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Graduate School of Management

Master in Management Program

Factors affecting the efficiency of air cargo transportation in Russia.

Master's Thesis by the 2nd year student

Concentration — International Logistics & Supply Chain Management

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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ
ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

Я, Юрканский Аркадий, студент второго курса магистратуры направления «Менеджмент», заявляю, что в моей магистерской диссертации на тему « Факторы, влияющие на эффективность воздушных грузоперевозок в России», представленной в службу обеспечения программ магистратуры для последующей передачи в государственную аттестационную комиссию для публичной защиты, не содержится элементов плагиата.

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26.05.16   (Дата)

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Abstract

Master Student's Name	Arkadiy Yurkanskiy
Master Thesis Title	Factors affecting the efficiency of air cargo transportation in Russia.
Faculty	Graduate School of Management
Main field of study	International Logistics & Supply Chain Management
Year	2016
Academic Advisor's Name	Dr. Axel T. Schulte
Description of the goal, tasks and main results	This master thesis presents the analysis of air cargo transportation market in Russia, reviews the literature on air cargo operations and compares theoretical studies with the practical problems of cargo carriers and forwarders. The goal of the study is to identify factors affecting the efficiency of air cargo transportation in Russia, challenges and trends of the Russian market. Data obtained using a questionnaire survey and two-structured interviews revealed that cargo operations are closely connected to passenger transportation in Russia, cargo forwarders consider overall economic conditions and increased terminal handling fees as their major challenges and do not see any ways for improvement. Cost-cutting strategy and therefore keeping a position in the market are the main trends of operators in the market. This master thesis could be used as a basis for cross-regional studies of emerging markets related to air cargo transportation in order to identify similarities and patterns of freight shipment structure of emerging markets.
Keywords	air cargo transportation; efficiency factors; challenges and trends.

Аннотация

Автор	Аркадий Юрканский
Название магистерской диссертации	Факторы, влияющие на эффективность воздушных грузоперевозок в России.
Факультет	Высшая Школа Менеджмента
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Год	2016
Научный руководитель	Аксель Шульте
Описание цели, задач и основных результатов	В данной магистерской диссертации представлен анализ воздушных грузоперевозок в России, обзор научной литературы и исследований на тему воздушных грузоперевозок и сравнение теоретических концепций с практическими проблемами грузоперевозчиков. Цель работы заключается в выявлении факторов, влияющих на эффективность воздушных грузоперевозок в России, проблем и трендов на рынке. Данные были получены при помощи анкетного опроса и двух структурированных интервью. Практическое исследование выявило, что воздушные грузоперевозки в России во многом зависят от пассажирских, так же грузоперевозчики считают, что основными факторами, влияющими на эффективность, являются общая экономическая ситуация и повышение сборов на терминальную обработку. Стратегия снижения издержек и сохранения места на рынке является приоритетной для большинства компаний, и они не видят других путей для развития. Данная магистерская диссертация может послужить основой для кросс-региональных исследований рынков воздушных грузоперевозок среди развивающихся стран.
Ключевые слова	воздушные грузоперевозки; факторы эффективности; проблемы и тренды.

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Introduction

Research area lies in the field of air cargo transportation. Key topics that underlie the understanding of this phenomenon are problems of airlines and freight forwarders, general underdevelopment of transportation logistics in Russia. Main research question that it is stated in the thesis is "What are the factors affecting the efficiency of air transportation industry in Russia?" The goal of the thesis is to identify key features of air cargo transportation market in Russia. In order to achieve this goal and answer the research question there will be a combination of quantitative and qualitative data collection methods, both secondary and primary data. There is going to be comparison of the results of the empirical study with modern practices and other researches in order to achieve maximum validity of the results. The stages of the research are the following:

- Analysis of scientific articles, reports and empirical studies
- A survey amongst freight carriers and forwarders in Russia
- Two structured interviews with freight forwarders

This literature review involves sources from EBSCO, Elsevier and JSTOR databases. For the search, the following key words were used: "air transportation", "air cargo" and "Russia", "logistics", "supply chain".

This particular subject of research might be relevant for the following reasons. Air cargo plays a crucial role in Russian economy because of countries territory and lack of roads. Logistical issues and geographical location of several regions force business to choose air over other means of transport. Economic crisis also has to be taken into account, especially in terms of its impact on the industry and challenges that it has created. Understanding the trends, where the whole industry is going is a crucial in terms of improving the current state of events.

Many of the existing studies in this area were focusing on one particular territory or region, mainly the United States of America. However, there is a strong need to study air cargo transportation in emerging markets, extend the geographical scope in 3PL research, particularly to support practitioners as they expand import and export operations in other countries. Initial literature review demonstrated that this topic still has a room for future research and it is hard to do an empirical study in 3PL market, mostly due to its complexity. It also suggests that it would be reasonable to implement more theoretical studies, using various methods of data collection. Moreover, research specifically on Russian market seems to be even more underdeveloped.

Due to complexity of the data collection process and problems that the research in Russia faces when it is needed to implement an empirical study, the focus of this particular paper would

be more general. Many researchers face obstacle related to low response rates. There has been a number of studies focusing on Asian countries, however almost nothing related to air cargo transportation in Russia. Therefore, the objective of this master thesis is to bridge this gap, by making a more general market study, using different methods of data collection.

