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University of Applied Sciences

Degree Program in Business Logistics

Budarina Mariia

Intermodal Freight Transportation of Foreign Trade Cargo (Case: Transportation of Elite Cars from Italy to Russian Federation)

Bachelor's Thesis 2015

## ABSTRACT

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Budarina, Mariia	Intermodal Freight Transportation of Foreign Trade Cargo (Case: Transportation of Elite Cars from Italy to Russian Federation)
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The objectives of the study were the determination of the optimal route of cargo delivery (elite sport cars) from Italy to Russian Federation by using the intermodal transport. The relevance of this study lies in the fact that with the optimal delivery route costs and delivery time might be reduced significantly.

In the practical part are results based on the interviews that were done with Executive Director on foreign economic activity in Sovtransavto Company in Saint Petersburg.

A two routes of delivery were considered. As a result of this case was selected the optimal route for this case. Conclusion part describes achieved goals of this thesis.

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## 1. Introduction

Intermodal transportation is the use of two or more kinds of different vehicles during the transportation of bulky goods in the same loading unit (e.g. container). (Muller, G. Intermodal Freight Transportation. Eno Transportation Foundation, Inc., 1999).

Intermodal transportation is more efficient and economical, and with the help of this mode of transportation will reduce carbon dioxide emissions. (European Intermodal Association, Annual Report, 2013).

Organizing of transportation of goods from one country to another is a process that requires compliance with international conventions and agreements on transport and transit, high quality service, accurate performance of the terms of the contract, compliance with customs and state laws.

The main component of transport should be the design of the optimal (rational) transportation process. The focus is on finding the best organizational and technically feasible solutions that maximize the efficiency of transportation of goods from the place of production to the place of consumption.

### 1.1 Importance of this study

Today the freight intermodal transportation is very relevant and it's every day increasing popularity. Moreover, it is very obvious that using of multimodal transportation saves time of delivery. One does not have to worry about product safety, because of loading and unloading the container, not the product itself.

Generally, multimodal transportation and delivery takes one transport or logistics firm, which is also called logistics provider or LSP. (Business Dictionary, 2015).

Delivery is carried out in the same contract, which means that significantly less time is required for preparation and execution of various documents. By using intermodal transport it's possible to deliver the goods anywhere in the world from door to door.

Any LSP that provides multimodal transport of goods independently develop optimal price and period delivery scheme that guarantees the safety of all products. These are likely to already have established partnership agreements with LSPs, insurance companies, and customs services to ensure the continuity and security of the delivery process. (Intermodal Transportation and Containerization, 2014).

According to this scheme goods are carried out large-scale intermodal container transportation and delivery of small consignments of goods. It is profitable and convenient for those organizations that successfully develop and work on the intercontinental level.

Determination of the optimal delivery schedule will help reduce financial costs and competitive advantage. (Committee on Intermodal Freight Transport, Transportation in the New Millennium, 2014).

The first stage defines all required data containing the necessary information about the cargo for its transportation from one country to another. At the second stage of the work, based on dimensions, weight and cost characteristics of the cargo is defined type of package for transportation of particular cargo. Then, at the next stage, based on the analysis of regional infrastructure, geographical location the points of loading and unloading, the analysis of the compliance of the three modes of transport (rail, road and sea), developed several routes for each modes of transport. For each route are calculated its value and temporal characteristics, and the cargo safety on each of the routes. Based on these indicators, the final step is to select the best route. On the bases of the chosen route is determined by a list of document required for transportation. The financial costs i.e. cost of the current assets are not taken into account in this study.

## 1.2 The focus and object of the study

The main research problem is the difficulty to choose the optimal route and the choice of type of transport. The aim of the study is to prove: does the intermodal transportation have more priority than the containerized road transportation? This will be developed route intermodal import transportation of cars in containers.

It is the transportation of elite sport cars that should be placed in the containers. The transportation of valuable cargo in the container is more reliable and safer because the cargo has a specifically fixed inside the container. Due to this, the breakages and the damages are minimized. (Safe Transport of Containers: Industry Guidance for Shippers and Container Stuffers, 2010).

The study will address the transportation scheme that uses different modes of transport, namely the road and combined (the use of two or more different modes of transport). The study has calculation of length of the route, the time of delivery and the cost of transportation of each route. In the end all the results are compared with each other.

This study consists of background information, the theoretical part and practical part. The practical part consists of the assessment of means of transport, routes, terminals, loading and unloading, planning optimal logistics transportation route, the calculation of all costs and a conclusion with links.

## 1.3 Research method

In my thesis, I will use a qualitative research method. By using qualitative research method subject an accurate and clear information about the subject. This method of research allows to obtain detailed data on the behavior, opinions and attitudes of particular group of people. A qualitative research is indispensable for the development of new products, the study of the image of companies, trademarks and other similar tasks. (Smith, 1988).

I will do the analysis of the data which are obtained from the interview and from the statistics of the company that uses various modes of

transportation. For the analysis, the data and the statistics of Sovtransavto Company will be used. The company is engaged in transportation, especially combined transport of goods in the containers.

#### 1.4 Concepts and terms explanation

In my thesis I will follow these definitions: intermodal transport is the transportation of goods in one and the same loading unit a several modes of transport, where one of the carriers is obliged to organize the transport of cargo from door to door.

At the United Nation Conference on Trade and Development on multimodal transport in 1996, the concepts were developed for each of the types of such services. These include:

- 1) Intermodal transport;
- 2) Multimodal transport;
- 3) Segmental transport;
- 4) Combined transport;
- 5) Bimodal transport.

Intermodal transport is a concept for all the above types of transportation. They are defined as the carriage of cargo by several modes of transport, where one of the carriers is obliged to organize all shipping (door to door) from one point of departure or port through one or more points in the final destination. (International Organization for Standardization, 2015).

Multimodal transportation is transportation in which the single carrier company is responsible for the entire process of delivery (door to door). In this case, he may issue to the sender of a document for multimodal transportation which covers the entire route of the cargo. (International Organization for Standardization, 2015).

Segmental transportation is transportation in which each carrier is responsible particularly for his part of the delivery process. (International Organization for Standardization, 2015).

Combined transport is the carriage of cargo in the same carriage (container) undertaken by several modes of transport - road, rail and water. (International Organization for Standardization, 2015).

In bimodal transportation, the road transport is associated with the railroad. Bimodal transportation provides a more rapid, safe and profitable delivery of goods, through the use of a combination of the advantages of road and rail transport. These shipments are based on the use of trailers, which have road and railway wheelset. While moving by rail trailer is using railway wheelsets. On the other side while moving by road trailer is using road wheelsets, at the same time railway wheelsets are lifted up. (International Organization for Standardization, 2015).

Multimodal (intermodal) implies a system of delivery of goods by several modes of transport under a single transport contract with their overload in points of transshipment from one mode of transport to another without the involvement of the cargo. (UNCTAD conference, 1996).

