency, 2011b)

General cargo had the largest share, 52% of the total international cargo traffic, in the port of Helsinki in the year 2010 (Table 2.8). The rest of the cargo handled mainly includes other merchandise, coal and coke, paper and paperboard, metals and metal manufactures, chemicals, oil products and sawn wood. The share of other than above mentioned commodity groups was quite small (less than 2 % of the total cargo volume). As the table 2.8 below shows, paper, paperboard and sawn wood were mainly exported and coal/coke imported through the port of Helsinki. Other cargo types were divided roughly equally between export and import (Finnish Transport Agency, 2011a).

Table 2.8. Cargo transported through the port of Helsinki by commodity groups in the year 2010, thousand tonnes. (Finnish Transport Agency, 2011a)

Commodity group	**Export**	**Import**	**Total**
General cargo	2,516	3,083	5,599
Other merchandise	832	1,231	2,063
Coal and coke	2	700	702
Paper and paperboard	572	79	651
Metals and metal manufactures	277	307	584
Chemicals	226	216	442
Oil products	239	101	340
Sawn wood	250	7	256
Crude minerals and cement	33	51	83
Veneers and plywood	55	10	65
Ores and concentrates	9	21	31
Timber	4	6	10
Wood pulp	8	0	8
Fertilizers	1	5	6
Cereals	1	3	3
Crude oil	0	0	0
Total	**5,025**	**5,818**	**10,843**

In the year 2010, around 34 % of the total cargo volume (measured by tonnes) of the port of Helsinki was originated from or destinated to German ports, 26 % from/to Estonian ports, 8 % from/to Dutch ports, 7 % from/to Swedish ports, 6 % from/to Polish ports, 6 % from/to Belgian ports and 5 % from/to Danish ports. The share of traffic originating from/destined to ports in other countries was about 10 %. The most important departure and destination port in the port of Helsinki's international cargo traffic in 2010 was Tallinn (Table 2.9). Nearly 25 % of the port of Helsinki's imports came from the port of Tallinn and 27 % was destined to the port of Tallinn. Travemünde was the next most important port and its corresponding figures were around 19 % and 16 %. Other important departure and destination ports for the port of Helsinki's seaborne international cargo traffic were Rotterdam, Hamburg, Stockholm, Gdynia, Antwerp, Rostock, Bremerhaven and Århus. Around 85 % of the port of Helsinki's total seaborne international cargo traffic by cargo volumes was originated from or destinated to these top 10 ports. Tallinn and Travemünde in this order were the most important ports in the port of Helsinki's unitised cargo traffic as well. Rotterdam, Hamburg, Stockholm, Rostock, Bremerhaven and Antwerp in this order were the next most important departure and destination ports in Helsinki's unitised cargo traffic (Finnish Transport Agency, 2011b).

Table 2.9. The 10 most important departure and destination ports in the port of Helsinki's seaborne international traffic in the year 2010. (Finnish Transport Agency, 2011b)

Import, departure ports	**Th. tonnes**	**Share (%)**	***Export, destination ports***	**Th. tonnes**	**Share (%)**
Tallinn	1,455	25.0	Tallinn	1,346	26.8
Travemünde	1,100	18.9	Travemünde	820	16.3
Rotterdam	501	8.6	Hamburg	375	7.5
Antwerp	313	5.4	Stockholm	306	6.1
Stockholm	312	5.4	Bremerhaven	302	6.0
Gdynia	304	5.2	Rotterdam	280	5.6
Hamburg	274	4.7	Rostock	270	5.4
Rostock	237	4.1	Gdynia	249	5.0
Bremerhaven	198	3.4	Antwerp	226	4.5
Århus	167	2.9	Århus	215	4.3
Total (incl. others)	**5,818**	**100**	**Total (incl. others)**	**5,025**	**100**

Figure 2.10 presents the annual unitised cargo volumes in the port of Helsinki's international seaborne traffic in the years 1993–2010. The total amount of unitised cargo has almost doubled from 4.8 to 9.3 million tonnes during the viewed period. Especially, the volume of trucks has increased remarkably (+374 %). The volume of unitised cargo in exports has almost every year been slightly greater than in imports. The top year for unitised cargo has so far been the year 2007 when approximately 10.8 million tonnes of international unitised cargo was transported through the port of Helsinki. Mainly due to global recession, the unitised cargo volume fell by almost 2 million tonnes in the year 2009 compared to the previous year. In the year 2010, the unitised cargo traffic was returned to growth and by the end of the year port of Helsinki handled approximately 9.3 million tonnes of unitised cargo of which 3.4 million tonnes were in trucks, 3.2 million tonnes in containers and 2.7 million tonnes in trailers. Measured by number of units that means around 290,000 trucks, 192,000 trailers, 190,000 containers (316,000 TEUs) and 9,000 other vehicles. The annual share of the unitised cargo of the port of Helsinki's

total international seaborne cargo traffic has varied between 63 to 87 % over the period 1993–2010. In the year 2010, the share of the unitised cargo was about 86 % (Finnish Transport Agency, 2011b).

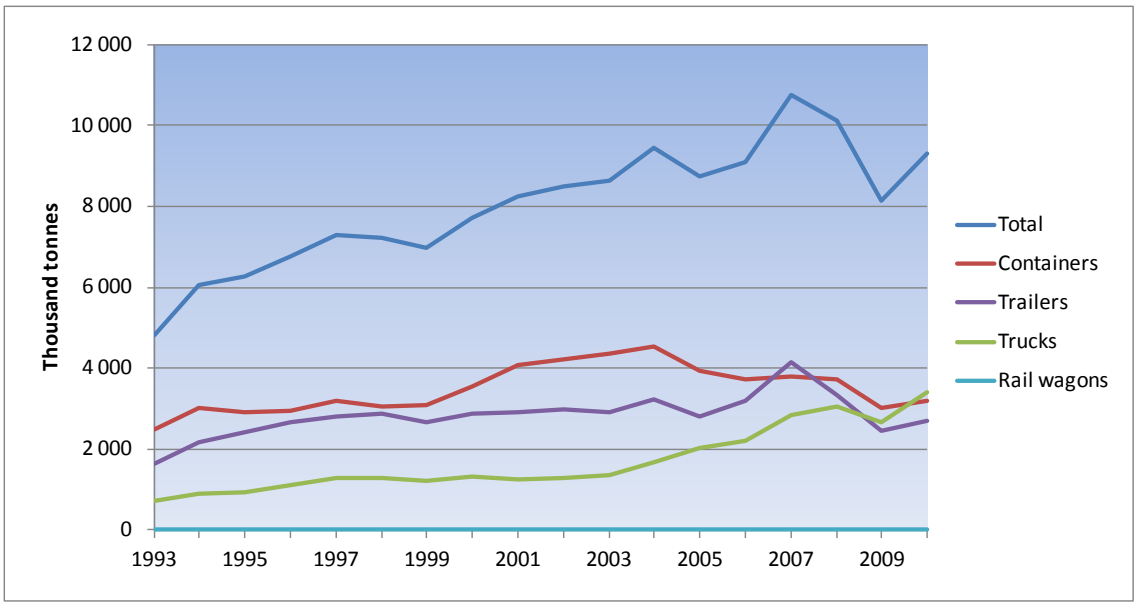


Figure 2.10. Unitised cargo volumes in the port of Helsinki's international seaborne traffic in the years 1993–2010. (Finnish Transport Agency, 2011b)

The Helsinki-Tallinn route has become the most significant Ro-Ro traffic route for the port of Helsinki. In the year 1993 only 22 % of all the units of lorries and trailers handled in Helsinki was transported via the Helsinki-Tallinn route but in the year 2010 the corresponding figure was 49 % (Figure 2.11). The role of the port of Helsinki as a Ro-Ro cargo port to goods originating from or destined to Sweden has diminished 20 percentage points during the period 1993–2010. In the year 2010 the share of Sweden was only 8 %. Nowadays, especially Naantali is used as a gate to Sweden. In the year 2010, around 34 % of the lorries and trailers handled in Helsinki was transported via Helsinki-Germany routes, which are traditional routes to the Western European markets for Finland. In the year 1993, the corresponding figure was 41 %. Poland has a minor role in lorry and trailer traffic of the port of Helsinki. The annual share of Poland has varied between 3–6 % during the viewed period (Finnish Transport Agency, 2011b).

Both on the Helsinki-Tallinn route and on the Helsinki-Germany routes the amount of units has grown during the period 1993–2010. On the Helsinki-Tallinn route the number of units has increased from 36,200 units in the year 1993 to 236,500 units in the year 2010, and on the Helsinki-Germany routes the number of units has increased from 67,200 units in the year 1993 to 162,500 units in the year 2010 (Finnish Transport Agency, 2011b).

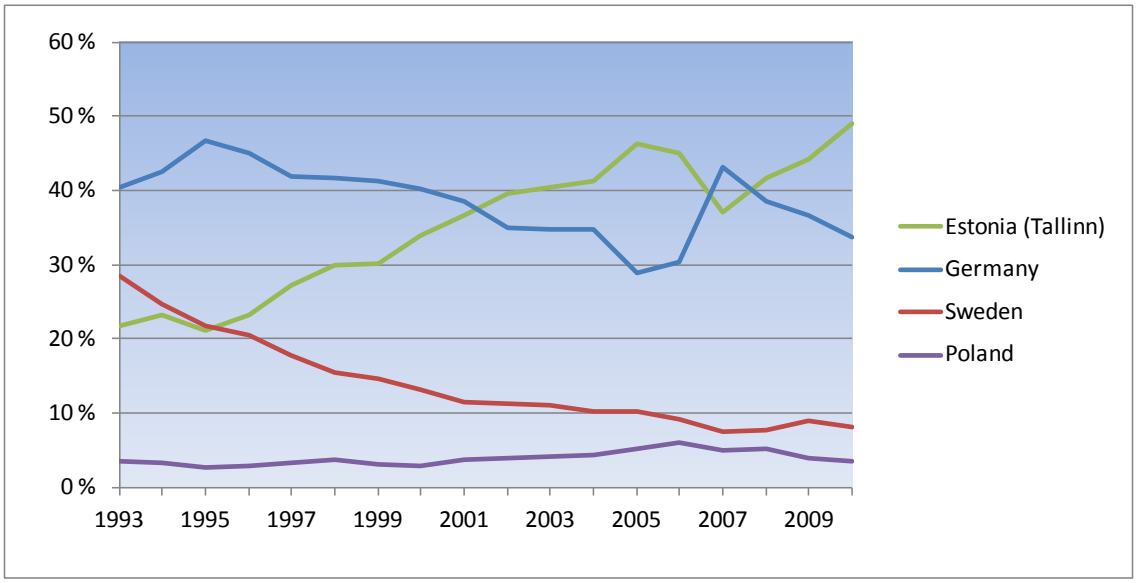


Figure 2.11. The share of lorries and trailers handled in Helsinki by countries in the years 1993–2010. (Finnish Transport Agency, 2011b)

2.3.3 The Port of Tallinn

The Port of Tallinn is the biggest port authority in Estonia. The port is state-owned limited liability company (Port of Tallinn, 2011b). The port of Tallinn handles both cargo and passenger traffic. The port consists of five constituent harbours: Old City Harbour / Vanasadam (including Old City Marina), Muuga Harbour, Paldiski South Harbour, Paljassaare Harbour and Saaremaa Harbour (Port of Tallinn, 2011a). The four first mentioned harbours are located on the northern coast of the Estonia on the shores of the Gulf of Finland around 80–100 kilometres from Helsinki in Finland to south/southwest, and the Saaremaa Harbour is located in the north-western coast of Estonia's biggest island Saaremaa, about 180 kilometres from Tallinn to southwest (Figure 2.12). All of the harbours are open all year-round (World Port Source, 2011a). Muuga, Paljassaare and Paldiski are focused on cargo handling, Old city harbour handles both passengers and Ro-Ro cargo, and Saaremaa is a pure passenger harbour.

Figure 2.12. Locations and specializations of the Port of Tallinn's harbours. (Port of Tallinn, 2011b)

The Muuga Harbour is the biggest cargo harbour in Estonia and in the year 2009 it was the 7th biggest port in the Baltic Sea region by cargo volumes (Särkijärvi et al., 2010). It is located around 20 kilometres to the east from Tallinn. The Muuga Harbour handles about 80 % of the total cargo volume of the port of Tallinn and approximately 65 % of total cargo traffic and 90% of the transit cargo volume passing through Estonia. Some 75 % of the cargo volume of the Muuga Harbour includes crude oil and oil products (Port of Tallinn, 2011a; Särkijärvi et al., 2010). The harbour also handles dry bulk (mostly fertilizers, grain and coal) and other types of cargo. In the year 2009, the total cargo traffic handled in the Muuga Harbour was around 25 million tonnes of which exports accounted for about 21 million tonnes and imports 4 million tonnes. The harbour's cargo traffic included around 20 million tonnes oil and oil products, 3 million tonnes dry bulk (mainly coal, coke and fertilizers) and 1.5 million tonnes other dry cargo. Approximately 131,000 TEUs of containers and 16,000 trucks and trailers passed the Muuga harbour (Särkijärvi et al., 2010). The key features of the Muuga Harbour are shown in Table 2.10.

Many plans have been proposed in recent years to develop the port of Muuga. These plans include the extension of the Eastern part of the harbour including the extension of container terminal area, a viaduct connecting the Eastern part and the industrial park of the Muuga Harbour, constructing a rail access to the Industrial Park of Muuga Harbour and extension of the Free Zone at the Eastern part of the Muuga Harbour. Long term development plans of the harbour include also the extension of the Western part of the harbour as well as the construction of a breakwater in order to improve maritime safety,

facilitation of vessel navigation and environmental risk management and to increase the cargo processing volumes on quays under weatherproof conditions (Port of Tallinn, 2011a).

Table 2.10. Key features of the Muuga Harbour. (Port of Tallinn, 2011a)

The Muuga Harbour	
Territory	524,2 ha
Aquatory	752 ha
Number of berths	28
Total length of berths	5.9 km
Max. depth	18 m
Max. length of a vessel	300 m
Max. width of a vessel	48 m
Terminals	6 liquid bulk terminals 2 multipurpose terminals (one of them with a reefer complex) container terminal and Ro-Ro terminal dry bulk terminal grain terminal steel terminal coal terminal
Storage area	Warehouse area: 151 000 m² Open storage area: 670 000 m² Reefer warehouse area: 11 500 m² Oil tank capacity: 1 100 000 m³ Grain silo: 300 000 t

Old City Harbour (Vanasadam) is the biggest passenger harbour in Estonia, and it is one of the biggest and busiest passenger harbours in the Baltic Sea region as well (Port of Tallinn, 2011a). In the year 2009, some 7.2 million passengers (incl. Saaremaa) passed through the harbour in the international traffic (Särkijärvi et al., 2010). Old City Harbour is located in the heart of the city of Tallinn. Besides passengers, the Old City Harbour handles Ro-Ro cargo and also some break bulk cargo (Port of Tallinn, 2011a). In the year 2009, the Old City Harbour was the third biggest harbour of the port of Tallinn in terms of handled cargo volumes. The total cargo traffic handled in the harbour was around 2 million tonnes which was divided almost equally between import and export. Over 190,000 trucks and trailers passed the harbour (Särkijärvi et al., 2010). However, there are plans to convert the Old City Harbour into a pure passenger port by moving the cargo handling gradually out from the Old City Harbour and relocating cargo handling activities into the Muuga and Paldiski South Harbours. The aim of the plan is to design and establish an integrated multifunctional city district into the busy Old City harbour area taking into consideration also the specific requirements and characteristic of the port (Port of Tallinn, 2011a). The key features of the Old City Harbour are shown in Table 2.11.

Table 2.11. Key features of the Old City Harbour. (Port of Tallinn, 2011a)

The Old City Harbour	
Territory	52.9 ha
Aquatory	75.9 ha
Number of berths	23
Total length of berths	4.2 km
Max. depth	10.7 m
Max. length of a vessel	320 m
Max. width of a vessel	40 m
Terminals	4 passenger terminals (incl. Ro-Ro facilities), mixed terminal
Storage area	Covered warehouse area: 10,400 m² Open storage area: 95,000 m²

The Paldiski South Harbour is the Port of Tallinn's second largest cargo harbour by cargo volumes. It is located around 50 kilometres to the west from Tallinn. The Paldiski South Harbour is concentrated on the handling of Estonian export and import cargo as well as transit cargo. The harbour handles mainly Ro-Ro cargo, scrap metal, timber, peat and oil products (Port of Tallinn, 2011a). In the year 2009, the total cargo traffic handled in the harbour was around 3.8 million tonnes of which exports accounted for approximately 2.1 million tonnes and imports 1.7 million tonnes. The harbour's cargo traffic included around 2.5 million tonnes liquid bulk (mainly oil and oil products), 0.9 million tonnes dry bulk (mainly ores, metal waste, coal and coke) and 0.4 million tonnes other dry cargo. Over 24,000 trucks and trailers passed the harbour (Särkijärvi et al., 2010). The key features of the Paldiski South Harbour are shown in Table 2.12.

The Paldiski South Harbour's future developing plans include accommodating activities related to transit of new cars for neighbouring markets and pre-sale service for cars. Due to the Paldiski South Harbour's development potential, a large proportion of the Port of Tallinn's investments go to Paldiski. The currently ongoing projects include construction of new quays, enlargement of the car terminal areas and developing of an additional 21 ha of industrial park area bordering the harbour. Long term development plans include the construction of an additional berth for the processing of Ro-Ro cargo and passenger vehicles as well as the construction of a breakwater in order to improve the harbour's risk management and protection against the weather condition as well as increase the cargo processing volumes at the berths (Port of Tallinn, 2011a).

Table 2.12. Key features of the Paldiski South Harbour. (Port of Tallinn, 2011a)

The Paldiski South Harbour	
Territory	138.6 ha
Aquatory	137.2 ha
Number of berths	8
Total length of quays	1.4 km
Max. depth	13.5 m
Max. length of a vessel	230 m
Max. width of a vessel	35 m
Terminals	passenger terminal ro-ro & general cargo terminal timber terminal metal terminal biodiesel terminal (under construction) 2 car terminals
Storage area	Warehouse area: 12,000 m² Open storage area: 270,000 m² Oil tank capacity: 259,900 m³

The Paljassaare Harbour is the Port of Tallinn's fourth largest cargo harbour by cargo volumes. It is located on Paljassaare Peninsula in Tallinn, some 6 kilometres from the centre of the city to the west. Due to its geographical location, the Paljassaare Harbour is one of the most sheltered harbours in Estonia from a viewpoint of winds and waves. The annual cargo handling capacity of the Paljassaare Harbour is around 3 million tonnes, and therefore, the harbour is considerably smaller than Muuga and Old City Harbour. The Paljassaare Harbour is specialised in handling mixed cargo, coal, oil products, timber and perishables. It is also used for cooking oil shipments by the neighbouring refinery (Port of Tallinn, 2011a). In the year 2009, the total cargo traffic handled in the Paljassaare harbour was around 0.75 million tonnes of which export accounted for about 0.55 million tonnes and import 0.2 million tonnes. The harbour's cargo traffic included around 0.55 million tonnes dry bulk (mainly coal and coke) and 0.2 million tonnes liquid bulk (mainly oil and oil products) (Särkijärvi et al., 2010). The key features of the Paljassaare South Harbour are shown in Table 2.13.

Table 2.13. Key features of the Paljassaare South Harbour. (Port of Tallinn, 2011a)

The Paljassaare South Harbour	
Territory	43.6 ha
Aquatory	33.5 ha
Number of berths	11
Total length of berths	1.9 km
Max. depth	9 m
Max. length of a vessel	190 m
Max. width of a vessel	30 m
Terminals	oil terminal cooking oil terminal timber terminal coal terminal general cargo terminals (incl. reefer terminal) dry bulk terminal
Storage area	Covered warehouse area 16,000 m2 Open storage area 105,000 m2 Oil tank capacity 42,000 m3 Reefer warehouse area 15,000 m2

The Saaremaa Harbour is located in the north-western coast of Estonia's biggest island Saaremaa, about 180 kilometres from Tallinn to the southwest. Construction of the harbour started in the summer of 2005 and the harbour was opened for use about a year later in the summer of 2006. Saaremaa is a pure passenger harbour. It has 2 quays available for vessels accompanied by a quay for auxiliary vessels and a floating berth for small crafts. The Saaremaa Harbour with the depth alongside the quay of 10 metres is capable of servicing vessels with the length of up to 200 metres. The natural depth of the harbour location is sufficient for receiving the biggest cruise ships sailing in the Baltic Sea. Due to the harbour's favourable geographical location, the Saaremaa Harbour has potential to host regional cruises and also to develop regular passenger lines between Scandinavia and Saaremaa Island (Port of Tallinn, 2011a). The key features of the Saaremaa Harbour are shown in Table 2.14.