1. Air cargo transportation and operations : theory and global practices

1.1 Conceptual framework of air cargo transportation structure

The following part presents the overview on airfreight operations and transportation on a global scale in order to identify crucial attributes and characteristics of this industry. In addition, the objective is to find some practical issues that correlate with the theoretical background in this area of research.

According to Feng et al. 2015, air transportation is a driving force of the world economy. This is the main idea that could be easily found in any research or study on this topic. No researcher seems to undermine the importance of future development of this industry. "The air cargo market has doubled in volume every 10 years since 1970, and this trend is expected to continue over the next 20 years with an annual average growth rate of over 6 %" (Chang et al., 2007, 555). Much of this growth has come from the integrated sector and the 'big 4' operators UPS, DHL, FedEx, and TNT. (Boeing, 2004). "Based on the cargo capacity of the main airlines in the US, Europe, and the Asia-Pacific region between 1995 and 2004 (as published on their respective websites), the airfreight volume has grown, on average, 50% faster than the air passenger volume in the past decade." (Wong et al., 2009, 361)

Airfreight forwarder is a third-party logistics providers, that has air cargo services as its main business. Today in case a company wants to decide what airfreight forwarder to choose, it probably should use the following set of criteria: infrastructural and informational abilities, equipment and fleet, distributional reach and route network. The majority of third-party logistics company provide services and solutions for the entire supply chain not only simple transportation. (Yang et al., 2010) For this reason, the market is quite different from other markets and has more complexity. (Petersen, 2007)

There are many companies that are involved in transporting air cargo from one point to another; however, they can be classified into three main groups: airlines, freight forwarders and integrated providers. The majority of airlines (especially internationally) are combination carriers that carry both cargo and passengers. Air cargo can be shipped in freight airplanes and in passenger aircrafts (almost 60 % of air cargo worldwide). The market structure is such that in order for the airline to operate it must have connections with freight forwarders and agents who act as an intermediary with customers. (Belavina & Girotra, 2012) Normally airlines do not accept orders directly from customers, however in some cases an airline can serve as a forwarder as well. Integrated companies provide solution for the entire supply chain and are responsible for delivering goods from the origin to destination, working directly with customers and getting round the usual role of freight forwarders. The integration of air and ground services became a

competitive advantage of integrated operators because a large number of manufacturing companies have the urge to manage and control international distribution networks and supply chains. This situation has been an accelerator of division of cargo services into different groups (see Fig. 1). At the bottom stage, there are traditional cargo forwarders in which the forwarder is an intermediary between the customer and the carrier, responsible for transportation on ground, customs regulations and booking a space for the carrier. (Bowen & Leinbach, 2004)
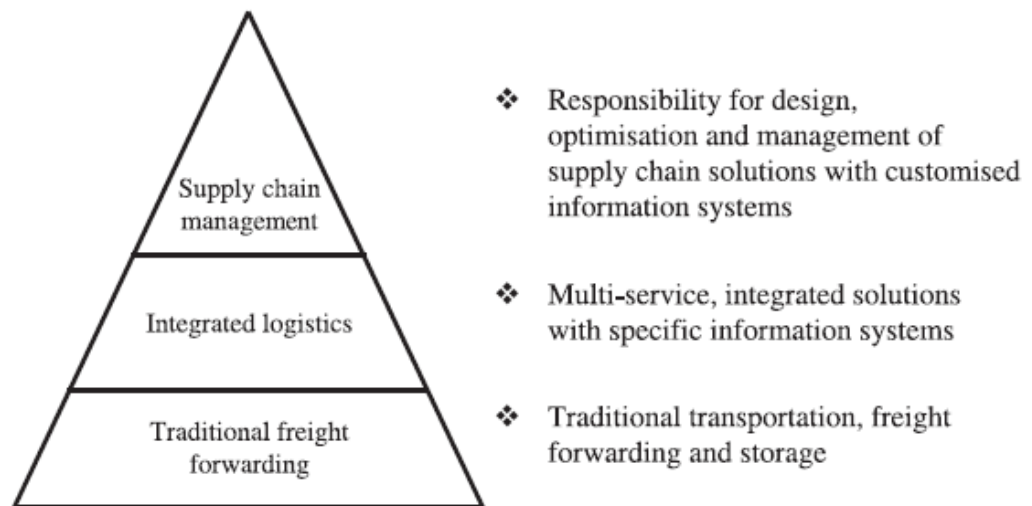

Figure 1. Freight services.
Source: Bowen & Leinbach, 2004

Airfreight transportation has a connection with passenger transportation, obviously, because both services employs aircraft as core mean of transport. Feng et al. 2015 in their study of different publications have identified several differences between two above-mentioned types. Airfreight transportation has a higher unpredictability level than passenger transportation in terms of capacity availability. Essentially, cargo forwarders have higher volatilities when dealing with capacity management. (Feng et al., 2015; Mongeau & Bes, 2003)