Container transport (or containerization) is a modular system for the loading and transportation of goods using standard modular containers, sizes, and fixtures, which are prescribed in ISO standards: ISO 668, 1161, 1897.

Standard sizes of containers are 20' and 40' (6.1 and 12.2 m respectively). Containers can be carried by sea, river, railway and road transport. (International Maritime Economic History Association, 2006).

The containers have a standard size and are easily transported by any means of transport, which makes them indispensable in intermodal transport. Container shipping guarantees the safety of the cargo: the container is sealed in the presence of the client, and is opened at the destination in the presence of his or his representative. Despite this, transportations of container cargoes involve risks. Cargo insurance will help to avoid losses from any contingency in the way of cargo. (German Insurance Association, 2006).



## 2. Transportation of foreign trade cargo

In the global economy, the transport occupies a special role and the efficiency, quality and development of foreign economic relations of any country are depending on it work. Foreign trade is very closely associated with transport. Transportation makes possible to deliver the goods from the exporter to the importer. (Transport for a Global Economy, 2015).

### 2.1 Freight transport and modes of transportation

Transport logistics is the planning, organizing, managing and controlling the material flow from one point to another on the optimal route. (Dictionary of Transport and Logistics, 2014).

Based on this concept, we can see that the purpose of transport logistics is to ensure the material flow to the recipient at a specific time and with minimal costs. (The role of transportation in logistics chain, 2015).

Transport logistics solves the following tasks:

- Creation of transport systems;
- Joint planning of transport processes on various types of transport;
- Providing technological unity transport and storage process;
- The choice of mode of transport and vehicle;
- Determining efficient routes of delivery. (Council of Logistics Management, 2014).

Nowadays, transportation is primarily used by public transport, namely rail, sea, river, road, air and pipeline. These kinds of transport are the material basis of the process of conversion. (T&DI Congress: Integrated Transportation and Development for a Better Tomorrow, 2014).

In the process of procurement and delivery of material resources, as well as finished products, firms have the opportunity to use different types of transport, as well as various transportation options. (The role of transportation in logistics chain, 2015).

On vehicle, choice is influenced by many factors, such as:

- the nature of the goods (weight, volume, texture);

- the number sent to the parties (your container);
- the urgency of delivery to the customer;
- the location of the destination with respect to weather, climate, seasonal characteristics;
- the distance at which the goods are carried;
- the value of the goods (insurance);
- the proximity of the point of delivery to the transport and communications;
- the safety of the cargo, failure of supply. (Handbook of transportation science, 2014).

### Road transportation

The main characteristic of a road is that it is free to access. The second characteristic is its universality, i.e. roads create connections between other modes of transport. It is the universality of roads is that the main advantage of this mode of transport. Because of the road transportation there is availability for delivery from door to door. However, the cost of transportation for road transport is very high, and that is a big disadvantage. (Handbook of transportation science, 2014).

In addition, trucks have a small capacity in comparison with other modes of transport. This can lead to lack of competitiveness if the country has well developed rail or water routes. (Handbook of transportation science, 2014).

### Rail transportation

The main advantage of rail transport its large capacity, which capacity is much higher than that of road transport. (T&DI Congress: Integrated Transportation and Development for a Better Tomorrow, 2014).

That is why this type of transport is convenient for shipping goods in large amounts. The disadvantages of this form of transportation can be an attributed a long time of delivery, as the goods are often detained in the sidings. Also, transshipment is a disadvantage of rail transport.

Most often, the beginning and the end of the carriage is connected with road transport. Additional transshipments are increasing the risk of damage of the cargo due to which extends the delivery time. (Dictionary of Transport and Logistics, 2014).

### Sea transportation

Marine transportation is the most difficult of all types of transportation, and there should be strict compliance with all the requirements of the carriage of goods from the customer and from the company that provides these services. (Maritime Ambition, Seatrade Review, 2014).

For sea freight is needed a large amount of the cost of energy and labor. However, the benefits of this type of transport: low cost, high performance. The disadvantages are slow speed, lower frequency, and the need for careful packing. We can notice that this type of transportation is the slowest and cheapest among all possible types of cargo. (T&DI Congress: Integrated Transportation and Development for a Better Tomorrow, 2014).

We are all responsible for taking care of our planet. The environmental issue is relevant in our days. CO<sub>2</sub> emissions from maritime transport are significantly lower compared to other modes of transport. However, it is not always possible to avoid spills and contamination of water systems, but nevertheless, maritime transport is the most ecological for environment. (The Department of environmental protection, 2015).

The use of maritime transport affects the environment. Sea ports are sources of air pollution, the emission of solid and gaseous substances. The intensity of air pollution and the emission of pollutants depend on the volume and types of basic processed goods. A huge role in air pollution play ships diesel engines and boilers of ships. (The European Federation for Transport and Environment, 2015).

### Transportation in containers

Container transportations of cargoes have been successfully used with both international and domestic transport systems. Standard sizes of

containers are 20 'and 40' (6.1 and 12.2 m respectively). The containers have a standard size and are easily transported by any means of transport, it makes them indispensable in intermodal transport. (Maritime Logistics: Contemporary Issues, 2015).

The main parameters of the container:

- gross weight (maximum weight of the cargo container);
- length, width and height (external and internal);
- internal volume;
- own weight of the container. (Containerization, Container transportation, 2015).

The containers are used to transport almost all types of cargo. The main advantage of the container its high strength and reliability. This helps to ensure the safe transportation of different goods by different modes of transport. In addition, transportation in a container does not allow other people to see the content of container. (Policy Choices for a Multimodal Future, 2015).

The essence of container transportation is that the load is carried in a in a single cargo tank (in the container) that makes it more simple to transfer it from one mode of transport to another. (Containerization, Container transportation, 2015).

The use of containers simplifies loading and unloading and storage operations, reduces the cost of cargo handling work, decreasing the cost of packaging. On this basis, it increases the safety of shipping and accelerates delivery, which is very important for competing transportation companies. (Improving Productivity in Marine Container Terminals, 2015).

In container transport, warehouses are used open warehouses which are cheaper than closed warehouses. In addition, the containers themselves are warehouses of temporary storage. Transportation in container is more economical, because the full container is the most economical amount of cargo space, regardless of the mode of transport. (Transport support commercial activities, 2015).

## 2.2 Packing of cargo

For the safety of the goods during the carriage, the key point is the selection of the right packaging. Packaging is a tool that protects the goods from damages and losses, environmental contamination, and facilitates the process of storage, transportation and handling. (Export Import Procedures: Documentation and Logistics, 2014).

The packaging consists of a container, packaging materials and means of conservation. Tara is the most important component of the package. Packaging materials are used for isolation of the load from harmful environmental factors and for protection against mechanical influences. The means of preservation are designed for the safety of the goods during prolonged storage. (Logistics Management and World Seaborne Trade, 2015).