Table 2.14. Key features of the Saaremaa Harbour. (Port of Tallinn, 2011a)

The Saaremaa Harbour	
Territory	13.6 ha
Aquatory	44.3 ha
Number of berths	3 + floating berth for small crafts
Total length of berths	460 m
Max. depth	10 m
Max. length of a vessel	200 m
Max. width of a vessel	30 m

Cargo volumes in the port of Tallinn

Figure 2.13 presents the development of the port of Tallinn's (including all its harbours) cargo volumes over the period 1999–2010. During this period, the port of Tallinn's cargo volume has increased approximately 39 % from 26.3 to 36.6 million tonnes. The top year has so far been the year 2006 when around 41 million tonnes of cargo was handled in the port of Tallinn. During the years 2007 and 2008, the cargo volume (mostly transit cargo volume) transported through the port was declined significantly. In the year 2007 the volume diminished about -13 % and in the year 2008 about -30 % compared to the year 2006 (Port of Tallinn, 2011c). The main reason for the decrease was the statue dispute between Russia and Estonia. Due to the dispute Russia shifted its foreign trade transports from Estonian ports to its own ports (Posti et al., 2009). During the years 2009 and 2010, the port of Tallinn's cargo volume returned to growth. Around 31.5 million tonnes of cargo was transported via the port in the year 2009 and around 36.6 million tonnes in the year 2010 (Port of Tallinn, 2011c). The annual share of Tallinn's cargo volumes from the total volumes of the Estonian seaborne cargo traffic has varied between 73 and 84 % over the period 1999–2010 (Port of Tallinn, 2011c; Statistics Estonia, 2011).

Approximately 90% of the total **transit cargo** volume passing through Estonia is handled in the Tallinn's Muuga Harbour (Port of Tallinn, 2011a). The annual share of the transit cargo from the Tallinn's total cargo volume has varied between 75 to 85 % over the period 1999–2010. Due to the large share of the transit cargo, the Tallinn's total cargo volumes and transit cargo volumes have followed closely one another (Figure 2.13). The top year for the transit cargo traffic has so far been the year 2006 when nearly 35 million tonnes of transit cargo was handled in the port of Tallinn (Port of Tallinn, 2011c). The volume of the westbound transit traffic has almost every year been manifold compared to eastbound traffic (Statistics Estonia, 2011). When only the cargo volumes are viewed, Estonian own export and import transports have had a minor role in the port of Tallinn's operations. The annual volume of import transports has been varied from about 2.6 to 4.0 million tonnes and the volume of export from about 2.4 million tonnes to 4.8 million tonnes over the period 1999–2010 (Port of Tallinn, 2011c).

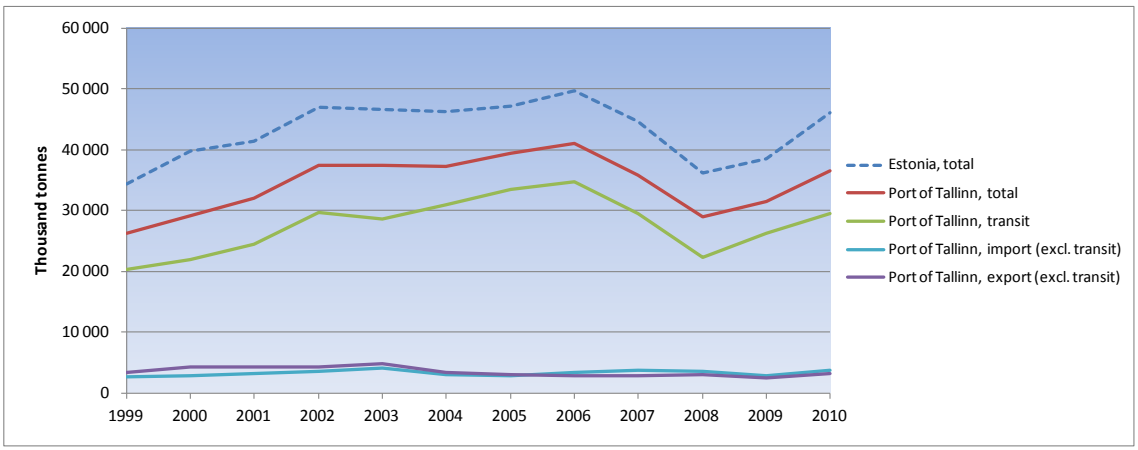


Figure 2.13. The port of Tallinn's cargo volumes in the years 1999–2010. (Port of Tallinn, 2011c)

By type of cargo, around 68 % of the port of Tallinn's total cargo volume in the year 2010 was comprised of oil and oil products (Figure 2.14). Most of the cargo was transit cargo originating from Russia, and most of it was handled in the Muuga Harbour. The other main cargo groups were Ro-Ro cargo (10 % share of the total volume), fertilizers (4 %), coal (4 %), gravel and salt (4 %), containers (4 %), crude oil (2%), scrap metal (1 %), and other cargoes (3 %). Large share of the oil and oil products originating from Russia contains a business risk for the port. According to the Port of Tallinn, the opening of a terminal for petroleum products in the port of Ust-Luga in Russia and how the volumes of this terminal will develop in the future will most likely alter the structure of the port of Tallinn's cargo types in the near future whereas the development of the Ro-Ro and containerised cargo volumes will depend on the region's economic recovery. The expansion of a container terminal in the Muuga Harbour in late 2010 forms the basis for future growth of container cargo transit volume. Business risk concerning the large share of liquid cargo in the port of Tallinn is being reduced by passenger transit (Port of Tallinn, 2011d).

The expectations of growing amount of containerized transit cargo are partly based on visions, where Tallinn could be a hub for the goods, which will be transported by rail from China to Tallinn via Kazakhstan. From Tallinn goods could be delivered to the markets in other Baltic States, Russia and Scandinavia (Sundberg et al., 2010).

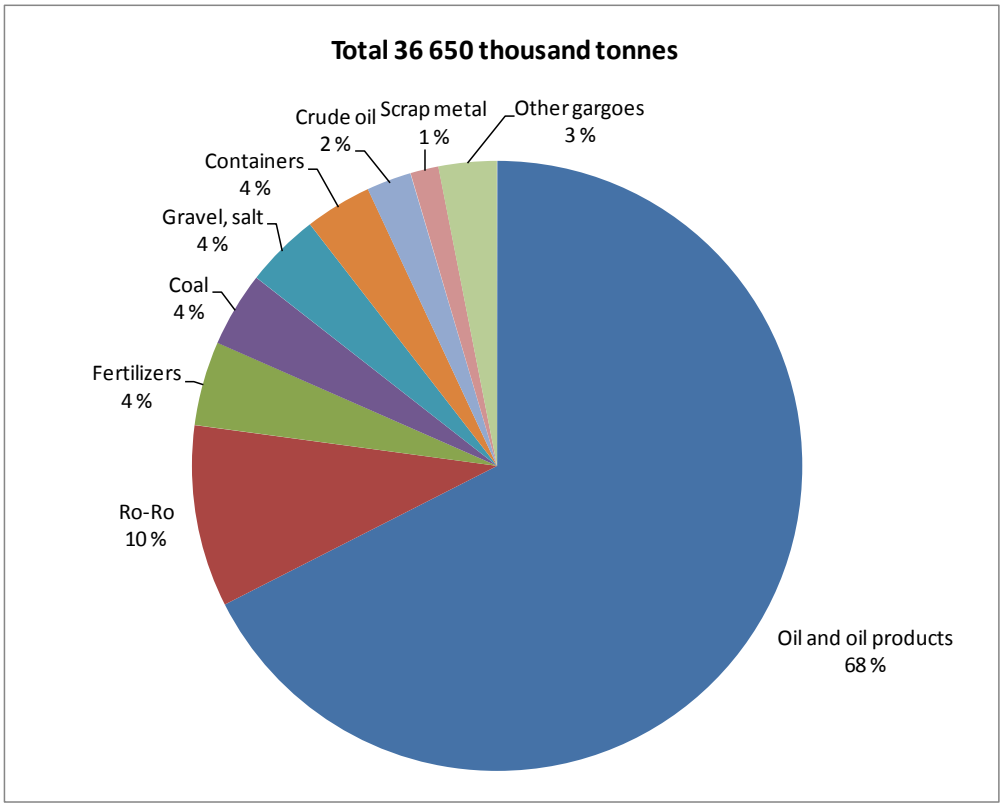


Figure 2.14. The port of Tallinn's cargo volumes by commodity groups in the year 2010. (Adapted from Port of Tallinn, 2011d)

Table 2.15 presents the development of **unitised cargo** transports in the port of Tallinn in the years 1999–2010. The amount of containers (TEU) has increased over 130 % from 65,000 TEUs to 152,000 TEUs over the viewed period. The highest figures have so far been recorded during the years 2007 and 2008 when about 181,000 TEUs of containers were handled in the port of Tallinn (Port of Tallinn, 2011c). In the year 2009, the amount of containers handled in the port was approximately 131 100 TEUs of which the Muuga Harbour handled 130,800 TEUs and Paldiski South harbour 300 TEUs (Särkijärvi et al., 2010). The port of Tallinn's annual container volumes in tonnes have varied between 1.1 and 1.4 million tonnes during the period 2005–2010 (data from the years 1999–2004 was not available) (Port of Tallinn, 2011d, 2010, 2009, 2008 & 2007). Vehicle traffic, in turn, has grown almost 270 % from around 367,000 to 1,360,000 pieces during the period 1999–2010 (Port of Tallinn, 2011c). Passenger cars, buses, trucks and trailers are included in the vehicle traffic. In the year 2009, the port of Tallinn's vehicle traffic comprised of some 865,000 passenger cars, 23,000 busses and 230,000 trucks and trailers. Around 190,000 of the trucks and trailers were transported through the Vanasadam Harbour, 24,000 through the Paldiski South Harbour and 16,000 through the Muuga Harbour (Särkijärvi et al., 2010). The amount of the port of Tallinn's annual Ro-Ro traffic has varied between 2.7 and 3.6 million tonnes during the period 2005–2010 (data from years 1999–2004 was not available) (Port of Tallinn, 2011d, 2010, 2009, 2008 & 2007).

Table 2.15. Unitised cargo traffic in the port of Tallinn in the years 1999–2010. (Port of Tallinn, 2011c, 2011d, 2010, 2009, 2008 & 2007)

Year	Containers (th. tonnes)	Containers (TEU)	Ro-Ro (th. tonnes)	Vehicles (pcs)
1999	N/A	65,246	N/A	366,965
2000	N/A	76,692	N/A	445,340
2001	N/A	78,072	N/A	485,261
2002	N/A	87,912	N/A	530,698
2003	N/A	99,629	N/A	577,996
2004	N/A	113,081	N/A	789,275
2005	1,111	127,585	3,080	938,590
2006	1,321	152,399	3,339	988,108
2007	1,365	180,911	3,563	1,057,165
2008	1,366	180,927	3,523	1,135,092
2009	1,187	131,059	2,664	1,142,815
2010	1,297	151,969	3,533	1,355,388

Transit traffic constituted 81 %, export 9 % and import 10 % of the port of Tallinn's cargo volume in the year 2010. Approximately 66 % of the cargo handled in the port of Tallinn originated from Russia (Table 2.16). Other countries where relatively large cargo volumes were coming to Tallinn were Estonia (9 % share of the Tallinn's total cargo volume), Finland (7 %), Belarus (4 %), Kazakhstan (3 %), Venezuela (2 %), Netherlands (2 %), Sweden (1 %) and Germany (1 %). Main destination countries for cargo leaving the port of Tallinn in the year 2010 were USA (25 % share of the Tallinn's total cargo volume) and Netherlands (19%). Over 95 % of cargo volume destined to these two countries comprised of oil and oil products. Estonia (10 %) and Finland (6

%) held the next largest shares of the cargo as destination countries (Port of Tallinn, 2011d).

Table 2.16. The most important origin and destination countries in the port of Tallinn's cargo traffic in the year 2010. (Port of Tallinn, 2011d)

Origin countries, share (%)		**Destination countries, share (%)**	
Russia	66	USA	25
Estonia	9	Netherlands	19
Finland	7	Estonia	10
Belarus	4	Finland	6
Kazakhstan	3	Europe	6
Venezuela	2	Singapore	4
Netherlands	2	Great Britain	4
Sweden	1	Denmark	3
Germany	1	Belarus	2
Other	5	Nigeria	2
Total	**100**	Italy	2
		Other	17
		Total	**100**

Tallinn vs. other Estonian ports in the sea cargo traffic between Finland and Estonia

Concerning the cargo flows originating from Finland to Estonia, Tallinn dominates as a port of destination. The annual share of Tallinn's volumes of the total traffic from Finland to Estonia has varied between 75 to 88 % over the period 2002–2010 (Figure 2.15). In the year 2010 approximately 87 % of the total volume coming from Finland was transported to the port of Tallinn. Nearly every year during the period almost all of the general cargo from Finland to Estonia has been transported to the port of Tallinn. For example, in the year 2010 all the general cargo was transported to Tallinn and in the year 2009 only 0.7 % of general cargo (6.5 thousand tonnes) was handled in other ports than the port of Tallinn. The main commodity group that is handled also by other Estonian ports than Tallinn has been crude mineral and cement. In the year 2010 Tallinn handled around 93,000 tonnes of crude mineral and cement while other Estonian ports handled about 293,000 tonnes of crude mineral and cement. In the year 2009 Tallinn was the number one also in cement and crude minerals with the volume of 303,000 tonnes. Other Estonian ports handled 251,000 tonnes, respectively (Finnish Transport Agency, 2011b). In Finland the ports of departure (e.g. Inkoo, Parainen, Skogby and Siilinjärvi) for the commodity group crude mineral and cement are located near the raw material sources. It can be assumed that in Estonia the destination ports are situated near the places where the raw material is used because of the heavy weight of raw minerals and cement.

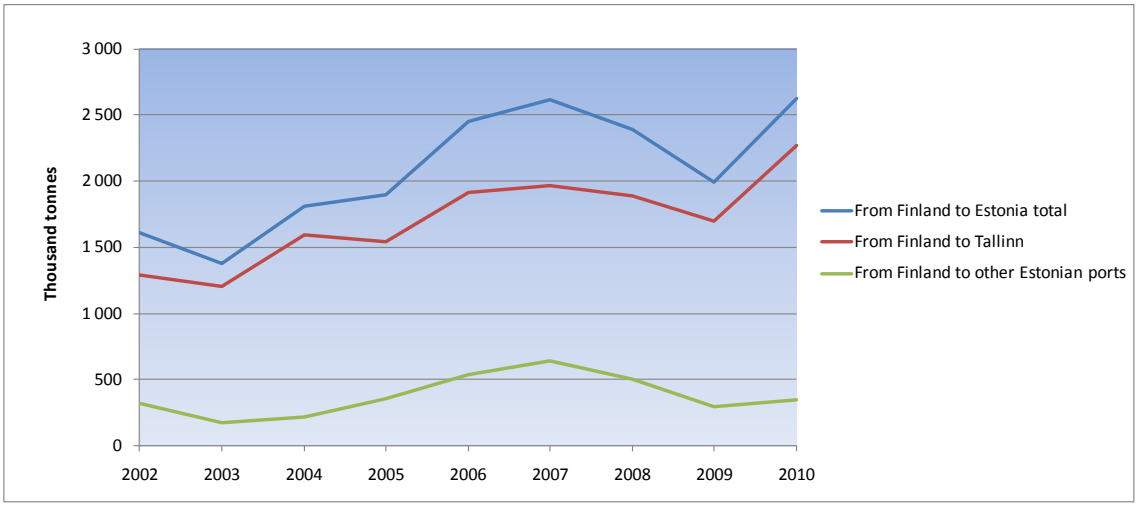


Figure 2.15. Seaborne cargo traffic from Finland to Tallinn and other Estonian ports in the years 2002–2010. (Finnish Transport Agency, 2011b)

Tallinn also dominates the cargo flows coming from Estonia to Finland but not in that extent compared to cargo coming from reverse direction. The annual share of Tallinn's volumes of the total traffic from Estonia to Finland has varied between 55 to 74 % over the period 2002–2010 (Figure 2.16). In the year 2010 approximately 63 % of the total volume was transported via the port of Tallinn to Finland. The main reason for the smaller share of Tallinn's volumes in the cargo traffic from Estonia to Finland is the large amount of timber (= raw wood and wood chips) that is transported from Estonia to Finland via other Estonian ports than Tallinn. It can be taken for granted that ports in Estonia are near the logging areas, for example in the year 2010 about 460,000 tonnes were loaded to Finland in Pärnu, only 50,000 tonnes in Tallinn and 525,000 tonnes in other Estonian ports. In the same year the biggest ports of discharge in Finland were Kotka, Rauma and Imatra, which all have paper industry (Finnish Transport Agency, 2011b).

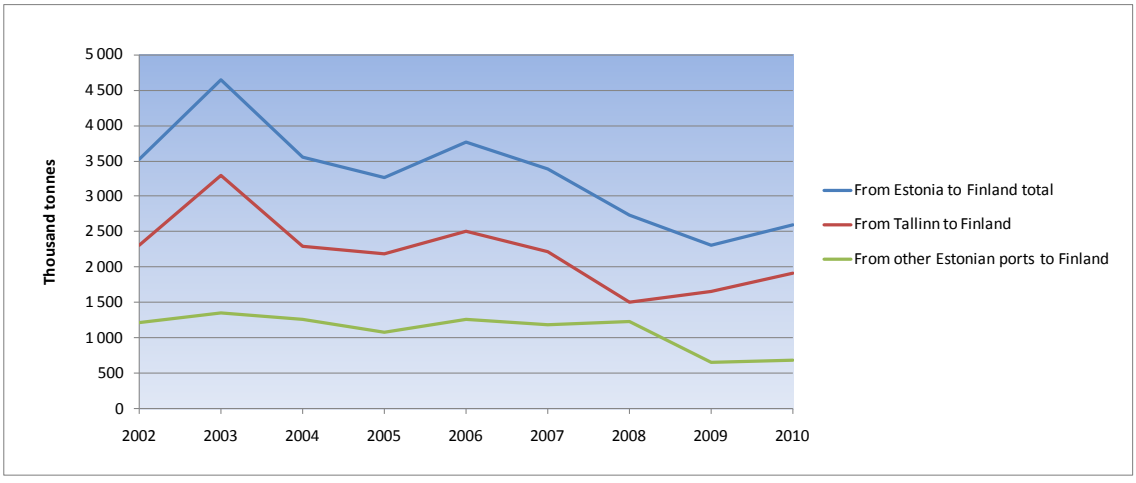


Figure 2.16. Seaborne cargo traffic from Tallinn and other Estonian ports to Finland in the years 2002–2010. (Finnish Transport Agency, 2011b)

Seaborne unitised cargo in trucks and trailers has been transported almost solely on the Helsinki-Tallinn route. The situation has changed in some extent during the year 2011, when the shipping company Navirail OÜ started to use private Paldiski Northern Port instead of Muuga Harbour in Tallinn. In Helsinki the company still uses the Vuosaari Harbour as before. The company operates one Ro-Ro ferry carrying cargo (Navirail, 2011). In the route Hanko-Paldiski the shipping company Transfennica operates with a Ro-Ro cargo ferry. Transfennica has also a liner service between Paldiski and some Northern Sea ports (Transfennica, 2011). Volumes are counted to the figures of the port of Tallinn because the shipping company uses Paldiski Southern Harbour owned by the port of Tallinn. In the year 2010 the number of lorries and trailers transported between Hanko and Tallinn (Paldiski) totalled 445, which is only 0.2 % of the total amount of units (237,112) transported in the Finland-Estonia traffic. Totally 236,523 units were transported on the Helsinki-Tallinn route. There was also a short period of two years when cargo and passengers were carried between Kotka and Sillamäe. In the year 2007 about 6,000 lorry and trailer units were transported between Kotka and Estonia (Finnish Transport Agency, 2011b).

3 STATISTICAL ANALYSIS OF TRADE AND SEABORNE CARGO TRAFFIC BETWEEN FINLAND AND ESTONIA

This chapter presents the results of the statistical analysis of trade and seaborne cargo traffic between Finland and Estonia. First, the trade statistics between Finland and Estonia are examined (section 3.1) and then the seaborne cargo traffic statistics between these countries are studied (section 3.2). On the basis of the examinations, the trade and seaborne cargo traffic between Finland and Estonia are compared in section 3.3. The aim of the comparison is to clarify how large amount of the seaborne cargo traffic in the Finland–Estonia route is other foreign trade than inter-country trade between Finland and Estonia (also called hinterland cargo or transit cargo). In section 3.4, the corresponding statistics of the other Baltic countries are explored in order to find out their role in the seaborne cargo traffic in the Finland–Estonia route. On the basis of these calculations, the role of other Finland's and Estonia's hinterlands which are potential users of the route can be estimated on rough level. Finally in section 3.5, the seaborne cargo traffic statistics between the ports of Helsinki and Tallinn are examined.