The reason for this is that usually customers of cargo shippers have to make a booking way ahead of the delivery date, whereas passengers can book their ticket couple of hours before the flight. Therefore, passenger airlines have more flexibility. (Wadud, 2013) "Cargo capacity forecasting is significantly more complex than passenger aircraft capacity forecasting. While the capacity of a passenger aircraft is fixed by its number of seats, cargo capacity depends on the container types used, which are further specified by multiple dimensions. For instance, the capacity may be enough in terms of volume but not in terms of weight when a heavy cargo

arrives. Multiple dimensions are a key feature of freight, which render both complexity and uncertainty to airfreight capacity management." (Feng et al., 2015, 323)

The same as passenger transportation, airfreight operations contain both indirect and direct costs. Direct cost is a spending related to buying or renting the airplane and necessary facilities, as in combination with the service charges. Indirect cost is a spending connected with management expenses and ground handling services. Moreover, operation costs also include variable and fixed costs. FC that do not depend on the distance contain spending on takin off and landing, security, and ground operations. On the contrary, variable costs (i.e. the cost of fuel), depend on the distance of the flight. (Chao & Hsu, 2013; Guimera et al., 2005)

D. Wenzel in his article for Nord/LB makes a general review of airfreight market. Due to specifics of this type of transportation, in comparison with other types, it is considered as a more value-adding type. It is also more frequently used for transportation of items that are more valuable and items that have to be delivered in a shorter period. Therefore, it is only logical that from the demand side, customer are willing to pay more to use air shipment. "The air cargo market is highly fragmented with fierce competition and excess capacity. The generally low switching costs for end customers intensify competition among the carriers. As a result, prices for air freight set rather supply oriented than cost-covering." (Wenzel D., 2015, 3) From the 3PL providers point of view there is a significant difference in demand in different parts of the world. For this reason, there is a problem of proper usage of airplane capacity. "The air cargo market is heavily concentrated and around 70% of the global freighter fleet is used by the top 20 air cargo carriers." (Wenzel D., 2015, 3)

Zou et al. 2013 acknowledges that the increase in freight volumes establishes a need for airlines that work with cargo as well to have appropriate and efficient revenue management schemes in order to minimize their losses. With regard to passenger transportation, such schemes are quite common and widespread and have been used for almost two decades. In fact, most of the methods were applied for freight management and therefore cargo operations are still highly dependent on ground rules of passenger schemes of revenue control. It is probably not a question of debate that airfreight is not the same as passenger operations; for example, shippers' booking patterns, capacity allocation uncertainty, demand forecasting and therefore passenger revenue management schemes should not be unadvisedly applied to the air cargo sector. (Zou et al., 2013)

Besides market researches, there has been a conceptual study by Becker and Wald (2010) on airfreight revenue management. In this, article authors focus on the main challenges of revenue management (ACRM) and establish some ways of addressing them. Authors claim that passenger revenue management schemes should not be unadvisedly applied to the air cargo

sector. Authors mention three main challenges in their paper: "complexities, trade-offs and organization. Capacity offer for the transportation is not a constant figure; moreover, it is a variable that depends on many others factors (i.e. amount of fuel)." (Becker & Wald, 2010, 180)

The networks are becoming more complex and number of transportation routes is extending, so sea and train shipment has also be taken into account. (Derigs et al., 2009) From the demand prospective, authors acknowledge unequal trade lanes as an important complexity issue. It means that a particular shipment at a booking stage can range from zero to over tendering. Trade-offs are important problem of ACRM in terms of creating a mismatch of goals inside Revenue Management and how this goals correlate to the targets of other department. For example, utilization is a top priority for ACRM but usually is not so important for sales department. The same thing exists for profitability that is again much more important for RM than sales. (Becker & Wald, 2010)

The last complexity that authors mention is organization. Becker and Wald suggest that ACRM integration in the organizational system is de-centralized. It, basically, means that revenue management can reach its goals on a local but not a global scale. In the last part of the article, authors discuss ways of managing the challenges. In order to deal with complexities companies have to use "IT integration and data quality" and "forecasting and optimization/decision support methods". Reliable data and forecasts from all the dimension has to be applied in this case. In addition, from the supply side efficient workflow is important. In other words, live tracking of item fluctuations and adjusting the capacity according to the changes. In terms of organizational issues, authors suggest the target of ACRM should go in line with goals of other departments. Sales and revenue management should also be measured against profitability, utilization and revenue" and coincide with corporate targets of the firm. (Becker & Wald, 2010)

In general, there has been only a number of studies related to air freight RM questions. Kasilingam, 1996 established the main differences between passenger revenue management and freight revenue management. Very often passenger aircrafts carry cargo as well, so the amount of cargo depends on the type of the plane, number of passengers on board and how much luggage they have. "Therefore, air cargo capacity is stochastic in nature, and the uncertainty makes capacity allocation decisions more complex." (Becker and Nadja, 2007, 176). One more important aspect of cargo that it is different to passengers is multi-dimensional structure of cargo capacity (weight, volume, and position in the aircraft cargo hold), flexibility in routing and path selection, and the cargo assignment request before the general sales. (Li et al., 2012)

In terms of costs and financing airfreight security, there is a difference in opinions. This is mainly because no one really has the intention to overspend. To begin with, governments are obviously under severe budget constraints. Although, operators will argue that they are not able to guaranty the integrity of their cargo when it goes further in the supply chain to be bundled for shipping. In addition, the vast majority of small forwarders do not possess the required amounts of money to make necessary investments in security. On the other hand, each large integrated operator often spends over 50 million euros a year on security. Ground handlers and airline companies claim that they already spend the cost of maintaining and controlling quality certification. Because the independent validator issue remains unclear (who certifies the validator, which are the standards, the price, etc.), the reaction of the different stakeholders is very uncertain. (Domingues et al., 2014)