### Marking of cargo

Marking is the application of special labels or marks on the goods, packaging and containers during transportation. Marking can be of four types: commercial, cargo, transport and special. (Dictionary of Transport and Logistics, 2014).

The commodity label indicates the name of the cargo and the company, the manufacturer, information about the terms of appointment and application. It is applied by the manufacturer. (Export Import Procedures: Documentation and Logistics, 2014).

Cargo marking is applied by the shipper, and includes the inscriptions with the name of the points of departure and destination, as well as the addresses of the consignor and the consignee. (Export Import Procedures: Documentation and Logistics, 2014).

Transportation marking is applied by the transport company that takes over the goods for carriage. It contains information about the number of seats in the consignment of cargo and number of the shipping document

on which cargo is accepted for transportation from the enterprise. (Export Import Procedures: Documentation and Logistics, 2014).

Special marking is applied by the shipper and provides guidance on the correct handling of the cargo during transportation, loading, unloading and storage in the form of warnings or signs. (Export Import Procedures: Documentation and Logistics, 2014).




Figure 1 shows the international standards for the marking of goods

# Labels, Placards & Markings

## Labels

 <p><b>DOT</b> Hazard Class labels are required on all packages containing hazardous materials. Labels must measure at least 100mm x 100mm and comply with the labeling section in 49 CFR, Part 172.400.</p>	 <p><b>Subsidiary Risk</b> Materials which meet the definition of more than one hazard class must display labels that correspond to both the primary and subsidiary hazard.</p>	 <p><b>International</b> Text is not required on primary or subsidiary hazard labels in Classes 1, 2, 3, 4, 5, 6 or 8. These wordless labels may be used to ship domestically as well as internationally.</p>	 <p><b>Shipping Name</b> Labels must be affixed to the surface (other than the bottom) of a package, and be located on the same surface near the proper shipping name marking. Labels meet both labeling (172.400) and marking requirements (172.300) of CFR.</p>
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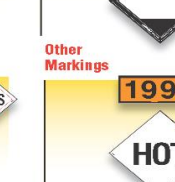
## Placards

 <p><b>Worded</b> Bulk packaging, freight containers, unit load devices, transport vehicles and rail cars must be placarded on each side and each end with a minimum 250mm x 250mm placard as shown in 49 CFR, Part 172.500.</p>	 <p><b>Bulk Packaging</b> Must be marked with a placard and the 4-digit identification number specified for the material. The numbers should measure 88mm and may be displayed across the center area of the placard.</p>	 <p><b>International Wordless</b> For other than Class 7 and the Oxygen placards, text indicating a hazard is not required. Wordless placards may be used for domestic as well as international shipments.</p>
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## Labels

<b>CLASS 1</b> 	<b>CLASS 2</b> 	<b>CLASS 4</b> 	<b>CLASS 6</b> 	<b>CLASS 8</b> 	<b>Air Labels and Markings</b> 
	<b>CLASS 3</b> 	<b>CLASS 5</b> 	<b>CLASS 7</b> 	<b>Additional Labels and Markings</b> 	

## Placards

<b>CLASS 1</b> 	<b>CLASS 2</b> 	<b>CLASS 4</b> 	<b>CLASS 6</b> 	<b>CLASS 8</b> 	<b>IMO Markings</b> 
<b>CLASS 3</b> 	<b>CLASS 5</b> 	<b>CLASS 7</b> 	<b>CLASS 9</b> 	<b>Other Markings</b> 	

labelmaster.com

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Figure 1 The marking of goods (Labelmaster.com, 2015).

## 2.3 Risk management

Any business activities contains risk. In the field of transport, risks are of special importance. Risk is the combination of conditions and factors that create the danger of the entire transport chain. (Risk management, 2015).

In this regard, there is a need to insure cargo. Often insurance of goods is a prerequisite for the implementation of international transportation.

Insurance is issued depending on the nature of the traffic, either a single policy for each shipment, or general policy. The general policy is an agreement on insurance of certain goods under specified terms and applies to all such shipments declared by the insured. (Cargo insurance, 2015).

### 2.1.1 Incoterms 2010

International commerce terms are international rules that provide unambiguous interpretation of commonly used trade terms in foreign trade. International commercial terms are the standard terms of contracts for the international sale and purchase, which are defined in advance in an internationally recognized document. (International chamber of commerce, 2015).

In Incoterms 2010, terms to facilitate understanding are grouped into categories:

- group E (EXW), whereby the seller only makes the goods available to the buyer on its territory;
- group F (FCA, FAS, FOB), according to which the seller must deliver the goods to the carrier appointed by the buyer;
- group C (CFR, CIF, CPT, CIP), includes terms whereby the seller has to contract for carriage, without incurring the risk of loss, damage to the goods or additional costs due to events occurring after shipment and dispatch of goods;
- group D (DAF, DES, DEQ, DDU, DDP), under which the seller has to bear all costs and risks needed to bring the goods to the destination country. (International chamber of commerce, 2015).