The trade statistics that are presented in this chapter come from Finnish Customs and from the Uljas database that is a distribution system for foreign trade statistics provided by Finnish Customs. The seaborne cargo statistics come from the Finnish Transport Agency and from the Martina database that is a tool for analysing the Finnish international seaborne cargo traffic provided by the Finnish Transport Agency. It should be noticed that there are some restrictions concerning the comparison of the Finnish Customs' and the Finnish Transport Agency's statistics. The Finnish Customs and the Finnish Transport Agency are using different statistical methods to collect the statistical data. The main difference is related to cargo weight: the Finnish Customs uses net weight and the Finnish Transport Agency gross weight. For example the weight of the pallets and transport packages are included in the gross weight but not in the net weight. However, the weight of empty transport equipment (e.g. container, trailer) is not included in gross weight. These factors may cause some differences between the statistics so the comparison figures presented in this chapter are rough and only indicative. However, the comparison of the Finnish Customs' and the Finnish Transport Agency's statistics is, in practise, the only way to get estimates of the hinterland cargo flows in the Finland-Estonia transport route. Also the classification of goods differs. When considering the sea transport statistics, the Finnish transport agency is using the classification, which is based on general classification for transport called NST/R (Standard goods classification transport statistics). However, the classification has been modified to respond the requirements of seaborne cargo transport (Finnish Transport Agency, 2011a). The Finnish Customs, in turn, has several different classifications for the compilation of foreign trade statistics. In this study a SITC classification (the Standard International Trade Classification) is used. With the SITC, it is easier to get an overall picture of the trade e.g. when comparing trade relations between countries or other larger entities (Finnish Customs, 2011b).

The main focus in this study is on the unitised cargo traffic. Therefore, the cargoes that are non-unitisable or are usually not transported as a unitised cargo between Finland and Estonia are removed from most of the statistics presented in this chapter (this is indi-

cated in connection with the figures and tables). The same cargoes are removed both from the Finnish Customs' trade statistics and from the Finnish Transport Agency's international seaborne cargo traffic statistics. However, the names of the removed cargo groups are partly different since the statistical methods of the Finnish Customs and the Finnish Transport Agency differs. The cargo groups that are removed from Finnish Customs' trade statistics include minerals fuels, electric current, cork and wood (except sawn and planed wood), and the cargo groups that are removed from the Finnish Transport Agency's international seaborne cargo traffic statistics include coal, unsawn wood, oil and oil products. In the Uljas database of the Finnish Customs all the other product groups except sawn wood is presented in tonnes. Therefore, with sawn wood a conversion from cubic metres to tonnes has been made by using the conversion factor of 0.5 in export and 0.53 in import. These factors were conducted from the available transport statistics of the Finnish Customs. The observation period was chosen to be the years 2002–2010 in most of the statistics that are shown in this chapter. The period was considered to be long enough to form a good picture of the development of the trade and seaborne cargo traffic between Finland and Estonia.

3.1 Trade between Finland and Estonia

The total trade between Finland and Estonia (excluding mineral fuels, electric current, cork and wood, except sawn and planed wood) has varied quite a lot over the period 2002–2010 (Figure 3.1). In the years 2002–2004, the amount of the total trade dropped from around 1,750 to 1,200 thousand tonnes. In the year 2005, the total trade returned to growth and in the year 2007 the highest figure (over 2,200 th. tonnes) during the viewed period was recorder. During the years 2008–2009, the total trade decreased again and in the year 2009 around 1,600 thousand tonnes of goods were traded between Finland and Estonia. In the year 2010, the total trade returned to growth again and by the end of the year about 1,800 thousand tonnes of goods were traded between Finland and Estonia. By commodity groups, inedible crude materials (except fuels) has been the most traded commodity group almost every year during the period 2002–2010. In the year 2010, the amount of inedible crude materials traded between Finland and Estonia was around 870 thousand tonnes. Basic manufactures has been the other important commodity group by trade volumes, and in the year 2010 it was traded around 420 thousand tonnes between Finland and Estonia. In the same year, these two most traded commodity groups altogether accounted for over 70 % of the total trade between Finland and Estonia. The next most traded commodity groups during the viewed period have been chemicals and related products (180 th. tonnes in 2010), machinery and transport equipment (110 th. tonnes in 2010), food and live animals (120 th. tonnes in 2010) and miscellaneous manufactured articles (60 th. tonnes in 2010) (Finnish Customs, 2011b).

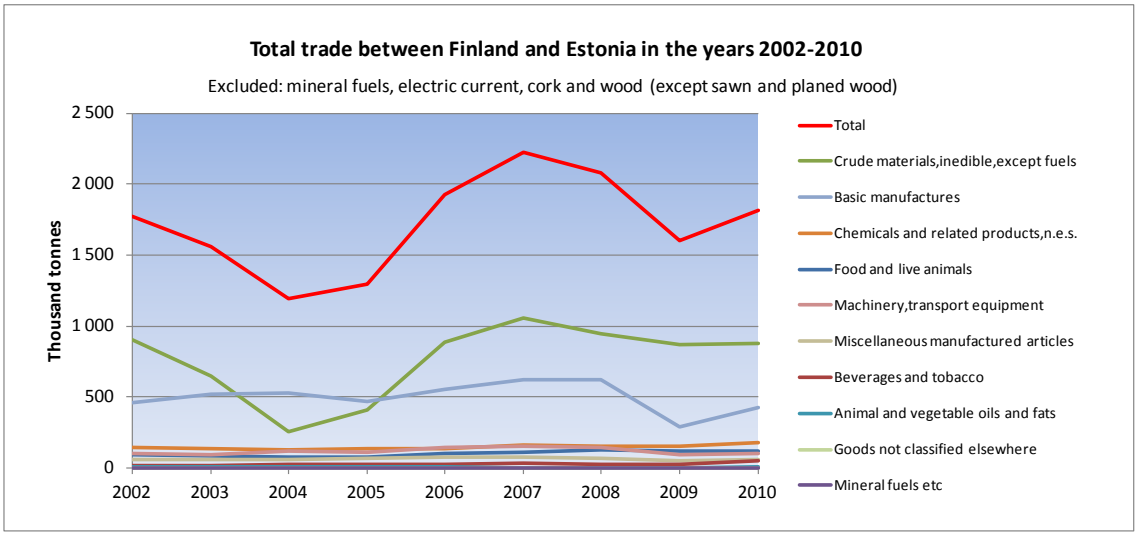


Figure 3.1. Total trade between Finland and Estonia by commodity groups in the years 2002–2010. (Finnish Customs, 2011b)

Figure 3.2 presents the development of the import trade from Estonia to Finland by commodity groups in the period 2002–2010 (excluding mineral fuels, electric current, cork and wood, except sawn and planed wood). During this period, the import trade has increased approximately 46 % from around 620 to 910 thousand tonnes. In the year 2009, the import trade fell by some 27 % compared to the previous year but a year later the import trade returned to growth and the highest figure (around 910 th. tonnes) over the period was recorded in the year 2010. By commodity groups, inedible crude materials (except fuels) and basic manufactures have distinctly been the most imported goods over the period. In the year 2010, they altogether accounted for over 75 % of the total import trade from Estonia to Finland. The next most imported commodity groups have been machinery and transport equipment, miscellaneous manufactured articles, food and live animals, and chemicals and related products. The share of other commodity groups has been quite minimal (Finnish Customs, 2011b).

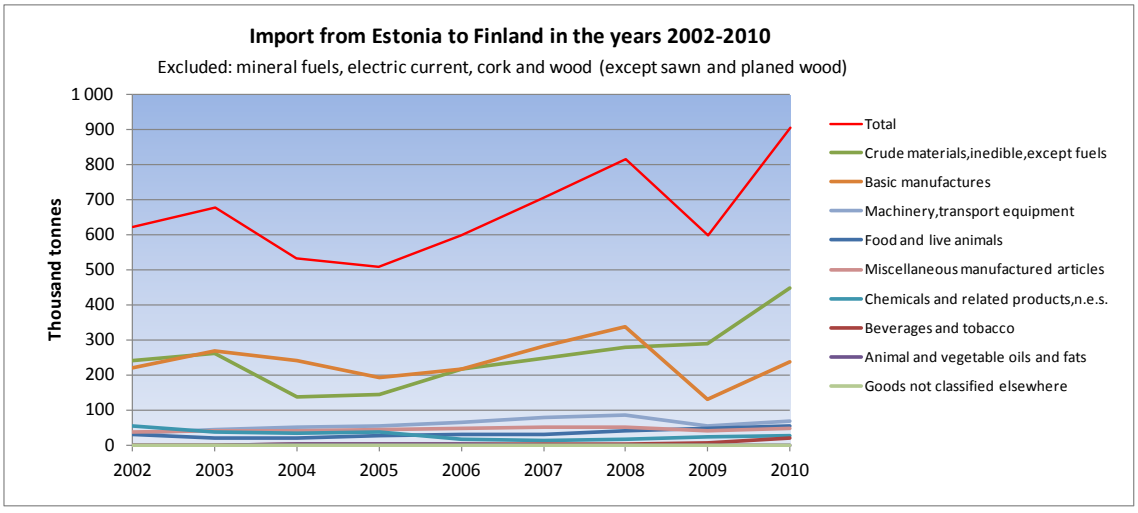


Figure 3.2. Import from Estonia to Finland by commodity groups in the years 2002–2010. (Finnish Customs, 2011b)

Figure 3.3 presents the development of export trade from Finland to Estonia by commodity groups in the years 2002–2010 (excluding mineral fuels, electric current, cork and wood, except sawn and planed wood). As it can be seen in the figure, there has been quite a lot variation in the amount of export trade over the viewed period. During the years 2002–2004, the quantity of export trade dropped from around 1,150 to 650 thousand tonnes. In the year 2005, the export trade returned to growth and in 2007 the highest figure (over 1,500 th. tonnes) during the period was recorder. In the period 2008–2010, the export trade decreased again and in the year 2010 around 900 thousand tonnes of goods were exported from Finland to Estonia. By commodity groups, inedible crude materials (except fuels) has been the most exported commodity group almost every year over the period 2002–2010. In the year 2010, the amount of inedible crude materials that was exported from Finland to Estonia was around 430 thousand tonnes. Basic manufactures (190 th. tonnes) and chemicals and related products (160 th. tonnes) were the next most imported commodity groups in the year 2010. These three commodity groups accounted for some 84 % of the total export trade from Finland to Estonia. The share of other commodity groups has been quite minimal (Finnish Customs, 2011b).

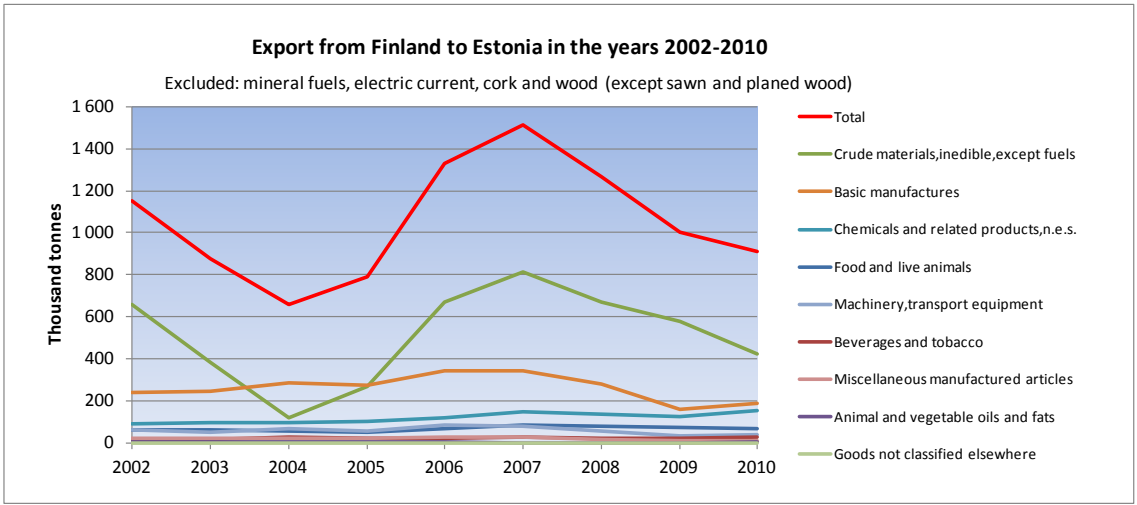


Figure 3.3. Export from Finland to Estonia by commodity groups in the years 2002–2010. (Finnish Customs, 2011b)

3.2 Seaborne cargo traffic between Finland and Estonia

The total international seaborne cargo traffic between Finland and Estonia (excluding coal, unsawn wood, oil and oil products) has increased around 75 % from 2.3 to 4.0 million tonnes over the period 2002–2010 (Figure 3.4). The growth started in the year 2003 and continued quite strong till the end of the year 2007. In the year 2008, seaborne cargo traffic between Finland and Estonia still increased but only a little. In the year 2009, the cargo volume fell by nearly 20 % mainly due to the global recession. Especially the amount of general cargo and minerals decreased. A year later, in 2010, the cargo traffic returned to growth and by the end of the year the total volume of seaborne

cargo traffic between Finland and Estonia amounted to approximately 4 million tonnes (Finnish Transport Agency, 2011b).

By commodity groups, the general cargo[2] has been every year the most transported cargo type during the period 2002–2010. The annual share of the general cargo from the total seaborne cargo volumes between Finland and Estonia has varied between 55 to 64 % over the viewed period. In the year 2010, the general cargo amounted to approximately 2.2 million tonnes (55 % share of the total cargo volume). Minerals has been the other important commodity group by cargo volumes, and in the year 2010 approximately 0.8 million tonnes of minerals (or 19 % share of the total cargo volume) was transported between Finland and Estonia by sea. The next most transported cargo groups over the viewed period have been other cargoes, ore, paper and metals including cars (Finnish Transport Agency, 2011b).

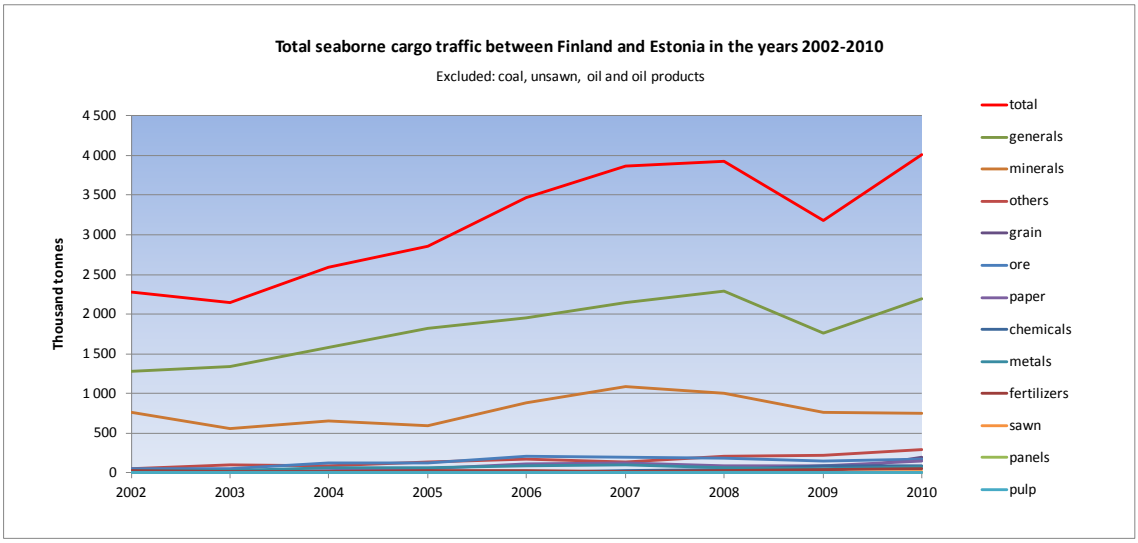


Figure 3.4. Total international seaborne cargo traffic between Finland and Estonia in the years 2002–2010. (Finnish Transport Agency, 2011b)

The amount of international seaborne cargo traffic (excluding coal, unsawn wood, oil and oil products) that is transported from Estonia to Finland has increased over 160 % from 0.7 to 1.8 million tonnes over the period 2002–2010 (Figure 3.5). The annual growth has been between 9 and 14 % in the years 2002–2006 and up to 20 to 24 % in the years 2007–2008. In the year 2009, the Finnish import seaborne cargo volume from Estonia fell by nearly 15 % or over 0.2 million tonnes mainly due to the global recession. Especially the amount of general cargo and minerals decreased. In the year 2010, the cargo traffic returned to strong growth and by the end of the year the volume of international seaborne cargo traffic from Estonia to Finland amounted to approximately 1.8 million tonnes which is some 38 % or 0.5 million tonnes more than a year before (Finnish Transport Agency, 2011b).

[2] All cargo transported in containers, trailers, trucks, rail wagons and other transport vehicles by type cannot be specified. These loads in the statistics are classified as "general cargo". Consumer goods, food supplies and machines are typical examples of general cargo. Also paper and sawn wood can be classified as “general cargo”, if they have not categorised in their own commodity groups.

By commodity groups, general cargo has been every year the most transported cargo type in the Finnish imported seaborne cargo traffic from Estonia during the period 2002–2010. The volume of general cargo has increased some 155 % from 0.4 to 1.1 million tonnes over the viewed period. In the year 2010, the share of general cargo of the total import volume was nearly 61 %. Minerals has been the other important commodity group by cargo volumes, and in the year 2010 nearly 0.4 million tonnes (or 20 % share from the total import volume) of minerals were imported from Estonia to Finland by sea. The next most imported cargo groups over the viewed period have been other cargoes, ore and paper (Finnish Transport Agency, 2011b).

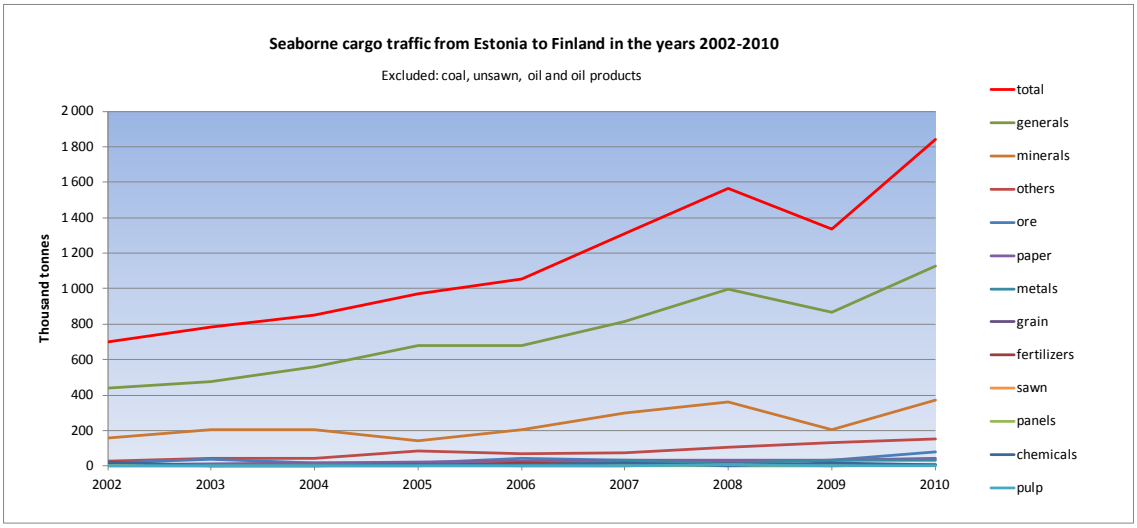


Figure 3.5. International seaborne cargo traffic from Estonia to Finland in the years 2002–2010. (Finnish Transport Agency, 2011b)

The amount of international seaborne cargo traffic (excluding coal, unsawn wood, oil and oil products) that is transported from Finland to Estonia has increased some 37 % from 1.6 to 2.2 million tonnes over the period 2002–2010 (Figure 3.6). The growth started in the year 2003 and continued until the end of the year 2007 when the highest figure (over 2.5 million tonnes) in Finnish seaborne export to Estonia during the viewed period was recorded. During the years 2008 and 2009, the export volume fell by around 28 % compared to the year 2007 mostly due to the global recession. In the year 2010, the export volume from Finland to Estonia returned to growth and by the end of the year it amounted to nearly 2.2 million tonnes (Finnish Transport Agency, 2011b).

By commodity groups, general cargo has been every year the most exported cargo type from Finland to Estonia during the period 2002–2010. The annual volume of general cargo has varied from around 0.8 to 1.3 million tonnes over the viewed period. In the year 2010, the share of general cargo of the total export volume transported from Finland to Estonia was about 61 % or 1.1 million tonnes. Minerals has been the other important commodity group by cargo volumes, and in the year 2010 nearly 0.4 million tonnes (or 18 % share of the total import volume) of minerals were exported from Finland to Estonia by sea. The next most exported cargo groups over the viewed period have been in this order ores, other cargoes, paper and metals including cars (Finnish Transport Agency, 2011b).

