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Attractiveness of the Finnish rail transit route

Case study: VR Group

Viktoriya Snezhkova

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Authors	Group
Viktoriya Snezhkova	X
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This thesis revealed development opportunities of the Finnish railway transit route for the transportation of bulk raw materials coming from Russia westbound. The thesis research question was to investigate attractiveness of the Finnish railway transit route for the transportation of bulk raw materials from Russia westbound. The study revealed level of attractiveness of the Finnish railway transit route, competitive advantages and disadvantages of the Finnish transit route for the transportation of raw bulk materials, such as iron, fertilizers, oil and oil related products.

The thesis research is based on the previous studies of Jumpponen (2007), Kilpeläinen (2004) and Lautso (2005). Previous researches analyzed competitive advantages of the competing transit routes between the West countries and Russia. The main transit routes for the raw materials transportation from Russia westbound have been examined and compared, advantages and disadvantages of the Finnish rail transit route are defined and recommendations on the future development for the Finnish rail transit route are presented in the thesis.

The thesis study was carried as empirical research. Data for the study was gathered by interviewing freight forwarding companies in Finland and Russia and Finnish railway authorities. The analytical approach was qualitative. Overall, eleven qualitative semi-structured interviews have been conducted and one e-mail enquiry has been received during the study process.

The thesis research was commissioned by the state-owned transportation company VR Group. Therefore, implications of findings and conclusions were presented for the commissioning party. Also recommendations for the future development of the railway transit transportation have been made.

The thesis research revealed the factors, affecting transit route choice for the transportation of bulk commodities westbound and the level of competitiveness of the Finnish railway transit route for the raw materials transportation westbound. The research revealed that attractiveness of the Finnish railway route is dependant on the attractiveness of the entire transit route via Finland, particularly on the ports' services. The main problems affecting attractiveness of the railway route as part of the entire route via Finland are the cost levels, lack of flexibility in negotiations and cooperation between railway transportation provider, ports and the other freight providing companies and participants of the transit chain via Finland.

Research findings have supported theoretical background of the study, particularly, factors affecting transit route choice. However, thesis study has defined level of importance of the different factors for the railway transportation of raw bulk materials. Besides, competitive advantages of the railway transit route for the transportation of raw bulk materials differ from the competitive advantages of the route via Finland, presented in previous studies by Lautso (2005), Kilpeläinen (2004) and Jumpponen (2007).

The thesis had practical importance for the commissioning party because it has revealed level of attractiveness of the railway transit route, defined advantages and disadvantages of the Finnish transit route and suggested the need for cooperation between the Finnish freight providing companies in order to increase attractiveness of the entire route via Finland. Besides, the thesis defined main factors affecting the transit route choice for raw bulk materials transporta-

tion. Attractiveness of the railway transit route can be increased also by influencing those factors. Therefore, findings of the research can be used by VR Group as background for the creation of international strategy, directed at increasing attractiveness of the railway transit route via Finland for the transportation of raw materials from Russia westbound.

Key words
Transit, freight, railway transportation, bulk, raw materials, Russia

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1 Introduction

Transportation plays a key role in the world economy. On the one hand, international transportation supports global economic development, but on the other hand, transportation volumes are dependant on the international trade. Brisk economic development of Russia and East-European countries and rapid growth of Asian economies caused international trade activation and, consequently, lead to international transportation volumes growth. Rapid growth of economy in Russia resulted lack of capacity of Russian own logistic infrastructure and, therefore, was followed by increasing westbound transit via neighbouring countries, such as Finland, Baltic countries and Poland.

Finnish logistics development benefited from the international trade growth and European Union enlargement. Logistics business has been developed by taking advantages of the growing economies of the bordering countries. Particularly, Finnish logistics benefited from growing exports to Russia and development of the eastbound and westbound transit transportation via Finland. A special governmental program had been developed by the Finnish government directed at "strengthening Finnish logistics position" as result of growing logistics sector (Ministry of Transport and Communication 2005). Hence, transit transportation development is very important for the Finnish logistics development.

However, global economic recession has resulted decline in the international transportation volumes in 2009. The competition between international transportation routes has become tougher. Therefore, competitive advantages of the existing transit routes have to be analyzed carefully in the changing economic conditions because of the changes in international exports and imports structure of different countries.

Finland has a strong position as transit country for the eastbound transportation of highly valued goods. Nevertheless, competitive advantages of Finland as transit country over competing transit routes are important to be analysed for the westbound transit transportation as well. Retaining and increasing current transit transportation market share is possible by implementing clear strategic actions. Consequently, the analysis of the attractiveness of the Finnish transit route westbound is needed.

Railway transit transportation development is important for the Finnish economy. First of all, railway transportation is the most environmentally friendly mode of transportation and it is less harmful for the environment. Secondly, the Finnish railway infrastructure is well devel-

oped, has free capacity for handling bigger transit transportation volumes, and does not need additional investments for development of freight transit transportation in Finland. Moreover, development of the westbound transit traffic from Russia is important for the Finnish logistics growth and employment sector. Hence, development of the railway freight transportation has high importance for Finland.

Therefore, current thesis aims to analyze the level of attractiveness of the Finnish railway transit route for the transportation of bulk raw materials from Russia westbound. Particularly, railway transit transportation of fertilizers, metals, oil and oil related products coming from Russia westbound is researched. The thesis work aims to reveal level of attractiveness of the rail transit route for the transportation of mentioned above commodities and to find out possible solutions on how to increase competitiveness of the Finnish railway route for transit transportation westbound.

1.1 Research problem

The thesis research objective was to find answer to the following research problem: how attractive the Finnish railway transit route is for the transportation of bulk raw materials from Russia westbound.

The other research questions were:
-What is the role of the transit transportation in international transportation?
-What is the role of the railway in international transportation and transit transportation?
-How ports' infrastructure affects transit transportation development?
-How is transit transportation developed in Finland?
-What are the transit routes from Russia westbound for the transportation of raw bulk materials?
- What are the competitive advantages of the Finnish transit route?
-What are the competitive advantages of the competing transit routes?
-How competitiveness of the Finnish railway transit route can be increased?

1.2 Thesis research framework

The thesis research aim was to determine the level of attractiveness of the Finnish railway transit route and to find possible solutions on how to increase westbound transit transportation by railway. In order to achieve this goal, theoretical framework for the thesis research had

been developed. First of all, importance of transit in international transportation and factors affecting transportation mode and route choice were researched. Besides, importance of the railway in international transportation was discussed in the thesis study. Secondly, country specific analyzes had been done and Russian exporting structure was also discussed in the thesis. Besides, main competitive advantages of the transit routes from Russia westbound via Finland, Baltic countries, Russian own ports and Poland were defined. The empirical part of the thesis revealed competitive advantages and disadvantages of the Finnish railway transit route, defined factors affecting the choice of the route for the transit of bulk commodities westbound and analyzed competitiveness of the Finnish route among other competing routes. The conclusions are presented in the final part of the thesis.

The structure of the thesis research framework is presented in the figure 1.

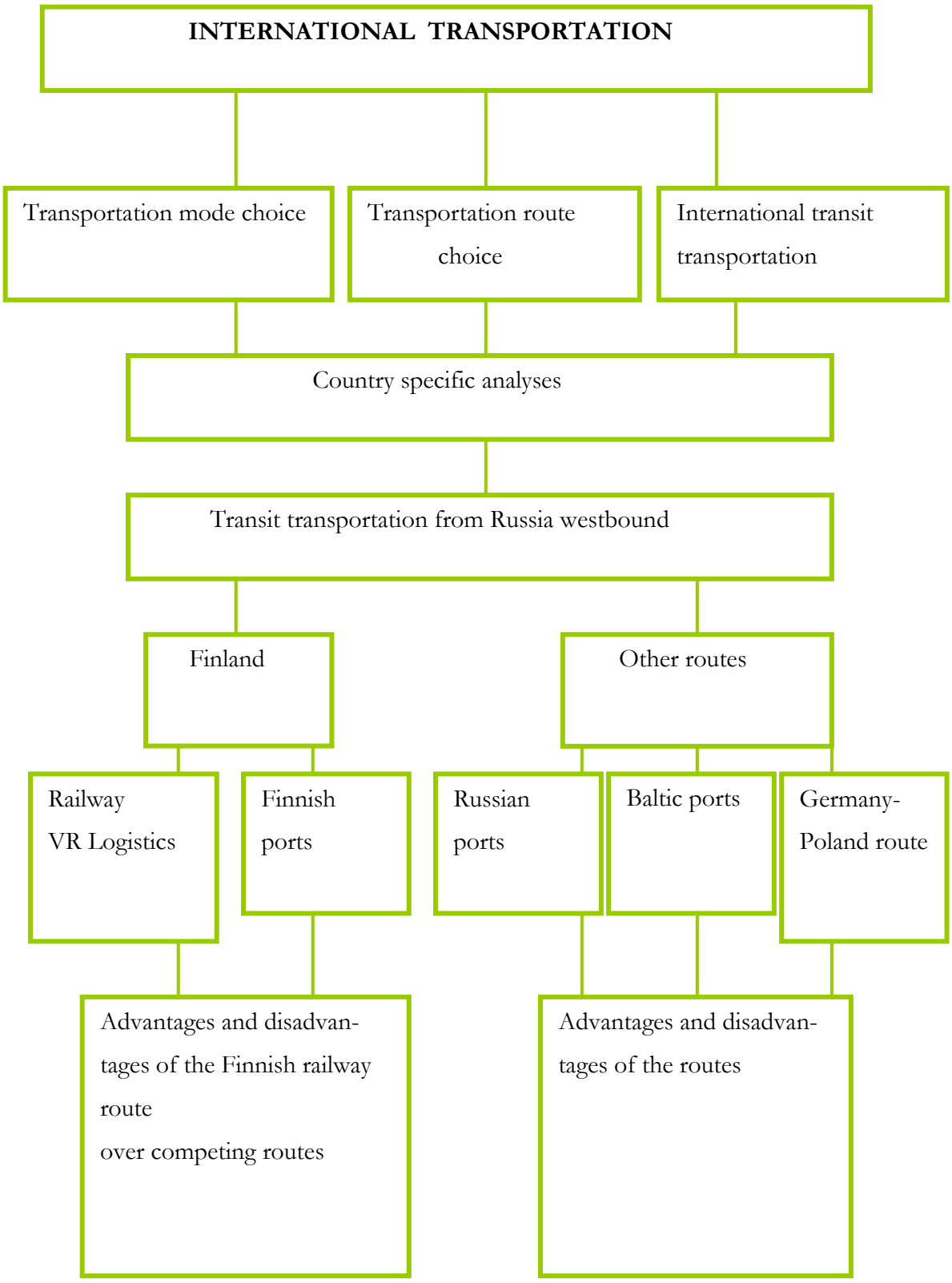

Figure 1. Thesis research framework 2009. By author.

1.3 Research limitations

Current thesis research has been commissioned by the railway department of the state-owned logistics company "VR Group". Therefore, conclusions and recommendations of the thesis

are applied for the department VR Logistics. In addition, only westbound transit traffic of raw bulk commodities has been researched. Moreover, the nature of transported products is limited by bulk materials such as oil and oil related products, fertilizers of different forms and irons, which constitute the biggest share of the Russian exports westbound.

The empirical part of the thesis was carried as qualitative research. Personal and phone interviews have been carried with the representatives of the international transportation companies in Finland and Russia.

Current economics trends were considered in the presented thesis research. Hence, the affect of the global economic downturn is taken into consideration when analyzing competitiveness of the transit routes.

The SWOT analyses of the transit routes had been done in order to define current competitive advantages and disadvantages of different routes and reveal external factors which affect development of the routes. The analyses are done based on the previous studies commissioned by the Ministry of Transportation and Communications "Transport connections between the EU and Russia. Current status and outlook for the future" (Lautso, Venäläinen and Lehto 2005), "Strengthening Finland's logistics position" (Ministry of Transportation and Communication 2005). Other researches, such as "Development of transit traffic via Finland in 1997-2003"(Kilpeläinen 2004), "Competitiveness of the transit chains" (Jumpponen, Märkälä, Arposalo, Liedes 2007) about transit transportation development were used as theoretical background of the thesis. Nevertheless, previous theoretical reviews did not consider bulk raw materials as the main commodity for the westbound transit transportation. Therefore, empirical part of the thesis has a practical value. It has revealed the level of attractiveness of the Finnish railway transit route for transportation of bulk raw materials westbound.

2 International transportation

2.1 Transportation modes in international logistics

The transportation mode choice depends on many factors in international trade. The nature of the product affects the choice of the transportation mode, as well as other factors, such as freight hauled, cost, speed, reliability, capacity, length of haul, and flexibility (Bloomberg 2002, 100). Also, transit time, security of goods, government regulations, safety and fit with integrated logistics strategy are affecting the choice of the right mode (Bloomberg, 2002, 119).

Thus, the most challenging task in international transportations is in "accounting for all these factors simultaneously" (Bloomberg, 2009, 119).

The nature of the product affects the transportation mode and, consequently, transportation route choice. The biggest share of the bulk products are transported by the sea transport. At the same time air transport remains very popular for the valuable goods transportation. Oil and gas deliveries are transported mainly by pipelines.

Speed requirements are also important for the transportation mode choice. Urgent deliveries of oil and oil related products, when the price for oil is high enough, can be transported by railways. For instance, the majority of oil exports from Russia were transported by pipelines in 2007, but around 300 barrels per day were transported by sea and railway (US Energy Information Administration 2008). Railway transportation of oil and oil related products can be efficient in case of high world oil prices and tough time requirements by the buyer. Thus, speed requirements might be also important for the transportation mode choice.

The importance of the main transportation modes in international logistics is described next. Transportation by sea plays the most important role in international freight logistics due to the high share of bulk products in the total worldwide transport (Lautso 2005, 14.) Large volumes can be transported by the sea transport at low costs. However, the main disadvantage of the sea transportation is low speed. Nevertheless, this transportation mode is the most suitable for the bulk materials transportation.

Railway transportation is used mainly for haul of high density, low valued freight over long distances (Bloomberg 2002, 104). The costs of the railway transportation are usually lower than road transportation and air, but higher than water and pipeline transports. Rail haul is the most suitable for transportation of coal, stone, sand, metals, fertilizers, grains and other bulk materials. Main competitors for the railway haulage are water and truck carriers (for transportation of highly valued goods), in some cases pipelines, when crude oil is considered as commodity for the transportation. Railroads can handle a wide variety of goods for transportation. However, lack of flexibility and high speed delivery make this transportation mode less competitive compared to road transportation (Bloomberg 2002, 105). As disadvantages of the railroad transportation can be admitted poor scheduling, a substandard infrastructure, and unreliable equipment (Bloomberg 2005, 105). However, railway transportation has also its share in international transportations, even though "water transportation is a significant competitive alternative to rail in Europe" (Lewis, Semeijn and Vallenga 2001, 24).

Railway transportation mode is one of the most suitable for bulk materials haul. Railway transport is an integral part of intermodal freight transportation to the ports. Therefore, railway transportation should be considered as part of the international transportation chain consisting of the railway and water transportation. Therefore, ports services and infrastructure are also important for transit development.

Intermodal transportation, or transportation of goods by using more than one mode of transportation to move goods to the destination (Bloomberg 2002, 108) is very important for international transportation development. The benefits of multiple transportation modes can be utilized in international transportations by combining different transportation modes. Intermodal transportation has become very popular with development of international trade. International freight railway transportation in combination with the sea transportation is widely used in Baltic countries and Finland as part of intermodal transportations from CIS countries to the USA and Europe.

2.2 Westbound transportation from Russia (Russian exports)

Brisk economic development in Russia 2000-2008 resulted strong business cooperation with many European countries, the US and China. Russian exports and imports have been growing steadily over the past few years. Russia has been importing huge volumes of cars and electronics, while natural resources remained the main commodity for Russian exports (Lautso 2005, 29). Oil and oil-related products, coal, metals, irons and chemicals were the most exported commodities to the long distance countries during 2008 (Rusimpax 2008. See also appendix 1).

International transit and logistics services have been developing under the impact of the Russian economic growth. International freight volumes transported from Russia have increased as result of active international trade in 2000-2008; however, transit transportation was affected by the world economic slowdown, which had negative impact on Russian exports in 2009.

The volumes of trade between Russia and its western economic partners –the European Union and the US- have declined in 2009. According to the statistical data of Russian Customs, export sales to the European Union were 265 541 million US dollars in 2008 (FTS 2009). However, the volumes of international trade started to decline in late 2008. Therefore, the

volumes of international trade between Russia and the US declined by 36, 4% in 2009 compared to the year 2008 (Volovik 2009.) The trade volumes declined due to the decreased consumption in the western countries. For instance, imports of fuel, metals, chemical products, minerals decreased significantly in the Western countries in the first three quarters of 2009 (Volovik 2009.)

Russian exports are transported westbound mainly by the sea, pipelines and railway transportation modes. According to the Statistical Unit of the Finnish National Board of Customs, water transportation is prevailing for transportation of goods coming from Russia to Finland (53% of total transportation); rail transportation makes around 25% of the total freight transportations from Russia (Finnish customs 2009.)

Figure 2 represents main transportation modes for exported goods from Russia to Finland in 2008.

Figure 2. Russian exports to Finland and via Finland to the third countries.
Source: Finnish Customs 2009. Foreign trade 2008. Finnish trade in Figures. http://www.tulli.fi/en/finnish_customs/statistics/publications/pocket_statistics/liitteet/pocket2008.pdf Published 6.4.2009.

The presented by the Finnish National Board of Customs data represents data from the Finnish Customs concerning imports to Finland or third countries via Finland from Russia, or Russian exports. The Figure 2 shows that railway transportation was the second the most popular transportation mode for the freight transportation from Russia to Finland in 2008. The data presented by the Finnish Customs shows flow of all goods coming from Russia to Finland or via Finland. However, transportation mode choice might differ based on the transported product. Thus, sea transportation mode is used for exports of 55 percent of oil from

Russia, 40 percent of oil is transported via Druzhba pipeline and 5 percent is transported by rail (Liuhto 2003, 15).

Crude oil is transported mainly by pipelines from Russia westbound. The main exporting pipeline route goes via Druzhba trunk line. Druzhba Pipeline is the largest oil pipeline in the world. The northern link of the pipeline goes from Russia through Belarus and Poland to Germany, the southern line goes via Ukraine, Hungary, and Slovakia to Czech Republic. Construction of an extension of Druzhba pipeline to the Baltic, Baltic Pipeline System, started from June 2009 (Pipelines International 2009). The Baltic Pipeline System will connect the Unech junction and Ust-Luga terminal on the Gulf of Finland by December 2013 (Pipelines International 2009).