Figure 2 shows who is in charge for costs, risks and insurance at each stage

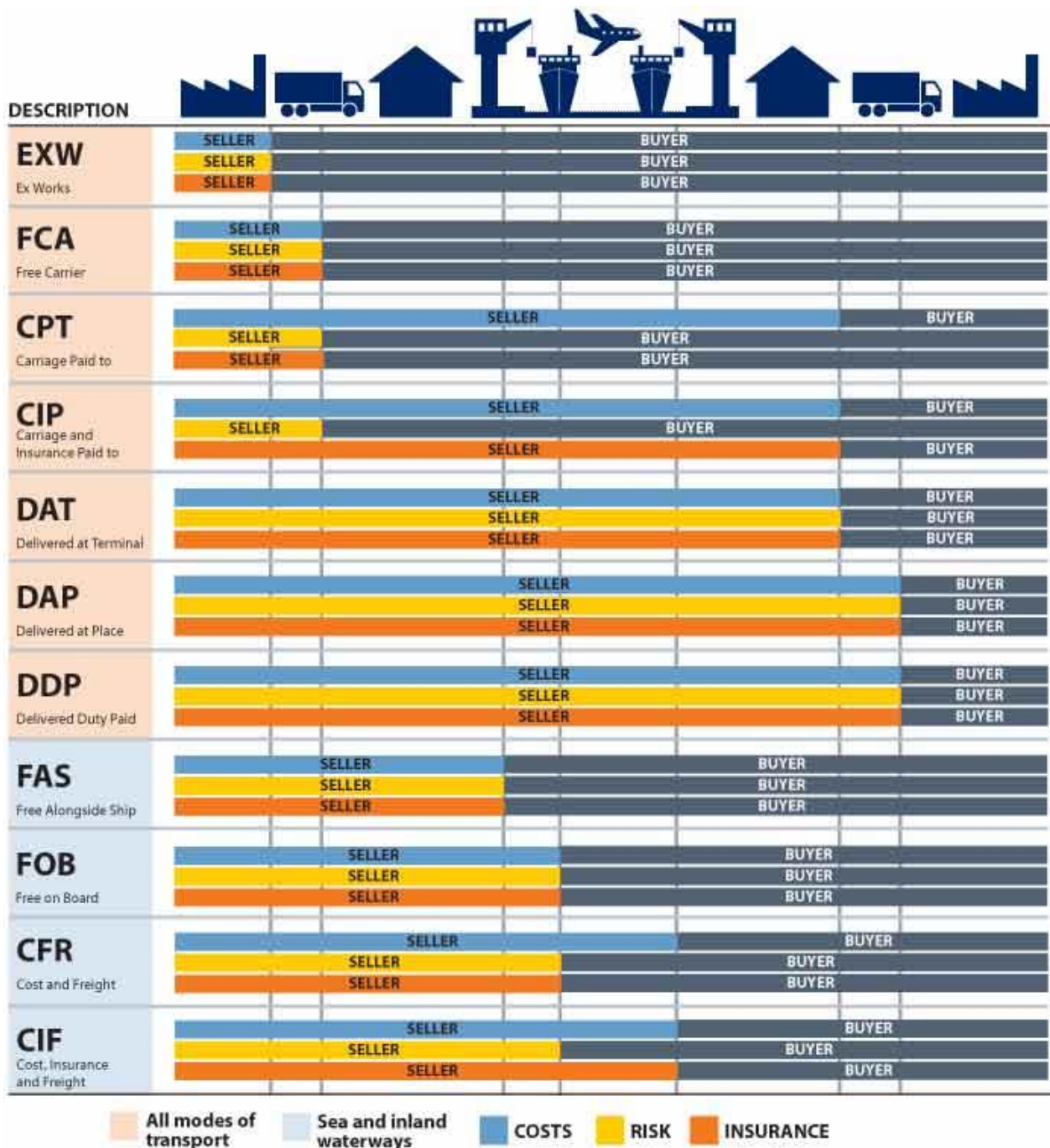


Figure 2 Incoterms 2010 (conship.biz, 2015).

In Incoterms 2010, 11 terms are identified, 7 of which are applicable to any kind of transport. (Incoterms 2010 Rules, 2015).

**EXW - Ex Works**

The goods will be collected by the buyer specified in the contract. The seller's warehouse and the payment of export duties are the responsibility of the buyer.

**FCA - Free Carrier**

The goods are delivered to the main carrier of the customer specified in the agreement. Delivered export duties are paid by the seller.

**CPT - Carriage Paid To**

The goods are delivered to the main carrier. Transportation to the terminal of arrival, which is specified in the contract, paid by the seller. Customs clearance, insurance costs and delivery from the arrival terminal, which is specified in the contract, paid by the buyer.

**CIP - Carriage and Insurance Paid To**

Same as CPT, but the main carriage is insured by the seller.

**DAT - Delivered at Terminal**

Carriage paid to the customs terminal, which is specified in the contract. This means that the export fees and transportation, including insurance, paid by the seller, and customs clearance for import is paid by the buyer.

**DAP - Delivered at Point**

Delivery to the destination specified in the agreement, import duties and local taxes paid by the buyer.

**DDP - Delivered Duty Paid**

The goods are delivered to the customer at the place of destination specified in the contract, cleared of all duties and risks.

(Incoterms 2010 Rules, 2015).

The four terms applicable to maritime transport:

**FOB** - Free on Board

The goods are shipped on a vessel of the buyer, the handling is paid by the seller.

**FAS** - Free Alongside Ship

The goods are delivered to the vessel of the buyer, the agreement specifies the port of loading. Transshipment and handling are paid by the buyer.

**CFR** - Cost and Freight

The goods are delivered to the specified in the treaty port of destination of the buyer. Insurance, transportation, unloading and handling are paid by the buyer.

**CIF** - Cost, Insurance and Freight

The same as CFR, the seller is insured by the main carriage.

(Incoterms 2010 Rules, 2015).

### 2.3.2 TIR Transports International Routers

Carnet the TIR is customs transit document, which gives the right to transport goods across borders in sealed customs bodies of vehicles or containers with the simplification of customs procedures. The document covers the road and multimodal transport of goods between countries. In the presence of TIR Carnets, cargo follows through borders and customs without unnecessary delay. For customs, the presence of TIR Carnets is a guarantee that the goods are transported in compliance with all the standards required for international road transport, and that customs duty is sure to be paid. (Customs Convention on the international transport of goods, 2015).

## 2.4 SCM and Logistics

Supply Chain Management consists of work with suppliers, customers, intermediaries and carriers, accounting documents, track the status of ongoing projects. The SCM system can satisfy the demand for the company's products and reduce the costs of logistics and procurement. (Business Dictionary, 2015).

The aims of SCM:

- Improvement of the level of service;
- Optimization of the production cycle;
- Stock reduction;
- Improvement of the performance of the enterprise;
- Increased profitability;
- Control of the production process.

The SCM includes:

- Planning;
- Source;
- Production;
- Delivery.

Each stage is very important and each stage is associated with another. Logistics allows to minimize the cost of goods and reduce the time of customer service. It should be noted that the reduction of terms of service (for example, reduction of terms of delivery of goods), requires additional financial costs. (Supply Chain Management and Logistics, 2015).

## 2.5 Analysis of foreign trade relations of countries

### Italy

Italy is a highly developed industrial-agrarian country divided into highly developed industrial north and poor, agrarian south. Gross national product per capitals \$30 000 per year. (World Economic Outlook Database, 2015).

The leading branches are machine building, metallurgy, chemical and petrochemical, and food industries. Italy is among the largest producers

and suppliers on the world market for cars, bikes and mopeds, tractors, washing machines and refrigerators, industrial equipment, automobile tires, and ready-made garments and leather shoes, pasta, cheese, olive oil, wine, fruit and tomato preserves. Italy has a large state budget (\$972 billion as of 2012, the 7th largest in the world). (The World Bank, 2014).

Italy has an extensive network of railways and roads. Cars transport more than 90% of passengers and more than 80% of goods. The external transport is dominated by the maritime transport.

The merchant marine of Italy consists of 667 vessels. In the internal freight transportation and passenger transportation takes a major role road transport and railway transport. (Central Intelligence Agency, The World Fact book, 2014).

In Italy, road transportation accounts for 3/4 of all overland cargo transportation. Approximately, there are half of the roads in northern Italy. Railway transportation inferior road transportation, but in Italy nowadays most of the capital investments are going to railway transportation. The largest Italian, port of Genoa, is one of the most important ports in the Mediterranean. Genoa serves as a gateway to the outside world for the whole of the north-west of Italy. The second largest turnover and one of the most important oil ports of Europe is Trieste. (Statistics Italy, 2014).

Nowadays, Italy is the most important strategic trade and economic partner of Russia.