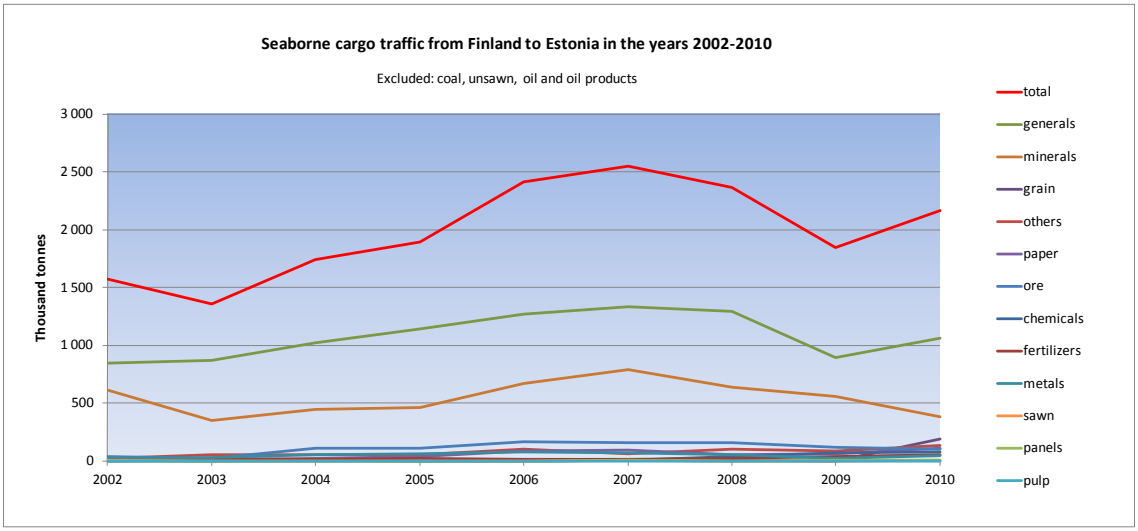


Figure 3.6. International seaborne cargo traffic from Finland to Estonia in the years 2002–2010. (Finnish Transport Agency, 2011b)

3.3 Comparison of trade and seaborne cargo traffic statistics between Finland and Estonia

This section presents the comparison of the trade and seaborne cargo traffic statistics between Finland and Estonia. The aim of the comparison is to clarify how large amount of the seaborne cargo traffic between Finland and Estonia is originated from other countries than Finland and Estonia themselves. In other words, the objective is to find out the amount of hinterland cargo flows or transit cargo (the cargo that is neither Finland's nor Estonia's own foreign trade) in the seaborne cargo traffic between Finland and Estonia. As background information, Table 3.1 shows that almost all of the foreign trade between Finland and Estonia is transported by sea. Therefore, there is no need to take any other transport modes into account when the trade and seaborne cargo traffic statistics between Finland and Estonia are compared.

It should be noticed that the figures presented in Table 3.1 includes all commodity groups but the cargoes that are non-unitisable or are usually not transported as a unitised cargo between Finland and Estonia are removed from the comparison figures presented in this section since the main focus of this study is on the unitised cargo traffic. Therefore, the trade volumes presented in Figure 3.1 in section 3.1 and the trade volumes shown in Table 3.1 below differ from each other.

Table 3.1. Transports of foreign trade between Finland and Estonia by transport modes in the years 2005–2010, thousand tonnes. (Finnish Customs, 2011a)

	2005	2006	2007	2008	2009	2010
Ship transports	2,415	2,741	3,004	3,001	2,286	2,999
Rail transports	0	1	3	8	36	68
Road transports	8	0	0	1	1	0
Air transports	1	1	1	0	0	1
Other transports	0	18	14	0	0	0
Total	**2,424**	**2,761**	**3,021**	**3,011**	**2,324**	**3,067**

Figure 3.7 presents the comparison of total trade and seaborne cargo traffic between Finland and Estonia in the period 2002–2010. As it can be seen in the figures, the seaborne cargo volume has been every year higher than the foreign trade volume. The difference was still quite small, about 0.5–0.6 million tonnes, in the years 2002 and 2003. In the year 2004, the seaborne cargo volume increased 21 % while the foreign trade volume decreased by 23 %, and therefore, the difference between their volumes increased nearly by 140 % from around 0.6 to 1.4 million tonnes compared to the previous year. During the period 2004–2008, the gap between the seaborne cargo traffic and the foreign trade continued its increasing and by the end of the year 2008 it already amounted to 1.85 million tonnes. In the year 2009, both the seaborne cargo volume and foreign trade volume fell but the decrease of seaborne cargo volume was greater than the decrease of foreign trade volume, and thus, the difference between their volumes diminished about 14 % or 0.26 million tonnes and ended to 1.59 million tonnes by the end of the year. In the year 2010, the seaborne cargo traffic and the foreign trade returned to growth, as did the gap between their volumes. By the end of the year 2010, the difference between the volumes of seaborne cargo traffic and the foreign trade amounted to 2.2 million tonnes. During the viewed period 2002–2010, the seaborne cargo volumes between Finland and Estonia has increased over 76 % from around 2.28 to 4.01 million tonnes while the foreign trade has increased only about 3 % from 1.77 to 1.82 million tonnes (Finnish Customs, 2011b; Finnish Transport Agency, 2011b).

As it was explained above and as it is shown in Figure 3.7, the annual difference between the volumes of the seaborne cargo traffic and the foreign trade between Finland and Estonia has varied from 0.5 to 2.2 million tonnes over the period 2002–2010. This roughly means that according to this statistical comparison every year during the viewed period 0.5–2.2 million tonnes of cargo that is not Finland's or Estonia's own foreign trade is transported between Finland and Estonia by sea. The annual share of that hinterland or transit cargo from the total seaborne cargo traffic between Finland and Estonia is quite large since it has been varied between 27 to 62 % over the period 2002–2010 (Finnish Customs, 2011b; Finnish Transport Agency, 2011b).

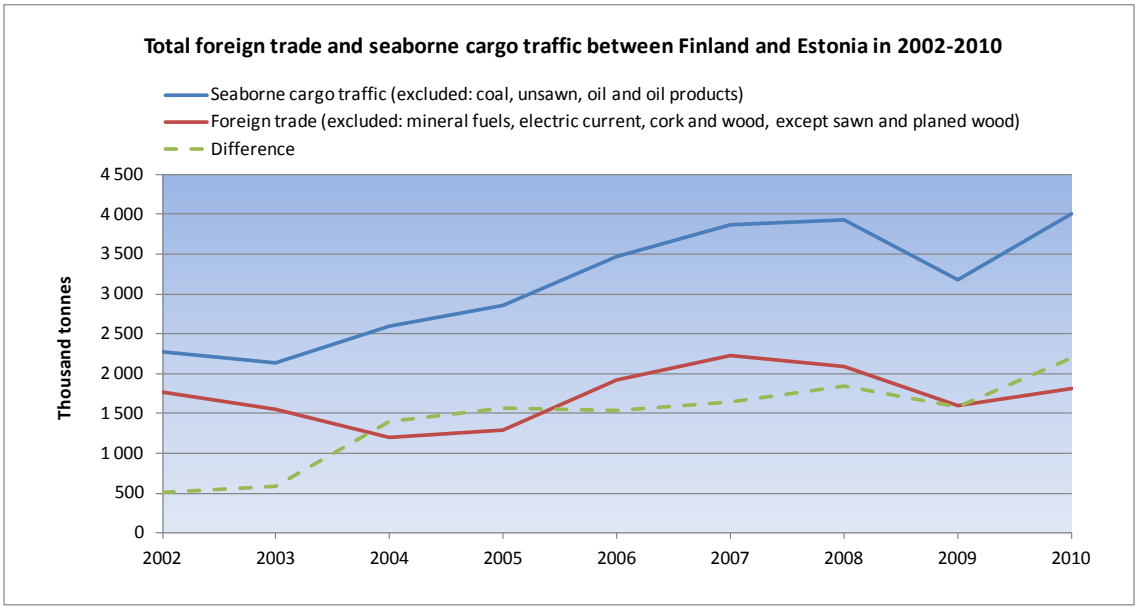


Figure 3.7. The comparison of total foreign trade and seaborne cargo traffic between Finland and Estonia in the years 2002–2010. (Finnish Customs, 2011b; Finnish Transport Agency, 2011b)

Figure 3.8 presents the comparison of imported foreign trade and imported seaborne cargo traffic from Estonia to Finland in the period 2002–2010. As it can be seen in the figure, the profiles of the import graphs are quite similar to the profiles of the total graphs shown above (see Figures 3.7 and 3.8). Also concerning imports from Estonia to Finland, the seaborne cargo volume has been every year higher than the foreign trade volume. The difference was only about 0.08 million tonnes in the year 2002 and 0.10 million tonnes in the year 2003 but during the years 2003–2008 the gap between import of the seaborne cargo traffic and import of the foreign trade increased nearly 640 % from around 0.10 to 0.75 million tonnes. In the year 2009, both the volumes of the import seaborne cargo and the import foreign trade from Estonia to Finland fell but the decrease was almost the same in seaborne cargo traffic and in trade, and therefore, the gap between their volumes stayed nearly at the same level (0.74 million tonnes) than year before. In the year 2010, the import seaborne cargo traffic and the import foreign trade returned to growth and so did the gap between their volumes. By the end of the year 2010, the difference between the import volumes of the seaborne cargo traffic and the foreign trade amounted to around 0.93 million tonnes. During the viewed period 2002–2010, the import seaborne cargo volumes from Estonia to Finland has increased over 160 % from 0.70 to 1.84 million tonnes while the foreign trade has increased around 46 % from 0.62 to 0.91 million tonnes (Finnish Customs, 2011b; Finnish Transport Agency, 2011b).

The annual difference between the import volumes of the seaborne cargo traffic and the foreign trade from Estonia to Finland has been varied from 0.08 to 0.93 million tonnes over the period 2002–2010. Therefore, according to this statistical comparison, every year during the viewed period around 0.08–0.93 million tonnes of cargo that is not Estonia's own foreign trade is transported from Estonian ports to Finnish ports by sea. The annual share of that hinterland or transit cargo from the total import seaborne cargo traf-

fic from Estonia to Finland has varied between 11 to 55 % over the period 2002–2010 (Finnish Customs, 2011b; Finnish Transport Agency, 2011b).

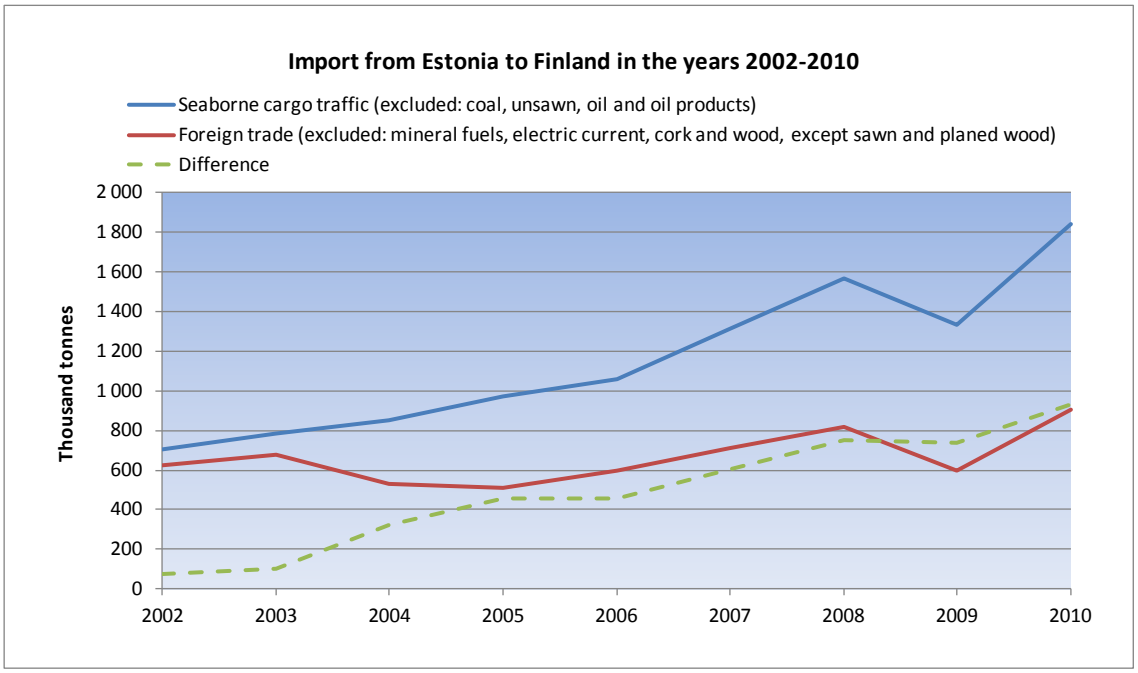


Figure 3.8. The comparison of import foreign trade and import seaborne cargo traffic from Estonia to Finland in the years 2002–2010. (Finnish Customs, 2011b; Finnish Transport Agency, 2011b)

Figure 3.9 presents the comparison of export foreign trade and export seaborne cargo traffic from Finland to Estonia during the years 2002–2010. Also in export from Finland to Estonia the seaborne cargo volume has been every year higher than the foreign trade volume. The difference was around 0.43 million tonnes in the year 2002 and 0.48 million tonnes in the year 2003. In the year 2004, the export seaborne cargo volume increased 28 % or 0.38 million tonnes while the foreign trade volume decreased 23 % or 0.22 million tonnes, and therefore, the difference between their volumes increased some 123 % from around 0.48 to 1.08 million tonnes compared to the previous year. During the years 2004–2008, the gap between the export seaborne cargo traffic and the export foreign trade stayed nearly at the same level even though the export cargo volumes of seaborne traffic and foreign trade fluctuated up and down. In the year 2009, the gap decreased about 22 % or 0.25 million tonnes but in the year 2010, it returned to growth (+48 %) and by the end of the year the difference between the export seaborne cargo traffic and the export foreign trade from Finland to Estonia amounted to 1.26 million tonnes. During the viewed period 2002–2010, the export seaborne cargo volumes from Finland to Estonia has increased some 38 % from 1.58 to 2.17 million tonnes while the foreign trade has decreased around 21 % from 1.15 to 0.91 million tonnes (Finnish Customs, 2011b; Finnish Transport Agency, 2011b).

The annual difference between the export volumes of the seaborne cargo traffic and the foreign trade from Finland to Estonia has been varied from 0.43 to 1.26 million tonnes over the period 2002–2010. Therefore, according to this statistical comparison, every year during the viewed period around 0.43–1.26 million tonnes of cargo that is not

Finland's own foreign trade is transported from Finnish ports to Estonian ports by sea. The annual share of that hinterland or transit cargo from the total export seaborne cargo traffic from Finland to Estonia has varied between 27 and 62 % over the period 2002–2010 (Finnish Customs, 2011b; Finnish Transport Agency, 2011b).

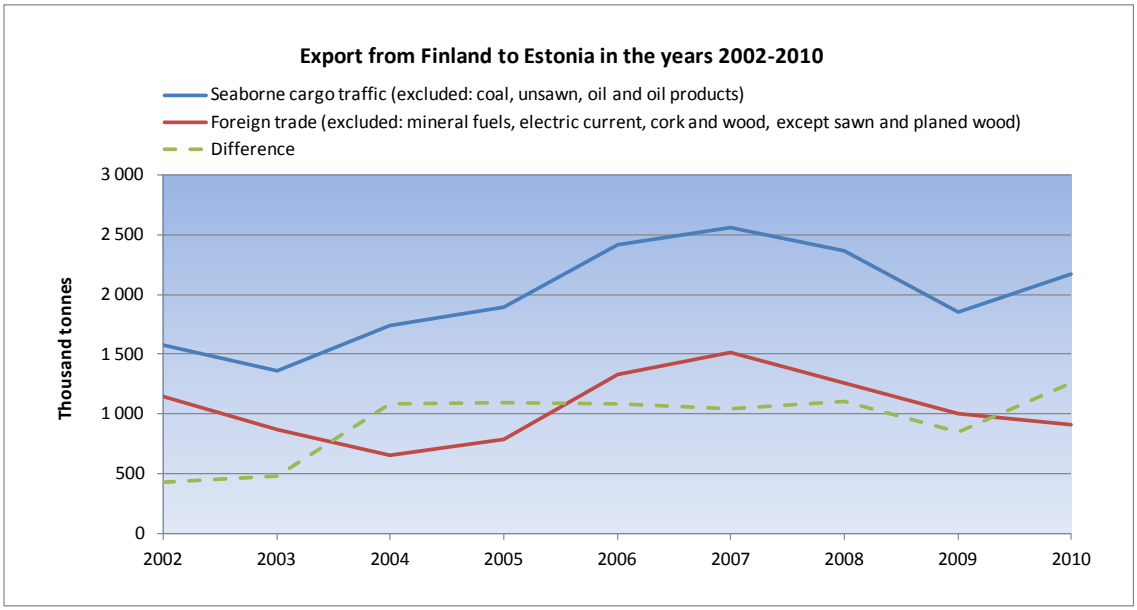


Figure 3.9. The comparison of export foreign trade and export seaborne cargo traffic from Finland to Estonia in the years 2002–2010. (Finnish Customs, 2011b; Finnish Transport Agency, 2011b)

3.4 Comparison of trade and seaborne cargo statistics between Finland and the other Baltic States

In this section the foreign trade and seaborne cargo statistics between Finland and the other Baltic States than Estonia are briefly compared in order to get an overview of the hinterland cargo flows of Latvia and Lithuania. The comparison of the statistics between other Baltic States and Finland has been done with the same presumptions than the comparison of the statistics between Finland and Estonia (see more details from the beginning of the chapter 3). In the end of the section foreign trade and seaborne cargo statistics between Finland and all the Baltic States together are also compared.

The graphs of import trade and seaborne cargo traffic from Latvia to Finland are almost equal (Figure 3.10). The trend of both graphs was slightly mounting during the time period 2002–2009. In the year 2010 there was a large leap in the volumes and both graphs peaked the level of around 400,000 tonnes. Over 300,000 tonnes of basic manufactures was imported to Finland. The import volume of seaborne cargo traffic has been annually around 11,500 tonnes larger than the import trade volume. In certain years the remainder between the Finnish Transport Agency's and the Finnish Customs' statistics is negative because of the differences between the statistics.

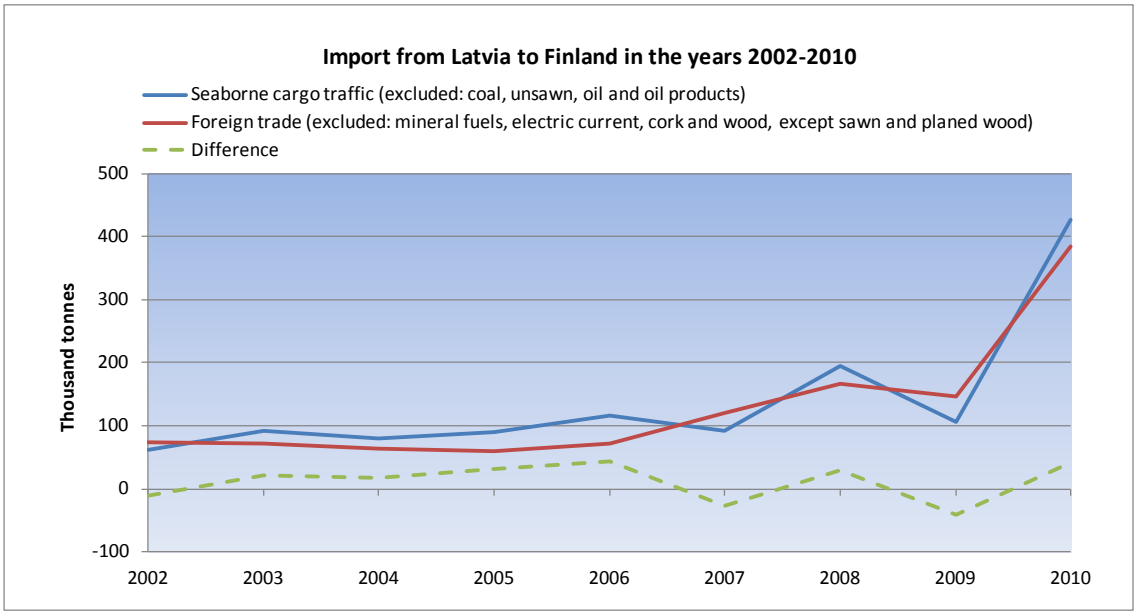


Figure 3.10. The comparison of import foreign trade and import seaborne cargo traffic from Latvia to Finland in the years 2002–2010. (Finnish Customs, 2011b; Finnish Transport Agency, 2011b)

When the flows from Finland to Latvia are viewed, it can be noticed that annual export foreign trade has been on average about 106,000 tonnes higher than the seaborne cargo flow to Latvia (Figure 3.11). The main reason for large fluctuations of export flows during the time period 2006–2010 has been the variation of export of crude materials and in some extent basic manufactures. The figure reveals that around 80,000–140,000 tonnes of cargo has been annually transported via other routes than directly from Finland to Latvia.