There are a few transit routes connecting Western Europe and Russia – the routes via Russian own ports, via ports of Finland and Baltic countries and the railway route via Poland. The westbound transportations are done via Russian ports of St. Petersburg, Vyborg, Vysotsk, Ust-Luga, Primorsk and Kaliningrad, via Baltic ports in Tallinn, Riga, Ventspils, Liepaja and Klaipeda. The main Finnish ports for the westbound transportation from Russia are the ports of Hamina, Hanko, Helsinki, Kokkola, Kotka and Turku (Kilpeläinen 2004, 38).

The figure 3 presents main transit routes connecting West countries and Russia.

Figure 3. Main transit routes connecting Russia and West Europe (Source: Lautso 2005.)

The transit route from Russia via Finland is shown by the blue line at the Figure 3. The transportation is done via the main ports of Finland – Port of Hamina, Port of Kotka, Port of Helsinki, Port of Hanko, Port of Kokkola and other ports. The transit commodities are trans-

ported either by trains or by vehicles to the ports. The red lines on the route represent transit routes through the Russian own ports at the Baltic Sea- the port of Saint Petersburg and the port of Kaliningrad. The violet lines represent transit routes via Baltic countries- Estonia, Latvia and Lithuania. And finally, the black line of the figure 3 shows Germany-Poland ground transit route. In addition, there is another railway transit route, which goes through the Northern part of Finland to the port of Kokkola. This route is not presented at the Figure 3.

The transportation of the Russian exports to the Finnish ports is done mainly by railway (Kilpeläinen 2004, 39). The main exported commodities are fertilizers, coal, irons, oil and oil related products. Railway transportation mode was also popular for the transportation of oil and oil related products in Russia in 2003-2007, when the oil price was high enough. The volumes of rail transportations of oil and oil related products has doubled in the year 2003 compared to the year 2002 (Delovaa pressa 2003.) The deliveries were done mainly through Russian port in Kaliningrad and Latvian port in Ventspils (Delovaa pressa 2003.) Railway transit transportation to the ports of neighbouring countries has been growing because of the high demand and high price levels for oil. Even though the transportation by rail is more expensive than by pipelines, the capacity of pipelines was not high enough for the big volumes transportation of crude oil. However, railway transportations of crude oil were applied in period of brisk international trade and high demand for the oil in the West countries. Pipelines and sea transportation modes are more efficient for the transportation of crude oil westbound.

Brisk economic development in Russia has been followed by the development of transit routes via neighbouring countries. However, overall Russian logistics policy is directed at development of the Russian own ports and logistics infrastructure. According to the Russian Minister of Transport, Russian own ports are one of the key elements in the Russian transportation system (Levitin 2007.) Consequently, around 60% of the export transportations are done via the Russian own ports (Levitin 2007.) The development and competitiveness growth of the Russian own ports are a part of the policy of the Ministry of Transportation in Russia. Nevertheless, transit routes via neighbouring countries are still used and have big importance for the development of international trade between Russia and Western countries.

2.3 Railway in international transportation

The railway transportation plays important role for the economic development of countries and for competitiveness of many industries. Railway transportation is used mainly for the domestic transportation of coal, stone, sand, metals, grain and automobile (Bloomberg 2002,

104). Even though domestic water carriers are considered as primary competitors for the railway transportation, especially along certain routes, in some cases, the railway is an integral part of the intermodal transportation chain (Bloomberg 2002, 104).

Railway transportation mode is an important part of intermodal freight transportation. Railway transportation mode provides the long-distance line-haul component of intermodal moves and serves the nation's sea ports; it facilitates international trade (AASHTO 2009.) The importance of the railway transit transportation is significant in intermodal transportations, since deliveries of the bulk commodities to the main international sea ports are done mainly by the railways. For instance, westbound exports of bulk materials, such as coal, iron ore, oil related products from Russia westbound are done by railway via the main transit ports - Russian own ports, Baltic ports and Finnish ports; also the ground railway route via Poland is used for direct deliveries from Russia to the Western Europe (Lautso 2005, 51). Hence, railway transportation is very important for the international freight transportations as part of intermodal chain.

However, railway freight transportation share in international long-distance deliveries is relatively modest (Lautso 2005, 14). Railway transportation system has quite many problems within Europe; the infrastructure is "still oriented more towards serving national needs than international goods transport" (Schary 2000). Railway transportation mode still has lack of dynamism, reliability, flexibility and customer orientation (European Commission 2008). Railway infrastructure affects competitiveness of the railway transportation mode and competitiveness of the transit route in international transportations. Even though, the development of the railway is promoted by the European Union, "in spite of EU policies the total volumes of freight transports seems to have deteriorated" (Ghjisen, Semeijn, Linden 2007, 42). The most of international transportations are done by the road or water transports, while share of the rail transportation remains relatively low in the European Union (European Union 2008.) The railway's share in freight transportation has decreased to 16,7% in 2006 in the EU-27 (European Commission 2008).

Nevertheless, the railway transportations share can be increased with development of the intermodal transportation chains (Lautso 2005, 16). Besides, the importance of railway transportation is growing due to the growing environmental concerns in Europe (European Union 2008). Thus, the development of the railway transportation is of great importance for the European Union's "economic competitiveness and sustainable development" (European Commission 2009). One of the EU's aims is upgrading important freight routes (European Com-

mission 2009). Moreover, development of intermodal transportation modes is considered as necessary by the European Commission (European Commission 2009).

Railway freight transportation has many benefits compared to the road transportation. They include "reduced road congestion, reduced road maintenance costs, reduced number of road accidents, reduced noise and air pollution and after all, reduced affect on climate change"(Cavill 2001.) Besides, railway transport generates less carbon dioxide emissions than the other modes of transport. Figure 5 shows carbon dioxide emissions level from different transportation modes. Also, railway transportation is cheaper in some segments than road and air transportation and sometimes railway transportation mode can outperform road or air transport (European Commission 2008).

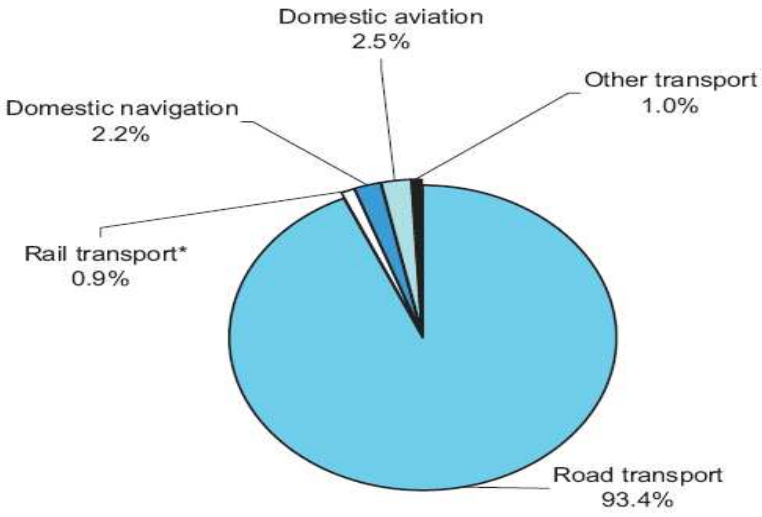

Figure 4. Carbon dioxide emissions from different transportation modes. Source: European commission 2004.

New technologies are being implemented to enhance the railway transportation in the European Union. Railway technological innovations include multi-voltage electric locomotives, which allow locomotives to work across the borders, new signalling systems: a key component of European rail traffic management system, which allows reducing operating costs and enhances rail's competitiveness through the implementation of continent-wide standards, gauge transfer, full standardization of rail gauge across EU, new rapid gauge changing technologies has been developed to re-gauge wagons (OECD 2010). However, the implementation of new technologies directed at enhancing and improving international railway transportation might take a few more years (OECD 2010).

In brief, railway freight transportation is a very important and competitive transportation mode. Development of the railway freight transportation is beneficial for the sustainable logistics. In fact, railway freight transportation is less harmful for the environment than road and air transportation modes. Besides, railway transportation mode facilitates development of intermodal transportation being a part of the transit route via Finland for the transportation of bulk raw commodities from Russia westbound.

2.4 International transit transportation

The importance of transit transportation has grown with international trade development. Logistics has become a factor of competitiveness in many industries. Consequently, companies have been searching for efficiency in their operations by choosing the best transit routes and transportation modes. However, routing is a complicated strategic process, which requires careful planning.

The choice of the best transportation route is a challenging task. The best for the transit transportation routes are not always the shortest ones. Indeed, transportation via certain routes for some products is more cost efficient than via other ones. Therefore, transit routes choice is very important for the international companies since it allows transporting goods in a most efficient and convenient manner (Bloomberg 2002, 108). Besides, route planning is a necessary part of the integrated logistic activities in the most of companies. Hence, routing is a very important step of the export activities.

Planning and decision making on the transit route choice depends on many factors. According to Jumpponen (2007, 6) safety, availability of services, price and time are the decisive factors of transit route choice. In addition, Bloomberg (2002,119) admits importance of such factors as nature of the goods, access to carriers, security of goods and fit with integrated logistics strategy in transportation management routes selection. Besides, such factors as availability, storage and handling equipment, and customer service are also considered as part of the integrated logistics (Bloomberg 2002, 65). Lautso (2005, 7) underlines impact of cost and service level in routing. Speed of transport modes, level of infrastructure, supply of logistics services, frequency of transport connections, safety and functionality of border crossing operations and public authority activities are important for the transit route choice (Lautso 2005, 7). Therefore, there are many different factors, which are affecting the choice of the transit route.

Transportation route and mode choice are made carefully by the decision makers, since "transportation is the most expensive logistics activity, accounting for 50 percent or more of total logistics costs" (Bloomberg 2002, 49). The decision making process on a choice for the routing is presented in the figure 5:

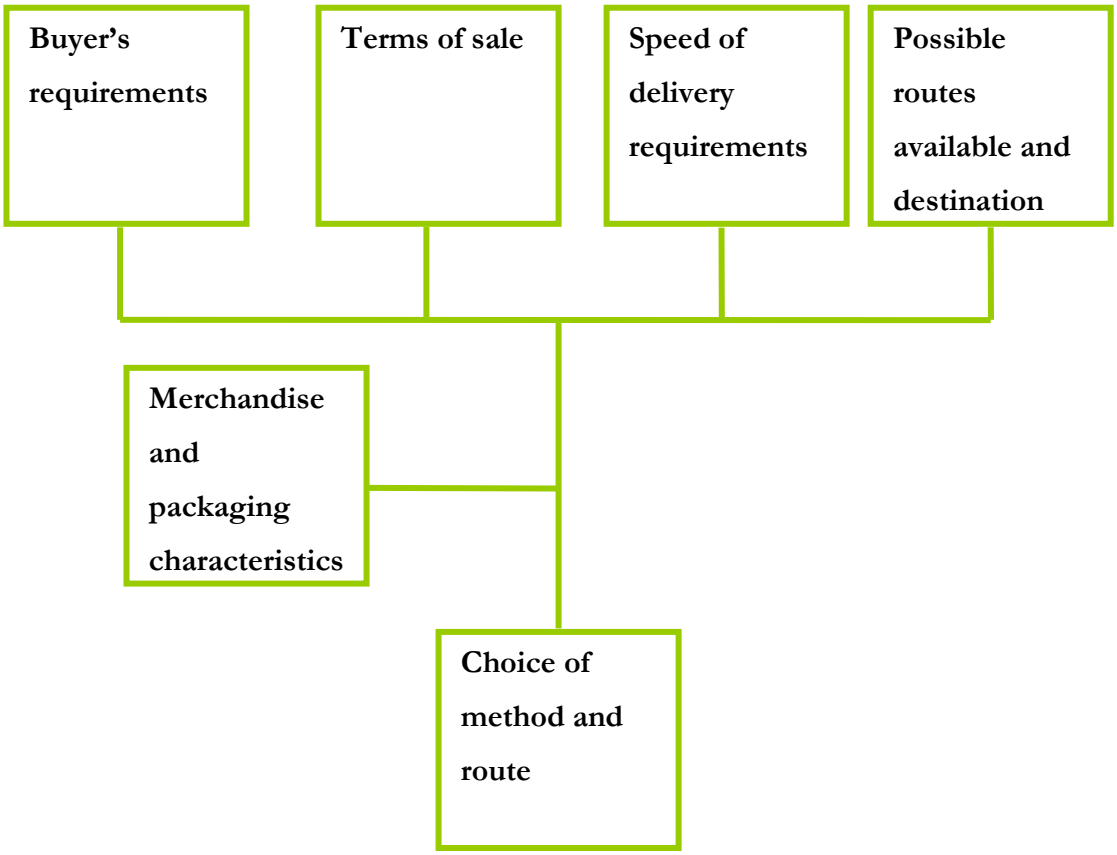

Figure 5. Making a choice of routing.
Source: Downs 1992. Understanding the freight business.

Figure 5 shows that the route choice is affected also by the buyer's requirements and conditions of order or contract, terms of sale, speed requirements, alternative routes available, technical requirements on merchandise and packaging characteristics for the freight transportation. Thus, transit route choice is dependent on many factors, which should be considered individually for different freight commodities. Cost effectiveness of the transit route might vary for different product categories. For instance, freight transportation tariffs differ depending on the commodity of transportation (Down 1992, 85). Thus, factors affecting transit route choice might be more or less important for different product categories depending on the conditions of a contract.

Nature of the product is also important in routing. For instance, highly valued goods might require premium transportation. In this case the "safety" factor will be decisive. In contrast, perishable products will value factor of time as the most important (Bloomberg 2002, 75). Furthermore, transportation of bulk products requires high cost-efficiency, because "transportation costs for these goods represent a high percentage of the sales dollar" (Bloomberg 2002, 75). Therefore, importance of different factors affecting transit route choice might differ depending on the commodity of transportation.

The choice of the transportation route is also affected by the transportation service providers. Carrier selection is dependent on such factors as price, accessibility, responsiveness, claims record, and reliability (Bloomberg 2002, 121). Price is important factor for the carrier selection. Another decisive factor affecting carrier choice is accessibility or capacity of the transportation provider. Required capacity levels should be available for the customers. Large carriers might create competitive advantage of the locating equipment at the customers' site or in different countries (Bloomberg 2002, 125). Responsiveness, or ability of the service provider to respond readily to changing customers' needs, is also another important factor affecting carrier choice. Claim records, or ability of a carrier to deliver goods in undamaged condition, are also considered by the customers. In other words, the factor of safety is also important in carrier selection process. Reliability is also meaningful factor for the customers, since delivery of goods on time is very important for a consignor. Hence, route and carrier selection is a complicated process, which requires consideration of many factors simultaneously.

Logistics infrastructure is developed differently in different markets. Services, cost levels, transport connections, speed of transportation vary in different countries. Thus, efficiency in international freight transportation is achievable by using transit routes via countries with high level of desired logistics services. Additional services, which are provided by the logistics providers to meet Just-in-time delivery, are also important for the customers, even though not all modes of transportation can implement it (Bloomberg 2002, 114). Therefore, logistics infrastructure and additional services are also important for the routing. The demand of the different services might differ depending on the nature of the transported products. Therefore, product nature might require using special routes, where the desired level of logistics services can be achieved.

Bloomberg (2002, 114) defined Just-in-time delivery as "ability of freight carrier to meet demanding requirement for short, well-defined transit times" and be more "customer service

oriented". Customized services might include establishing "milk runs", where specific routes and times are scheduled for the customers, providing dedicated equipment for certain customers, owing specialized equipment for fast loading and unloading so that customers' delivery needs can be met, developing transportation information systems that can constantly monitor the shipment, innovative pricing of services and contracts (Bloombers 2002,114). Even though implementation of Just-in-Time delivery is difficult for railroads, pipelines and water carriers, customized services might affect the choice of transit route as well.

International transit transportation is beneficial for the global logistics efficiency. Transit via huge logistics centers allows reducing transportation distances and reaching higher efficiency levels in operations. Delivery frequencies can be increased by using cost-efficient routes, which is beneficial for just-in-time production and deliveries. The transit transportation also increases efficiency of the sea transportation, since it makes possible transportation of additional freight. Besides, transit transportation development is beneficial for the economies of the transit countries: they increase employment rates and guarantee additional income for the logistics providers.

Negative influence of transit transportation should be admitted as well. Transit transportation might be harmful for the environment of the transit country. Increased transit traffic might cause such negative affects as air pollution, noise, climate change, accidents and affect nature (Jumpponen 2007, 6). Therefore, environmental issues should be considered during the route planning by transportation companies and by the transportation authorities of the transit countries. Besides, well-developed transportation infrastructure might decrease negative impact of the transit transportation on the environment of the transit country.

Nevertheless, the overall global environmental impact of transit transportation should be assessed as positive, since "intermodal transit, where multiple methods of transport are used to move goods, is now seen by the most planners as an excellent alternative because it reduces the environmental impacts of all modes, while using the fastest routes to reduce time and cost" (Rochester Institute of Technology 2009). In other words, using intermodal transit routing allows reaching higher efficiency levels and decrease overall environmental impact.

Factors, affecting route and carrier choice, are summarized in the figure 6.

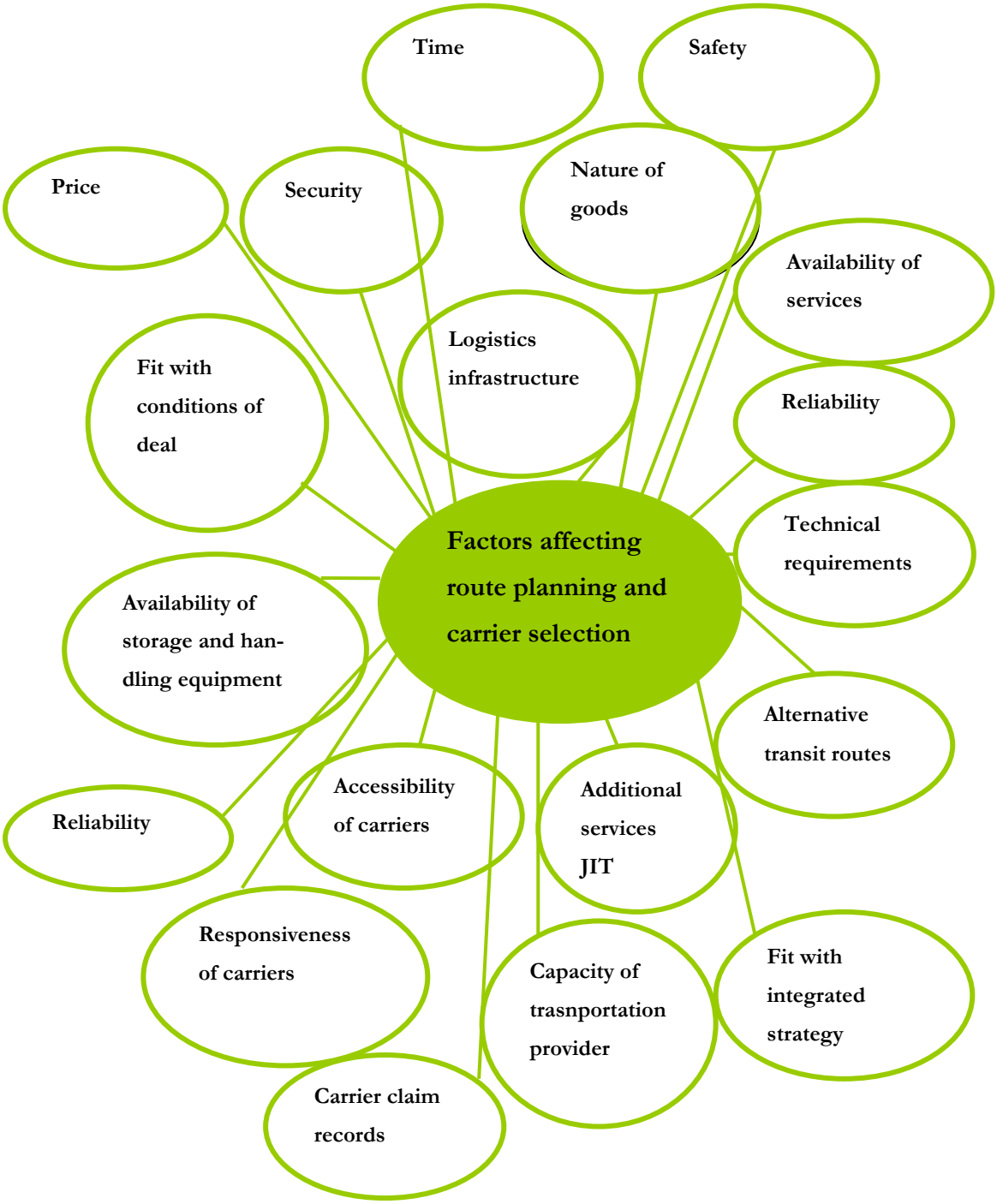

Figure 6. Factors affecting route and carrier selection. Summarized by the author.