Exports of Italy brings 19% of its gross income, but on the other hand Italy imports a big amount of a raw materials, goods and services.

Figure 3 shows the structure of imported goods from Italy to Russia.

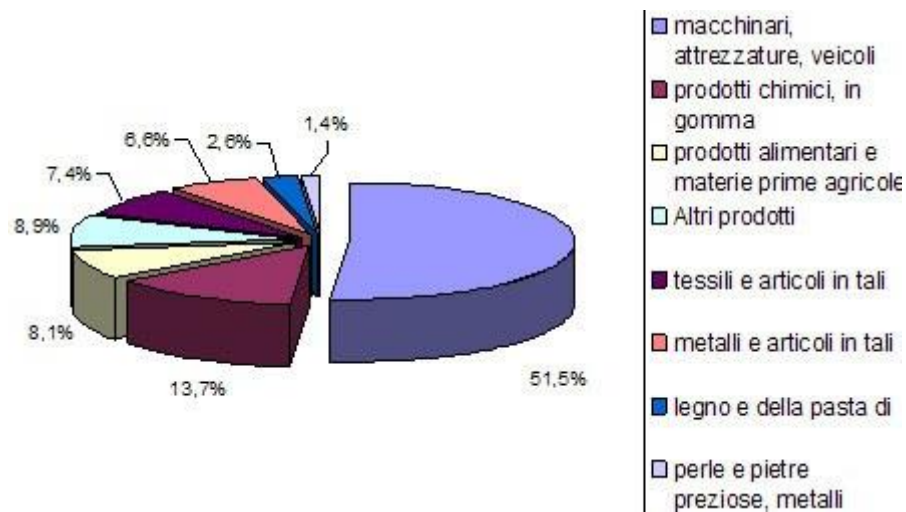


Figure 3 The export from Italy to Russia (Farnesina, The Information Resource, 2010).

Imports are dominated by machinery, equipment and vehicles accounting for 51.5% of the total; chemical products to 13.7%; textiles, textile products and footwear to 7.4%; food products and agricultural raw materials to 8.1%; and 2.6% of cars.

## Russia

Russia belongs to the category of agro-industrial countries. The Russian economy takes the sixth position among the countries of the world. In 2012, the share of the Russian economy in the global economy was 4.1%. However in 2013, the share of the Russian economy in the world economy has decreased and its amount is 3.4%. According to the World Bank, Russia's GDP per capita at PPP in 2013 amounted to \$24120. (The World Fact book, 2013).

The volume of foreign trade in 2012 amounted to \$900.6 billion, exports to \$542.5 billion and import to \$358.1 billion. The main exports are oil and petroleum products, natural gas, metals, wood and wood products, chemicals and a wide range of civil and military industrial products.

Russian imported products are machinery, vehicles, pharmaceutical products, plastics, meat, fruits and nuts, optical and medical instruments, iron, steel.

The main consumers of Russian exports are the Netherlands, China, Italy, Germany and Poland. Most of the imports come from China, Germany, Ukraine and Italy. (Central Intelligence Agency, The World Fact book, 2014).

The transport system of Russia includes more than 120 thousand kilometers of railways, 1 million kilometers of roads, 230 thousand kilometers of trunk pipelines and 150 thousand kilometers of navigable waters. Water transport plays a significantly smaller role because of the short navigation period. A share of road transport in total freight turnover is small, anyway big amount of cargo is carried through it. (Federal State Statistics Service, 2015).

In 2010, the freight turnover amounted to 4.75 trillion tons of which rail transport accounted for 42 %, pipeline 50 %, automotive 4.1 %, sea 2.1 % and inland water 1.1%. (Federal State Statistics Service, 2015).

A commodity structure of the Russian-Italian trade has remained virtually unchanged for many years. Russian exports are a distinct fuel and raw materials. In 2007, 88.1% of total exports were for fuel and raw materials, which includes 65.3% of crude oil and petroleum products, 23.5% of natural gas. The second largest group are metals and metal products with an 8.4% share of exports.

### 3. The creation of optimal delivery route

In the third part of my thesis, the focus is to make the choice of optimal schemes of cargo delivery. All necessary data were obtained during the interview with the Executive Director on foreign economic activity of the company in St. Petersburg and all the information on company's website. The dialogue was aimed at obtaining information about the services that the company provides and what services are mostly used by clients and why. The SWOT analysis will be compiled based on the received data, the results of which will help build the optimal scheme of cargo delivery.

### 3.1 Company description

The group of companies "Sovtransavto" is not only one of the largest holdings in Russia, having a fleet of 700 trucks, one of the international logistics providers with an extensive network of companies in Europe. The main direction of international transport is Western Europe (for example, Germany, Italy, Poland, Finland). "Sovtransavto" includes more than 20 subsidiaries and affiliated transport companies that are located in Russia and in Europe. The company's strategy provides for intensive development of logistics services: 3PL, brokerage, engineering, supply chain management, consulting and insurance. (Sovtransavto Company, 2015).

### 3.2 The transportation of cars in containers

According to statistics, approximately 10 million cars are transported by Ro – Ro and another 1 million cars in containers. (Transportation Statistics, 2015).

Container transportation is universal. This fact makes this type of transportation very convenient, as one can easily overload the container from one vehicle to another and deliver the goods anywhere in the country. This principle is based on multimodal transport which is used for the optimization of time and cost of transportation.

The company's objective is to carry luxury sports cars that will be transported in containers. The company proposes to use containers of a new generation of Trans-Rack. Trans-Rack is a system of metal frames with ramps and is intended to fasten vehicles in containers. Each container with such equipment shall be issued a certificate Lloyd. No additional mechanisms for securing a durable car in the container is not required. Trans-Rack allows to immerse in a standard 40-foot container (Hi-Cube) from two to four full-size cars, and the transportation cost will also be significantly lower. When used properly, the system ensures the complete safety of road vehicles and eliminates the appearance of scratches and dents on the body during loading and transportation.