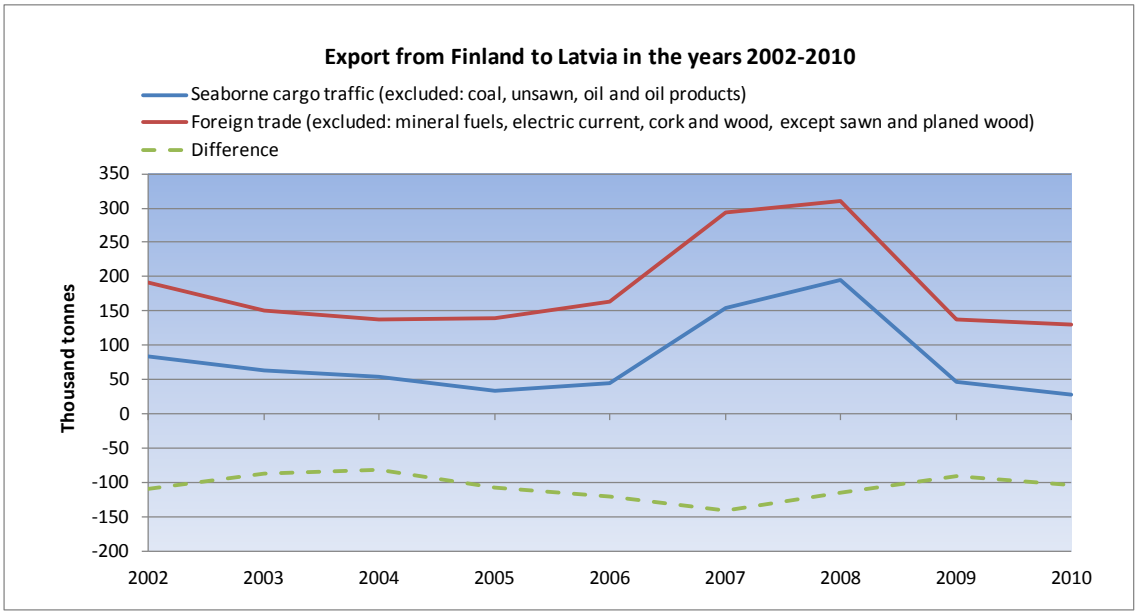


Figure 3.11. The comparison of export foreign trade and export seaborne cargo traffic from Finland to Latvia in the years 2002–2010. (Finnish Customs, 2011b; Finnish Transport Agency, 2011b)

The graphs of import trade and seaborne cargo traffic from Lithuania to Finland are almost equal (Figure 3.12). In the flows from Lithuania to Finland the annual seaborne cargo flow has been on average only 2,800 tonnes bigger than the trade flow. In the top year 2005 the seaborne cargo traffic from Lithuania to Finland amounted to some 290,000 tonnes and foreign trade to some 275,000 tonnes. During the period 2005–2007 the trade and the seaborne cargo volumes decreased significantly mainly because of the decrease of trade and seaborne traffic of minerals. In 2008, both the trade and seaborne cargo volumes returned to growth and they both amounted to around 170,000 tonnes by the end of the year 2010.

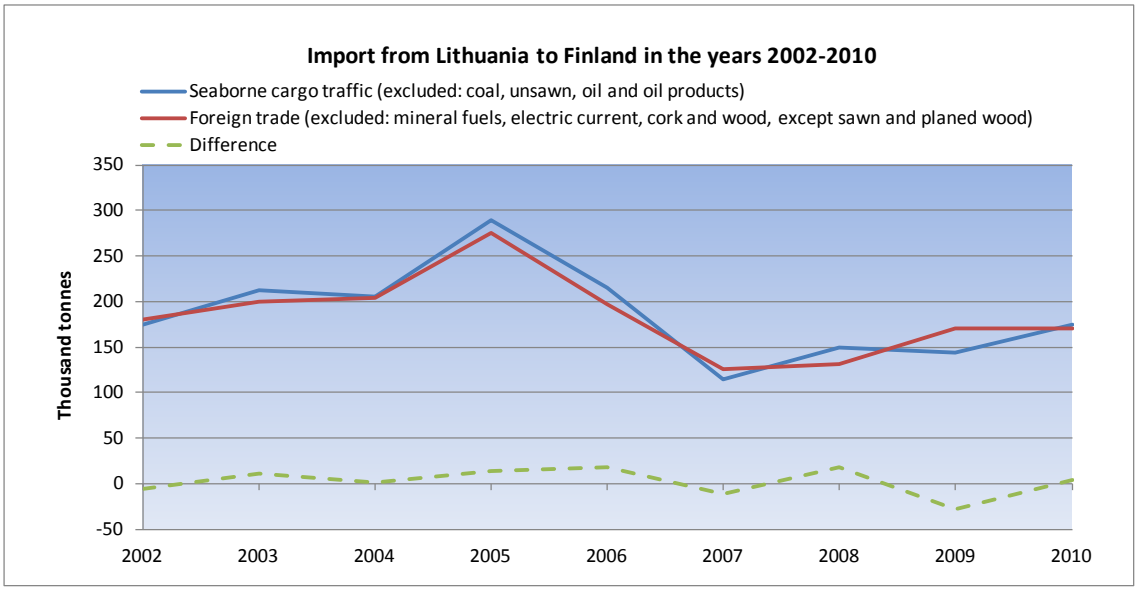


Figure 3.12. The comparison of import foreign trade and import seaborne cargo traffic from Lithuania to Finland in the years 2002–2010. (Finnish Customs, 2011b; Finnish Transport Agency, 2011b)

In the flows from Finland to Lithuania the annual amount of foreign trade has varied between 106,000–230,000 tonnes while the annual volume of seaborne cargo traffic has varied between 26,000–100,000 tonnes (Figure 3.13). Therefore, the annual trade flow from Finland to Lithuania has been on average around 89,000 tonnes larger than the seaborne flow. This means that also other routes than only the direct route to Lithuania are used in the trade between Finland and Lithuania.

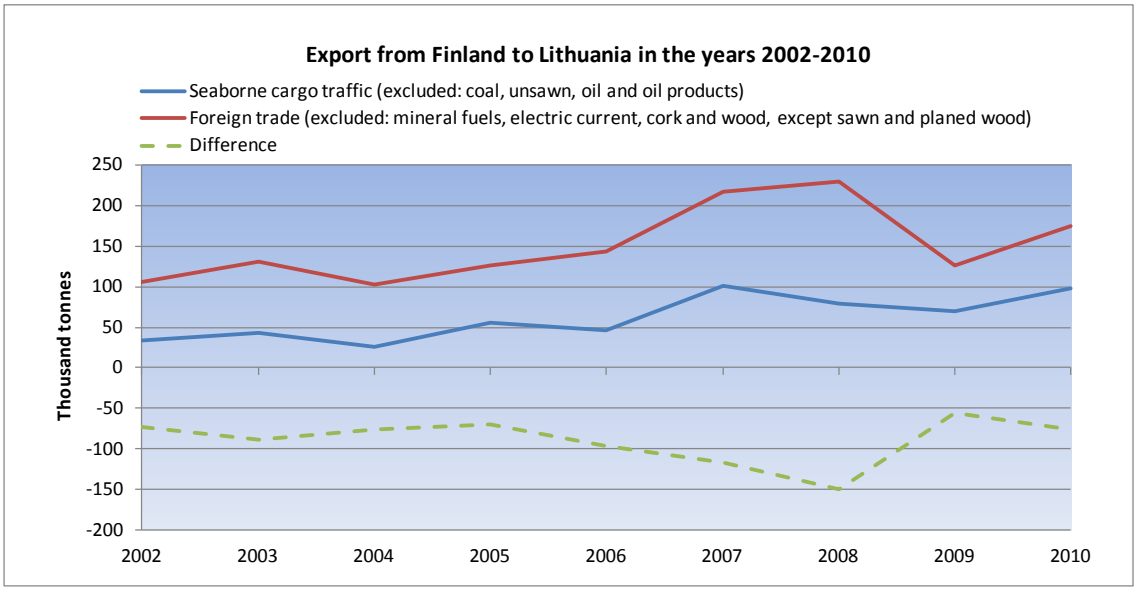


Figure 3.13. The comparison of export foreign trade and export seaborne cargo traffic from Finland to Lithuania in the years 2002–2010. (Finnish Customs, 2011b; Finnish Transport Agency, 2011b)

As it can be seen from the previous figures, Latvia and Lithuania are roughly at the same level as a trading partner of Finland measured in tonnes when mineral fuels, electric current, cork and wood (except sawn and planed wood) are excluded. Latvia is the neighbouring country of Estonia, where as Lithuania does not have a border with Estonia. Polish ports are relatively near to Lithuania. When the Baltic States are considered as an entity, Estonian flows are the biggest component and Latvian and Lithuanian flows have a minor role.

When comparing the total sum of seaborne flows in all the Baltic States together with the trade flows, it can be noticed that seaborne flows are significant higher both in export from Finland and import to Finland (Figures 3.14 and 3.15). In both cases the difference is around one million tonnes. This means that around two million tonnes of seaborne cargo traffic between Finland and the Baltic States is derived from the foreign trade between Finland and other regions than the Baltic States. In the flows from the Baltic States to Finland the difference between the seaborne cargo flows and Finnish-Baltic trade flows has been increased almost every year during the period 2002–2010. The only exception was the year 2009. Whereas in the flows from Finland to the Baltic States there have been fluctuations after the period of rapid growth, but nonetheless in the year 2010 the difference exceeded one million tonnes.

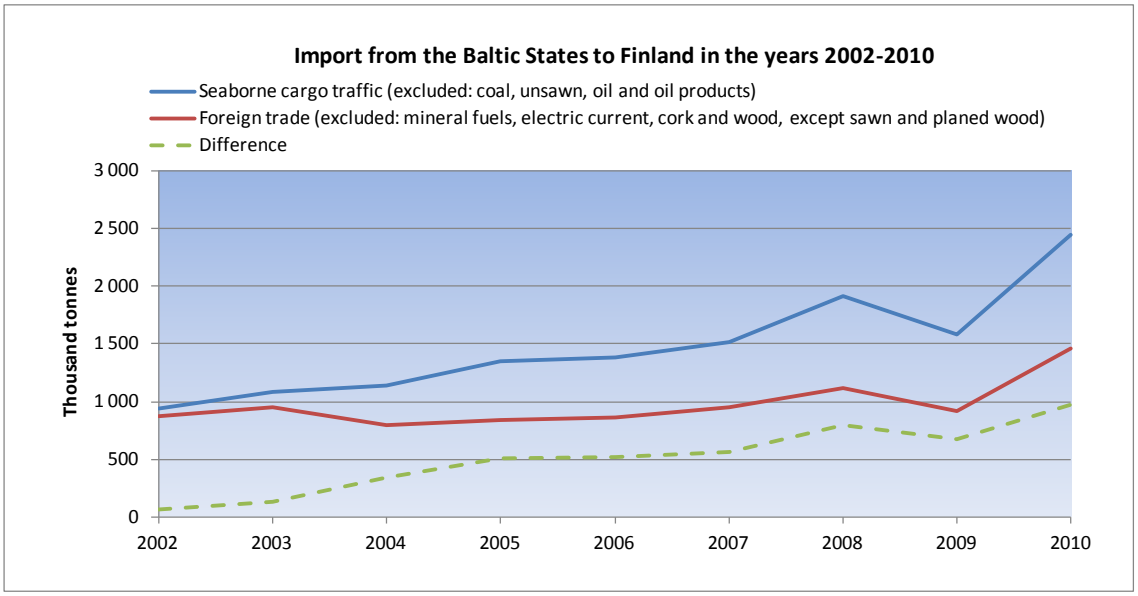


Figure 3.14. The comparison of import foreign trade and import seaborne cargo traffic from the Baltic States to Finland in the years 2002–2010. (Finnish Customs, 2011b; Finnish Transport Agency, 2011b)

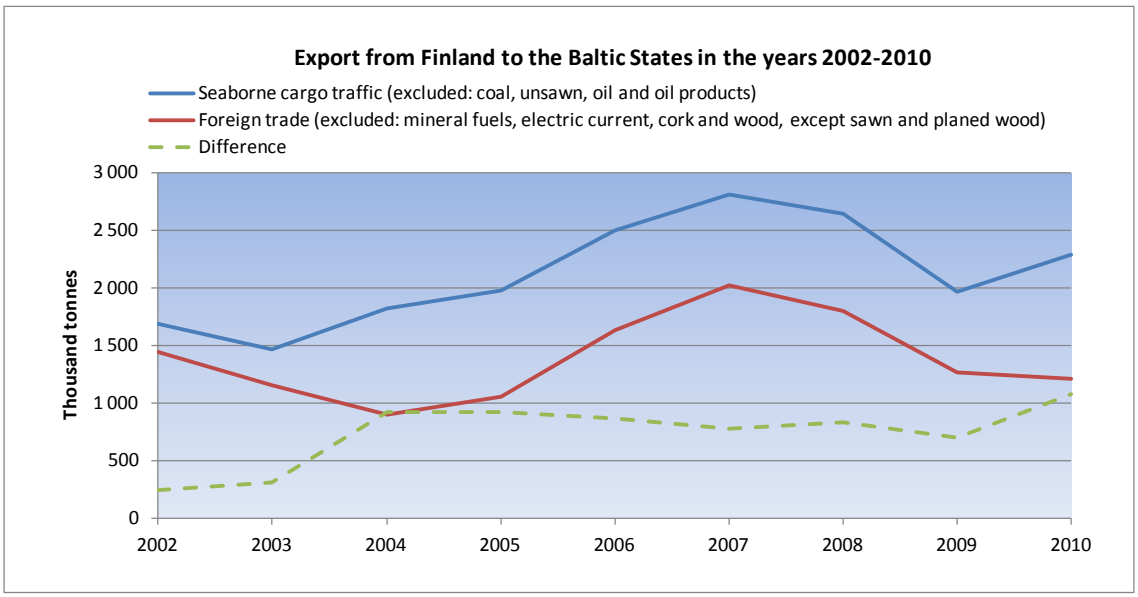


Figure 3.15. The comparison of export foreign trade and export seaborne cargo traffic from Finland to the Baltic States in the years 2002–2010. (Finnish Customs, 2011b; Finnish Transport Agency, 2011b)

3.5 Seaborne cargo traffic between the ports of Helsinki and Tallinn

In the traffic between Helsinki and Tallinn unitised cargo is transported in Ro-Ro and ropax-vessels. Units are mainly semi-trailers. Semi-trailer is a type of a cargo trailer, which does not have front axles. Instead of front axle a semi-trailer is normally equipped with legs, called "landing gear", which can be lowered to support the trailer when it is uncoupled from the pulling unit. In the ferries semi-trailers are transported with or without a pulling unit, which is also called a road tractor or a truck. Semi-trailer

coupled to a truck (called also a trailer lorry) is the most common mean of transport in the ferries on the Helsinki-Tallinn route. Semi-trailers without a truck are also transported but they are more used on the longer routes. Vehicle combination with so called full trailer, which have axles on the both end of the trailer is not used on the route. In the statistics of the Finnish Transport Agency the category "Trucks" includes lorries and vehicle combinations with a truck and a trailer. The category trailer includes both semi-trailers and full trailers transported as separate units.

The turn-return balance of the traffic measured with the number of units transported in the both directions can be considered good on the Helsinki-Tallinn route. In the year 2010 about 118,800 units of trucks and trailers were transported from Helsinki to Tallinn and 117,800 units from Tallinn to Helsinki. In the year 2009 the respective figures were 93,800 units and 92,100 units. When the balance is measured in tonnes, it must be taken into account the generalisation that industrial goods are exported from Finland and consumer goods are imported to Finland. Industrial goods are in general heavier than consumer goods. Normally, the total weight of cargo has been bigger in transports from Helsinki to Tallinn than from Tallinn to Helsinki. For example in the year 2008 about 1,362 thousand tonnes were transported southwards and 1,080 thousand tonnes northwards. In the year 2010 about 1,338 thousand tonnes of cargo was transported from Helsinki to Tallinn and respectively thousand 1,368 tonnes from Tallinn to Helsinki.

The total seaborne cargo traffic between the ports of Helsinki and Tallinn (excluding coal, unsawn wood, oil and oil products) has increased nearly 650 % from 0.36 to 2.71 million tonnes over the period 1993–2010 (Figure 3.16). During the viewed period, the cargo volume has grown every year, except in the years 1999 and 2009. In the year 2009, the total cargo volume fell by 16 % from 2.46 to 2.06 million tonnes mainly due to global recession. In the year 2010, the total cargo volume returned to growth (+31 % compared to 2009) and it amounted to 2.71 million tonnes by the end of the year. The export volume from Helsinki to Tallinn has been almost every year greater than the import volume from Tallinn to Helsinki. During the period 1993–2010, the export volume has increased around 570 % from 0.20 to 1.34 million tonnes and the import volume over 740 % from 0.16 to 1.37 million tonnes. The global recession had a bigger effect to the export than the import – in the year 2009 the export from Helsinki to Tallinn fell by some 24 % while import from Tallinn to Helsinki decreased only some 7 %. In the years 2010, both the export and the import volume returned to growth and they both amounted to around 1.35 million tonnes by the end of the year. The amount of transit cargo in the seaborne cargo traffic between Helsinki and Tallinn has been quite minimal over the period 1993–2010. The annual transit cargo volumes have been varied between 0–43 thousand tonnes and most of the transit cargo has been general cargo from Tallinn to Helsinki (Finnish Transport Agency, 2011b).

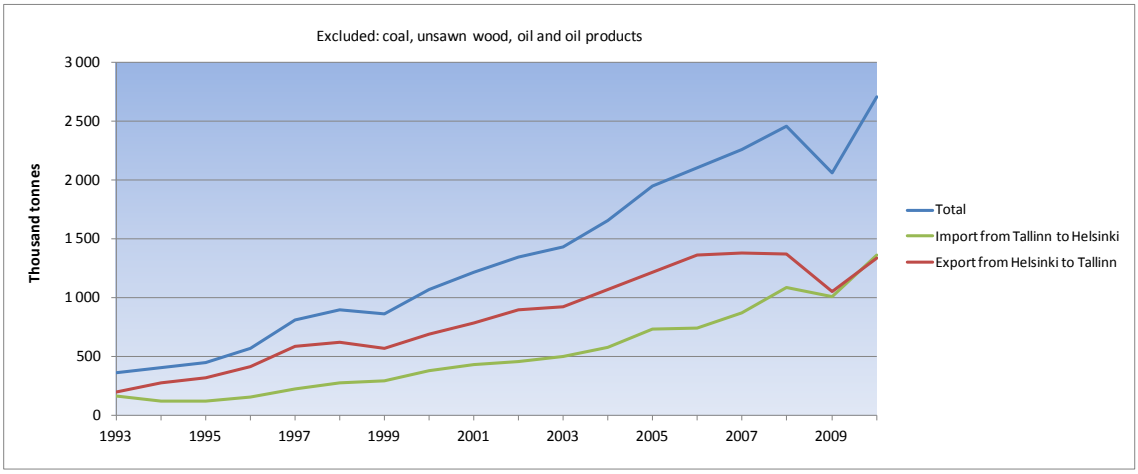


Figure 3.16. Seaborne cargo traffic between ports of Helsinki and Tallinn in the years 1993–2010. (Finnish Transport Agency, 2011b)

As it can be seen in Figure 3.17, seaborne export cargo traffic (excluding coal, unsawn wood, oil and oil products) from the port of Helsinki to the port of Tallinn has been composed mainly of general cargo over the period 1993–2010. The volume of general cargo has increased nearly 420 % from 0.2 to over 1 million tonnes during the viewed period. The share of the general cargo from the total cargo volume from Helsinki to Tallinn has varied between 66 and 100 % during the period. In the year 2010, the general cargo amounted to 1.04 million tonnes and its share from the total export cargo volume was 77 %. Other cargoes, paper, metals, ore and chemicals in this order have been the next most transported commodity groups from Helsinki to Tallinn over the period 1993–2010. In the year 2010, they altogether amounted to around 0.3 million tonnes and their share from the total cargo volume that was transported from Helsinki to Tallinn was some 22.5 %. The share of other commodity groups has been quite minimal over the viewed period (Finnish Customs, 2011b).