Speaking about the costs of freight transportation by aircrafts it is important to mention ground handling costs. The activities that are related to freight handling are integrated or act as an integral part of airfreight supply chain. Apart from freight handling, such chain has different stages hat depend on various actors involved in it. The so-called freight-forwarder is extremely important in the chain: it is responsible for door-to-door shipment of items from the point of sending to the point of receiving. Freight-forwarder plays a role of an agent in the relationship with air carrier, usually the airline and reserves a spot for a particular shipment, quite often together with other orders. (Janic, 2015)

The handling of air freight usually is divided to three following activities:

- Warehouse handling: collecting of freight for export flows, distribution of freight among the forwarding agents for import flows, building up and breaking down of pallets in the handling warehouse.

- Ramp transport: transportation of freight from the warehouse to the aircraft and vice versa

- Ramp handling: loading and unloading the aircraft (Burghouwt et al. 2014)

Changing the topic back to security, all experts agreed that 100% screening is not feasible, and therefore a risk-based approach is in order. This is consistent with both political strategic goals for strengthening air cargo security and the recommended policy package for the basis of a risk-based approach that proactively adapts security procedures to threat and risk levels. This, in

turn, relates directly to the need of one harmonized air cargo security regulatory framework. (Macário et al., 2012).

The next conceptual practice related to cargo shipment is intermodality. Intermodality is a feature of a transportation network in which more than one types of transport are used in order to organize a door-to-door delivery. Moreover, multimodality can be a characteristic of to what extent the transportation network is integrated. In that sense, higher level of intermodality results in higher integration and interconnection amongst modes and a more effective transportation network in general. (Reyes et al., 2013)

Intermodal cargo transportation service includes a number of integrated cargo players. The first one is called a Freight Forwarder, which is a company that operates with different agents in order to use every party involved fully, and enhance the overall efficiency of the transportation network. Those companies are extremely important in terms of generating synergies, which increase the total effectiveness and decrease unnecessary activities. Therefore, it is possible to say that the overall productivity is more than just a simple adding up the result every single player in the market. Speaking about multimodal transport, it is made of various single and non-integrated transport operations and thus, the overall productivity is just a result of the simple adding up of different independent transportation operations. (Azzam et al., 2013)

Calling upon the freight forwarders, it should be noted that they all are not equally skilled. Different freight forwarders follow different processes of intermodal cargo transportation services and as such, they are likely to obtain different performances from the same set of dual systems. The air transport industry is going through a paradigm shift, due to the disintegration of the concept of modal superiority of the sector (Macário, 2011).

Typically regarded as independent nodes of the transport network airports benefit from a monopolistic market positioning, which allows them to keep their attractiveness even if they don't have a connection to the overall transport network. However, this reality is changing significantly and nowadays the interaction between transport modes is more intensive than what it was in the past, which has led to the concept of transport integration, co-modality and intermodality. Airports are no longer exceptions, being now important multi-modal interchanges and central nodes in the network. (Reyes et al., 2013)

Air- and land-based connectivity is a necessary condition for the success of airports and the development of an airport city and other similar concepts. Although not all airports have embraced the concept of airport city, they all have been affected by the liberalization and deregulation phenomena and consequently, have changed their business model. The following

picture depicts the evolution of airport business models over the last few decades. (Allroggen & Malina, 2014) Over time, airports have reduced their dependency on the aviation business and progressively increased the amount of non-aviation activity (such as: retailing, conference centers, amusement parks, business centers, etc.), in particular in the landside of the airport (from over 95% in the 1970s down to 30% currently). Thus, current airport business models are based on the generation of traffic, showing that the profitability of airports does not necessarily depend on the quantity of passengers, but rather the number of people that use the airport for any reason (for example, as a transfer between land-based modes of transport). (Macário, 2011).

Nowadays, an airport's economic development depends largely on the capacity to induce air- and land-based traffic to feed their non-aviation business. Consequently, in the current context fundamental conditions for the success of airports include (air- and land-based) connectivity, integration with the modal transport networks or the existence of co-modal services. (Lehner, 2013) The advance of high-speed railroads (HSR) brought major change to the dynamics of competition and cooperation with air transport. Until that moment, air transport ruled was undoubtedly the preferred mode of transport for longer distances; however, the situation completely changed with the construction of the first HSR routes. The reductions on the transport time on well-known rail routes can go up to 65%. Such reductions in time changed the transport paradigm and many passengers shifted from air to rail transport. (Reyes et al., 2013)

Another key aspect of freight transportation and logistics in general is sustainable practices. Referring to the past and current small- and medium sized enterprises (SMEs) practices and their endeavors to engage into airfreight supply chain and airfreight network, a set of implications can be drawn to facilitate future-oriented directions of SMEs. The central clue is a need to decide where to compete and how to compete, it is an external view. On the one hand, SMEs need to clarify their strategic position in the supply chain and strategic focus. On the other hand, there is a deficit in internal capabilities, trust built up, management skills, team building, understanding of business etc. Again, when recalling the duality of markets and resources. Hence, combination of both perspectives is needed. (Beifert et al., 2013)