Based on the obtained factors, the next conclusions were made, which show the advantages of transporting cars in containers:

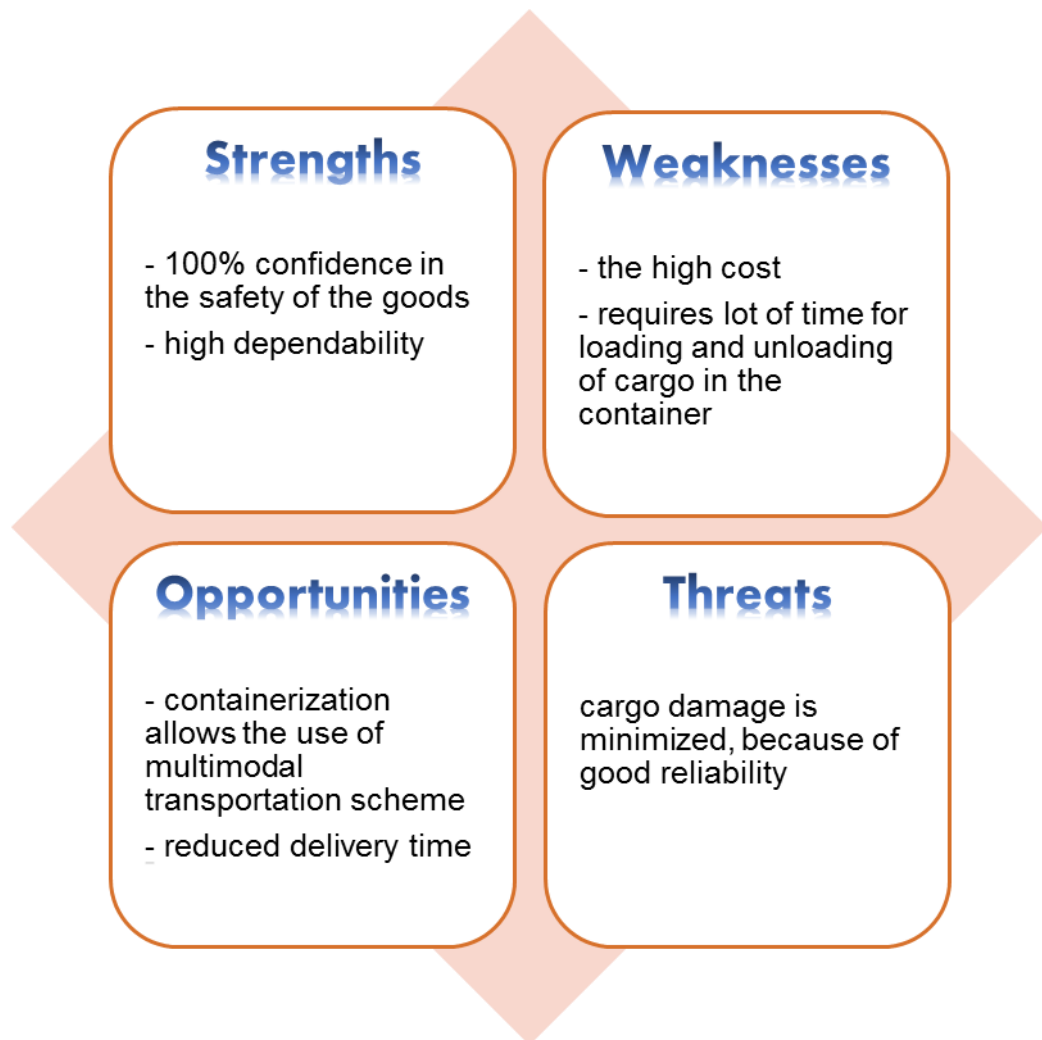


Figure 4 SWOT analysis (Based on the data obtained in an interview with the CEO).

The rules of loading the car in the container:

- The car should be washed and dry;
- The tire pressure should ensure the contact area of the tire in 130-150 mm;
- In the tank there should be gasoline, and the battery must be disconnected;
- The flow of any liquids must not be allowed;

- After installation make sure the handbrake is pulled up and first gear is on for a manual, and parking mode brake is on for automatic transmission.

### Necessary documents and Incoterms

For transportation on routes that were previously considered, the following documents are required:

- The contract between the shipper and the carrier;
- The bill of lading;
- Bills of lading for transportation in the city;
- Certificates for the cargo (if required). (Rules of Cargo Transportation, 2015).

### 3.3 Choice of delivery route

The company's mission is to provide elite sports cars from Bologna (Italy) to Moscow (Russia). Transportation Company Sovtransavto proposed to develop two versions of cargo transportation on international routes - land and combined (to use land and water transports) and to calculate freight costs. Next step is to make the analysis of two delivery options and choose the best. In order to find out which route is most optimal, the components that make up each route the length of routes, the cost of each of the routes, the reliability of each of the routes and the total time of passage of cargo on each route are defined.

#### Land route

This route is only on land and is 2690 kilometers long. The car will be placed in the container in Bologna (Italy). The cost of fuel, wages of drivers, and maintenance of rolling stock in the delivery process are such an indicators that define the cost of delivery by road transport. The average price fuel in Europe is €1.25 by 09 April 2015. Sovtransavto has its own trucks, so you might use them. According to the company, the salary of the driver is approximately €0.1 per kilometer, and repair and maintenance costs are €0.05 per kilometer. The consumption of the truck, is 30.5 liters per 100 kilometers. From all this, calculation of the cost for

distance of 2690 kilometers is €4486. The goods have to be insured. Sovtransavto uses the services of the insurance company Rosgosstrakh. The cost of insurance is 0.15% of the cargo value. In accordance with the rules of cargo transportation, Vehicles are allowed to move 16 hours a day. The permissible average speed of the truck is 70 km/h. In total, the driver will require 60 hours for delivery of the goods, and a day to go through customs.