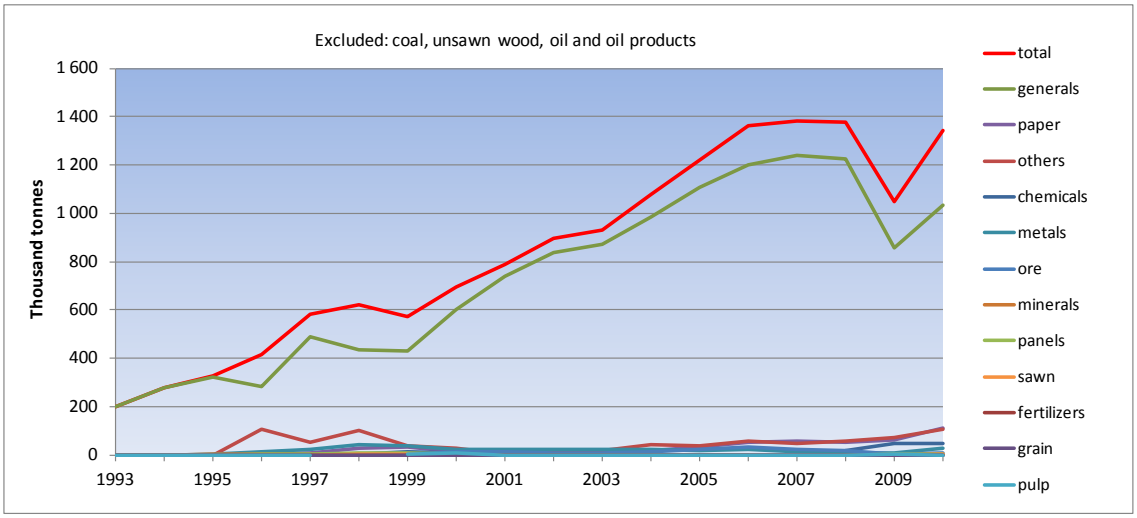


Figure 3.17. Seaborne cargo traffic from the port of Helsinki to the port of Tallinn by commodity groups in the years 1993–2010. (Finnish Transport Agency, 2011b)

Over the period 1993–2010, general cargo has been the most transported commodity group also in the cargo traffic that is originated from the port of Tallinn to the port of Helsinki (Figure 3.18). The volume of general cargo has increased nearly 600 % from 0.16 to 1.11 million tonnes during the viewed period. The share of the general cargo from the total cargo volume from Tallinn to Helsinki has been varied between 73–100 % during the period. In the year 2010, the general cargo amounted to 1.14 million tonnes and its share from the total export cargo volume was some 82 %. Other cargoes, paper, ore and metals in this order have been the next most transported commodity groups from Tallinn to Helsinki over the period 1993–2010. In the year 2010, they altogether amounted to around 0.23 million tonnes and their share from the total cargo volume that was transported from Tallinn to Helsinki was some 17 %. The share of other commodity groups has been quite minimal over the viewed period (Finnish Customs, 2011b).

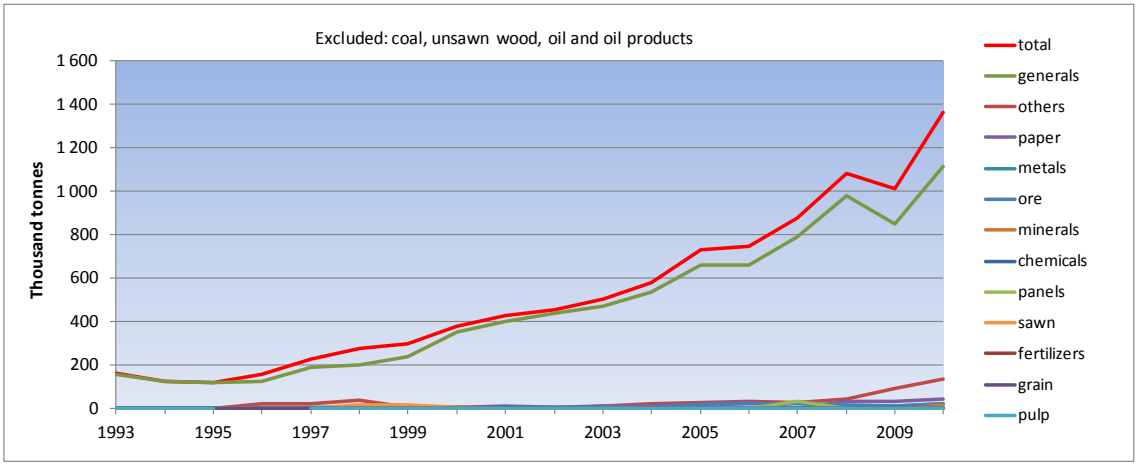


Figure 3.18. Seaborne cargo traffic from the port of Tallinn to the port of Helsinki by commodity groups in the years 1993–2010. (Finnish Transport Agency, 2011b)

Figure 3.19 presents the development of unitised cargo sea transports from the port of Helsinki to the port of Tallinn during the years 1993–2010 by cargo volumes. The amount of unitised cargo has increased some 575 % from 0.2 to over 1.3 million tonnes during the viewed period. The growth was quite strong until the end of the year 2006 when approximately 1.35 million tonnes of unitised cargo was transported from Helsinki to Tallinn. In the years 2007 and 2008, the unitised cargo volume stayed nearly at the same level but in the year 2009 it fell by some 23 % to 1.05 million tonnes mainly due to global recession. In the year 2010, the unitised cargo volume returned to growth (+28 % compared to the previous year) and it amounted to around 1.34 million tonnes by the end of the year. Every year in the period 1993–2010, over 95 % of the annual cargo volume that is transported from the port of Helsinki to the port of Tallinn has been unitised cargo (Finnish Transport Agency, 2011b).

The unitised cargo from Helsinki to Tallinn has been composed mainly of trucks and trailers. The truck volume and trailer volume were nearly at the same level (around 80–170 thousand tonnes) still in the period 1993–1995 but between the years 1995–2010 the annual volume of the trucks has increased over 600 % from 0.17 to 1.34 million tonnes while the annual trailer volume has been at the level of 0.1–0.3 million tonnes. The annual amount of container traffic from Helsinki to Tallinn has been only 2,000–

20,000 tonnes over the period 1993–2010. In the year 2010, the share of truck volume from the total unitised cargo traffic from Helsinki to Tallinn was some 88.8 % (1.34 million tonnes), the share of trailer volume 10.8 % (0.15 million tonnes) and the share of container volume 0.4 % (0.005 million tonnes) (Finnish Transport Agency, 2011b).

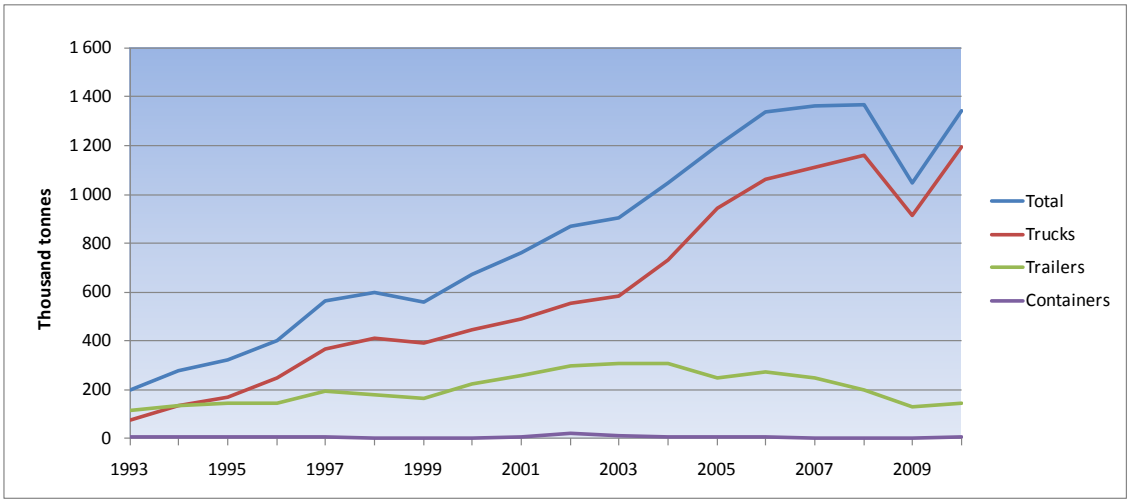


Figure 3.19. Unitised cargo transports from the port of Helsinki to the port of Tallinn in the years 1993–2010, thousand tonnes. (Finnish Transport Agency, 2011b)

When the development of unitised cargo transports from the port of Helsinki to the port of Tallinn in the period 1993–2010 are viewed by pieces of units, it can be seen that the profiles of the graphs are quite similar with the unitised cargo volume graphs presented above (see Figures 3.19 and 3.20). The annual amount of units that has transported from Helsinki to Tallinn by sea has increased over 430 % from around 23,000 to 120,000 pieces over the viewed period. The number of trucks and trailers were nearly at the same level (about 10,000 pieces) still in 1993 but during the period 1993–2010 the amount of trucks has increased over 10-fold to 104,000 pieces while the amount of trailers has stayed quite the same level than in 1993. The amount of containers and other vehicles transported from Helsinki to Tallinn has been quite minimal over the period 1993–2010. Only around 100–1,200 containers and 100–5,700 other vehicles have been transported annually from Helsinki to Tallinn by sea (Finnish Transport Agency, 2011b).

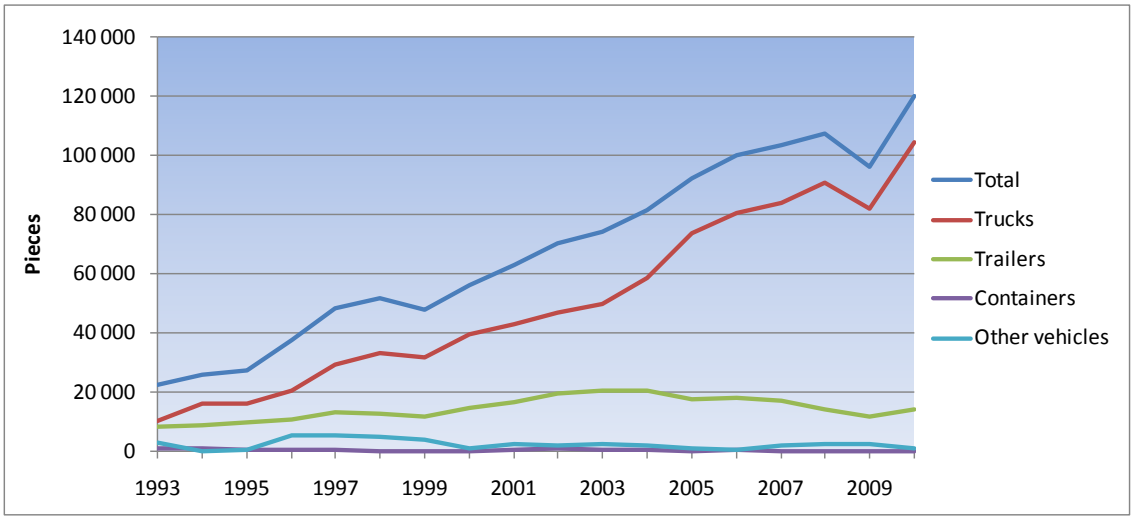


Figure 3.20. Unitised cargo transports from the port of Helsinki to the port of Tallinn in the years 1993–2010, pieces of units. (Finnish Transport Agency, 2011b)

The amount of unitised cargo traffic transported from the port of Tallinn to the port of Helsinki has increased some 760 % from 0.16 to 1.37 million tonnes over the period 1993–2010 (Figure 3.21). The growth has been quite strong almost every year during the viewed period. Even the global recession in 2008–2009 did not have a very big effect to the unitised cargo volume in the traffic from Tallinn to Helsinki as in the year 2009 the unitised cargo volume fell by only some 7 % or 70 000 tonnes compared the previous year. In the year 2010, the unitised cargo volume from Tallinn to Helsinki returned to growth (+ 36 %) and it amounted to 1.37 million tonnes by the end of the year. The annual share of unitised cargo from the total cargo volume from Tallinn to Helsinki has been varied between 48–99 % (Finnish Transport Agency, 2011b).

Also the unitised cargo from Tallinn to Helsinki has been composed mainly of trucks and trailers. The truck volume and trailer volume were nearly at the same level (around 50–100 thousand tonnes) still in the period 1993–1996 but between the years 1996–2010 the annual volume of the trucks has increased over 1100 % from 0.1 to 1.2 million tonnes while the annual trailer volume has increased some 220 % from around 0.05 to 0.17 million tonnes. The annual amount of container traffic from Tallinn to Helsinki has been only 300–8,000 tonnes over the period 1993–2010. In the year 2010, the share of truck volume from the total unitised cargo traffic from Tallinn to Helsinki was some 87.8 % (1.2 million tonnes), the share of trailer volume 12.1 % (0.17 million tonnes) and the share of container volume 0.1 % (0.001 million tonnes) (Finnish Transport Agency, 2011b).

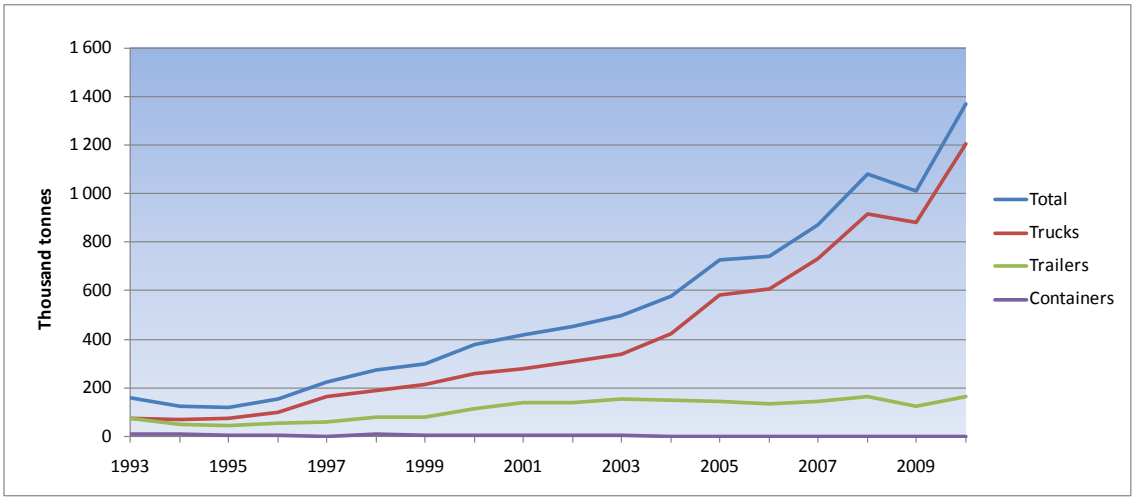


Figure 3.21. Unitised cargo transports from the port of Tallinn to the port of Helsinki in the years 1993–2010, thousand tonnes. (Finnish Transport Agency, 2011b)

Figure 3.22 presents the development of unitised cargo transports from the port of Tallinn to the port of Helsinki by pieces of units in the period 1993–2010. The annual amount of units that has transported from Tallinn to Helsinki by sea has increased 470 % from around 21,000 to 119,000 pieces over the viewed period. The growth is almost entirely due to the increase of number of trucks. The trend in trailers has been almost at the same level during the whole period. Containers and other vehicles have a minor role in unitised cargo transports from the port of Tallinn to the port of Helsinki. Only around 15–1,500 containers and 100–5,700 other vehicles have been transported annually from Tallinn to Helsinki by sea during the years 1993–2010 (Finnish Transport Agency, 2011b).

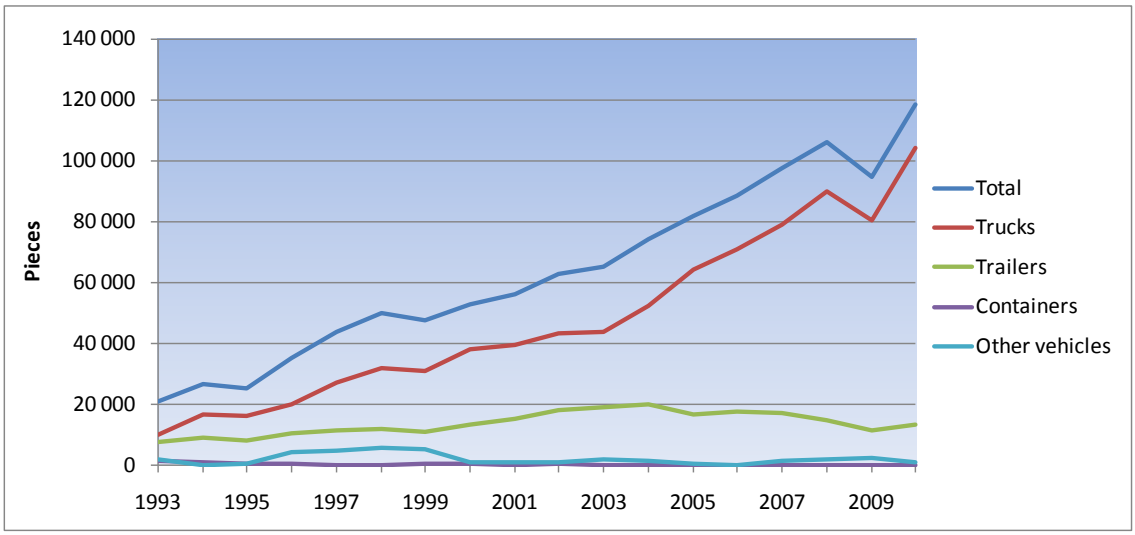


Figure 3.22. Unitised cargo transports from the port of Tallinn to the port of Helsinki in the years 1993–2010, pieces of units. (Finnish Transport Agency, 2011b)

4 RESULTS OF THE INTERVIEWS

4.1 Implementation of the interviews

The interview study was made as a part of the study to supplement the picture gained in the desk research and the statistical analysis. The interview study was conducted in the Helsinki metropolitan region in the spring 2011. The interviews were restricted to shipping companies carrying cargo on the Helsinki-Tallinn route. The number of shipping companies is limited on the route but the interviews were made comprehensively. Representatives of all three shipping companies (Eckerö Line, Tallink Silja and Viking Line) which are transporting cargo between Helsinki and Tallinn on liner traffic were interviewed. In addition, a representative of one international transport and logistics company (Schenker Oy) was interviewed in order to get more precise information about the hinterland traffic and the structure of goods transported on the route. Totally 6 persons from 4 companies were interviewed. The interviewed persons are presented in Appendix 1. The themes of the interviews are presented in Appendix 2.

Interviews were semi-structural and thematic. Results of the interviews were gathered together and organised by themes. This chapter is solely based on visions and opinions of the interviewees. The interviewers have not made any interpretations. Visions and estimations of the interviewees reflect on the economic situation of that moment.

In the next sections the results of the interview study are presented by themes. First, the present situation and estimations of the future development of the cargo flows on the Helsinki-Tallinn route are discussed. Second, the modes of transport and cargo units used on the Helsinki-Tallinn route are handled. Third, the operational environment of the Helsinki-Tallinn route is viewed.

4.2 Cargo flows on the Helsinki-Tallinn route

4.2.1 Present flows

Balance of cargo

The interviews revealed that the market shares of the shipping companies on the Helsinki-Tallinn route vary roughly so that two companies have each a market share of a quarter and the biggest actor has a market share of about 45 % of the liner cargo traffic between Helsinki and Tallinn.

The interviewees were quite unanimous that the balance of two-way transportation is quite good on the route. At the moment, total import volumes on the Helsinki-Tallinn route to Finland are a little bit larger than export volumes. The fifty-fifty balance is exceptional even if only the number of units is considered. Share of empty units in both directions is estimated to be low. For example on the German-Finnish route the share of empty units has been quite high from time to time.

Structure of the goods

The interviewees emphasised that overwhelming majority of goods on the Helsinki-Tallinn route is classified as general cargo. General cargo is not authorized or accurately defined concept. In a way all cargo on the Helsinki-Tallinn route can be called as general cargo or unitised cargo. Shipping companies do not know exactly what the units contain because they are selling lane metres in the vessels and they are mainly interested in utilization degree of their vessels' capacity.

According to the interviews, rule of thumb is that downwards cargo on the Helsinki-Tallinn route consists of industrial products and semi-manufactured products. Upwards consumer goods are common. Commodity groups that are transported on the route reflect the structure of the Estonian national economy, as Estonia does not have significant amount of export downwards. Estonia exports mainly to Finland and Sweden.

The trend to relocate industry from Finland to the low cost countries seems to be still going on. Finnish companies still use subassembly and subcontracting companies in Estonia but the Finnish companies are seeking new possibilities from other Baltic countries outside Estonia and from Eastern and Southern Europe, including also Belarus and Ukraine. Production will shift to the low-cost locations. Because of the subcontracting, commodity groups transported are largely the same in the both directions. For example metal goes in both directions. But also products that are not manufactured on a subcontracting basis, such as alcohol and paper, are transported in both directions.

Some details concerning the goods structure were mentioned in the interviews. Food supplies or provisions is a group, which exports have enlarged lately. High amounts of building materials are imported to Finland because the capacity of the Finnish construction industry is insufficient to fulfil the demand in Finland. Spare parts of vehicles are transported downwards, so from Finland to Estonia.