Fugure 6 summarises the factors, affecting choice of the transit route and carrier selection, defined by the different authors (Bloomberg (2002), Jumpponen (2007), Lautso (2005) and Downs (1992)). These factors are important for the international transportation routing, but they are not related to any specific industry. Moreover, these factors might be ranked differ-

ently by different industries. Hence, importance of the factors might vary depending on the nature of transported goods and other requirements for the decision-maker.

Factors affecting the choice of the transit route for the westbound transportation of bulk commodities are defined in the empirical part of the study (Figure 11). The factors, which are important for the decision makers in international routing, could be considered by the international freight providing companies. Indeed, the knowledge of the factors affecting routing can be used in strategic planning of increasing transit route attractiveness for different products. Therefore, factors affecting the choice of transit routes are defined in both, theoretical and empirical parts of the study.

3 Transit routes from Russia westbound

As it has been mentioned above, bulk raw commodities are exported from Russia westbound via the main transit routes- the routes via Finland, the Baltic counties, Russian own ports at the Baltic Sea and pipelines and via the ground railway route through Poland (Figure 3).

It is very important to analyse competitive position of the different transit routes from Russia westbound in order to assess competitive position of Finland as transit country and define opportunities for development of the Finnish railway transit route for the westbound transportation of bulk commodities. Consequently, the routes are described and SWOT analyses of different routes are presented in the thesis.

3.1 Finland and transit transportation

According to Bloomberg (2002) "transportation plays a key role in economic success by allowing for the safe and efficient distribution of goods and services throughout the supply chain" (Bloomberg 2002, 94). Finnish infrastructure is well developed and includes 78000 kilometers of public road, (Finnish Road Administration 2008) 5 919 kilometers of railway lines including 3067 kilometers of electrified lines (Finnish Rail Administration 2009), 21 airports, 7600 kilometers of coastal fairways and 7900 kilometers of inland waterways (The Finnish Maritime Administration 2009). Thus, there are four major transportation modes in Finland: railway, road, air and water transportation modes.

The overall level of the Finnish transportation infrastructure has been assessed by European Commission as excellent (Ministry of Transportation and Communication 2007). Also "traffic

safety level is remarkably higher in Finland than on average in the EU countries" (Ministry of transportation and Communications 2007). Besides, transit transportation infrastructure is well developed in Finland.

Transit route via Finland is widely used for transportation of goods to and from Russia. Transit traffic discussed in the thesis research comes to Finland by rail from Russia and goes via Finnish ports to the third countries westbound by sea.

Finnish economy is affected positively by transit transportation development. Transit traffic affects infrastructure development and employment rates in Finland (Ministry of Transportation and Communication 2008, see appendix 4). Transit traffic created "more than half a million man-days of work in Finland, providing employment for professionals in many different fields" (Turunen 2009.) Employment level in transit traffic is high and accounts to three thousand jobs in Finnish business and commerce - forwarding agencies, ports, warehouses and terminals, according to Elina Muultanen, Executive director of Straightway Finland (Turunen 2009.)

Especially, Finnish ports and the Finnish railways (VR Group) have been affected by the transit traffic growth significantly (Kilpeläinen 2004, 28). In addition, logistics development has been promoted by the Finnish government as one of the prior for the Finnish economy. "Logistics services have been developing as result of brisk international trade, export, and import and transit volumes growth... Finnish logistics and transportation connections are of great importance for competitiveness in the future" (Ministry of Transportation and Communications 2009).

Finnish railway transportation is important for the international westbound freight traffic. The main role of the railway transit route is transportation of bulk raw materials coming from Russia westbound (Kilpeläinen 2004, 49). Bulk materials transported via Finland include mainly fertilizers in various forms, sulphur, iron and steel products as well as oil and oil related products (Kilpeläinen 2004, 53). Therefore, the infrastructure of the Finnish logistics system is appropriate for the transportation of raw bulk commodities.

The Finnish railway transit route plays significant role in international trade between Russia and Finland, especially because of the benefits of Trans-Siberian route. The Trans-Siberian rail road crosses Finnish-Russian border and connects railway to Moscow, Far East Russian prov-

inces, Mongolia, China and the Sea of Japan. The Trans-Siberian route is shown in the next figure 7.

Figure 7. The Trans-Siberian railway route.
Source: The Trans-Siberian Railway 2009.

The presented in the figure 7 railway route from Helsinki to Moscow is shown by the black line, Trans-Siberian line from Moscow to Vladivostok is shown by the red line. The railway Trans-Siberian line is connected to Baikal-Amur mainline (green line of the figure 7) and Trans-Mongolian line (pink line) with connection to Beijing in China.

The connection via the Trans-Siberian route provides Finnish railroad connection to the Far East of Russia and the North of China. With development of international trade between China, Russia and Europe the railway connection between these countries is very important for the transportation of the finished and highly valued goods. The development of the rail transit transportation via Finland has good opportunities, since "capacity and operability of the Trans-Siberian railway is at its best on the north of Moscow" (Lautso & Venäläinen & Lehto 2005). However, the importance of Trans Siberian railway is not significant for the transportation of bulk raw commodities. The Trans-Siberian railway is used for the transportation of highly valued finished goods; however, sea transportation is more preferred for the raw bulk material transportation on the long distances because of the transportation costs levels.

The main railway border crossing points between Finland and Russia are Vainikkala, Imatrankoski, Niirala and Vartius (Finland's railway network 2008). The main ports for transit transportation are the ports of Hamina, Kotka, Kokkola, Helsinki, Hanko and Turku. The transit freight is delivered there by railway to the ports. Therefore, railway transportation affects competitiveness of the Finnish transit route.

Finnish transit route is always marketed as a whole chain for effective transit transportation at international markets (Straightway 2010). The choice of port for further sea transportation depends on the services provided by the ports, nature of the bulk commodity and port equipment for handling and reloading bulk raw materials. Therefore, ports' services are very important for the transit route choice.

The transit transportation volumes have been growing steadily during 1999-2008 (Finnish Maritime Association 2009). The transit traffic growth is presented also in the Figure 8.

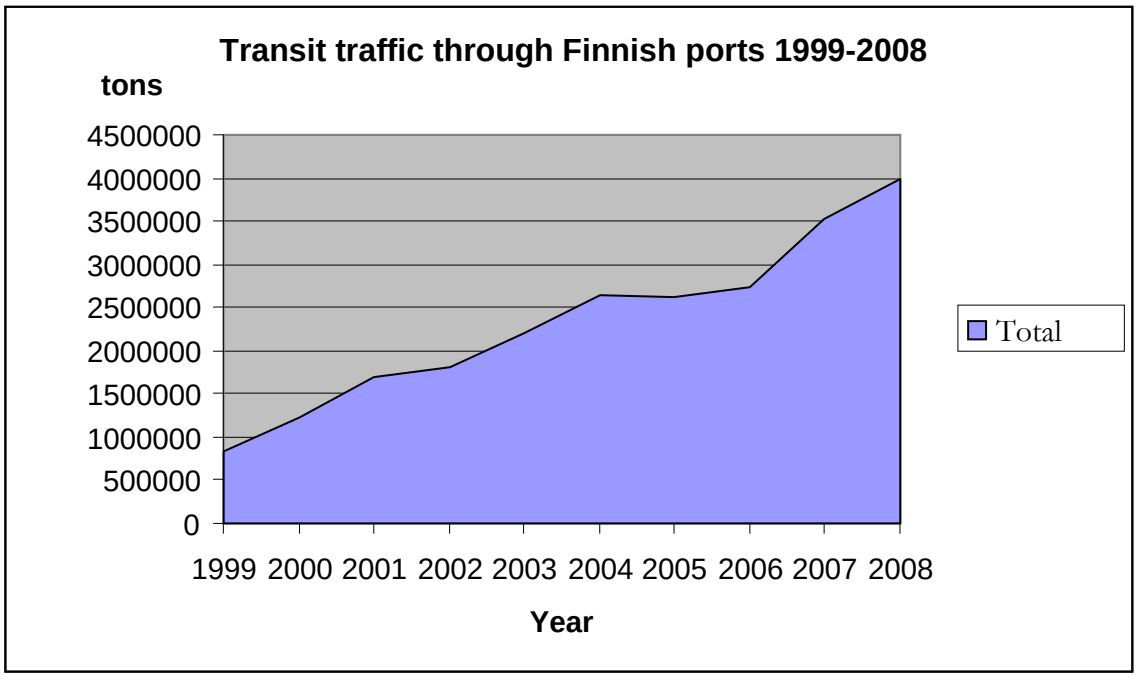

Figure 8. Transit traffic through the Finnish ports 1999-2008
(Source: Finnish Maritime Association 2009).

Figure 8 includes statistical data of the eastbound and the westbound transit traffic through the Finnish ports. Therefore, it shows growth of the transit traffic in the both, the eastbound and the westbound, directions. However, there might be difference in the growth rate by different directions.

The westbound and the eastbound transit transportation volumes have been growing in 1980-2008 (see appendix 3). International railway freight transportation was 4% higher in 2008 than in 2007 (Finnish Rail Administration 2009). Railway freight traffic between Finland and Russia has grown by 13 percent in the year 2008 compared to the year 2007. Railway transit traffic totalled 41, 9 million tonnes in 2008 and rose by 35% compared to the year 2007 (Finnish Rail Administration 2009).

However, due to economic turndown in the end 2008, the results of the first half of the year 2009 have shown decline in international transportation both in passenger and in freight services. Freight carrying in the second quarter of 2009 was 30, 3% less than in the previous year 2008 (VR Group 2009). Freight traffic between Finland and Russia declined by 38, 6 percent in the six months period, including Finnish exports and imports as well as transit traffic (VR Group 2009). Rail transit freight from Russia has declined by 32 percent from January till June 2009 period (VR Group 2009). Thus, railway freight transportation volumes declined as result of the global economic slowdown in 2008-2009.

3.2 Governmental logistics policy of Finland

The governmental logistics policy of Finnish state is directed at supporting and developing logistics growth (Ministry of Transportation and Communications 2009). The measures taken by the Government are directed at improving competitive position of Finland as transit country.

According to The Programme of the Finnish Prime Minister Matti Vanhanen and Finnish Government, in the context EU –Russian economic cooperation the Government has prepared a transport development program aimed at "strengthening Finland's logistics position and exploiting its economic potential"(Ministry of Transport and Communications 2005). Efficient logistics services were considered as crucial for competitiveness growth of Finland as transit route in the government program. Governmental measures were directed to maintaining Finish logistics position and increasing competitiveness to Latvian, Estonian, Lithuanian and Poland transit routes (Ministry of Transport and Communication 2005).

The program developed by the Ministry of Transport and Communication revealed main advantages and disadvantages of Finland as logistics route country. In the Finnish-Russian transportation process the efficiency of the services could be achieved not by major investments in infrastructure, but mainly by the improvement of border crossing practices. High level of punctuality was achieved as result of predictability and developed operations management. As part of Governmental Action Plan 2005 development of operational practices, technology and know-how were admitted as necessity for future success (Ministry of Transportation and Communication 2005). Among the other prior aims of the Ministry of Transport and Communications and Ministry of Foreign Affaires was mentioned "implementation of measures for simplifying the special permit system for heavy goods rail transportation" (Ministry of

Transport and Communications 2005). Also necessity in revising rail transit transport agreements with Russian authorities were considered in the Action Programme (Ministry of Transport and Communications 2005).

Thus, improvements in the railway freight border crossing practice have been done. Railway freight transportation has become more effective as result of implementation of electronic forms. The border crossing procedure for the freight transportation has been modified. A special electronic waybill form has been implemented. The form allowed freight railway customers of both sides, Russia and Finland, to have electronic information of the arrival goods before the physical arrival of goods. The information could be send to the customers and logistics service providers before the arrival of goods. The form allowed function the whole logistics chain more effectively. Freight delivery time by railway between Finland and Russia has reduced (RailCom Expansion 2006). The project was coordinated by VR Group (previous VR Cargo) and Russian Railways (RZD). The program has increased efficiency of transportation services between Finland and Russia. The volumes of export, import and transit transportation have been growing steadily in 2005-2008 (Ministry of Transportation and Communications 2008).

The Finnish Government supports development of the rail transportation. The Government launched a transport investment programme for 2008-2011, which includes 17 new transport investment projects (Ministry of Transport and Communications 2008). The Government has allocated 165 million euro for the development programme. "The biggest transport infrastructure projects will include repair of works on the motorway E18 between Helsinki and the Finnish-Russian border, a metro link between Helsinki and Espoo and a railway connection to the Vantaa airport" (Ministry of Transport and Communications 2008). In addition, Finnish Government has created strategic framework for the logistics infrastructure development till 2030. The framework is directed to reducing green house gas emissions from transport and increasing competitiveness of business logistics services (Ministry of Transportation and Communications 2007). There is also tight international cooperation on governmental level with neighbouring countries, particularly with Russia. Thus, based on the governmental policy of Finland and cooperation projects with Russia, positive estimations about future railway transit transportation development can be made.

The European Union also supports "development of the rail freight services in addition to and as alternative for the road transportation, to cope with the growing environmental and congestion problems" (Weigmans and Donders 2007). This fact might have impact on east-

bound railway freight transportation development in the future, since road transportation is prevailing in the eastbound traffic.

3.3 The Finnish transit route

The transit freight from Russia westbound is transported mainly by using multiple modes of transportation. Intermodal transportation, when railway or road transportation is combined with sea transportation is used mainly for the westbound deliveries of exports. Since raw bulk commodities are transported mainly by railway to the ports, Finnish transit transportation by rail and sea is analyzed in the thesis.

Finnish railway infrastructure is well developed. The railway network includes domestic and international passenger and freight traffic lines. There are also number of ongoing projects directed at railway infrastructure maintenance and development. Development projects are essential for increasing competitiveness of the railway transportation mode. Thus, there are projects of direct line construction from Kerava to Lahti, which will increase capacity to Eastern Finland and Russia and a second track to be constructed between Kokkola and Ylivieska in 2010-2014 (Finnish Railway Administration 2010). The new line construction will significantly improve freight traffic capacity (Finnish Railway Administration 2010). The investments into railway infrastructure are increasing attractiveness of this transportation mode in Finland and internationally.

International railway connections are presented in the Figure 9.

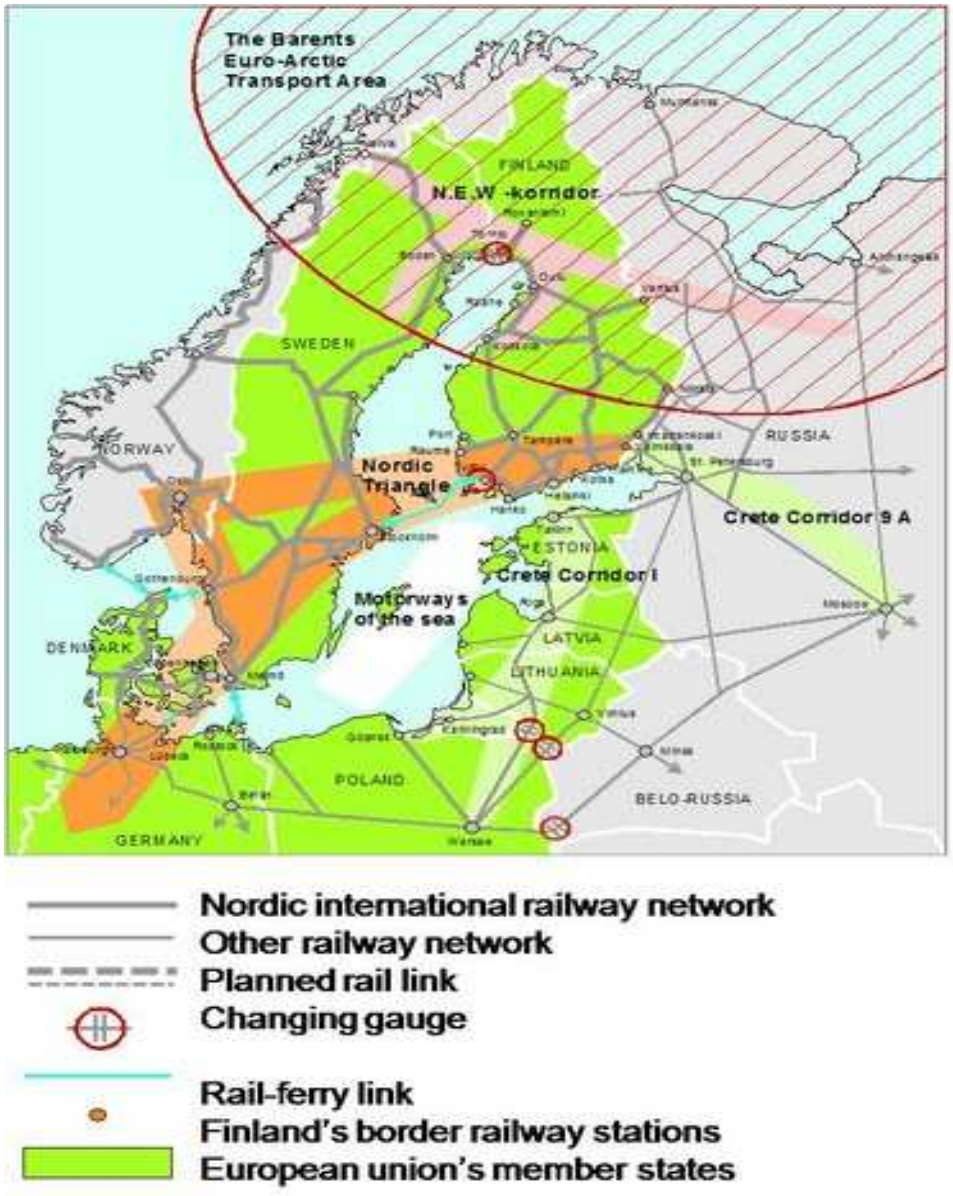

Figure 9. International railway network.
Source: Finnish railway administration 2009.