The present research argues that SMEs involved into the air cargo forwarding or handling services as well as regional airports as the airfreight operations have to intensify collaboration partners with large and globally operating enterprises in the air cargo industry. This enables the small businesses, first, a better relationship positioning in the supply chain, since large airfreight forwarders as the first-tier logistics providers have focused on delivering multiple performance based on their competences. In this sense, SMEs could focus on the specific competences and offer differentiated services, thus meeting qualitative requirements of their customers. Through

specific and differentiated services SMEs and regional airports are capable to gain a strategic position on the niche air cargo market, which is not fully penetrated by large air cargo forwarders and handling enterprises. In this regard, they could place more focus on building competences in the field of warehousing, airfreight handling and transportation. (Beifert et al., 2013)

1.2 Modern practices in airfreight management

Apart from conceptual studies, there has been a few empirical studies that are worth mentioning in this literature review. These studies in the majority are focusing on some rather narrow aspects of the research area. The following studies were conducted from the point of view of supply, 3PL companies.

Swan (2011) has analyzed market structure of air transportation industry and has come to the following conclusions. First of all the cost structure of cargo shipment market differs from production. "Transportation as a product cannot be stored for later sale as an inventory of finished automobiles might be stored. A transportation firm that has assembled the resources to transport goods must actually have something to transport before it can produce." (Swan, 2011, 97) In terms of supply-demand structure, researcher has concluded that the total demand for cargo shipping does not depend on a price in the short term. Therefore, economies of scale lead to circumstances that the lower number of 3PL providers might result in "lower cost service". This situation occurs due to the fact, that this kind of service has a significant amount of "fixed and semifixed costs". (Swan, 2011)

Ashenbaum, Arnold & Rabinovich (2005) acknowledge that there has been many studies in third party logistics and there were many attempts to evaluate the level of usage. Although, based on their literature review of publications about logistics, these studies have seldom been applied to research in logistics. The goal was to get an understanding of how third-party logistics (3PL) operations have changed over the time. In this case, the researchers focused on the market of United States of America. "Third-party logistics usage cannot be studied in a laboratory, so multiple studies in different settings and with different samples are appropriate to accumulate data on this phenomenon." (Ashenbaum et al., 2005, 43) As a research tool, authors used meta-analysis in order to create an overview of previous studies in this area. They were trying to evaluate existing studies based on impression of peer researches and compare different publications using "subjective criteria". (Ashenbaum et al., 2005)

Ashenbaum, Arnold & Rabinovich were looking at growth rates in 3PL and as a basis for their analysis, they compared two studies by Robert Lieb and John Langley, Jr. To the sake of my own research, in describing their findings the focus will be only on transportation. Therefore, it is important to say that transportation outsourcing in US from 1996 to 2004 has been growing at 5-8 % per year, which again proves the fact that logistics market has been growing not only for the past several years. For this reason, the general lack of research in 3PL and its irrelevance, especially in air cargo, seems questionable at least. (Paleari et al., 2010)

Ashenbaum et al. focused on US market of third-party logistics. Jankiewicz & Huderek-Glapska (2015) have researched the European market of air transport after the influence of liberalization. The focus of study was on changes that happened after the liberalization of air transportation market in Central and Eastern Europe. In addition, authors tried to compare both markets in terms of development. These finding are important in terms research in Russia, since it is an emerging market. Researchers established that population change plays a big role in shaping air transportation market. "Using econometric tools, the paper also attempted to identify any similarities and differences with regard to the impact of socio-economic factors on the activities of air transport sectors. The analysis also provided insight on the way some key factors that shape air transport markets work in emerging markets. Air transport has a high sensitivity to cyclical fluctuations (the influence of GDP and employment levels). The economic situation, including labor market conditions, also had great importance for development paths." (Jankiewicz & Huderek-Glapska, 2015, 53)

Gardiner and Ison (2008) in their international survey of airports established key factors that are taken into account by cargo airline when choosing the airport for their operations. According to different predictions the number of cargo airplanes will tripled in the nearest 10 year, "many of which will be for the non-integrated sector, suggests that these carriers will be heavily involved in locating new services in the future". (Gardiner & Ison, 2008, 57) In the study, authors also used three interviews with the airlines.

In the end of the research, Gardiner and Ison obtained factors that according to them have an influence "on the geography of non-integrated cargo airlines". "These factors can either positively contribute to an airline's decision by attracting them to an airport, or they can contribute negatively by dissuading or preventing airlines from operating to a particular airport." (Gardiner & Ison, 2008, 58) The name of the paper assumes that respondents had to be from different parts of the world, in other words international. The objective of the interviews was to gain a more in-depth perception of the results of the questionnaire. Therefore, the airlines interviewed were from Europe, the United States and Asia. Among two airport that participated

in the study, one was European and one from the US. As a result, Gardiner and Ison, using above-mentioned methods of data collection, "identified 15 factors which can influence the location decision of a non-integrated cargo airline." (Gardiner & Ison, 2008, 59) The list of the key factors turned out to be narrower than 25-factor list that was represented in the original questionnaire. In addition, it is worth mentioning that authors categorized these factors as Push and Pull. The list of the findings is presented below (see Figure 2). (Gardiner & Ison, 2008)

Pull factors	Push factors
O–D demand	Bilateral restrictions
Freight forwarder presence	Night ops capability[b]
Passenger airline ops[a]	Noise regulation
Presence of partner airlines	Infrastructure availability
Flying time/cost	Congestion
Location of competitors	
Airport charges	
Incentives	
Airport reputation	
Airport advertising	

[a] If the airline operates both passenger and freighter services.
[b] Only where the airline desires to operate night services.