One interviewee estimated that the company he represents has the following commodity group structure: 50 % general cargo, 25 % electronics and machines, and 25 % wood products and paper. The amount of paper and wood is bigger than the amount of iron. In addition, recycled paper has a quite large share of the total volume of this company's transports.

Changes in the structure of economies can generate new types of cargo. An example of this type of change mentioned in the interviews was the emergence of service products. For example, significant amounts of laundry are transported to Estonia to be washed there and transported back to Finland.

Commerce and industry

The interviewees found it difficult to segregate conceptually the cargo volumes of commerce and industry. As an example, are transported beverages industrial or commercial cargo flows? If the cargo flows of whole sale business are compared with the flows of manufacturing industry, it can be said that commerce has only a minor share,

maybe only less than 10 %. One interviewee estimated that 70 % of flows downwards on the Helsinki-Tallinn route are industrial.

One interviewee reminded that ports are typically specialised to handle certain type of cargo. For example, the port of Helsinki is a ferry port that mainly handles high value goods. Also other cargo types, for example paper, are already unitised when it arrives to Helsinki for loading. This procedure differs from typical loading methods in Finnish ports that handle forest products. In Helsinki the goods are transported in trailer lorries and in semi-trailers.

The interviewees stated that the industrial flows dominate the export of Finland. It was also noted that the balance of the Helsinki-Tallinn route is backed up to the fact that wholesale business and central corporations of commerce are situated in Helsinki Metropolitan region giving import cargo flows to the port of Helsinki.

Hinterlands

According to the interviews, shipping companies do not know the final destinations and exact content of the cargo. They have regular business meetings with the big logistics companies which are their customers in order to get an overview of the cargo flows. Conclusions can also be made based on the origin of the transport companies and registration country of the vehicles. Several small transport companies from the East Europe operate on the route between Helsinki and Tallinn. They usually drive between their home countries and Finland. In many cases, they carry partial loads and pick up and discharge cargo en route. The interviewees estimated that the share of the East European transport companies is not insignificant.

The interviews revealed that big transport and logistics companies have hubs where the cargo goes if it is not delivered straight to the consignee. In hubs consignments can be combined, or alternatively only a truck can be changed and a semi-trailer hauled by an another truck carrying cargo immediately moves on. Hub can also act as a distribution centre. The first destination of a cargo load might be a hub, but where the cargo goes thereafter, and is the final destination of the cargo situated in Estonia or in another country inside the EU is in many cases difficult to say.

Estonia's economy is quite small. One interviewee reminded that unitised cargo traffic between Helsinki and Tallinn has reached nearly the same level as the seaborne traffic of trailer lorries and trailers between Finland and Germany which is the main route to/from the Finnish main markets in the Western Europe. One can thus conclude that all cargo on the Helsinki-Tallinn route does not stay in Estonia.

The interviewees emphasised that the Baltic States are all quite small economies. Poland has a significant role in the economical development of Eastern Europe. The share of Poland is increasing in logistics. Poland is said to be an Eldorado for a salesman in the logistics business. A lot of industry has been relocated from Western Europe to Poland. Also Czech, Slovakia and Hungary are the hinterlands of the Helsinki-Tallinn route, not to mention also Bulgaria and Romania. For example one interviewed expert

told that there is a steady flow of so called white line products from Hungary to Finland. This product group includes household appliance such as refrigerators, stoves and washing machines. Vegetables and fruits are also transported from Romania and Bulgaria. Dairy products are imported to Finland via the Helsinki-Tallinn route from Central Europe. Other agricultural products are transported temporarily from Poland and Baltic countries to Finland but their share is quite small compared to the volumes these countries have with Sweden in agricultural business. Fertilizers are exported from Finland to Poland.

Finland is not a transit country for the cargo transported on the Helsinki-Tallinn route. Common vision of the interviewees was that all the cargo coming to Finland stays in Finland. In some cases, a small amount of new cars are transported on the route heading via Finland to Russia. From Sweden there is shipping line to Estonia and the Helsinki-Tallinn route is used only temporarily if there is a lack of capacity in the summer.

The interviewees' gestimates of the hinterland cargo volumes on the Helsinki-Tallinn route varied significantly. Some interviewees estimated that over half of the volumes going downwards on the route passes Estonia while the most drastic guess was that the share of Estonia is only a quarter of the total volume on the route. On the other hand, one estimation was that a third of the traffic originates from or goes to some other country than Estonia. The figure can be a little bit higher because of the hubs in Estonia where also foreign cargo is handled. It must be taken into account that the interviewees usually meant units when they estimated the volumes.

The Helsinki-Tallinn route has competing routes depending on the origin and final destinations of cargo. There are direct shipping lines between Finland and Poland as well as between Finland and Germany. The interviewees very unanimous that the route via Estonia is fast, which gives the Helsinki-Tallinn route competitive advantage. However, in many cases the routes with long sea leg are most economical and environmental friendly. For example Helsinki-Gdynia line serves the traffic of the Eastern Central Europe.

4.2.2 Development of the flows

IMO's sulphur regulations

The Baltic Sea and the North Sea belong to the IMO-defined SECA (SO_x Emission Control Areas), which have tighter restrictions on ship fuels than other sea areas. The sulphur content of fuel will be further restricted. In SECAs the sulphur limit will be 0.1 % after 2015. This will lead to a radical decrease in SO_x emissions but also to considerable additional costs due to the high price of the new fuel quality (Appendix 4).

The interviewees stated that if the sulphur regulations will come in the force, Finnish foreign trade has to find new routes to the continent. The decision is likely give an enormous boost to the Helsinki-Tallinn route because the leg between Helsinki and Tallinn is short. The Via Baltica route will have a competitive edge when sea transports are

avoided on purpose. The route from Finland via Sweden to the continent will be also used. The interviewees gave slightly dissenting opinions by the interviewees, whether the route via Tallinn is better than the route via Sweden. Via Sweden two sea legs are normally needed while via Estonia there is only one sea leg. Finland´s important market areas are situated in Western Europe and there is a railway connection from Sweden to the south.

On the other hand, the Finnish paper industry might not survive if logistics costs will increase with 30 %. In one vision the Northeast Passage, the Northern sea route between Europe and Asia, will gain a new meaning because Hamburg is also situated inside the SECA area. The trade between Asia and Central Europe could use the Northeast Passage. A hub might emerge in Northern Norway. Vessels might call at Murmansk and other Russian ports in the area. One option could be that the goods will be transported via Finland by land as transit traffic. In that case monthly volumes could be as high as 150,000 units on the Helsinki-Tallinn route according to the interviewee's vision. Nowadays the volume of the route is about 19,000 units per month.

The interviewees were in the opinion that IMO's sulphur regulations are out of tune with the EU's traffic policy. As a result of the regulations there will be a modal shift from sea back to the roads. Therefore, interviewees were not completely convinced that the regulations will be implemented.

Growth estimations

The Baltic countries are small economies. According to the interviews, the trade between Finland and other Baltic States than Estonia does not have much growth potential. Other hinterlands (e.g. Bulgaria, Poland, Romania and Ukraine) have more potential, not merely due to the fact that the population of these countries are tens of millions. The growth of the hinterland markets simply correlates with the population of the countries. There are big economies but how much Finland could increase trade with these countries is another question. The main issue is what products Finland is able to export to these countries. In one interview it was reminded that relocation of industry from Western Europe to Eastern Europe has a certain impact on the cargo flows but it means that these flows are taken away from other traffics.

The interview study revealed that there is currently an upgoing trend in the volumes on the Helsinki-Tallinn route. It was generally seen that during the next couple of years the growth rate on the route will be a two number digit. The question remains how long growth will go on with a 10 % annual increase? On a long run that kind of growth rate generates huge volumes. Large population and cost advantage of the emerging economies gives back up to the growth but the interviewees emphasised that it is hard to estimate exact figures. One interviewee calculated that if there would be an annual growth rate of 10 % in the cargo units on the Helsinki-Tallinn route, the total volume would not double in five years, but if IMO's sulphur regulations will come in force, the volume can easily be doubled. Another interviewed expert estimated that the growth rate will be 15 % for the year 2011 and then 10 % for the years 2012 and 2013. If IMO's regulations will come in force, the situation will change drastically.

The interviewees were not willing to give estimations for a longer period than couple of years. In one case a little longer period was considered. According to this estimation, the growth of the Eastern Europe market will be about 30–50 % in the period of 5–10 years, which means that the market will be returned to level that it was before the recession.

4.3 Modes of transport and cargo units

Ropax concept and its restrictions

According to the interviews, the ropax concept, where cargo and passengers are transported in the same vessel, was seen as the only economical profitable solution on the Helsinki-Tallinn route. Cargo and passenger traffic are supporting each other. If cargo and passengers have separate vessels, it would mean that the prices of tickets for passengers would be on another level and growth of the traffic will not be expected. The ropax traffic will be the main concept also in the future.

However, ropax concept means some restrictions to the transport of cargo. Passengers want to travel from city centre to city centre. It is an advantage, if tourist attractions are within a walking distance. On the other hand, city centres are inconvenient to the trailer lorries. Environmental regulations might also restrict the traffic. For example, noise limits are quite low near the settled areas. In Helsinki, Katajanokka has these kinds of restrictions but Western Harbour is also expected to have restrictions when the new district around the harbour will be ready to receive inhabitants. Timetables have to be planned so that both passengers and cargo are taken into account and not forgetting the environmental regulations.

Interviewees stated out quite clearly that the Vuosaari Harbour is not an option for the high frequency ropax traffic because it is not originally planned for that kind of traffic. There are restrictions also in Tallinn as trucks are not allowed to drive through the city. The centre must be bypassed.

The interview study revealed that in the ropax vessels there are some restrictions concerning the transportation of dangerous goods due to the fact that passengers are transported in the same vessel. Certain amount of specified dangerous goods can be transported in the ropax vessel but high volumes and very dangerous goods must be transported in a cargo vessel. Also oversized transports are more suitable to be carried in the cargo vessel. It was also mentioned by a representative of a company operating a ropax vessel calling the city centre of Helsinki that it is not allowed to use roll trailers (so called MAFI trailers) because of the terms defined by the city. This means for example that containers that are not transported on the road vehicle cannot be transported in the ropax vessel. At the moment, one cargo ferry operates on the Helsinki-Tallinn route.

Unitised cargo

In ropax vessel the cargo is handled by using Ro-Ro method. The interviewees were unanimous that Ro-Ro cargo is the main method of carrying cargo on the Helsinki-Tallinn route now and also in the future. Trailer lorries (a truck with a semi-trailer) is the most used unit following the semi-trailers that are transported in the ferries without a hauling motor vehicle. The traffic on the route will be based on trailer lorries also in the future. One interviewed expert stated that the ratio of semi-trailers and trailer lorries is expected to maintain in the present level. The vision is based among others to the fact that on the Finland-Sweden route the ratio of semi-trailers and trailer lorries has been quite constant for a long time. Some interviewees estimated that trailer lorries will gain even a larger share but there will be at least 10 % semi-trailers also in the future. When economy is booming, the share of semi-trailers might increase because it is hard to find truck drivers.

One interviewed shipping company told that the ratio of the cargo changed when a new competitor penetrated the markets with a cargo ferry. This competitor does not operate on the Helsinki-Tallinn route anymore but it is operating between Finland and Estonia on another route. Before the period 2006–2007, when the high-speed ropax ferries came to the route, cargo moved slowly. Using the unmanned units (semi-trailers without trucks) was in line with the speed of the logistical chain. When the ropax ferries have a travel time of two hours between the cities, it is normally unprofitable to build up a system where a retrieving motor vehicle must be used in the both ends. In the trailer lorry traffic a driver has an opportunity to eat and rest in the ferry. Compared to the semi-trailer traffic, the trailer lorries are faster. The semi-trailers must be hauled from and to the ferry by a stevedoring company. Usually the semi-trailers are hauled from the ferry last when the trailer lorries are already on the road. Semi-trailers need quite much space for parking. In some cases the logistic chain of a shipper is based on semi-trailers. For example if there is a goods flow several times a day from the mill to the port, it make sense to use semi-trailers, otherwise a driver must spend a lot of time in the ferry.

On the Helsinki-Gdynia route semi-trailers without trucks are commonly used. The structure of Finnish foreign trade is favourable for using semi-trailers because goods are imported to Finland in the beginning of the week and exported in the end of the week. This means that drivers must be in Finland and wait for cargo. For large companies semi-trailers are flexible means of transport. They can be sent to different destination whereas trailer lorries operate usually between the destination and transport firm´s country of origin.

Van traffic

The researchers considered van traffic as an important indicator of the twin-city concept. However, the share of vans cannot be separated from the statistics of seaborne transport.

According to the interviews, van traffic has a minor role to the shipping companies. Vans are transported in the ferries as cargo units or as passenger vehicles depending on

how the customer has booked the space. If cargo is transported in the van, the van has to be transported as a cargo unit. The shipping companies do not have special interest to control which option is used, even if some losses of revenues may occur.

Several aspects were drawn by interviewees concerning the use of the vans on the Helsinki-Tallinn route. Vans are used for several purposes. Cargo is transported in vans. Entrepreneurs and workers commuting between Finland and Estonia use vans carrying their tools and equipments. Tourists are using vans for example when they are shopping large amounts of alcohol. One additional segment of vans is taxicabs.

The interviews revealed that the amount of the vans is only few percents from the total volume of units between Helsinki and Tallinn. One estimate was that fewer than 5 % of the cargo units carried by this specific shipping company are vans carried as cargo. In addition, it should take into account the amount of the vans carried as passenger cars. Half of the vans carrying cargo are delivery traffic in the Tallinn area. Other Baltic States are the most significant hinterlands for the van traffic but there are also vans that are driving the routes up to the central Europe or even further. Usually the shipping companies do not have statistics concerning the amount of the vans on the Helsinki-Tallinn route.

If there is a strong cargo flow between Helsinki and Tallinn, consignments can be combined to a full trailer load and transport the link as trunk haulage with trailer lorries between the terminals of the transport company. Delivery of consignments can be done with vans or other vehicles in each city.

Rail Baltica

Rail Baltica was not seen as an option for the transports from/to Finland in the interviews. To be economically beneficial, high amount of cargo needs to be transported both directions. Railroad transport does not suit the present pattern of carrying cargo in land transport. Nowadays, road transport companies are carrying partial loads and picking up cargo from several points. If the transport consists of several legs or parts and different modes of transport (including railways) must be used, it might be difficult to keep the schedules. If the tight timetables are not required, a ferry to/from Poland is an option to the Finnish shippers or consignees.

The interviewees emphasised that construction of a railroad needs huge amounts of capital. The revenues/investments ratio is not seen profitable. There are road transport hubs in Latvia and Lithuania which are underutilised in the present economical situation. This means that a workable land transport infrastructure already exists. On the other hand, if IMO's sulphur regulations come into force, rail road transport is better alternative than road transport from the environmental viewpoint.

From transport companies' viewpoint the train should serve long distance transports as the Germany-Mediterranean connection does. Transport companies should also make modifications to the trailers which are used in the so called huckepack traffic.

Huckepack is a transportation arrangement in which truck trailers with their loads are moved by train to a destination.

4.4 Operational environment

Logistics companies

According to the interviews, transport and logistics companies are the customers in liner ferry business. Large transport and logistics companies use all the shipping companies, which are operating on the route. They are biggest customers to the shipping companies. In the Nordic countries transport business is concentrated and large corporations, such as DP Schenker, DHL and DSV, are dominating the markets. Two companies of purely Finnish origin can also be mentioned: Ahola Transport and Transpoint International which are both significant customers on the route. Large companies use also the cost advantages by having East European drivers and trucks registered to some low cost country.

The interviews revealed that on the continent there are a lot of small-sized transport companies. Their role has been growing due to the fact that they are flexible. The business is moving from country to country depending on cost level. For example the cost level of Estonia is growing and Latvian firms are coming to the markets. Similar consolidation development of the firms as has happened in the Nordic countries is not expected to be seen in the Eastern Europe.

Changes of the port structure

As discovered in the interviews, larger ocean-going container vessels are being built. New duties must be found to the older fleet. This means that smaller ocean-going container vessels are going to call Baltic Sea ports and also the size of the feeder vessels will be larger. Ocean liner is already calling Gdansk regularly. Meanwhile idea of using Ust-Luga as a container hub for Finnish foreign trade did not get any support by the interviewees.

It is obvious that large ocean-going container vessels calling at Gdansk will have an impact on traffic volumes on the Via Baltica. If Gdansk will become a hub for ocean containers, the attractiveness of the Rail Baltica will also increase. The effect of Gdansk as a hub on the Helsinki-Tallinn route was not seen as clearly by the interviewees. If Gdansk becomes a hub, a sea leg from Finland to continent will become shorter for feeder vessels and there is no longer necessary to transport all ocean containers from Finland to Hamburg or other ocean ports in the North Sea region. The Helsinki-Tallinn route would also be an option if cargo is needed to transport urgently between Finland and the hub, because trailer lorry is faster than a vessel. However, if IMO’s sulphur regulations will come in force, large ocean-going container vessels are not going to call Baltic Sea ports.

Other factors

The effects of the Finnish stevedoring strike in the year 2010 were also discussed with the interviewees. The strike had temporarily a positive effect on the volumes of the Helsinki-Tallinn route. A significant share of the Finnish foreign trade was funnelled via Estonia. For example Paldiski became a temporary hub. The extent of the benefits to the shipping companies' business caused by the strike varied depending on the nature of their collective agreements. Because the Helsinki-Tallinn route is situated on the sea area where the wave height is low, there is usually no need to secure the trailer lorries by stevedores. This increased the share of lorries during the strike when semi-trailers vanished from the route. In some cases, lane capacity could not be fully used because there were not enough workers on the cargo deck showing distances to the drivers. Generally speaking, strikes are more critical than before because intermediate storages are not used anymore.

Bottlenecks

The interviewees stated that there are not notable bottlenecks on the Helsinki-Tallinn route. Natural conditions can form bottlenecks in some cases. Hard winters and ice conditions incur expenses. Older vessels have difficulties to keep the timetable. In worst cases departures must be cancelled. The key issue for a liner service is to keep schedules. It is irrelevant if the journey takes 1.5 or 2 hours, but cancelling the sailings for several days might be a fatal issue. With the new vessels these kinds of situations are unlikely. With the exception of the English Channel, one cannot find as high frequency elsewhere in Europe as on the Helsinki-Tallinn route. One cannot speak about uncertainty when the Helsinki-Tallinn route is concerned. It can be spoken only about a few hours when troubles are concerned.

As said before, environmental regulations have an effect on the planning of schedules. For example in Helsinki Katajanokka, morning departures are not possible. A ferry could not stay overnight in Katajanokka because noise limits that are defined in the environmental permit are exceeded in Katajanokka. Cities have also restrictions to the lorry traffic. Cooperation is made with the city to plan the schedules so that rush hours can be avoided as much as possible. In Finland and Estonia a rush hour is a relative concept compared to many other countries.

5 CONCLUSIONS

This report is made as a part of the Helsinki-Tallinn Transport and Planning Scenarios project, also called H-TTransPlan, which is an ERDF project funded by Southern Finland-Estonia sub-programme of INTERREG IV A 2007–2013 Programme. The H-TTransPlan project studies development needs of the Helsinki-Tallinn region in the viewpoint of logistics and regional planning. The project includes a mobility study focusing on mobility of people and goods in the region. This report handles the mobility of goods and it provides analysis of transport and cargo flows for regional and local planners. The results of the study will be used in the H-TTransplan project to create 2–3 scenarios on the most feasible transport systems and modes of transport between the twin cities of Helsinki and Tallinn, in order to increase the competitiveness of the twin-city region. The report can also be used as a source of information on cargo transport in the other phases of the project as well.

The report gives an analysis on the present cargo flows on the Helsinki-Tallinn route, the current volume and structure of the flows and estimations how the cargo flows will develop in the future and the determinants behind the flows. Special interest is put on the hinterland flows, in other words in the cargo flows between Finland and other countries than Estonia using the Helsinki-Tallinn route. H-TTransPlan project is linked to the studies of Rail Baltica, a potential new north-south rail connection. Therefore, the Rail Baltica was one topic in the expert interviews conducted as a part of this study. The results and conclusions presented in this report are based on desk research, statistical analysis and expert interviews.

The desk research showed that Finland is very dependent on maritime transportation. Over 80 % of Finnish foreign trade is transported by sea. The amount of the Finnish seaborne foreign cargo traffic including transit cargo has almost tripled from 33 million to 93 million tonnes over the period of 40 years, from 1970 to 2010. The highest figures of cargo flows have so far been recorded in the years 2007 and 2008 when about 102 million tonnes of foreign cargo traffic was handled in Finnish ports annually.