Figure 9 shows that the Finnish railway network is connected to the ports of Helsinki, Kotka, Hamina, Hanko, Turku, Kokkola and Oulu. Besides, Finnish railway provides international connections to Sweden, Norway and Russia.

Cooperation between Finnish and Russian railways is strong. It is based on the historical background and valuable experience of cooperation. Besides, the same size of the rail gauge makes international freight transportation more efficient. The Finnish railway gauge has a size of 1524 millimetres (Finnish Railway Administration 2010), which is the same with Russian rail gauge distance. Baltic countries- Estonia, Latvia and Lithuania have the same size of the rail gauge with Russia as well. Thus, freight transportation does not require reloading or changing the railway gauge in international transportations between Russia and Finland, Russia

and Baltic countries. Swedish rail gauge size differs from Finnish and it is 1435 mm. Therefore, rail gauge change is needed in international transportations between Finland and Sweden.

International railway freight transportation is under development projects. Thus, there are projects which consider possible growth in the railway freight transportation in the North part of Finland. Additional railway is planned between Salla and Alakurtti with a connection to Murmansk rail (Finnish Railway Administration 2008). Also opportunities of expanding railway traffic from the Northern part of Russia to Norway via Finland are researched (Ojajärvi 2008.) Railway route from the Northwest Russia to the Finnish ports along the Bay of Bosnia had been promoted by the Northlink project in 2002-2004. The Finnish ports of Oulu, Kemi, Raahe, Kokkola and Pietarsaari were promoted during the project. The route via Northern part of Finland to the ports of Oulu and Kokkola is still efficient for the westbound transit transportation of Russian bulk commodities. Besides, development of the railway transit route from Russia via the territory of Northern Finland to Sweden and Norway is also possible (Nummelin (2009)).

Creation of the joint venture "Freight One Scandinavia Oy" between VR Group and Russian Freight One Company (PGK) also supports development of the railway freight services in Finland. A new joint company has been established for providing wide range of logistics solutions for transportation of freight from Finland to Russia and opposite direction (Freight One Scandinavia 2009).

Finnish-Russian railway border crossing practices has been improved. Railway freight border crossing efficiency was increased by longer service working hours and shorter document processing time (Finnish Railway Administration 2009.) The railway transportation capacity of Vartius border crossing point has increased.

Finnish ports play very important role for the foreign trade development. Thus, around 90 percent of the Finnish foreign trade pass through the ports (Finnish Port association 2010.) Finnish ports provide wide range of services for freight and passenger transportation. Besides, quite many of the Finnish ports provide services for the bulk materials international transit transportation.

Port of Hamina is located in the eastern part of Finland, close to the Russian border. The port has excellent railway and road connections. The location proximity to Russia allowed developing transit logistics services to and from CIS (Commonwealth of Independent States, organi-

zation of Post Soviet Republics) countries. The port features container and liquid terminals, it is specialized in the storage and handling of liquids. As result of the economic slowdown the transit traffic declined by more than 20 percent at the port of Hamina in 2009 (Port of Hamina 2010).

Port of Kotka is the leading export and transit port of Finland (Baltic Port Organization 2010). It has the terminals for dry bulk handling with maximum permissible draft 15, 3 meters and terminals for liquid bulk. Liquid chemicals are one of the most transported commodities from Russia via the port of Kotka westbound. Chemicals are delivered to the port of Kotka by the railways. Port of Kotka provides services in full service container terminal, several conventional terminals including LoLo heavy lift, RoRo terminal (Port of Kotka 2009). Transit traffic declined as result of the world economic downturn by 43 percent during 2009 (Port of Kotka 2010).

Port of Kokkola provides professional services in handling of dry bulk and quality handling of cargo: break bulk and neobulk, sawn timber, liquid bulk and all types of containers. Besides, the port has 70000 square meters of covered warehouse space. (Port of Kokkola 2010). The AWT (all weather terminals) of the port of Kokkola provides unique conditions for general cargo operations. Besides, the port has good railway and road connections to all parts of Finland and Russia (Port of Kokkola 2010). The port of Kokkola handles large quantities of dry bulk products, including zinc concentrates, iron ore, iron pellets. It is the most versatile ports of Finland for dry commodities handling. The port of Kokkola continuously invests into infrastructure and cargo handling equipment to increase capacity of the port. The cooperation between Port of Kokkola and VR Logistics allows increasing efficiency in port operations. Due to the technological improvements the throughput capacity of the port is very high. For instance, the new tippler terminal at the port of Kokkola allows saving time when loading iron pellets from the rail wagons to ships bound to the UK, Italy and Germany (Port of Kokkola 2010).

Port of Helsinki is the newest and the most modern port of Finland. It is well equipped for serving transit transportation to and from Russia. The main focus of the port is RoRo operations, which allow using different transportation modes, where a ship acts as ferry for loaded trucks (Bloomberg 2002, 108) and container traffic services (Port of Helsinki 2010). The main strengths of the Port of Helsinki are "frequent and regular ship traffic combined with efficient stevedoring operations" (Port of Helsinki 2010). Port of Helsinki has great importance for the international trade of Finland and it is also very important transit port. There are many regular

direct lines from the port of Helsinki to the Baltic Sea and North Sea ports and almost to all of Europe's coastal countries (Port of Helsinki 2010). The ports bulk transport consists mainly of oil products and coal. Port of Helsinki has own harbours for coal and oil. Kantvik harbour serves as bulk cargo port. Raw materials and coal are imported and exported through the Kantvik port (Port of Helsinki 2010). The port of Helsinki develops operations and services which cause less harm to the environment.

Another important port for the transit operations is the port of Hanko. The Port of Hanko has good connections to the ports in Europe, Finland and Russia. The port is specialized in paper exports and car imports. The port's services are not affecting the westbound transit of raw bulk materials; therefore, this port is not researched in the thesis.

Port of Turku is also one of the leading ports in Scandinavia (Port of Turku 2010). The port's main operations include passenger, container and automobile traffic. The port acts as a gate-way between Finland and Sweden. The port's services support international transportation between Finland, Sweden, other European countries and Russia. Unit cargo traffic, steel, paper and timber, some bulk products can be stored at the port's warehouse terminal.

There are advantages and disadvantages of the Finnish transit route. According to the study "Transportation connections between the EU and Russia" which compared main transit routes connecting Russia and Europe the benefits of the Finnish transit route include "the best line service, or line activities like traffic, warehousing, packaging, material handling, order processing, inventory (Bloomberg 2002, 227), to the core areas of Europe, the ports are highly efficient …The safety standards are high in Finland" (Lautso 2005, 52). Finnish railway and E18 road provide well developed ground connections to the Eurasian network and Russia. Finnish transit route offers multimodal transportation and additional freight services (handling of containers, hazardous chemicals, Ro-Ro-transport) which also attracts additional freights. Besides, railway network is well developed. The railway route connects Turku-Helsinki-St. Petersburg-Moscow and it is also connected to Scandinavia and Central Europe. Another railway connection goes to Finland from Archangelsk through Kostamus and Vartius. Mutual international agreements between Finland and Russia allow reaching better efficiency in the freight transportation services (Lautso 2005)

There are also other important advantages in development of the Finnish transit route and freight transport between EU and Russia. The increasing service standards requirements such as "safety, speed, security, value added logistics, transport service connections are the main

competitive areas of the Finnish transit route" (Lautso 2005). Transportation costs for the transportation of highly valued goods are also competitive in international arena (Lautso 2005).

The transit route via Finland is competitive enough to other routes connecting Russia and West Europe. Finnish logistics know-how and cost effectiveness are of big importance for the international trade development between EU, USA, Russia and Asia. Also cost level for logistics services of the Finnish transit route is competitive to the countries nearest rivals, such as Baltic countries and Poland (Jumpponen 2007, 5). Among competitive advantages of the route via Finland has been admitted geographical proximity, highly developed infrastructure, the speed of transport, safety and value added services and high level of logistics know-how (Lautso 2005, 56). Also "synergy benefits over rival transit routes" have been defined as success factor by the research (Lautso 2005, 78). Synergy benefits include frequent connections with Russia and agreements which allow using Russian transport capacity for the transit of goods (Lautso 2005, 81). Thus, international transportations of bulk raw materials from Russia westbound are carried by Russian owned fleets. Implemented information technologies and automating operation also support competitiveness of the route via Finland (Lautso 2005, 52).

The research carried out by the Research Institute of the Finnish Economy "Development of the Russian economy and its impact on Russian export and import transports" revealed that Finland "accounts relatively small proportion of Russian transport flows, when compared to Russia own total transport and the flows coming in and going out through the Baltic ports" (Ministry of Transportation and Communication 2005). It can be explained by special design of the Baltic ports in Russia, Estonia, Latvia and Lithuania aimed at high volume transports of crude oil and oil products and other bulk goods. Finland, instead, keeps its competitive position due to the small size of goods flow and safety (Ministry of Transportation and Communication 2005). The research studies also revealed that Finland "is less vulnerable and less dependant on the transit transportation than other Baltic countries" (Lautso 2005, 52). However, dependence of the competitors on the transit transportation makes the competition with these countries tougher (Lautso 2005, 64).

Among the negative features of the transit through Finland have been admitted the capacity level of the railway and also need for high speed railway traffic to the east of Lahti (Lautso 2005, 52). However, recent economic crisis revealed that the railways are able to provide high levels of additional capacity for international transportation of bulk raw materials. Besides, additional capacity can be assigned by the trucks, owned by the Finnish Railway Administra-

tion. The trucks are designed for the bulk materials transportations and don't require any additional investments.

The weakness of the Finnish transit route is that the transportation distance from Russia to the Western countries through Finland is longer than through competing Baltic ports and the direct land route via Poland (Ministry of Transportation and Communication 2005 and Kilpeläinen 2004, 46). Another weakness of the route is high costs levels in Finland, such as wages, fuel, taxes, which are higher than in competing Baltic countries and Poland (Kilpeläinen 2004, 62). Therefore, cost differences affect the overall cost competitiveness of the transit route. Transport flow is also split in Finland between different rival ports and small operators. Therefore, absence of cooperation between big freight providing companies and ports might affect negatively attractiveness of the whole transit route via Finland.

Also Russian domestic policy supporting development of own ports and logistical infrastructure is hindering transit transportation volumes growth through Finland. It has been admitted that "development of competitiveness of the Finnish rail transit route is affected by the Russian domestic policy supporting development of domestic ports" (Lautso & Venäläinen & Lehto 2005, 60). However, the capacity of the Russian ports is limited. Therefore, additional ports capacity of the neighbouring countries is needed.

The cooperation of the Finnish and Russian government affects positively international transportation development. For instance, common work of VR Logistics and RZD allowed establishing common set of rules in international railway transportation sector. Mutual investments in IT development projects, electronic customs clearance and modernising border stations helped to speed up freight transportation (Ministry of Transportation and Communication 2005). Besides, value added logistics services provided by the Finnish freight operators increase economic importance of transit transport. (Ministry of Transportation and Communication 2005).

The environmental concerns have a great impact on the logistics operations development in Finland. Logistics companies consider environmental policy which allows decreasing air and water pollution, decrease noise vibrations. Also waste management is considered by the ports in their everyday operations. Hence, environmental aspects are also taken into consideration by the Finnish freight providers.

The summary of the advantages and disadvantages, opportunities and threats of the Finnish transit route is presented in SWOT analyses (Table 1).

Table 1. SWOT analyses of the Finnish transit route. Summarized by the author.

Strengths	**Weaknesses**
-geographical location, neighbouring with Russia -the same size of the rail gauge with CIS countires -joint projects with Russian companies for the freight transportation development -frequent everyday connections to the ports of Scandinavia, Europe and US -non-freezing ports, all year round navigation -high environmental and safety standards -competitive price levels -logistics infrastructure -railway connection to Sweden, Russia, TEN-network -4 railway border crossing points with Russia -improved border crossing practices -implemented IT technologies in the port operations -additional trucks capacity for bulk transportation -"synergy benefits" -additional freight services provided by ports -efficiency of the port operations -new modernized port in Vuosaari harbour -terminals for handling bulk and liquid raw materials -Joint venture "Freight One Scandinavia Oy"	-the route is less popular than the routes via Baltic countries and Russia (it accounts relatively small proportion of Russian exports) -absence of high speed freight traffic -geographical distance from Central Europe (the distance is longer than through Baltic ports or Germany –Poland route) -high cost level (wages, taxes, fuel)
Opportunities	**Threats**
-railway development projects -development of railway transportation from North-West of Russia to ports of Oulu and Kokkola -railway transit route development from Russia to Sweden and Norway -development of railway traffic between Saint Petersburg and Vyborg	-growing competition in Baltic countries -Russian transportation policy directed at favouring domestic ports -economic decline and decrease in transit volumes

The Finnish transit route is competitive at the most for the transit transportation of high-valued goods (Jumpponen 2007, 4). Eastbound transit via Finland is very effective - one third of Russian imports are transported via the territory of Finland (Ministry of transportation and communication 2005). The westbound transit is concentrated on transportation of bulk materials. However, overall, Finland accounts for relatively small amount of transportation flow westbound when compared to Russian own total transport and transportation via Baltic ports (Ministry of Transportation and Communication 2005).

Other transit routes connecting Russia and West countries are the routes through the Russian own ports, Baltic countries and Poland. The competing with Finland transit routes have own competitive advantages, which make each route more attractive for transportation of certain commodities. The competitiveness of the route is dependant on the nature of the transported product. According to the research carried by the Lappeenranta University of Technology (Jumpponen, Märkälä, Arposalo, Liedes 2007.) nature of the product affects the choice of the transit route and its competitive advantages. The study (Jumpponen 2007.) revealed that Finnish transit route is valued differently depending on the industry and imported goods. Therefore, the final analysis of the transit route competitiveness is made based on the competitive advantages of the route for the bulk commodities transportation.

3.4 Russian own ports and pipelines

The routes via Russian own ports to the Western countries are of the huge importance for the Russian economy. The development of Russian own ports is one of the prior directions for the Ministry of Transportation of Russia. According to the Transport Strategy of the Russian Federation, "as high share as possible of the sea transport should be directed through domestic ports" (Lautso 2005, 65). The infrastructure development of the ports was favoured by the recent economic growth in Russia. Around 55 percent of all Russian exports were transported via Russian own ports in 2002 (Liuhto 2003, 15).

The ports have significant importance for the Russian foreign trade. The ports of Saint-Petersburg and Kaliningrad in the Baltic Sea provide connections to the main centres of Russia, the Eurasian network and inland waterways (Lautso 2005). Besides, the ports have connection with main pipelines, which is beneficial for loading of crude oil. Russian sea ports provide international transportation for transit freight; big share of them is originated in Kazakhstan (Liuhto 2003, 15).

The ports in the Baltic Sea have a great importance for the country. The major Baltic ports in Russia are the Big Port of Saint Petersburg, the port of Primorsk and the Ust-Luga Port. The major part of the Russian exports westbound is transported through these ports. Besides, turnover growth of the Russian ports is one of the priorities of the state energetic policy. However, increasing freight transportation volumes through the Russian ports is possible by decreasing transit volumes via the Baltic ports (Sutirin, Efimova, Popova 2003.)

Development of the ports is beneficial for Russian economy. The budget of Russian Federation annually has losses for about 1, 5 million dollars due to the transit transportation of oil and oil related products via Baltic ports and Finland (Sutirin, Efimova, Popova 2003.) Own infrastructure development for energy products exports is considered as a question of national security by the Russian government (Sutirin, Efimova, Popova 2003.)

Development of the Russian ports has been supported by the economic development of the country in 2000-2008 and growth of international transportation, also private investments into infrastructure provided development of the ports (Levitin 2007). However, economic decline in 2009 resulted lessening of investments into ports' infrastructure, while additional capacity has been released in the ports. Russian ports have favourable locations and good connections to the ports of Europe and the US. Besides, they provide range of services which support Russian exports westbound.

Most of the export operations of raw bulk materials from Russia westbound are done through the ports of Saint Petersburg, Primorsk, Murmansk, Novorossiysk and Kaliningrad.

The Big port of Saint Petersburg is the biggest port in the North-West of Russia. There are around 30 stevedore companies operating in the Big Port of Saint Petersburg. The biggest stevedore at the Big Port of Saint Petersburg and the North-West of Russia is the "Sea Port of Saint Petersburg". The commodities exported via the "Sea Port of Saint Petersburg" include coal, metals, mineral fertilizers, timber cargoes, ore, grain cargoes (Sea Port of Saint Petersburg 2010). Container transports make around 7 percent of the total exports via the "Sea port of Saint Petersburg" (Figure 10).

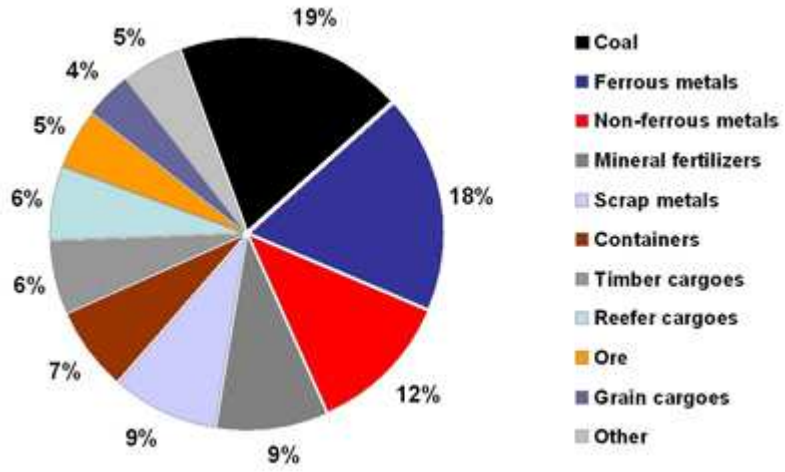

Figure 10. Commodities, transported via the Sea Port of Saint Petersburg in 2008.
Source: The Sea port of Saint Petersburg 2008.