Figure 5 shows the route on the map

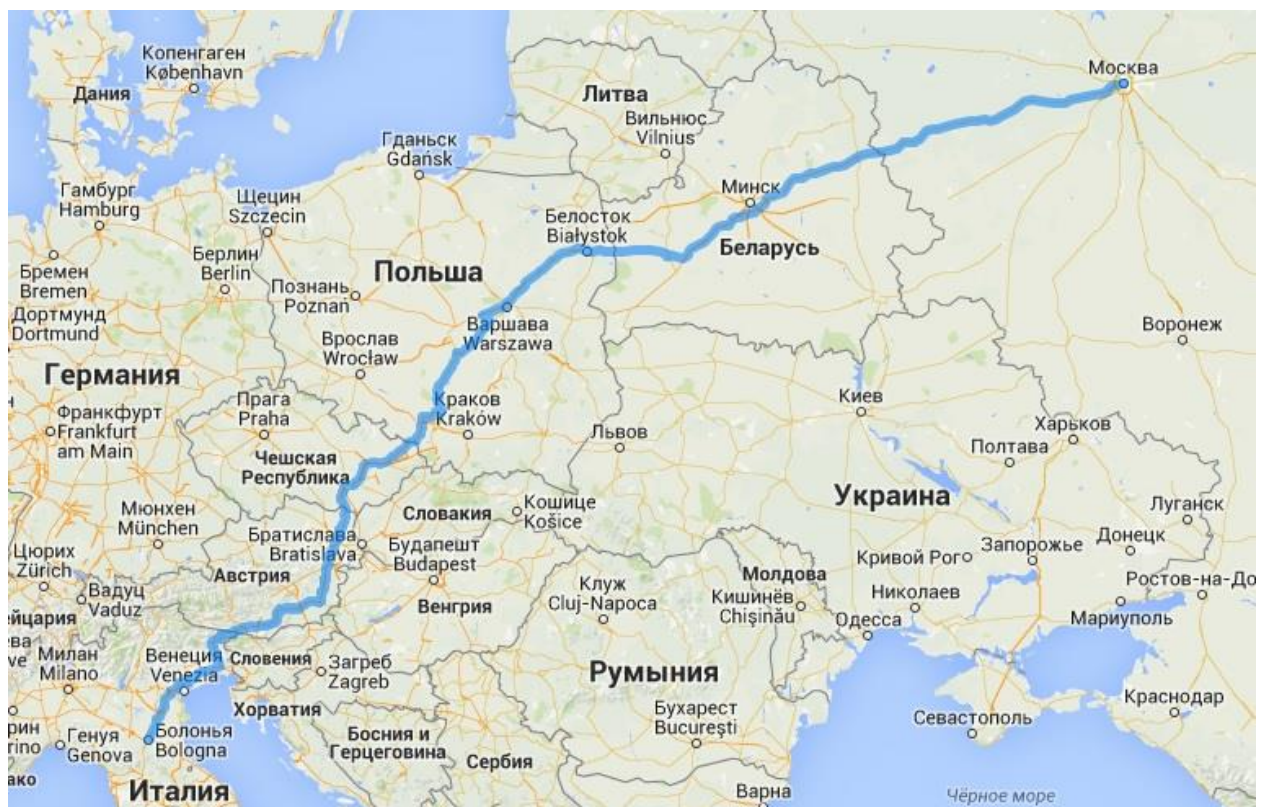


Figure 5 Map of road from Bologna to Moscow (made by googlemaps.com, 2015).

The map shows that the route passes through several countries: Austria, Czech Republic, Poland and Belarus.

### Intermodal transportation

Sovtransavto suggests to use the route: road transport from Bologna to port of Ravenna; from the port of Ravenna to the port of Novorossiysk to

use sea transport; from the port of Novorossiysk to Moscow to use road transport.

The company estimates that cost of transport on this route is €3323.

Figure 6 shows the total distance and time required for delivery.

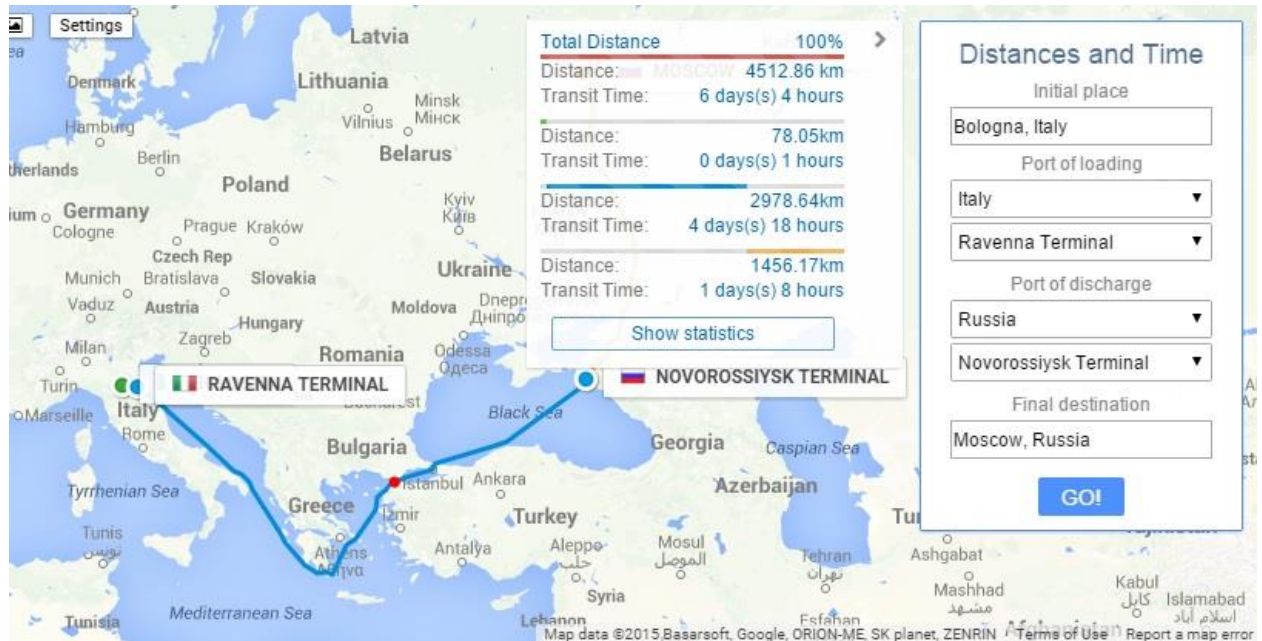


Figure 6 Map of route from Bologna to Moscow (made by Searates.com, 2015).

Figure 6 illustrates the total distance and the distance between each point of destination: from Bologna to port of Ravenna, from the port of Ravenna to the port of Novorossiysk, and from the port of Novorossiysk to Moscow.

In figure 7, the blue line represents the sea transport, and the orange line represents the road transport.