Figure 2. Push and pull factors.
Source: Gardiner and Ison, 2008

The study of Starkie (2002) claims that the market segment and the availability of other airports in the proximity affect the market position of the airport. Usually, the competition amongst and airport market power are examined in the papers according to passenger transportation. In the scope of airfreight, airport competition was not a popular topic amongst researchers. However, as airfreight transportation is a relatively independent business, airport competition in terms of freight can be relatively strong, especially in Europe, where main airports are often located within a few hours of driving from each other. Thus, a system of criteria that cargo companies use for choosing the airports is necessary for both governments and airports to make those airports attractive for cargo airlines and, by all means, increase economic activity. (Starkie, 2002)

Kupfer et al. 2016 in their article discuss the choice process that airlines use when deciding the airport and its location for their cargo operations. In this process, airlines consider a set of

different factors, which officials and airports do not necessarily are able to affect. Although, the state is in position to influence the growth of the industries affected by air transportation in order to create a more attractive area for freight operations. In addition, governments can provide a stable regulatory environment for the airlines as well as a framework for nighttime flights, which make a region more attractive to airlines. It is true because airports are crucial part of the economy in terms of value-adding activities and attractive and competitive airports are important, especially from a government's perspective. (Kupfer et al., 2016)

The authors of the article also implemented an empirical study in order to evaluate the compromises that airlines make when choosing between different airports. They collected stated choice data from 26 airlines and used this data as input for various logit models. The results showed that, within the scope of the research, the presence of passenger operations is not a significant factor in the airport choice for scheduled cargo operations. This conclusion does not depend on whether the airline is an all-cargo airline or combination carrier. Moreover, to some extent, it contradicts with previous studies that were described above by Gardiner and Ison, 2008, in which passenger operations turned out to be important for combination carriers. (Kupfer et al., 2016)

A first reason for this difference between the studies can be found in the different scope. While Gardiner and Ison (2008) look at the airport choices worldwide, Kupfer et al. 2016 only focus on airport choices in Europe, where cargo is often transferred to trucks for the last stretch instead of being transferred to another aircraft. Second, study of Kupfer only covers freighter operations, which are by nature less related to passenger operations than the transport of air cargo in passenger aircraft. Third, it is not uncommon for experimental studies to yield opposite results than observational studies. (Lordan et al., 2014)

Gardiner and Ison were looking at non-integrated sector of cargo airline. However, in a different research authors investigated possibilities of collaborative activities. Ankersmit, Rezaei & Tavasszy (2014) researched horizontal air transport collaboration. In their study, collaboration is defined as a joint activity of at least two or three freight forwarders. The difference between collaborative and non-collaborative situation is represented below (see Figure 3 and Figure 4). The study was based "on a selective flow of air cargo transport of three forwarding companies and one air cargo handler" that operate at a Schiphol airport in Amsterdam. Authors suggest that the objective of such collaboration is to justify its usefulness from a point of view of single 3PL provider's transport. For this reason "the most important differences of combined and single transport are quantified using the following KPIs gathered from a dozen forwarding companies at Schiphol:

- amount of transport movements

- amount of cargo processed

- transport costs per kilo

- average throughput time of shipments" (Ankersmit, Rezaei & Tavasszy, 2014, 175-176)
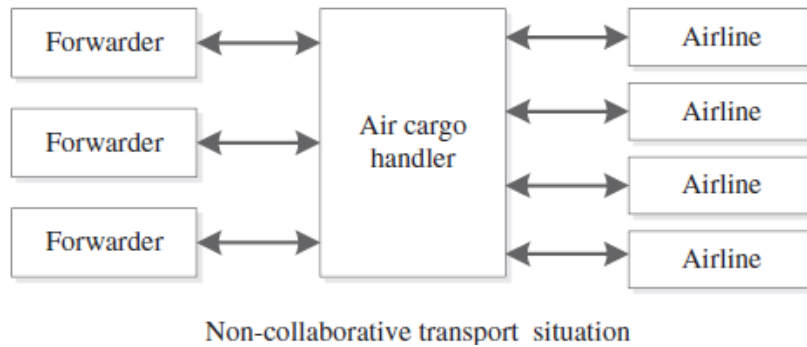