Economic downturn 2008-2009 has affected transportation volumes of the Sea port of Saint Petersburg. The freight traffic in the Big Port of Saint Petersburg has decreased by 16 percent in 2009 compared to the year 2008 (The Big Port of Saint Petersburg 2010). Bulk cargo volumes decreased by 20 percent and chemical fertilizers by 28 percent in 2009 compared to the year 2008 (The Big Port of Saint Petersburg 2010).

Export of crude oil and oil related products from Russia westbound is done via the "Petersburg Oil Terminal". It is the largest Russian terminal for oil products in the Baltic Sea (Petersburg Oil Terminal 2010). The terminal provides services of transhipment, storage of oil products for exports, as well as bunkering vessels (Petersburg Oil Terminal 2010).

Another important port for the transportation of bulk commodities in the Baltic Sea is the Merchant Marine Port of Primorsk. The Merchant Marine Port of Primorsk is the largest Russian crude oil terminal in North-West of Russia (Administration of the Big Port of Saint Petersburg 2010). The port is connected to the pipeline and it is the final point of the Baltic Pipeline System. There is also Ust-Luga oil terminal project. The work of Ust-Luga terminal will allow increasing significantly the volumes of exports from Russia, the volumes of oil transportation via Russian ports in Baltic region could be increased up to 120-140 millions tons per year (Mikhailov 2009.) Therefore, Ust-Luga oil terminal project is of big importance for the Russian economy.

Other important Russian ports for exporting are the ports of Murmansk in the North and the port of Novorossiysk at the Black sea. The port of Murmansk is strategically important for Russia. Murmansk commercial sea port is a non-freezing port which has all-year round con-

nections to Western Europe and the US. Major commodities transported via the Commercial Port of Murmansk are non-ferrous metals, rolled ferrous metals, coal in bulk, apatite concentrate in bulk, alumina in bulk, scrap and iron-ore pallets in bulk, chemical products, technological equipment, different cargoes in containers, oil and oil related products (Murmansk Commercial Seaport 2010.)

The port of Novorossiysk is one of the biggest ports in Russia. Around 20 percent of Russian exports and imports are transported via the port of Novorossiysk (Novorossiysk Commercial Sea Port 2010). The port handles various forms of cargoes including liquid, dry bulk, general cargo and containers (NCSP 2010.) The port is located at the shore of the Black sea and has advantages in infrastructure compared to other ports of Asov-Black sea region. Novorossiysk Commercial Sea Port has all year round connections to the ports of North and South America, Africa, South and South-East Asia and Europe. Sukhodno-Radionovskaya pipeline allows oil exporting companies transport crude oil to the oil export terminal of the port of Novorossiysk.

Port of Kaliningrad is also considered as one of the prior ports for the Russian Federation. The main difficulty of the Port of Kaliningrad is road connection to Central Russia- the road goes through Lithuania and Belorussia (Ministry of Transportation and Communication 2005).

There are development projects directed at infrastructure modernization of the Russian ports. The Government of Russian Federation have defined development of Russian ports as main element in domestic and international policy (Zhusupov 2008). There is ongoing program named "Modernization of Russian transportation system 2002-2010" and a new program "Development of Russian transportation system 2010-2015" has been developed as well. The development programs are directed at development of the transportation system in Russia, creation of high-technological handling of hydrocarbons, as well as creation of save navigation conditions (Government of Russian Federation 2010). The ports of Primorsk and Ust-Luga are the key elements of the transportation program. The program is funded by the Government of Russia.

Nevertheless, the Russian own ports have disadvantages. Some of them were admitted by the Russian Ministry of Transportation. Geographical location of some ports is admitted as a shortcoming for the ports development (Levitin 2007.) For instance, the "Big port of Saint Petersburg" is freezing during the winter period. Therefore, difficulties arise for the sea transportation during winter periods. "Absence of special economic zones, undeveloped logistics

and port infrastructure, rail and road access to the ports, environmental issues" has been admitted among other disadvantages of the Russian ports (Levitin 2007.) The infrastructure of the ports needs additional investments for development. However, due to the difficult economic condition in Russia nowadays, the investment projects might be postponed. Therefore, Russian ports do not always have necessary capacity for transportations and part of the exporting freight is reloaded to ships in the neighbouring countries. The volumes of transit transportation of some commodities, for instance coal, are significant via the Baltic countries.

Planned WTO membership of Russia might affect the transit transportation route choice. Russian national tariffs might grow because of the planned WTO membership (Levitin 2007.) Therefore, the choice of the transit route can be affected by the national tariffs policy in Russia in the future.

In spite of world economic slowdown, the transportation volumes via the Russian ports have been growing during 2009. Thus, the turnover during 2009 has increased compared to the year 2008 by 9, 2 percent (Association of the Sea Trade Ports 2010). Transportation of export freight through Russian ports increased by 11, 9 percent, transportation of coal increased by 20, 4 percent, of black metals by 14, 3 percent, of liquid bulk by 9, 3 percent compared to the year 2008, the volumes of fertilizers transhipment has decreased by 14, 6 percent in 2009 compared to 2008, transit of crude oil via Russian ports has increased by 14, 6 percent during 2009 (Association of the Sea Trade Ports 2010). The turnover of the port of Primorsk has increased by 4, 6 percent and made 79, 1 million tons, the turnover of the port of Murmansk has increased by 29, 7 percent and comprised 37, 4 million tons, turnover of the port of Visotsk increased by 8, 1 percent to 17, 3 million tons, turnover of the port Ust Luga has increased by 51, 3 percent to 10, 4 million tons. However, the turnover of the Big Port of Saint Petersburg has decreased by 16% to 50, 4 million tons (Association of the Sea Trade Ports 2010). The growth of freight transportation via some Russian ports can be explained by the redistribution of the transported volumes between different ports. Thus, some freight volumes were directed from the ports of Saint Petersburg to the ports of Ust-Luga and Visotsk. Besides, improvements in the infrastructure of the Russian ports allow increasing transportation volumes through own ports.

Improvements in infrastructure of the Russian ports are still needed. Most of the Russian ports were constructed in 60-70 years of the 19th century. Therefore, nowadays ports' infrastructure requires modernization. Some of the Russian ports are under development.

The ground transport connection to the ports is also under development projects. Existing oil ports in Primorsk and Ust Luga are under development and extension (Lautso 2005.) North-West Russian ports in Murmansk, Kandalaksha, Ust-Luga and Primorsk are used mainly for crude oil exports. The growth of these ports is determined by growth in international trade and Russian exports. North-West ports had a major growth in turnover compared to other Russian ports because of the growth in crude oil exports in the first half of the year 2009 (Barents Observer 2009.) Nevertheless, the crude oil exporting volumes transported through the Baltic ports of Estonia, Latvia and Lithuania exceed volumes transported via Baltic ports of Russia (Mikhailov 2009).

Transportation by pipelines is also important for the Russian economy. Crude oil constitutes a big part of the Russian exports structure. Pipelines are the most cost efficient transportation mode for the transportation of crude oil. Crude oil is transported by intermodal transportation modes as well. For instance, transportation by pipelines and by sea is widely used for intercontinental deliveries of crude oil. Therefore, transportation by pipelines is also considered in the study.

Pipelines play important role in transportation structure of the Russian economy. The majority of crude oil exports are transported by pipelines from Russia westbound. The major pipeline is the Druzhba oil pipeline. Besides, it is the biggest in the world pipeline. The Druzhba Pipeline remains the largest pipeline for exports of oil from Russia to Western countries. Another important pipeline is the Baltic Pipeline System. It is also used for transportation of crude oil from Russia westbound. The Baltic Pipeline System involves 450 kilometres pipe from Northern parts of Russia to the port of Primosk. The Baltic Pipeline System is fully owned and operated by Transneft.

The Baltic Pipeline system and the Druzhba pipeline allow oil companies transport crude oil from Russia to Europe via the ports of Primorsk, Kaliningrad, directly to Germany and Slovakia.
The map of the major pipelines is presented in the figure 11.

Figure 11. Pipeline network in Russia.

Source: Vladimir Putin Political Analyzes 2009.

Figure 11 represents the pipeline network in Russia. The green line represents Baltic Pipeline System and Druzhba pipelines, red line shows gas pipeline. Druzhba pipeline has two parts- Northern and Southern. Among development projects, construction of the new Baltic Pipeline System-2 should be admitted. A new trunk line of the Baltic Pipeline System is to be build by 2012 (RIA 2008). The Baltic Pipeline System 2 will run from western Bryansk region to the Leningrad region port of Ust-Luga with a branch to the Kirishi oil refinery (RIA 2008.) The new branch of the Russian pipeline system will enable increasing export transportation of crude oil through the Ust.Luga port. Besides, the infr astructure of the Ust-Luga port is under development. Thus, a new bulk-oil terminal is to be built in the Ust-Luga port.

Strong and weak points, as well as opportunities and threats of the transit route via Russian own ports are presented in the summarizing SWOT analyses in the table 2.

Table 2. SWOT analyses of the route via Russian own Baltic ports and pipelines westbound. Summarized by the author.

Strengths	**Weaknesses**
-cost efficiency -favourable location of ports in Kaliningrad, Ust Luga, Murmansk, Novorossiysk -connections to the core areas in Europe and the US, domestic connections to inland waters and Eurasian network -special design of Russian ports for handling crude oil, chemicals, fertilizers and other raw materials -Connection of the Primorsk Port to pipeline -developed network of pipelines connecting Russia to Central Europe	-limited capacity of Russian ports -absence of smooth logistics cooperation between railways and ports -poor railway and road access to the main ports -natural conditions of the ports (freezing port of Saint Petersburg) -difficulties of transportation via Kaliningrad port because of Lithuanian and Belorussian borders -absence of special economic zones -undeveloped logistics and port infrastructure due to ageing
Opportunities	**Threats**
- investments and development projects into infrastructure of the ports -capacity growth - transit priority through the Russian ports -Ust-Luga Port development -customs union of Russia, Belorussia and Kazakhstan will reduce obstacles in border crossing via the territory of Belorussia -transit development of crude oil from Kazakhstan - building of the Baltic Pipeline System 2	-lack of financial investments into logistics infrastructure -economic stagnation of foreign trade -environmental issues and threats -postponement of infrastructure investment projects due to economic conditions -growth of domestic tariffs for railway and sea transportation

Russian own transit route has high potential for the development, there are number of ongoing investment projects into infrastructure of the ports and building of a new pipeline system. Russian ports are competitive with the price; also, the ports provide number of services for the international transportation of raw bulk materials. Besides, pipeline connections to the Russian ports allow reaching high efficiency in exports of crude oil. There are disadvantages of the Russian ports as well. However, the ports' infrastructure and services are under development projects, directed at increasing competitive level of the Russian ports.

3.5 Transit route via Poland

Transit route Germany-Poland is a part of Pan-European International Transport corridor II, which connects Germany, Poland, Belorussia and Russia (European Transport Workers' Federation 2010). The route has also connection to Lithuania and Kaliningrad, which make the route even more attractive. The railway connection Berlin-Warsaw-Minsk-Moscow-Nizhniy Novgorod is of great importance for the Russian foreign trade. The governments and railway companies of Russia, Belorussia, Poland and Germany actively cooperate in reconstructing and modernizing railway line (RZD 2007). Common projects are aimed at reducing border and customs formalities, speeding up delivery times for freight and increasing trade among the four countries (RZD 2007).

Nowadays, two branded trains operate within the route. The Eastern Wind is container train which has been operating since 1995 and Russia Express- the high speed freight train, which started operations since 1998. Russian Railways has extended the railway route from Nizhniy Novgorod to the Trans Siberian Railway. Thus, the railway route connects Europe, Far East region and Central Asia (RZD 2007). The route has national significance for Russian and Belorussian economies.

There are benefits of the Germany-Poland ground route. First of all, Germany-Poland route is the only ground route connecting Europe and Russia. The route connects capital cities and areas of the countries. Multimodal transportation is developed in the route. Railway, road and waterway provide connections to Russia. The Germany-Poland route is the shortest by distance route from Russia to the core areas of Europe (Lautso 2005, 54). Railway track on the route is electrified and has heavy rails (Lautso 2005, 54).

The major commodity transported via Germany-Poland route is dry bulk (Lautso 2005, 54). However, the volumes of transit transportation from Russia westbound via Poland are not significant (Transport 2009). Transit to Poland goes mainly through the ports of Ventspils, Klaipeda and Kaliningrad, since the rail gauge size is the same in Russia and Baltic countries and there is no need to reload the goods (Transport 2009). As Mr. Ringa from BelInterTrans admitted, "the perspectives for the route development are slight, since every gauge replacement increases the cost of every freight ton, besides, it takes time" (Transport 2009). The necessity of gauge replacement was admitted as main reason of slow development of the ground Germany-Poland route. The cost level for the railway transit transportation via Poland

is high enough. The tariffs for the transit transportation via Poland are high and "railway providers are slow at changing tariffs" (Transport 2009). According to Starikh, Vice-director of the Strategic development department at RZD, "price-delivery time" is the major factor for choosing transportation route (Transport 2009). According to Starikh, Baltic ports in Russia are the most attractive for the export transportation, while the "route via Poland is considered as one of the alternative routes. However, it is now not attractive enough for transit of Russian exports" (Transport 2009).

Among other disadvantages of the route, Belorussia was admitted as a bottleneck of the route (Lautso, Venäläinen, Lehto 2005, 52). Also transhipment in Brest has been mentioned as a main bottleneck of the railway route, and additional investments needed for the railway development. The automatic rail gauge transfer system implementation needs additional resources and time (Lautso, Venäläínen, Lehto 2005, 52).

It was admitted in the previous researches that the Germany-Poland route has big potential for future development (Lautso 2005, 52). However, cost levels and infrastructure of the railway route are not highly competitive compared to the Baltic and Finnish transit routes.

Table 3. SWOT Analyzes of the ground route via Poland and Germany. Summarized by the author.

Strengths	**Weaknesses**
-the shortest ground route from Russia to Central Europe -importance of the route for Russian and Belorussian economies -high speed trains between Russia and Poland -connection of the route to Trans Siberian railway	-high tariffs for railway transportation of bulk commodities -absence of automatic rail gauge changing system -long leading transit time -low efficiency of the route -not attractive at the moment for the bulk materials transportation -absence of policy directed to increasing freight volumes
Opportunities	**Threats**
-projects between participating countries directed at decreasing formalities and obstacles at border crossing points - trade volumes growth will support development of the route -customs trade alliance between Russia, Belorussia and Kazakhstan will support the development of the railway route	-decrease in transit transportation volumes due to development of competing routes -absence of financial investments into infrastructure

Clearly, the route via Poland has potential for the development since it is the shortest route from Russia to Europe. However, due to the difference in the railway gauge system and absence of automatic rail gauge changing system the leading time is longer than through competing routes for the transportation of bulk raw commodities. The route is expensive enough for the low cost bulk commodities. However, competitiveness of the route via Poland might be different for other than bulk product categories.

3.6 Transit route via Baltic countries

Baltic countries- Estonia, Latvia and Lithuania are the main competitors of Finland as transit countries. Baltic countries are very dependent on transit transportation from Russia, since it is

one of the income sources for the countries (Lautso 2005, 61). Besides, transit traffic affects employment rates of Latvia, Estonia and Lithuania greatly. Major Baltic ports are the Port of Tallinn (Estonia), Ventspils Free port (Latvia) and Port of Klaipeda (Lithuania).

The port of Tallinn provides handling of various kinds of transit cargo, container transportation, dry bulk, like coal and grain from Russia and Kazakhstan, transit of metals, liquid cargo, including crude oil, cooking oil and soya (Port of Tallinn 2010). Transit transportation of crude oil from Russia makes around 98% of oil products (Port of Tallinn 2010). The transit of crude oil from Russia via the Port of Tallinn goes to the UK, Denmark, Sweden, Great Britain and other Western countries. The port of Tallinn is well-designed for handling crude oil transit- it has four liquid bulk transit-servicing terminals. Two oil products terminal are located in Paldiski South Harbour and in Paljassaarre Harbour of the Port of Tallinn. Fertilizers constitute big portion of Dry Bulk Terminal in the Port of Tallinn. Dry bulk terminal handles transit fertilizers from Russia which are transported to Central, South and North America, Europe, Asia, Africa and Australia. There are also a dedicated coal and grain terminals in the Port of Tallinn. The grain terminal is the biggest in Baltic region. The port of Tallinn has also a railway connection with the same rail gauge to Russia. Therefore, the infrastructure of the port is well designed for transit transportation of Russian exports via the Port of Tallinn.

The seaport of Klaipeda connects sea, rail and road routes from Russia westbound. The seaport of Klaipeda is a non-freezing port. The port of Klaipeda has a wide network of shipping. The port has daily connection to the ports of Denmark, Sweden, Germany, Poland, Belgium, Russia, Finland, the UK and other countries (Port of Klaipeda 2010). Port of Klaipeda handles wide range of cargo, including fertilizers (24%), oil products (31 %), Ro-Ro cargo (12%), container cargo (12%), agriculture products (6%), and metals (3%) (Port of Klaipeda 2010.) The Port of Klaipeda is open for cooperation is the area of transit transportation between Russia and west countries.

Ventspils Free port has beneficial geographical location and good climate conditions for all year round navigation. The port is specialized in the transportation of liquid bulk cargo, which constituted around 65% in 2009 of the port's turnover (Ventspils Free Port 2010). Crude oil and oil related products from Russia constitute big share of the transit transportation. Dry bulk products constituted around 35 percent of the port's turnover in 2009 (Ventsipls Free Port 2010). Latvian ports have big potential for development of transit transportation of fertilizers. Thus, a new project has been started between the leading Russian producer of fertilizers "OAO UralChem" and port of Riga about creation of a new transhipment terminal in the port

of Riga (Association of Sea Trade Ports 2010). A new joint venture Riga Fertilizer terminal will be created. Planned initial transportation volumes will be 2 million tons per year; however, the capacity can be increased up to 5 million tons. Therefore, the route through the Latvia sea ports for the transportation of fertilizers is getting more attractive for the transit of fertilizers from Russia.

Transit route via Baltic ports has a lot of advantages. The route has been used for the major part of export transportation from Russia westbound. Thus, the route has a good ground railway transport connection to Russia and the Baltic ports have well developed infrastructure for the transit transportation of crude oil, minerals, fertilizers, oil related products. Transportation services for dry and liquid bulk materials coming from Russia are highly developed (Lautso 2005.) Besides, many Russian companies had foreign direct investments in Baltic ports (for example Severstal and Lukoil). Therefore, the transit transportation volumes have been strong enough. Besides, the transit route via Baltic countries had been developing for many years since the Soviet Union and remained as popular transportation route after the disintegration of the Soviet Union. Baltic ports are highly efficient for the transportation of liquid and dry bulk freight. Baltic routes are of great importance for the transportation of bulk raw materials coming from Russia. These routes can be considered as main competing ones with the transit route via Finland (Lautso 2005, 72).