Figure 7 shows the scheme of this route

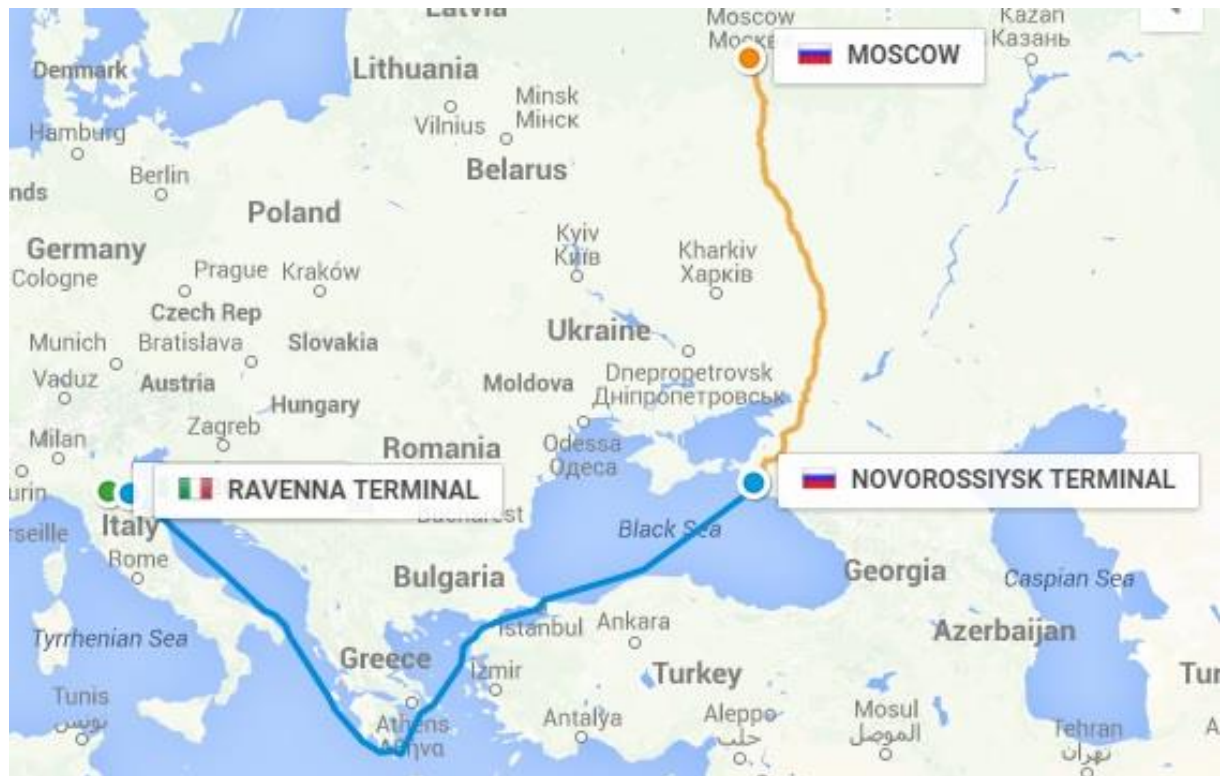


Figure 7 Map of route from Bologna to Moscow (made by Searates.com, 2015).

### 3.4 Analysis of two routes

We have considered two variants of delivery. In order to see the difference between the first and second route, we can review in detail Table 1.

	TOTAL DISTANCE, KM	TIME OF DELIVERY, H	COST, €
1 <sup>ST</sup> ROUTE	2690	89	4486
2 <sup>ND</sup> ROUTE	4512	138	3323

Table 1 The difference between the first and second route



The choice of the optimal scheme of delivery is determined by the company based on the three priority criteria:

- 1) prompt delivery "door to door";
- 2) the lowest cost of delivery;
- 3) the lowest probability of loss of or damage to cargo.

It appears that we can assume both delivery options are optimal because the first takes less time to deliver and the second is much cheaper. Safety and reliability of transportation for both delivery options are equally high because the goods are carried in a container. If the goal is to save on delivery, the second option should be chosen.

We can see that the second option is much cheaper. If a customer wants to save money, it will be cheaper and wiser to choose intermodal transport.

Figure 8 shows the results of the second route

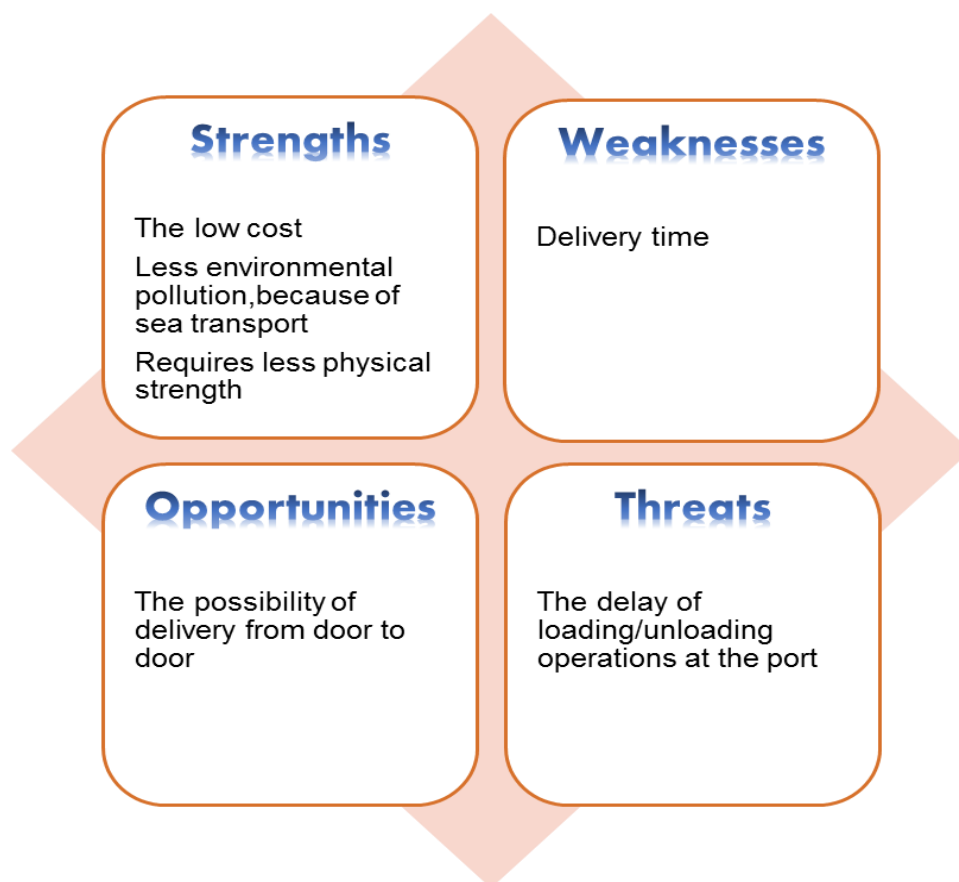


Figure 8 A SWOT analysis of intermodal transport

#### 4. Conclusion

Having examined the features of container transportations of cargoes, namely the effectiveness and problems in development, we can draw the following conclusions.

Nowadays, the most common and modern means of transporting with containerized cargo. Containers have been successfully used at both international and domestic transport arteries. This type of transportation has gained absolute leadership because of the use of containers. The container is adapted for rapid and easy loading on different modes of transport. Specially equipped trucks are capable of in a few hours to upload and securely attach to the vehicle a large quantity of containers.

The essence of the system of containerization of cargo is that cargo is transported from origin to destination in a single cargo tank. Any container can be easily transferred from one mode of transport to another. The main advantage of this type of container is its high durability and reliability. This ensures safe transportation.

Container transportation is the most economical and environmentally friendly form of transportation. When using containers, it is possible to completely eliminate heavy manual work and increase productivity, reduce packaging costs, improve the safety of the cargo, and to speed up the delivery of goods by 25-30%.

Multimodal transportation is an effective combination of sea, rail and road transport. This form of transportation allows timely and efficient delivery of cargo around the world.

Multimodal transportation is especially relevant between continents. The advantage of multimodal transportation is that one company, not several, operates it. The same company is responsible for the safety of the cargo. Because multimodal transportation consists of several segments, the speed of delivery is decreased and the costs are cheaper.

As can be seen from the calculations that have been made, selecting the best route allows to save on costs, as well as for faster and more reliable delivery of the goods.

All information for this thesis was obtained from interviews with the Executive Director on foreign economic activity of a company in St. Petersburg. We can assume that the aim of research was achieved. The most optimal route of delivery was developed, which will help to reduce the costs. Therefore it is important to mention that the calculations did not take into account the full costs. If all the financial costs would be taken into account, the result could have been different.



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