Estonia is very dependent on transit cargo coming from or going to Russia. During the period of 1993–2009, the annual share of the transit traffic of the total Estonian seaborne cargo traffic has varied between 63 and 78 %. Estonian own exports and imports have had a minor role in the Estonian seaborne cargo traffic. In the top year 2003, Estonian export and import seaborne cargo traffic together reached 14.3 million tonnes. In the year 2010, the total amount of Estonian seaborne cargo traffic was 46.1 million tonnes of which transit cargo accounted for 33.2 million tonnes and Estonian export and import cargo accounted for 12.9 million tonnes.

Helsinki and Tallinn are the main ports in the maritime cargo traffic between Finland and Estonia. In the year 2010 approximately 67 % of the total cargo between the port of Tallinn and Finland was transported to/from the port of Helsinki. The Helsinki-Tallinn route has become the most significant Ro-Ro traffic route for the port of Helsinki. In the year 1993 only 22 % of all the units of lorries and trailers handled in Helsinki was transported via the Helsinki-Tallinn route but in the year 2010 the corresponding figure

was 49 %. The distance between Helsinki and Tallinn is around 80 kilometres or 44 nautical miles and the sailing time of the fastest ropax vessels on the Helsinki-Tallinn route is only 2 hours year round. In addition, the infrastructure of the ports of Helsinki and Tallinn and the liner connections between the cities of Helsinki and Tallinn are good. It can be assumed that these factors have increased the popularity of the Helsinki-Tallinn route.

The statistical analysis made as a part of the study revealed that total trade between Finland and Estonia (excluding mineral fuels, electric current, cork and wood, except sawn and planed wood) has grown only a little (3 %) during the period 2002–2010. The slope of the trendline of the trade volume is 0.16[3]. However, the trade volume between Finland and Estonia has varied a lot during the period: the lowest trade volume, 1.3 million tonnes, was recorder in the 2004 and the highest trade volume, 2.2 million tonnes, in the 2007. Because of the recession, which started in the end of the year 2008, the trade volumes between Finland and Estonia turned downwards. A couple years later in the year 2010, the trade volume returned to growth and by the end of the year 1.8 million tonnes of goods were traded between Finland and Estonia.

The import trade from Estonia to Finland has grown during the period 2002–2010 from the volume of 0.6 million tonnes in the year 2002 to 0.9 million tonnes in the year 2010. The slope of the trendline of the import trade volume is 0.34. Due to the decrease in volumes of basic manufactures, the total import trade from Estonia to Finland decreased 27 % to 0.6 million tonnes during the recession year 2009. In the year 2010 the import trade returned to growth and the highest import trade volume, 0.9 million tonnes, during the period 2002–2010 was recorded.

The export trade from Finland to Estonia have fluctuated between 0.7 and 1.5 million tonnes during the period 2002–2010. However, in the long run the export trade volume has been quite steady and the trendline of the export trade volume in the period 2002–2010 is 0.05. Contrary to the import trade, the volumes of the export trade have decreased from 1.5 million tonnes in the year 2007 to 0.9 million tonnes in the year 2010. The trade volumes of export and import between Finland and Estonia were at the same level in the end of the year 2010.

The total international seaborne cargo traffic between Finland and Estonia (excluding coal, unsawn wood, oil and oil products) has increased around 75 % from 2.3 to 4.0 million tonnes over the period 2002–2010. There is a growing trend in the cargo volumes with the slope of 0.76. General cargo has been every year the most handled cargo type in the seaborne cargo traffic between Finland and Estonia during the period 2002–2010. The annual share of general cargo from the total cargo volume has varied from 55 % to 64 % over the viewed period.

[3] A trendline is a straight line that connects two or more swing points. Trendline indicates the direction of a time series data. A positive sloping line is defined as an uptrend. A negative sloping line is defined as a downtrend. If the slope of the trend line is zero, there is not neither growth nor decline. The magnitude of the slope of a trendline indicates the strength of the trend.

The amount of international seaborne cargo traffic transported from Estonia to Finland (excluding coal, unsawn wood, oil and oil products) has increased over 160 % from 0.7 to 1.8 million tonnes over the period 2002–2010. The slope of the trendline is 0.90, which indicates high growth. The growth has been quite steady, excluding the year 2009. In the year 2010 the volumes returned to strong growth. The main commodity groups transported from Estonia to Finland has been general goods and minerals during the whole period.

The amount of international seaborne cargo traffic transported from Finland to Estonia (excluding coal, unsawn wood, oil and oil products) has increased some 37 % from 1.6 to 2.2 million tonnes over the period 2002–2010. The trendline also indicates growth with the slope of 0.41. Fluctuations of the volume during the period 2002–2010 have been large varying from 1.6 million tonnes in the year 2003 to 2.5 million tonnes in the year 2007. Likewise in the cargo traffic from Estonia to Finland, the main commodity groups transported from Finland to Estonia has been general goods and minerals during the whole period.

When the volumes of the foreign trade and the seaborne cargo traffic between Finland and Estonia are compared, it can be seen that the growth of the seaborne cargo traffic has been significantly greater than the growth of the trade volume between the countries. During the period 2002–2010, the seaborne cargo volumes between Finland and Estonia have increased over 76 % from around 2.28 to 4.01 million tonnes while the foreign trade has increased only about 3 % from 1.77 to 1.82 million tonnes. The annual difference between the volumes of the seaborne cargo traffic and the foreign trade has varied from 0.5 to 2.2 million tonnes over the period 2002–2010. This roughly means that according to this statistical comparison every year during the viewed period 0.5–2.2 million tonnes of cargo that is not Finland's or Estonia's own foreign trade is transported between Finland and Estonia by sea. The annual share of that hinterland or transit cargo from the total seaborne cargo traffic between Finland and Estonia is quite large since it has been varied between 27 to 62 % over the period 2002–2010. The cap between the Finnish-Estonian seaborne cargo transports and the Finnish-Estonian foreign trade was in the year 2010 about 2.2 million tonnes. The difference between these two factors has grown strongly during the period 2002–2010. The slope of the trendline which describes the difference between the Finnish-Estonian seaborne cargo transports and the Finnish-Estonian foreign trade is 0.79.

The total seaborne cargo traffic between the ports of Helsinki and Tallinn (excluding coal, unsawn wood, oil and oil products) has increased nearly 650 % from 0.36 to 2.71 million tonnes over the period 1993–2010. During this period, the cargo volume has grown every year, except in the years 1999 and 2009. In the year 2009, the total cargo volume fell by 16 % from 2.46 to 2.06 million tonnes mainly due to global recession. In the year 2010, the total cargo volume returned to growth and it amounted to 2.71 million tonnes by the end of the year.

Seaborne export cargo traffic from the port of Helsinki to the port of Tallinn (excluding coal, unsawn wood, oil and oil products) has been composed mainly of general cargo over the period 1993–2010. The volume of general cargo has increased nearly 420 %

from 0.2 to over 1 million tonnes during the viewed period. The share of the general cargo from the total cargo volume from Helsinki to Tallinn has varied between 66 % and 100 % during the period. In the year 2010, the general cargo amounted to 1.04 million tonnes and its share from the total export cargo volume was 77 %.

Over the period 1993–2010, general cargo has been the most transported commodity group also in the cargo traffic that is originated from the port of Tallinn to the port of Helsinki. The volume of general cargo has increased nearly 600 % from 0.16 to 1.11 million tonnes during the viewed period. The share of the general cargo from the total cargo volume from Tallinn to Helsinki has been varied between 73–100 % during the period. In the year 2010, the general cargo amounted to 1.14 million tonnes and its share from the total export cargo volume was some 82 %.

The unitised cargo on the Helsinki-Tallinn route composes mainly of trucks and trailers. The annual amount of truck and trailer units that has transported from Helsinki to Tallinn by sea has increased over 430 % from around 23,000 to 120,000 pieces over the period 1993–2010. The annual amount of units that has transported from Tallinn to Helsinki by sea has increased 470 % from around 21,000 to 119,000 pieces over the viewed period. The share of the trucks of the total Ro-Ro cargo traffic on the Helsinki-Tallinn route has increased significantly. In the year 2010, the share of trucks was 88 %.

The interview study, where several thematic issues were discussed, was made to complement the picture obtained in the desk research and the statistical analysis. The interview study revealed that the interviewees were unanimous that the ropax concept is the only economical profitable operation mode on the Helsinki-Tallinn route. By carrying both passengers and freight in the same vessel the prices of tickets in passenger traffic can be kept on a level that guarantees adequate passengers flows and thus incomes for the shipping companies operating on the route. Ropax concept means that the cargo units in the ferries will be vehicle combinations and trailers also in the future. On the Helsinki-Tallinn route the most common unit is a semi-trailer with a truck. Also semi-trailers without the truck are transported but they have a minor role. Transporting of vehicle combinations is backing up the modus operandi, which is based on fast liner connections, because loading and unloading of vessels can be done quickly. Containers are not expected to become common on the route.

However, the ropax concept entails some requirements and restrictions. The interviewees articulated that for passengers it is convenient way to travel from city centre to city centre but having passengers onboard brings along some restrictions to the cargo traffic. There might be noise limitations in some harbours. The noise regulations as well as the heavy traffic during the rush hours must be taken into account when timetables are planned. On the other hand, there are needs for early morning departures. Schedules must be planned on the terms of both passengers and cargo. The interviewees made a point that the Vuosaari Harbour in Helsinki is not planned for high frequency ropax traffic.

The interviewees stated that in ferry traffic on the Helsinki-Tallinn route the frequency is high and connections are reliable regardless the season and weather conditions. To the

shippers in the manufacturing industries and in the commerce the issue is that one can rely on the schedules. Some minor raisings of speed on the route are not important because the minimum sailing time is already two hours. Inland connections are based on road transport. Small transport companies using the Helsinki-Tallinn route originate usually from Eastern Europe. These companies usually carry partial loads and they are picking and discharging the loads en route on their way back home. Large transport and logistics companies have a terminal or several terminals in each country on their market areas and they drive trunk lines with full trailer loads between the terminals.

The present way of operation in the railroad cargo traffic is based on large quantities and long distances. The interviewees emphasised that this is an opposite way of operation compared to the way, which is used by small transport companies. If transport consists of several hauls and different transport modes must be used, it may be difficult to keep the schedules. If tight schedules are not required, a seaborne route between Finland and Poland is an option to railroad connections. Interviewees also raised the question, whether there are enough volumes for the regular railway transports. For these reasons Rail Baltica was not seen as an option for the cargo transports from/to Finland. If the IMO regulations with the tight sulphur emission restriction on maritime fuel oil come into force, the price of the maritime fuel oil will increase significantly. This favours road transports instead of maritime transports.

Both the interviews and the statistical analysis showed that there are significant hinterland cargo volumes on the Helsinki-Tallinn route. One indicator is that the unitised cargo traffic between Helsinki and Tallinn has reached nearly the same level than the seaborne traffic of semi-trailers and truck semi-trailer combinations between Finland and Germany, which is the main route to/from the Finnish main markets in the Western Europe.

According to the interviews, other Baltic States than Estonia, Eastern Central Europe, East Europe and eastern corner of South Europe are hinterlands of the Helsinki-Tallinn route. Beside of Latvia and Lithuania, countries like Poland, Czech, Slovakia, Austria, Romania and Bulgaria can be mentioned but also Ukraine and Belorussia. Finland is and will survive as the final point of the Helsinki-Tallinn route in the north. This means that the Helsinki-Tallinn route is not used in transit traffic from/to Russia. Either the cargo from/to Sweden is not transported using the Helsinki-Tallinn route because Sweden has a direct line to Estonia. The situation does not change in that sense. The Helsinki-Tallinn route has competitive routes to hinterlands (e.g. Poland). One advantage of the Helsinki-Tallinn route is that it is fast.

The results of statistical analysis revealed that general cargo is the main commodity group transported on the Helsinki-Tallinn route. The interviewees described contain of the general cargo transported on the route more accurate. The export cargo from Finland using the Helsinki-Tallinn route mainly consists of industrial goods and the import cargo to Finland consists of consumer goods. In addition, Finnish metal and furniture industries conduct a lot of subcontracting in the growing economies. The companies started subcontracting first in Estonia but as the industries usually arranges the subcontracting functions according to the cost level of countries, subcontracting has been ex-

panding to other countries as well. As a result, the eastern Central European and eastern South European economies are expected to grow rapidly. The interviewees were unanimous that the growth will give cargo to the Helsinki-Tallinn route. Another question is what products Finland is able to export to these countries.

The interviewees gave only short term growth estimates for cargo volumes on the Helsinki-Tallinn. It should be noticed that the interviews were made in the spring 2011 and the estimations must be considered against the economic situation of that time. Generally it was seen that the two digit growth rate will continue at least during the couple of years. For example one interviewee estimated that next year the growth rate will be 15 % and then 10 % followed by another year with the growth rate of 10 %. If IMO´s sulphur regulations will come in force in the year 2015, the price of ship fuel will increase and the Finnish export and import will be funnelled to the routes where the sea leg is short. The IMO's decision will thus favour the Helsinki-Tallinn route and the route to Western Europe via Sweden. The volumes on the Helsinki-Tallinn route will boost and Rail Baltica could be an option to the Finnish foreign trade. Hamburg and other large continental North Sea ports are inside the area where the regulations are planned to be implemented. One vision is that the container traffic between Europe and Asia could use the North East passage and north-south flows via Finland could be emerged.

In the following main results and observations of the study are summarised:

- During the period 2002–2010 the volume of the seaborne cargo traffic between Finland and Estonia has increased significantly while the trend of the trade volume between Finland and Estonia has remained nearly constant. This indicates that the route via Estonia is increasingly used in the Finnish foreign trade. Because the ports of Helsinki and Tallinn are the main ports in the cargo traffic between Finland and Estonia, the role of the Helsinki-Tallinn route as a sea leg in the hinterland connections of Finland has increased.
- The growth of the cargo volume on the Helsinki-Tallinn route was estimated to continue on the annual level of 10 % during the next couple of years. In the long run the growth of the cargo volumes depends on the economical and industrial development of the former Eastern European countries.
- The fast and reliable connections year round on the Helsinki-Tallinn route have made it possible for service and logistics companies to reconsider their logistics strategies in a new way in the both side of the Gulf of Finland (e.g. laundry or delivery services). This new way of logistics patterns has begun and even more companies are looking for opportunities in combining the Helsinki and Tallinn together in their service offering.
- If the IMO's sulphur regulations will come in force, the Helsinki-Tallinn route will become one of the main routes also to the Western European markets, besides of the route via Sweden. The cargo volumes on the Helsinki-Tallinn route may be multiplied due to the regulations.
- The ropax concept, where cargo and passengers are transported in the same vessel, is seen as the only economical profitable solution on the Helsinki-Tallinn route because cargo and passenger traffic are supporting each other.
- The trucks (vehicle combinations) will remain the main mode of transport on the Helsinki-Tallinn route because general cargo is the main commodity on the

route. IMO's sulphur regulations and the changes in the structure of the Finnish industry may create prerequisites for rail road transport in the hinterland connections of Finland.

In this study the hinterland volumes were reviewed only on a rough level. Due to the limitations of available resources, the main method for estimating the hinterland cargo flows was statistical analysis completed with expert interviews. For several reasons the statistical analysis can give only indicative results. Two different statistical databases with different classifications and definitions were used. Qualifications concerning the compilation of statistics on intra-EU trade have been reduced. To get a more precise picture of the hinterland flows, a survey among the lorry drivers should have been done in order to get information on destinations and commodities transported in specific lorry. This kind of method is difficult to implement in the ports. Theoretically, it is also possible to analyse consignment notes of certain transport companies. If a more comprehensive study will be made, it is recommendable to conduct extensive expert interviews with transport and logistics companies.

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APPENDICES

Appendix 1. List of interviewed experts.

Interviewed expert	Title	Company	Date of the interview
Fagerholm Stefan	Manager of terminal operations	Viking Line ABP	25 March 2011
Fagerström Håkan	Director, Cargo services	Tallink Silja Oy	30 March 2011
Hellstén Heikki	Traffic director, International land transport, the Baltic Countries and Eastern Europe	Schenker Oy	14 April 2011
Karlsson Bjarne	Director, International land transport	Schenker Oy	14 April 2011
Onniselkä Markku	Freight director	Eckerö Line	25 March 2011
Tamminen Harri	Director, development, Viking Line Cargo	Viking Line ABP	25 March 2011

Appendix 2. The themes of the interviews.

1. **The volume and structure of shipping company's cargo transports**

- cargo volume on the Helsinki-Tallinn route
- harbours used on the Helsinki-Tallinn route
- structure of cargo transports on the Helsinki-Tallinn route
  - containers, trailers, vehicle combinations, vans, mafi trailers
  - turn-return balance of the cargo traffic
- market share and its development expectations concerning unitised cargo transport on the Helsinki-Tallinn route.

2. **Commodity groups of shipping company's cargo transports**

- the most transported commodity groups on the Helsinki-Tallinn route (both directions)
  - general cargo in more detail
- estimations for the development of commodity groups on the Helsinki-Tallinn route
- changes in commodity groups on the Helsinki-Tallinn route in the past 5–10 years.

3. **Hinterlands of the Helsinki-Tallinn route**

- the share of hinterland cargo (the cargo flows between Finland and third countries, other countries than Estonia) of company's total cargo volumes on the route
- origins and destinations of the hinterland cargo on the route
- cargo structure and commodity groups of hinterland cargo transports on the route
- the most common routes and modes of transport of hinterland connections on the route
- estimations for the development of hinterland cargo volumes on the route.

4. **Customers / shippers**

- the share of commerce of cargo transports on the Helsinki-Tallinn route and its development views
- the share of industry of cargo transports on the Helsinki-Tallinn route and its development views
- the share of three biggest customers of cargo volumes on the Helsinki-Tallinn route (both directions)
- types of forwarding companies and transport companies operating on the Helsinki-Tallinn route.

5. **The Helsinki-Tallinn route in common**

- estimations for the development of the cargo volumes and balance of turn-return transports on the route
- estimations for the development of the transports methods of unitised cargo on the route
- estimations for the development of the cargo structure on the route
- estimations for the impact of potential changes in port structures in the Baltic Sea to the cargo volume and the commodities on the route
- impact of nature conditions to the cargo traffic on the route
- bottlenecks of the route and potential solutions to these problems
- strategies and development actions of the shipping companies in cargo traffic on the route
- development suggestions of the route and the city structure of Helsinki and Tallinn concerning cargo traffic.

6. **Gathering and needs of information**

- methods used in the estimation of cargo structure and volumes by the shipping companies
- needs of information concerning the cargo traffic by the shipping companies
- suggestions for the development of the transport statistics.

Appendix 3. Units of lorries and trailers between Finland and certain countries in sea transport (both directions) in the years 1993–2010. (Finnish Transport Agency, 2011b)

	Germany	Sweden	Estonia
1993	92 800	167 500	36 200
1994	120 200	193 300	50 900
1995	138 400	204 100	50 600
1996	153 400	206 700	62 100
1997	182 300	229 600	80 800
1998	194 800	230 200	90 300
1999	199 300	233 000	86 100
2000	212 400	242 800	106 100
2001	225 800	229 000	115 200
2002	242 400	232 300	128 200
2003	254 100	240 500	133 600
2004	268 200	252 800	154 600
2005	275 800	269 400	173 400
2006	302 500	280 500	191 300
2007	325 100	293 800	204 700
2008	320 200	294 900	210 000
2009	259 300	249 300	186 300
2010	276 200	273 700	237 100

Appendix 4. Information about IMO's sulphur regulations. (SPC Finland, 2009)

The global limit of sulphur (SO_x) will be lowered to 3.5 % in 2012 and further lowered to 0.5 % in 2020. There will be a five-year extension period if there is no fuel on the market that fulfils these criteria by 2020. Nevertheless, this new regulation forces the use of distillate fuel oils by 2025 at the latest, because there is not enough residual oil with less than 0.5 % sulphur content available for global shipping.

The Baltic Sea and the North Sea are SECA areas and therefore have a stricter schedule for the change to distillates agreed in MEPC 58. In SECAs the sulphur limit will be 0.1 % after 2015, which in practice means changing from heavy fuel oils to marine gas oil (MGO). This will lead to a radical decrease in SOx emissions, but also to considerable additional costs due to the large price difference between the aforementioned fuel qualities.

Ship fuel quality regulations, SO_x emissions

- Global limit is 4.5 %-S
  - 3.5 %-S in 2012
  - further reduction to 0.5 % by 2020.
- The Baltic Sea and the North Sea (incl. the English Channel) belong to the IMO-defined SECA (SOx Emission Control Areas), which have tighter restrictions on ship fuels than other sea areas.
- The sulphur content of fuel in SECAs will be further restricted according to IMO MARPOL Annex VI as follows:
  - 1.5 %-S until 2010
  - 1.0 %-S from 2010
  - 0.1 %-S from 2015.
- The United States and Canada are proposing that specific portions of their coastal waters be designated as Emission Control Areas for nitrogen oxides, sulphur oxides and particulate matter (in MEPC 59).
- 0.1 %-S in EU ports and inland waterways from 2010.

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