Nevertheless, there are factors which affect negatively development of the transit route through Baltic countries. One of the negative factors, which have impact on development of transit transportation, is political relations between Russia and Estonia. Thus, political conflicts between Estonia and Russia affect the transit direction of Russian exports. Transit transportation from Russia via Estonian ports has decreased as result of political relations by 70 percent by the end of 2008 compared to the year 2006 (Regnum 2009).

There are also environmental risks of hazardous goods transportation via the metropolitan area of Riga and Tallinn (Lautso 2005, 64).

SWOT analyzes of transit route via Baltic countries is presented in the table 4.

Table 4. SWOT analyses of the Baltic ports. Summarized by author.

Strengths	**Weaknesses**
-Latvian, Estonian and Lithuanian infrastructure design, which favours Russian exports transit -handling possibilities of liquid and dry bulk cargo, including crude oil, coal, fertilizers, chemicals -special terminals for handling liquid and bulk cargo, crude oil -high volumes of transit transportation from Russia -the same rail gauge system with Russia -good infrastructure for multimodal transportation -non freezing ports in Latvia and Lithuania - high capacity for transportation of raw materials -low costs level (wages, fuel, taxes)	-difficulties in navigation during winter period in the Estonian ports
Opportunities	**Threats**
-investments into infrastructure of Baltic ports by the Russian companies -joint ventures between private companies directed at increasing transit volumes of chemicals, crude oil and fertilizers	-worsening of political relations with Russia -environmental threats and risks of transit transportation -high rates of employment in transit transportation -high dependence of the Baltic economies on transit transportation volumes

Indeed, Baltic counties have a good competitive position as transit country for the transportation of raw bulk commodities westbound. The infrastructure of the Baltic ports is well developed. Moreover, the Baltic ports are well-equipped for handling different kinds of dry and liquid bulk products. The Baltic ports have high capacity levels. Besides, the costs levels are low in the Baltic countries. Among disadvantages of the route via the Baltic countries can be admitted freezing ports in Estonia. The ports have good opportunities for the development because of the foreign investments into infrastructure. Still, there are threats of worsening

political relations between the Baltic countries and Russia, environmental risks and high dependence of the Baltic economies on the transit income.

4 Empirical study

The empirical part represents commissioning party of the thesis. The thesis was commissioned by the railway division of the state-owned logistics company VR Group. All logistics operations of VR Group were combined under the same division called VR Logistics. Therefore, name of the division is used in the thesis next.

The main aim of the research was to find out the level of attractiveness of the Finnish railway transit route for the transportation of raw bulk materials from Russia westbound. Therefore, main transit routes are examined and compared. Competitive advantages and disadvantages of the routes, factors, affecting choice of the transit route for transit of bulk commodities, as well as development opportunities of the Finnish railway transit route have been researched in the study.

4.1 VR Logistics

The commissioning party of the current thesis is VR Logistics, transportation service division of VR Group. The commissioning agreement has been sighed in September 2009 between VR Cargo and author of the thesis. During the study, some reorganization within the commissioning company has occurred. The subsidiaries of VR Group had been merged under the same division- VR Logistics in October 2009 (VR Group 2009). The new division VR Logistics includes previously called VR Cargo, Transpoint Oy Ab, Transpoint Cargo Oy and Transpoint International companies (VR Group 2009). "The aim of the reform was to improve customer service and operational efficiency of the company" said the Senior Vice President and director of VR Logistics Erik Söderholm (VR Group 2009).

VR Group today is a Finnish transportation provider, which offers railway and road freight and passenger transportation services. Besides, VR Logistics is a competitive freight transportation provider in international arena. The strategic goals of VR Logistics are directed to the growth of the rail and road transports market share. The company invests actively resources into infrastructure and development of the railway in Finland and has cooperation development projects with Russian National Railways RZD (VR Group 2009). Thus, a new joint venture "Freight One Scandinavia" was created by the Finnish VR Group and Russia's largest

railway operator JSC "Freight One" in 2009 and the company has started its operations in March 2010 (Freight One Scandinavia 2010). Besides, VR owns fifty percent of SeaRail Oy, which is also involved into international railway transportations between Scandinavian countries and CIS (SeaRail 2009).

VR Group Ltd is a state-owned company, former Finnish State Railways, which was transformed into a joint-stock company in 1995. VR Group operates under a mission to provide passenger and freight services and build and maintain the railway network (VR Group 2009).

VR Group generated net turnover of EUR 1540 million in 2008 and employed altogether 12500 people in 2008. The values of the Group are "safety, satisfied customers, successful together and responsibility" (VR Group 2009). The company value of safety is implemented through the safe and reliable services for freight transportation of goods and materials. Environmental concerns are also taken into account when planning operations. "Safety is VR's most important value... safety safeguards continuity and smooth, uninterrupted operations for the company" (VR Group 2009).

The freight services provided by the company are environmentally friendly and safe. "VR has developed environmental management over a period of more than 15 years" (VR Group 2009). The company also certified by the ISO 14001 series of standards most of its operations (VR Group 2009). Transport of raw materials makes around 20 percent of total railway transportations (VR Group 2009). According to the Finnish Railway Administration, international freight transported by railway accounted up to 16453 thousands tons in 2008 (Finnish Railway Statistics 2009).

The value of satisfied customers is implemented in freight transportation by providing high-quality and affordable customer oriented services. As part of international freight services has been implemented international waybill system, which improved efficiency of international freight transportation between Finland and Russia.

The value "successful together" in the company freight operations means productive and long term cooperation with customers; the cooperation is based on the principles of transparency and mutual respect (VR Corporate responsibility 2009.) Besides, according to Matti Andersson (2009), Sales Director of VR Logistics, the company is using individual approach in finding new solutions for the business customers. Thus, the marketing strategy of the company is well

targeted- the company has long-term relations with the biggest freight providing companies in Russia. This policy corresponds to the company's values of successful common work.

Responsibility, a cornerstone of the company's values, is implemented in everyday operations of VR Group. The company carries responsibility for its economic viability and environmental impact of its operations (VR Group 2009). VR underlines its "eco-friendly nature of railway services" (VR Group 2009).

VR Group operates under supervision of the Finnish Rail Administration (RHK) and Ministry of Transport and Communication. The Finnish Rail Administration is responsible for maintaining and developing Finland's railway network.

According to the VR Logistics international strategy, attraction of the new customers as well as retaining the old ones is very important for the company (Andersson 2009.) Therefore, research recommendations on how to increase attractiveness of the transit route are presented in the chapter six of the thesis.

4.2 Research Method

The empirical part of the thesis is conducted as a qualitative research. The qualitative nature of the study is necessary because of the research topic, which requires deep understanding and insight of the research problem. According to Flick (2002, 13) qualitative research is oriented towards analyzes of the concrete cases in their temporal and local particularity. Therefore, it is the most suitable research method for in-depths analyses of the research problem, which is of current importance for the commissioning party.

4.3 Data Gathering

The data for the thesis research was gathered from qualitative in-depth personal and phone interviews with professionals in international freight transportation. Twelve interviews have been conducted during autumn 2009 and spring 2010.

The method of the personal and phone in-depth interviews was chosen because of importance of personal opinions of professionals in logistics field for evaluation of the Finnish railway transit route attractiveness, revealing factors which affect transit route choice the most and analyzing competitive advantages of the Finnish railway route over competing ones. It

was important to include follow-up questions depending on the interviewee experience and knowledge. The interview questions for the respondents are presented in the Appendix 5 of the thesis.

The respondents for the thesis research were selected regarding their professionalism in the transportation industry. The practical experience and expertise of the respondents were considered for relevancy of the thesis research topic. The respondents were divided into two groups. One group of respondents (group A) is the freight providing companies which use or might use Finnish railway transit route for the bulk materials transportation. Group A includes Russian national railways company RZD, Freight One Company, Schenker Russia, Schenker Finland, Ros Neft, Shell companies. The other group of respondents, group B, consists of the companies and authorities which are interested in the development of the railway transit transportation via Finland. This group includes VR Logistics, Finnish Rail Administration, Straightway, SeaRail Oy and Freight One Scandinavia.

The field work of study includes five qualitative personal interviews (group B), six phone interviews (group A) and one e-mail enquiry (group B). Personal and phone interviews allowed discussing the research question in depths and ask follow-up questions. Phone interviews were chosen as appropriate research method because of the limited time frame for the research, location of the respondents and their own preferences. Thus, phone calls were made after preliminary agreement with the respondents on the suitable for them time. The respondents were initially proposed to have personal interviews; however, the most of respondents from other than Finland countries preferred phone interviews to the personal meetings because of their tough working schedule. The interviews were held in English and Russian languages and were tape or hand recorded.

Each interview was focusing on discussing the Finnish railway transit route competitive position compared to other transit routes connecting Russia and west countries. The interviews were conducted in Helsinki in October 2009-March 2010. Each interview lasted in average 30 to 45 minutes and was tape or hand recorded. The list of the interview questions is presented in the Appendix 6 of the current thesis research. The interviews were open in nature and provided respondent with the opportunity to discuss the topic in details. Therefore, the research questions were proposed for the discussion however, they could have been followed by the follow-up questions. Besides, two different lists of interview questions have been created for the groups A and B (Appendix 5). The interview questions for the group A aimed to reveal competitive advantages of the Finnish railway route, factors affecting the choice of the transit

route, competitive advantages of other routes and possible improvements from the prospective of the Russian freight providing companies and oil companies which might be using the route via Finland. In addition, Finnish authorities, Finnish transit route marketing company and transit transportation freight providing companies have been asked a different set of interview questions (Appendix 5). These companies have been asked about competitive advantages of the Finnish route over competing routes, disadvantages, future projects, capacity levels, development strategy from the prospective of the freight service providers. The answers from both respondents groups (group A and group B) were analyzed and compared. Personal interviews were transcribed by the author and hand-notes have been made during the phone interviews with the respondents.

4.4 Data analyses

The process of the data analyses is very important for the reliability and validity of the study (Valtonen 2000, 29). The data was analysed by the author as result of reading, having pauses for understanding and seeing findings from other prospective and by comparing the data with the theoretical background.

In practice, the transcribed and hand recorded interviews were first read through in order to gain an overall key points in the data. The analyses was done based on the main research questions and with the help of coding of the most important factors affecting the choice of the transit route, advantages and disadvantages of the different compared in the thesis research routes. Also, the findings from the different responding groups were compared. Thus, factors affecting transit route choice were defined based on the interviewing Russian and Finnish freight forwarding companies, which are using or might use different transit route for the transportation of bulk commodities. The factors are presented in the chapter five of the thesis. The advantages and disadvantages of the Finnish railway route were summarized based on the opinions of the both sides- Finnish railways and Russian freight providing companies. Besides, the opinions of the different respondents groups were compared.

The data analyzes process consisted of the two steps. First of all, the data was coded and categorised. Secondly, the data gathered from different respondents groups was compared and sorted in accordance with the research questions. Graphics and tables allowed visually present the findings of the thesis research.

5 Findings

Factors affecting the choice of transit route

The choice of the transit route for the transit transportation of bulk commodities from Russia westbound depends on many factors. The factors affecting transit route choice were discussed with freight forwarding companies, which are using different transit routes for the transportation of bulk commodities (group A). The companies' representatives were proposed to mention the most important factors affecting the transit route choice for the bulk commodities transportations westbound. Based on the number of respondents, who have mentioned the same factors as decisive for the transit route choice, Figure 11 has been created. Figure 11 shows level of importance of the different factors for the transit route choice. Raw bulk materials, such as fertilizers, metals, oil and oil related products, coal, were discussed as main commodities for transit transportation.

The thesis research proved that the nature of the product affects not only transportation mode, but also transit route choice (Figure 5). According to respondents, transit route choice differs depending on the bulk materials nature. Thus, Russian own ports and pipelines are preferred for transportation of crude oil, while the Baltic states are the most suitable transit route for transit transportation of coal westbound. Therefore, attractiveness of transit route depends on the product nature. Transportation of certain products via some routes might be too expensive or inefficient at all, while other transit routes might be attractive for the same types of product. However, some exceptions might be made based on the requirements or wishes of the buyer of raw bulk materials.

The interviews with oil companies' representatives proved that pipeline and sea transportation modes are the most popular transportation modes for the international transportations of crude oil and oil related products from Russia westbound. According to the majority of respondents (five respondents from group A), sea transportation mode is the most efficient for the long distance transportation of oil and oil related products from Russia westbound. Besides, pipeline transportation allows reaching high cost efficiency in large volumes transportation of crude oil and it is a very popular transportation mode for westbound transportation of crude oil from Russia. The Russian transportation infrastructure allows transporting crude oil to the Russian ports; therefore, Russian harbors are the most efficient for the export transportation of crude oil to the western countries. However, Finnish and Baltic ports are still attractive as transit routes for the westbound transportation of other bulk materials because of the

well-developed logistics infrastructure and efficiency of transit routes. Besides, limited capacity of the Russian ports requires using additional transit routes in the periods of brisk international trade.

Another important factor, which affects transit route choice for the transportation of bulk commodities westbound, is the cost of transit transportation. Indeed, cost efficiency is a very important factor in international transportations. Freight companies consider transit transportation costs as one of the decisive factors in transit route choice. According to the majority of respondents (five respondents from the group A) price and quality are the decisive factors in transit route choice. Some of the respondents also suggested the factor of price became more important due to the changes in the world economy in 2009. Besides, bulk products are not able to carry high transit costs. Therefore, attractiveness of a transit route is dependant on cost efficiency of the transit route. The overall cost of the transit transportation route is important for the freight forwarding companies. Although initial price of transportation through the Russian ports might be the lowest, additional costs might arise due to the long waiting time in the ports. Therefore, the full cost of transit transportation via the transit routes has the biggest importance for the transportation companies.

Transit time was also considered as important factor for the transit route choice. The factor of time has a special meaning in transportation of bulk commodities. Lead time, or time between the start of a process and its end, affects overall cost of transit transportation. Bulk commodities require special equipment for their transportation. Therefore, additional rent costs arise for the freight forwarding companies. Consequently, time efficiency makes certain transit routes more attractive than the others. According to the respondents, the routes via the Baltic countries and Finland are both time efficient. Thus, lead time is approximately the same for the transportation of raw bulk materials westbound through these routes. In contrast, the lead time is not always predictable at the route via the Russian own ports because of the long waiting time in the ports.

Reliability, safety and predictability factors were also mentioned by the respondents from the group A as important ones for the bulk raw materials transit route choice. The same factors were considered as important for the transportation mode choice and carrier selection by Bloomberg (2002) and Jumpponen (2007) (see figure 6). Hence, factors revealed in the empirical part of the study support the theoretical background about the factors affecting routing and carrier selection.

Ports and services provided by ports are very important for the bulk materials transportation westbound. Ports' infrastructure, value added services and capacity for handling and transportation of different kinds of bulk materials are very important for the raw bulk materials transit route choice, according to the majority of respondents from Russian freight providing companies. True, since sea transportation is the most appropriate mode of transportation for the bulk commodities, such as coal, metals, stone, fertilizers and oil related products, ports and services they provide are very important for the freight transportation of these products. Besides, ports' capacity and infrastructure levels affect efficiency of the whole transit route. Thus, Russian ports might decrease attractiveness of the route via Russian ports because of the delays and poor scheduling, which leads to the losses of the freight providing companies. Therefore, the routes through Finland and the Baltic countries are more appropriate in some cases, even though these routes are not the shortest ones.

Capacity is also important for the railway transportation of bulk commodities. According to the respondents from group B (Finnish authorities), capacity level of the Finnish railways is high enough for increasing transportation volumes. Besides, availability of the needed equipment for the railway transportation of bulk commodities allows increasing transit volumes. The transit bulk materials are transported by Russian owned fleets, but there are opportunities for increasing transit transportation volumes also by trucks owned by the Finnish Railway Administration. Besides, railway capacity levels are high enough compared to the year 2008. The capacity level is enough for increasing railway transportation volumes by 50 percent in Finland (Nummelin 2009). The capacity is significant enough due to the fact that international railway transportations have decreased by 35-40 percent during 2009. Therefore, Finnish railways have high level of free capacity needed for the international railway transportations. Finnish ports also have high capacity levels, especially the ports of Helsinki and Kokkola. However, it is important to mention, that the capacity of the railways is limited by the capacity of the Finnish ports and services provided by them. Therefore, there might be limitations on transported product in case if the Finnish ports are not able to handle certain kinds of cargo. In such cases, another route will be chosen. Consequently, the Finnish railway transit route might not be used if cargo can not be handled in the Finnish ports. It is important to mention, that the Finnish railway capacity is not limited by the availability of the equipment for the transportation of different kinds of bulk materials. The equipment is owned by the Russian side and, therefore, can be provided on the need base for the transportation through Finland.

Another important factor affecting railway transit route choice is railway tariffs. Railway tariffs are a part of the overall transit transportation cost. Therefore, this factor also influences

freight transportation companies' route choice. According to the respondents' opinion (both from group A and group B), some changes in the railway tariffs for the transit traffic between Finland and Russia could significantly increase transit transportation frequencies.

The factor of "individual solutions for the freight companies' needs" was also ranked highly by the freight providing companies (group A). Thus, efficiency in operations for the freight providing companies can be reached as result of analyses in different segments of their operations and negotiations about appropriate services from the Finnish side. This factor is the part of the "customer service oriented" approach (Bloomberg 2002, 86). Thus, in practice, Russian customers, such as freight providing companies would appreciate having communication with the Finnish railway freight provider in order to determine the most suitable services and possible alternatives. In response, Finnish freight providers might be able to provide "superior service to the customer", which is a main goal of integrated logistics (Bloomberg 2002, 64). Practically, it means that some flexibility could be useful in defining which services are to be included for the customers. For example, "package solutions" were mentioned as important by the Russian respondents. Complex intermodal delivery to the final customer could attract more customers. Also, railway transit to Russia eastbound is also very important for the Russian freight providing companies. The possibility of reusing railway equipment coming back to Russia is of big importance for the Russian authorities and freight providing companies. Reuse of the wagons for the return import traffic to Russia could increase efficiency in transportations, however, technically it is very difficult to implement nowadays because of the differences in the export and import structure of the Russian Federation (see chapter 2.2 of the thesis).

Environmental issues were admitted by the respondents as important decisive factors for the transit route choice as well (Group A, three respondents). Environmental requirements of transit country affect the choice of the route for transportation. Thus, the route via Baltic countries is more attractive for the coal transit transportation. The environmental requirements are less demanding in the Baltic countries than in Finland. This fact allows to use less modernized equipment for transportation and handling of raw bulk products. However, coming modifications and improvements in the European Union legislation concerning environmental requirements might change current situation and affect transit flows westbound. Thus, Baltic countries such as Estonia, Latvia and Lithuania will have to follow unified for the European Union environmental requirements. In such case, Russian own ports might become more competitive, unless the environmental legislation in Russia will also become more strict.