Non-collaborative transport situation

Figure 3. Non-collaborative transport situation

Source: Ankersmit, Rezaei & Tavasszy, 2014
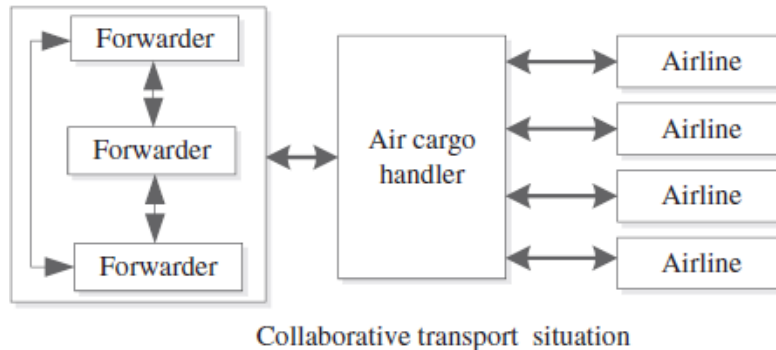

Collaborative transport situation

Figure 4. Collaborative transport situation

Source: Ankersmit, Rezaei & Tavasszy, 2014

Ankersmit, Rezaei & Tavasszy (2014) used both qualitative and quantitative methods of data collection (interviews and data sampling). In order to establish the opportunities for collaboration, authors used simulation method. As a result, they implemented a case study at Schiphol Airport and established that there are significant indicators that in the nearest future it will be hard for single companies to operate in air cargo market. The market has opportunities for combination carriers and horizontal collaboration that involves transportation of a number of forwarders at main freight airports. Although it is worth mentioning that seasonality should be

taken into account when we are taking about collaboration. This happens due to the fact, that different types of cargo have certain fluctuations in demand during the year. Therefore, "the primary focus should be on collaborating when it involves cargo of a more general nature that is not affected as much by seasonality." (Ankersmit et al., 2014, 177)

After implementing the simulation, authors concluded that collaborative activities could be beneficial for single cargo shippers. There is a higher number of individual shipments at a particular time, higher frequency picking up and deliveries for smaller forwarding companies without an increase in transport costs. Average throughput time of shipments for all collaborating companies is increased as well. Researchers mention that collaboration significantly decreases transportation costs for all the parties involved in the delivery chain. Moreover, collaboration results in more efficient use of resources and decreases the average load factor of individual forwarder transport fleet. (Ankersmit et al., 2014)

Chao et al. 2013 in their study provided a market segmentation of airline cargo transport according to service requirements of airfreight forwarders. Research was aimed at identifying the factors that influence cargo carriers and forwarders choice of the airline, by doing so authors tried to explore the problem of market segmentation. Authors used questionnaire as a Data collection method and cluster analysis for market segmentation. The questionnaire was designed according to suggestions in previous publications of different authors and interview with 10 experts in the research area, regarding service attributes of airfreight companies in Taiwan. (Chao et al., 2013)

"The sample of airfreight forwarders was selected from the list of registered members of the Association of Air Freight Forwarding and Logistics in Taiwan. The researchers have identified 36 service attributes. A number of service attributes in the end were established as significant to the respondents. These attributes are "cargo safety, freight rate, cargo tracing and tracking, flight punctuality, and ease of getting cabin space". (Chao et al., 2013, 1678)

Subsequently, Chao, Lirn & Shang used factor analysis to split 36 service attributes of airline cargo transportation to smaller sets of factors. They were able to identify significant patterns and group their results into factors. The airfreight forwarder respondents were separated into different market segments using cluster analysis. Authors acknowledged that "a large sample would ensure greater validity of the findings in reflecting the actual situation". As a result, six crucial service attributes, three market segments were identified: "professional service-oriented, empathy-oriented, and express service oriented airfreight forwarders." (Chao et al., 2013, 1678-1680)

Above mentioned articles were focusing on the supply side of the market, however there is a number of studies that had demand estimation as an objective. Totamane, Dasgupta & Rao in their paper tried to develop a model for air cargo demand forecasting. Big airplanes, such as passenger aircrafts, freight aircrafts, and charter aircrafts, are mainly involved in airfreight transportation. In terms of passenger transportation, freight supply and distribution depends on passenger flight schedules, which are organized according to passenger flows, thus the demand does not consist of passengers alone, and freight aircrafts are a crucial part of airfreight transportation. (Totamane et al., 2014)

In the result of the simulation that was implemented for different air carriers, authors concluded that their model was able to estimate demand with significant accuracy. In this model, they used some "generic predictors, such as time-varying functions, holidays, weekends, and so on." Obtained results help to increase average cargo load factors by 9-12 %. Although, the model can be improved by using a bigger number of predictors and region-specific factors. (Totamane et al., 2014)

May et al. (2014) study was based on the Virgin Atlantic Cargo's case. The main problem of the company was that inside the supply chain the necessary capacity was hard to predict. This is actually more of a whole industry problem than a specific company's problem. Freight forwarders do not pay for unutilized capacity previously reserved, the actual flight capacity of each flight is not precisely known until immediately prior to departure. The goal of the study was to optimize the KPIs (Key Performance Indicators) that were provided by Virgin Atlantic Cargo. Authors implemented Fuzzy multi-criteria decision-making tool in order to prioritize the KPIs. They mention the fact that network optimization is the most important KPI in this case. Other outcome-based KPIs of critical importance are optimizing density and overbooking. (May et al. 2014) It is possible to say based on research of May et al. (2014) that using KPIs and prioritizing them is a feasible solution for improvement in supply chain management.