Additionally, political relations were mentioned as factor affecting transit route choice for transportation of export commodities from Russia westbound by the respondents from both groups A and B. True, since railway providers are the state-owned companies in most countries, political relations between different counties might affect direction of transit flows. Thus, international political relations between transit countries and Russia might have important meaning on transit transportation development as well.

Besides, internal policy of the Russian transportation companies might also affect transit route choice. Thus, some freight providing companies have contracted responsibility to transport agreed volumes of freight via certain the transit routes. This factor is concerned mainly the railway transportation. In fact, railway tariffs can be fixed along certain routes. Even though the routes might not be optimal from the logistical point of view because of the distance, there might be a contracted responsibility to transport certain amount of freight for the agreed tariff rate. Consequently, agreements of the freight providing companies might also affect the transit route choice.

The importance of the factors affecting transit route choice (question 2, appendix 5) for the transportation of bulk commodities from Russia westbound is presented in the figure 11. Factors affecting transit route choice were ranked by their importance from one to five according to the number of respondents, who have mentioned the given factors as the most or less important. Grade one shows little importance to the respondents, figure five means the biggest importance for the customers. Besides, majority of respondents have underlined that mentioned factors are important in aggregate, not only one by one. Also, according to the majority of respondents, importance of the different factors might vary depending on the commodity of transportation and buyers' requirements according to the sales agreement. Besides, economical situation has increased importance of particular factors, such as cost, for example.

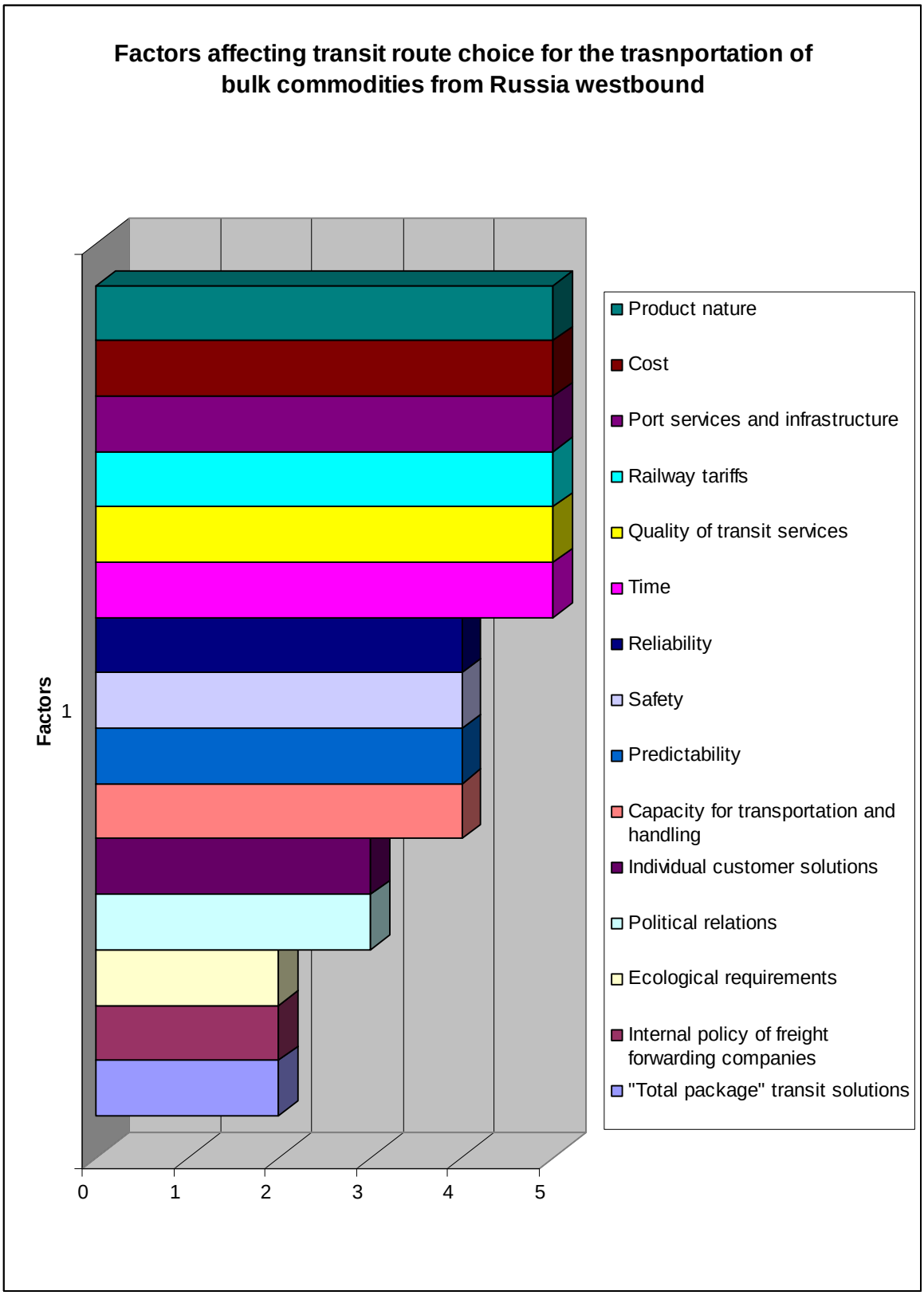

Figure 11. Factors affecting transit route choice for the transportation of bulk commodities from Russia westbound. By author.

Figure 11 confirms theoretical foundation concerning transit route choice. Thus, such factors as product nature, cost, time, reliability and safety have been mentioned in the previous stud-

ies (Figure 5). Nevertheless, current thesis study has revealed level of importance of each of the factors for the transportation of bulk commodities. Besides, such factors as individual customer solutions, ecological requirements, internal policy of freight forwarding companies, political relations and capacity has been admitted by the majority of respondents as important for the railway freight transportation industry. Besides, the importance of the overall cost level of the transit transportation has grown significantly. The importance of cost factor is caused by the low value of transported commodities and tough economical conditions and economic downturn in 2009. According to the respondent's opinion, some additional services might not be demanded nowadays, while tariffs are very important in the transit transportation.

Competitive position of the Finnish railway route

The transit route via Finland was highly valued by the Russian freight forwarding companies. The attractiveness and the perception of the Finnish transit route are based on the entire route, not on its separate components. Thus, the route via Finland was valued by the respondents as integration of the railway transportation and logistics services provided by the Finnish ports. Therefore, attractiveness of the route is very dependant on the ports' services, infrastructure, handling possibilities and capacity. Railway transit transportation is an integral part of the transit chain; therefore it affects attractiveness of the whole route via Finland.

Based on the responses of the group A, it can be concluded, that the transit route via Finland is less competitive than the routes via Baltic countries and Russian own ports for the transportation of bulk materials due to high transportation costs. The respondents from group A valued highly developed logistics infrastructure of the route via Finland and ports' services. However, bulk materials are not able to bear high transportation costs. The shortest transit route via Poland is not competitive for the bulk commodities transportation from Russia westbound, since it is the most expensive route due to the difference in the rail gauge and long lead-time. The route via Baltic countries is also well developed for the bulk materials transportation, has high level of logistics infrastructure and well equipped ports for the transportation of raw bulk materials. Besides, capacity levels are high in the Baltic ports (Table 4). The respondents valued infrastructure of the Baltic ports as highly as of the Finnish ports. Besides, low costs level attract foreign direct investments for the building of the raw materials processing factories in the Baltic countries. Therefore, transit flow of raw bulk materials might grow in the future via the Baltic countries. However, unstable political relations with Baltic countries affect attractiveness of the Baltic ports in a negative way.

The route via Russian own Baltic ports is the most cost efficient for the bulk materials transportation (Table 3). However, Russian ports' infrastructure and limited capacity levels are not able to handle all bulk materials exports from Russia westbound in the periods of brisk export activities. Even though, development of the Russian ports at the Baltic sea is the prior direction of the transportation policy of the Russian Federation, additional capacity of neighbouring ports will still be required in future for the reloading and handling of bulk products, especially in the periods of grows in international trade. Development projects are directed at increasing capacity levels and infrastructure improvements in the Russian ports. Besides, development of the Russian own ports at the Baltic Sea is one of the prior directions of the national transportation policy in Russia. Therefore, transit traffic through the Russian own ports will continue to grow.

Capacity levels and lead time were also admitted by the respondents from the groups A and B as competitive advantages of the transit route via Finland. The capacity levels have been increased by the upgraded border crossing points with Russia. Vainikkala customs point was upgraded; there has been implemented new signalling system, which allows increasing traffic through the border. ImatraKoski bordering point will be upgraded in the future, which will also give opportunity for the capacity level growth. The Vartius cross border point also has high capacity level for transportation. At the moment only 2-5 trains per day transport goods from Russian side, however, current level of capacity allow increasing it up to 10 trains per day (Nummelin 2009).

Besides, respondents from group A (three opinions) believe that the railway route via Finland is well-proven. Finnish railway route was valued highly by the respondents from the group A because of the minimum number of intermediaries involved into the transportation chain. Transportation by the railway is considered by the Russian customers as efficient because of the well planned and proved railway route and high service level.

Other advantages are frequent weekly and daily connections to the ports of Europe and the USA, ports' handling possibilities and value added services for bulk materials handling: sieving, filtering, pick packing, palletizing. The services provided by the Finnish ports vary for handling of different products- oil and oil related products, fertilizers, dry and liquid bulk, iron pallets. Value added service provided by the Finnish ports is a big competitive advantage of the Finnish transit route. The competition between Finnish ports affects positively the overall logistics situation, since the parties provide wide range of different handling services, which is always beneficial for the customer.

The capacity level of the Finnish ports, ports' services, handling possibilities, and infrastructure level were also admitted as main competitive advantages of the Finnish route by the respondents from group A. The Finnish ports accept majority of international vessels, except the biggest ones. Thus, international freight deliveries are done frequently to the European the US ports. Baltic ports also have high capacity level, while capacity level of the Russian ports at the Baltic Sea is limited. Non freezing Finnish ports, which allow transportation all year round, are also one of the biggest advantages over the Russian and Estonian ports at the Baltic Sea.

Finnish railway transit route has high potential for the development. There are projects which might lead to sufficient growth of the freight traffic. For instance, the possibility of return traffic from Finland could increase competitiveness of the railway route. However, this possibility requires careful planning. Besides, technically, return traffic is dependant on the nature of the transported product greatly because of the special equipment used for the raw bulk materials transit. It is difficult to find substituting products for the return traffic because of the different structure of products in Russian export-import structure. However, railway transit eastbound is also developing. Thus, VR Logistics in cooperation with RailTransAuto plans to increase transportation of cars to Russia by railway (Hämäläinen 2009).

There are also external factors which affect the advantages of the Finnish rail transit route. They include railway transportation policy of Russia and domestic tariffs system. Coming changes in Russian domestic tariff policy might affect attractiveness and competitiveness of the Finnish railway transit route. In fact, tariffs for domestic transportation in Russia are lower than international tariffs. However, in case the railway tariff will be same for both domestic and international transportation, the route via Finland might become more attractive.

Disadvantages of the Finnish transit route

Railway tariff conditions have been admitted among the disadvantages of the Finnish railway transit route between Finland and Russia by the majority of the respondents from group A (four respondents) and by some of the respondents from group B (three respondents). Absence in flexibility in negotiations of the price for the transit transportation is one of the negative features of the railway transit transportation in Finland.

Returning traffic of empty wagons to Russia was considered as another disadvantage of the railway transit route by the Russian customers. Russian freight forwarding companies are in-

terested in development of railway transit traffic eastbound. Therefore, return freight traffic from Finland to Russia is also of big interest for the Russian side, according to the opinion of the majority of the respondents from the group A. However, reuse of the same wagons for the return traffic to Russia is impossible to implement at the moment. The nature of goods exported from Russia and imported to Russia via Finland differs. Therefore, the equipment for the transportation of liquid or bulk commodities is not appropriate for the transportation of Russian imports. Nevertheless, railway transit traffic for the transportation of imports eastbound is also under development.

Ecological requirements for the transit transportation of bulk materials affect negatively transit route via Finland. Ecological requirements in Finland are higher than in the Baltic countries. Finnish and European sustainable logistics development benefits from strict ecological requirements. However, in some cases, ecological requirements affect the choice of the transit route. For instance, the route via Baltic countries is more popular for the transportation of coal and fertilizers, since ecological requirements of the Baltic countries are less strict than the Finnish ones. Never the less, unification of the EU legislation for the EU countries will affect the transit flow of some bulk commodities in the future.

The advantages and disadvantages of the Finnish railway transit route for the transportation of bulk commodities from Russia westbound are presented below in the table 5.

Table 5. Advantages and disadvantages of the Finnish railway transit route for the westbound transportation of raw bulk materials. By author.

Advantages	**Disadvantages**
-high level of railway transit services provided by the Finnish side -developed railway and port infrastructure -frequent sea ports connections to Europe and the US -trustworthiness of the entire Finnish route -liquid and dry bulk handling possibilities -the same size of the rail gauge with Russia -high capacity levels -high speed of transit transportation -all year round navigation in the ports -smooth border crossing practices by railway -skilled professionals in logistics services -value added services for liquid and dry bulk materials provided by the Finnish ports -investments in infrastructure development -transit development opportunities	-high railway tariffs -high ecological requirements (might disappear due to growing ecological standards in other EU countries) -high costs level -unstable situation in the Finnish ports (stevedores' strikes in March 2010) -stable fixed prices for transit transportation -lack of flexibility in negotiations between providing parties and customers -hidden competition and lack of cooperation between participants of the transit chain -the route is not provided as a whole transit chain, need to negotiate with the different participants of the transit chain -the railway route is dependant on the ports' handling possibilities -capacity of the railway route is limited by the capacity of the ports

Cooperation with the Russian partners affects positively development of railway freight transportation via Finland. Thus, a new joint venture has been created between the VR Logistics and the biggest Russia's railway operator "PGK" called Freight One Scandinavia Oy. Newly

established company provides export, import and transit freight transportation services between Finland, Russia and other CIS countries.

The overall competitiveness of the transit route via Finland, Baltic countries, Poland and Russian own ports for the transportation of raw bulk materials is presented in the table 6. The table 6 has been created by the author based on the factors affecting transit route choice and assessment of the transit routes provided by the respondents from the Finnish and Russian freight providing companies (Groups A and B).

Table 6. Strengths and weaknesses of the transit routes for the westbound transit of raw materials. By the author.

	Transit of bulk raw materials from Russia westbound			
Factors affecting transit route choice	**Route via Finland**	**Route via Baltic ports**	**Russian ports**	**Germany-Poland**
Overall cost	-	+ -	+-	-
Port services and infrastructure	+	+	+ -	
Railway tariffs	-	+ -	+	-
Quality of transit services	+	+	-	-
Time	+	+	-	-
Reliability	+	+	+	
Safety	+	+	+	
Predictability	+ -	+	-	
Capacity	+	+	+ -	
Ecological requirements	+ -	+ -	+	
Political relations and domestic policy	+	-	++	+

+/++ strength

- weakness

+- factor, which might be changed in the future

The presented table 6 shows strengths and weaknesses of the compared transit routes. Thus, the route via Finland has good competitive position based on its ports services and logistics infrastructure, transit lead time, reliability, safety, capacity levels and political relations. Its main weaknesses are the cost of the transit transportation for bulk commodities and railway tariffs, which affect competitiveness of the route. Predictability was admitted by the respon-

dents from the group A as positive of the route. However, stevedores' strikes, which caused stop of the Finnish ports operations for a few days (the Swedish Wire 2010) in March 2010, might have a negative impact on the factor of predictability. Therefore, the route via Finland is not assessed as fully predictable. Instead, predictability of the Finnish route is admitted as changing factor since it was negatively influenced by the recent stevedores' strike.

The Baltic ports have a good competitive position for the transportation of the bulk commodities westbound. The overall cost level is lower in Baltic countries than in Finland, the infrastructure is well-developed and the Baltic ports provide wide range of services needed for reloading of raw bulk materials. However, the railway tariffs are changing in the Baltic countries. Besides, the overall real cost of the transit transportation westbound might vary depending on the commodity of transportation. Therefore, careful analyzes of all costs involved into transit transportation of certain commodities is needed. The factor of political relations between Russia and the Baltic countries affects attractiveness of the route negatively. Besides, level of ecological requirements for the raw materials transportation will grow up with standardisation of ecological regulations in the European Union. Therefore, factor of low environmental requirements will not affect competitiveness of the route via Baltic countries in the future.

The Russian own ports at the Baltic Sea have the most competitive position for the westbound transportation of bulk commodities. The costs levels are the lowest among competing routes, besides, domestic railway tariffs are lower than international. However, the infrastructure of the ports still needs additional investments. Besides, lead time of transit trasnportation might vary because of the unpredictable delays in the Russian ports. In fact, lead time affects the overall costs of the transit transportation. Thus, port delays might decrease the route efficiency.

Russian own ports are favoured by the transportation policy of Ministry of Transportation. Therefore, the factor of "political relations and domestic policy" has been admitted as positive in the table 6. Capacity level has been marked as changing factor because of the unstable economical situation in the world economy nowadays. Thus, capacity level is sufficient nowadays, in the period of slowdown in economics and decline in international trade. However, the capacity of the Russian own ports will be limited with the activation of international trade and economic growth. Therefore, this factor might be changed in the future. Nevertheless, ongoing projects on development of the ports' infrastructure in Russia and building of new port terminals at the Baltic Sea might increase attractiveness of the Russia's own ports for international freight transit.

The route via Poland has been assessed as least competitive ground route for the raw bulk materials transportation. The cost level is too high for the low valued bulk cargo and long lead time make transit route the least attractive for the westbound transportation of raw bulk materials. However, the route is still considered as one of the alternatives by the Russian freight providing companies. Investments into the railway infrastructure might increase attractiveness of the route in the future. Nowadays, the railway route via Poland is used for the eastbound and westbound transportations of highly valued products.

6 Conclusions

The thesis study revealed that intermodal transportation by sea and railway is the most efficient for the international freight of bulk raw materials from Russia westbound. The most attractive routes for the westbound transportation go through the Russian ports at the Baltic Sea, Baltic countries and Finland. The route via Poland is less competitive to other routes for the transportation of raw bulk commodities because of the extra costs arising from the longer leading time. Such low valued cargo, as raw bulk materials, is not able to bear high transportation costs. Otherwise, the route via Poland has high potential for the development, since it is the shortest transit route between Russia and the Western counties. The route is widely used for the transportation of highly valued cargo.

The route via Russian own ports has significant cost advantage over the Baltic and the Finnish ports. The railway tariff for the bulk commodities transportation is lower than international in case of westbound transportation through the Russian ports. Therefore, the route via Russian own ports is the most cost-efficient for the westbound transportation of raw bulk materials. However, infrastructure and capacity of the Russian ports at the Baltic Sea do not allow handling all exports of raw bulk materials, therefore, transit routes will be used additionally to the Russian own ports in the Baltic sea in the future. Besides, long lead time affects negatively the image of the Russian ports. Lead-time has big importance for the bulk materials transportation because of the additional costs arising from the rent of equipment. Therefore, efficiency of the route via Russian own ports depends on the ports services and infrastructure greatly.

The Baltic ports are competitive enough to the Russian and the Finnish transit routes. The Baltic ports infrastructure and capacity levels are high, besides, the cost levels in the Baltic countries are lower than in Finland. The Baltic ports provide wide range of services for the raw bulk materials handling and processing, the railway infrastructure is also well developed

(see Table 4). Therefore, the route via Baltic countries is quite attractive for the transportation of bulk commodities westbound. However, political disagreements between Russia and Baltic countries affect negatively transit transportation development. Also unification of the environmental requirements in the European Union might affect competitiveness of the route via Baltic countries.

The Finnish railway route has high potential for the development as part of the whole transit route via Finland. Railway infrastructure is well developed and has domestic connections to all Finnish ports and international connections to Russia, Sweden and Norway. The Finnish railway has high capacity for cargo transportation and do not require additional investments. The railway freight transportation also benefits from the same size of the rail gauge with Russia. Finnish ports provide number of additional services such as sieving, filtering, pick-packing, and palletizing. Also, professionals working in logistics field in Finland increase competitiveness of the transit route. However, the railway transit route westbound is dependant on the port services, handling possibilities and their capacity. Besides unstable situation in the ports with stevedores' strikes in March 2010, which has stopped ports' operations for a few days, might affect attractiveness of the route via Finland as well. Hidden competition between freight providing companies and ports in Finland might slow down possible growth of the bulk materials transit transportation westbound. Ability for cooperation between the Finnish freight providing companies, high quality services and cost efficiency are very importation for the railway and entire route competitiveness growth.

Marketing of the route via Finland as a whole transit chain is beneficial for the route attractiveness. However, tight cooperation between participants of the transit chain is very important. Thus, providing the complete range of transit services by the same freight provider via Finland could increase attractiveness of the route. Besides, Russian customers could appreciate dealing with less number of participants in the transit transportation. Besides, some flexibility in negotiations from the Finnish side could affect positively development of the Finnish railway transit route. Customer oriented approach and creation of "package solutions" will increase railway freight traffic via Finland. "Package solution" means a single tariff from Finland to the final destination of the freight cargo.

Importance of the cost factor for the customers has grown. Therefore, active cooperation between different participants of the transit chain - VR Logistics and the Finnish ports is needed. Increasing competitiveness of the route is possible by providing competitive price for

the transit services through the entire Finnish route. Therefore, all possible costs involved into transit transportation should be analyzed and minimized by the freight providing companies. Russian freight providing companies defined number of factors affecting the choice of the transit route, such as product, cost of transit transportation, railway tariffs, ports infrastructure development and services, time, reliability, predictability, safety, individual customer solutions, package solutions with delivery to the final destination, ecological requirements and political relations between Russia and transit countries (Figure 11). Therefore, transit traffic through Finland can be increased by influencing the most important factors for transit route choice for the transportation of bulk materials westbound. Most of the factors such as safety, reliability, ports infrastructure and services have been admitted as advantages of the Finnish transit route by the both sides- the Russian and the Finnish freight providing companies. Therefore, high attention should be paid to the overall cost of transit transportation, customer service oriented approach and providing customer oriented solutions in transit transportation service.

VR Logistics could benefit from creation of the strategic plan on increasing attractiveness of the railway route via Finland westbound. However, it is very important to consider that attractiveness of the railway route is dependant on the attractiveness of the whole route via Finland, including ports' handling possibilities and infrastructure. Thus, cooperation with the Finnish ports is very important for VR Logistics international strategy.

Current strategy of VR Logistics for the westbound transit of bulk commodities is directed at differentiation through providing high quality services. Baltic ports and Russian own ports at the Baltic Sea are more cost efficient for the transit transportation of bulk commodities. Even though the quality of the services is very important, the cost factor should not be neglected by VR Logistics and the Finnish ports. Thus, attractiveness of the Finnish railway transit route can be increased as result of clear strategy directed at increasing efficiency of transit services, cooperation between the participants of the transit chain, such as ports and the Finnish route marketing companies and other railway freight providing companies.

This thesis has analysed attractiveness of the railway transit route for the transit transportation of bulk commodities from Russia westbound. The research concentrated mainly on the railway transportation. For the future research on the Finnish transit route attractiveness, more detailed analyzes of ports services and price competitiveness of the entire routes via Finland and Baltic countries could be recommended. The nature of the products affects the transportation costs as well because of the differences in railway tariffs for different commodities. Besides, there are other costs, except tariffs, involved into transit transportation- such as ports'

services, rent of equipment and labour costs, which affect cost competitiveness of the entire transit route via Finland. Therefore, providing full range of services by VR Logistics with defined full price could increase attractiveness of the route through Finland. Therefore, careful analyzes of all costs involved into transit transportation of raw bulk materials could be beneficial for the future research.

The thesis has practical importance for the development of the Finnish railway route. The study was conducted as empirical research, where theoretical background of the previous studies has been supported by the practical opinions of the professionals in the international freight field. The thesis provided the commissioning party with the analyses of the current competitive position of the Finnish railway route, defined advantages and disadvantages of the current railway transit transportation, as well as provided insight on the methods of increasing attractiveness of the railway freight transit transportation from Russia westbound.

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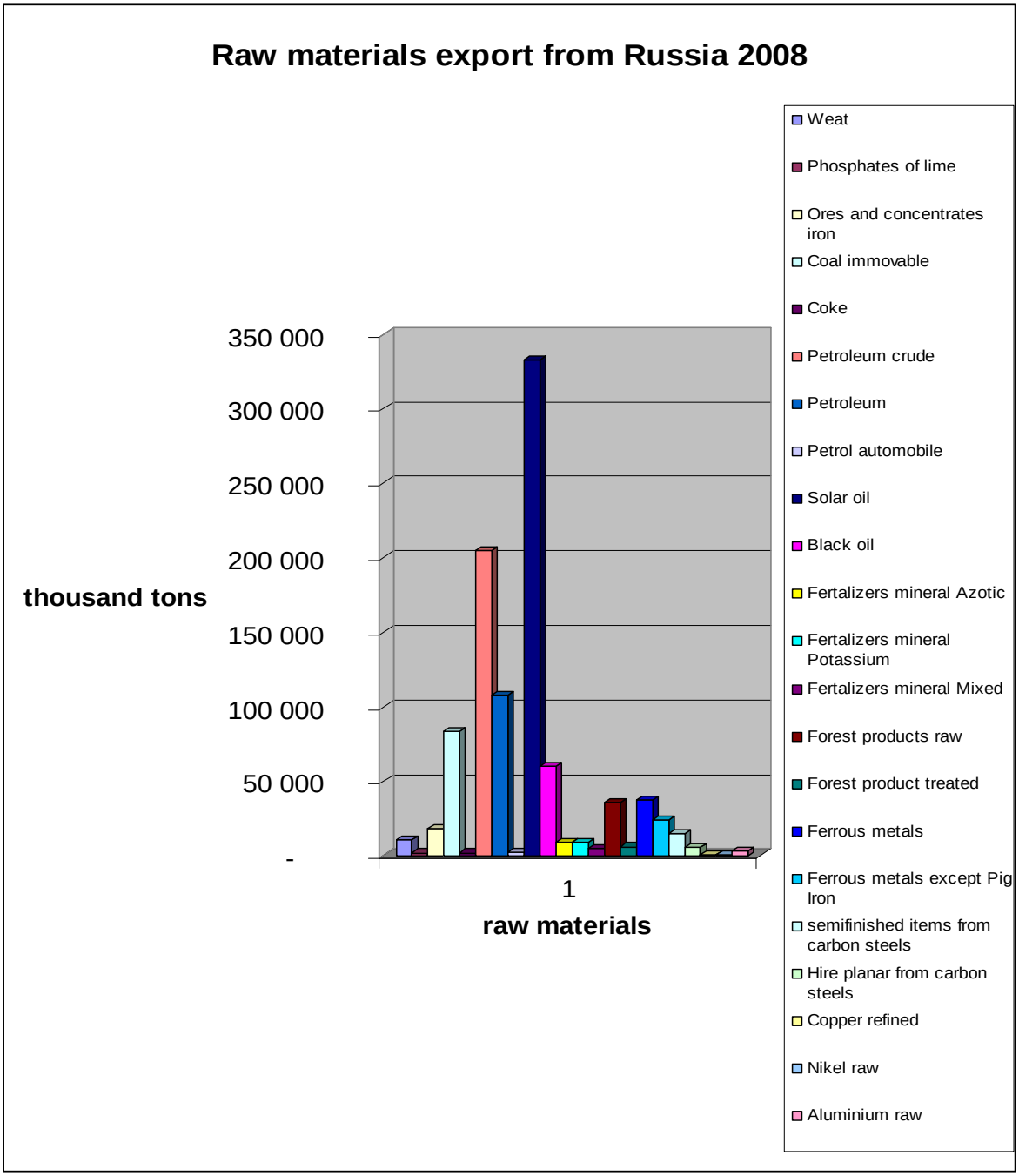
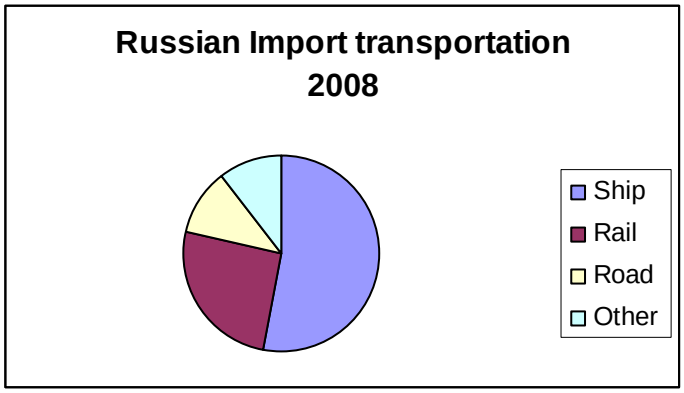
Appendices

Appendix 1. Russians export structure by products to the long distance foreign countries, excluding CIS, 2008



Source: Economy and statistics of foreign trade 2008. Rusimpax.ru

Appendix 2. Transports of Finnish foreign trade, 2008. Imports from Russia (westbound transportations)

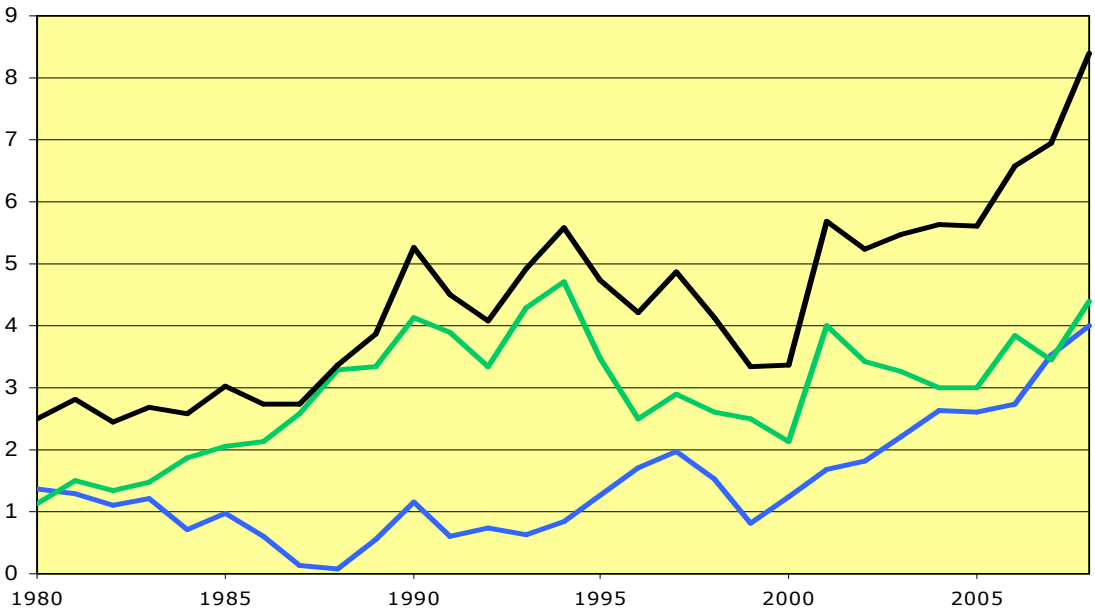


Transports by countries in 2008

Country of consignment/ destination	Ship	Rail	Road	Other	Total
Imports (1000 t)	**51 772**	**9 760**	**4 072**	**3 339**	**68 944**
Belgium	1 012	0	0	2	1 015
Belarus	175	671	2	0	847
Germany	3 319	24	0	5	3 348
Denmark	1 031	0	0	1	1 033
Estonia	1 702	7	0	0	1 709
United Kingdom	1 669	3	0	13	1 685
Latvia	1 394	15	-	0	1 409
Netherlands	2 502	3	0	2	2 507
Norway	3 342	1	125	0	3 468
Poland	925	0	0	0	926
Russia	**16 461**	**7 918**	**3 317**	**3276**	**30 972**
Sweden	9 065	11	582	6	9 664
Kazakhstan	69	802	-	0	871
Canada	841	-	0	1	842
USA	1 137	0	0	6	1 144

Source: Finnish Customs, Statistics 2009, "Foreign trade 2008. Finnish trade in Figures" http://www.tulli.fi/en/finnish_customs/statistics/publications/pocket_statistics/liitteet/pocket2008.pdf

Appendix 3. Transit traffic via Finland 1980-2008



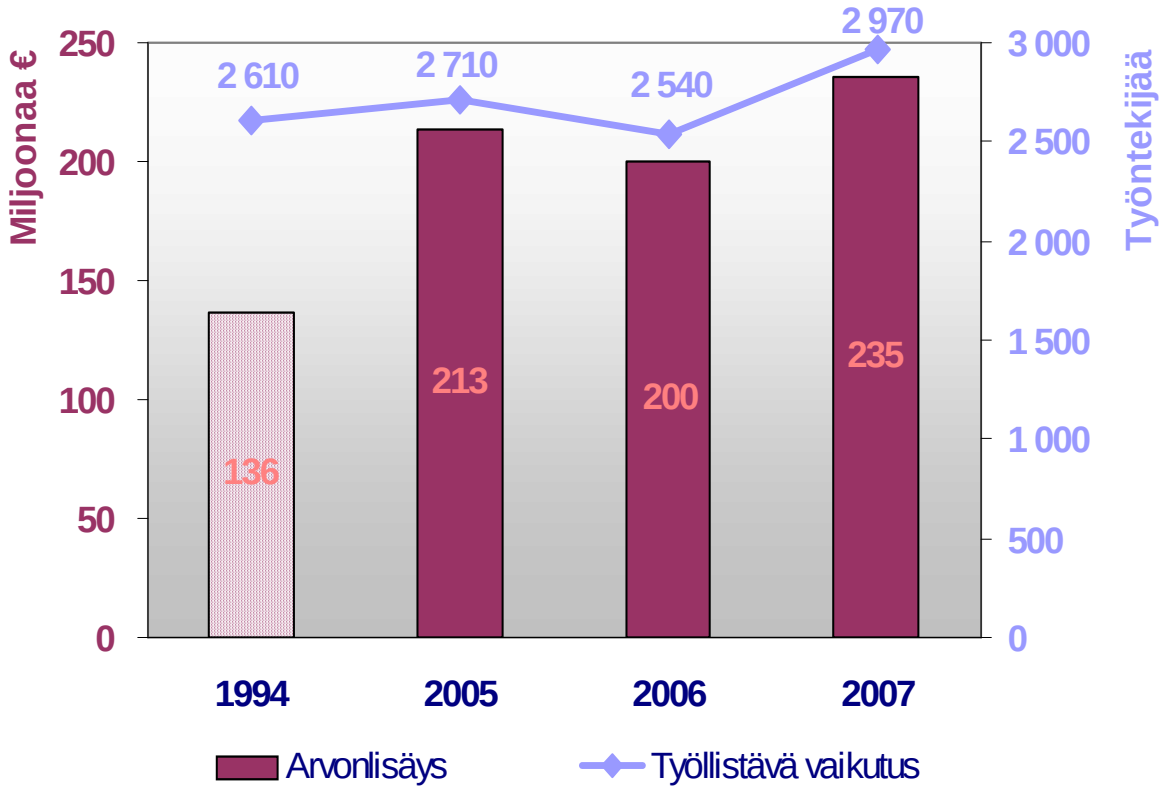
Black line- total

Green line- exports

Blue line- imports

Source : Finnish Maritime Administration, 2009.

Appendix 4. Finnish national income for the years 2005, 2006 and 2007 (transit via Finland)



Arvonlisäys- growth
Työllistävä vaikutus - affect on the employment
Työntekijää-employees numbers
Miljoonaa-millions, euros

Source: Finnish Ministry of Transportation and Communications 2008. TULOSRAPORTTI TRAMA Transitoliikenteen taloudelliset vaikutukset tietokonemalli. http://www.lvm.fi/fileserver/trama%202%20pp-esitys.ppt .

Appendix 5. Interview questions

Interview questions for the freight transportation companies RZD, Freight One OAO, Schenker Finland, Schenker Russia, Freight One Scandinavia Oy and oil companies RosNeft, Shell Oil (Group A)

1. What are the advantages and disadvantages of the railway transit route via Finland?
2. What are the disadvantages of the railway transit route via Finland?
3. Which factors define choice of the transit route for transportation of raw bulk materials (oil and oil related products, chemicals, fertilizers, iron, metals)?
4. What are the advantages and disadvantages of the transit route via Russian own ports?
5. What are the advantages and disadvantages of the transit route via Baltic countries compared to the route via Finland for the transportation of mentioned above commodities?
6. Which additional services could be important for the transit transportation of bulk materials through Finland? Why?
7. Which improvements could be made for increasing attractiveness of the Finnish railway transit transportation?

Interview questions for VR Logistics, Finnish Railway Administration, SeaRail Oy, Freight One Scandinavia, Straightway Finland (Group B)

1. Does capacity of the Finnish railways allows increasing transit transportation volumes from Russia westbound?
2. What are the competitive advantages of the Finnish railway transit route? What are the disadvantages of the route via Finland?
3. Is there a strategy directed at improving image of Finland as transit country for raw materials transit coming from Russia westbound?
4. Which additional services are developed for transit transportation of raw materials?
5. What are the main competitive advantages of Finland over Baltic countries and Poland for the raw materials transportation?
6. What kind of value added services are provided in Finland raw materials exports coming from Russia?
7. Are there any cooperation projects with Russian government or RZD concerning international rail transportation development? How they affect development of the transit transportation?

8. How attractiveness of the railway transit transportation can be increased for the transportation of raw bulk materials westbound?

The respondents of both groups A and B have been asked follow-up questions.