Amaruchkul et al. (2011) provided another solution, which can improve SCM. Their study was focusing on air-cargo capacity contracts. In the paper, authors discuss the current situation in the service chain. Usually, airlines and cargo shippers have an agreement for using aircrafts, because cargo shippers do not have their own air fleet. Therefore, they "purchase bulk cargo capacity by contracting with airlines". When shipping is done across boarder, airlines usually offer additional services for carriers, for example, customs paperwork. The question of the study was how a freight forwarder should choose allotments and financial terms of its contract. "Carriers (airlines) use medium-term contracts to allot bulk cargo capacity to forwarders who

deliver consolidated loads for each flight in the contractual period (season). Carriers also sell capacity to direct-ship customers on each flight." (Amaruchkul et al., 2011, 35-36)

As a result of the study, researchers "propose contracts in which the forwarder pays a lump sum in exchange for a guaranteed capacity allotment and receives a refund for each unit of unused capacity according to a pre-announced refund rate." (Amaruchkul et al. 2007, 465) In this case, it is rather important to acknowledge that researchers only studied the case when cargo forwarder did not have its own aircraft. To help airlines deal with the imbalance in the demand for different routes, they proposed the tying capacity allocation mechanism. The mechanism enables airlines to use the leverage provided by a scarce resource to foreclose sales in, and thereby monopolize, an underutilized one. Airlines make the leverage work by excluding some forwarders from partial business temporarily and making the selected partners collaborate through good and bad conditions by rewarding them with scarcer resources. Airlines gain in terms of profitability by adjusting the resource allocation structure in light of resource utilization efficiency; that is, the enclosed forwarders have lower resource unitization efficiency from the selected forwarders. The effectiveness of the proposed mechanism has been validated with a case study. Both overall tonnage and revenue have recorded significant improvement. (Amaruchkul et al., 2011)

One of the most promising opportunities in terms of air transportation services that might be suitable for SMEs or entrepreneurship is a so-called "Flying Truck" concept or Road Feeder Service (RFS), which would enable providing differentiated, specialized qualitative services. In fact, the pure airfreight-forwarding sector implies very high investments for the buying, leasing, maintaining, etc. of the machinery park, i.e. aircrafts. It will be rather a provocative assumption that SMEs may possess the required financial resources to start / enter pure airfreight operations. (Hall, 2011)

However, according to the secondary research data gained by the Baltic Air Cargo project, among ca. 18 companies that offer airfreight transport services in Germany only few possess *real* aircrafts. The whole fleet of majority of airfreight forwarders consists of normal trucks only and the majority of these transport companies that have been successfully operating on the air cargo transport market are regarded as SMEs. And that were not the huge investments in the "hard-ware" infrastructure, i.e. aircrafts that allowed them to enter airfreight forwarding business, but rather strategically conceptual and "soft" changes. Rather small and medium transport companies with a "fleet" ranging from 10 to 30 ordinary trucks qualified themselves for air cargo transport business. According to the results of the "Baltic.AirCargo.Net", the importance of the RFS is constantly growing nowadays, e.g. in 2012 the relative volume of air cargo

transported by "flying trucks" in the biggest air cargo hub in the Baltic Sea Region - Copenhagen Airport is ca. 35% from the total cargo volume. (Siren et al., 2013)

The definition of "flying trucks" is scheduled trucks operating between two airports only, on behalf of an air carrier. Trucks are operating under a flight number and the cargo is moved under same conditions as normal air cargo and the liability is in accordance with the Montreal Convention. (Ou et al., 2010) In other words, "flying truck" operates as a normal truck between to airports (departure from an airport security zone – and arrival to another airport security zone only) on so-called Air Waybill (AWB) or air consignment. The same as a real air carrier, a "flying truck" might have several route numbers or flight numbers if it is transporting freight from more than one airline. The flying trucks are treated and handled exactly in the same way like real aircrafts, i.e. the "flying trucks" possess herewith exactly the same insurance as if the goods were transported by aircraft and on route number, they are fulfilling all custom and security regulations set by the relevant authorities as if the goods were really flying by air. The cargo transported by "flying trucks" is a real air cargo that must have fulfilled all required security and transport norms that apply to air cargo. (Grandjot et al., 2007)

Hsu, Chen and Chen, 2013 implemented a study on cargo service strategies. The results show that an airline should use smaller aircraft and offer greater frequency of flights for express service when shipping volume is low. Thus, not only airline operation costs but also shippers' inventory costs can be reduced by increasing flight frequency. The results also suggest that an airline should provide greater flight frequencies for high-value and time-sensitive cargos because shippers of such goods prefer efficient delivery. On the other hand, in the cargo market with mainly low time-value goods, airlines should not provide express shipping service because the shipping volume attracted by express service would be small, which does not justify the extra service cost. The findings imply that the higher the proportion of high time-value cargos to total shipping cargos, the larger the niche for airlines to provide express service, and the more the airline can charge. (Hsu, Chen and Chen, 2013)

In addition, the researchers found out that for perishable goods that need to be stored in a low temperature environment to avoid quality decay, shippers of frozen goods can save much more in decay costs than shippers of fresh or chilled if temperature control service is provided. The findings suggest that the lower the temperature environment in which the cargos need to be stored, the higher the shipping price the airline can charge. The results of different air cargo markets show that, no matter how great the shipping demand for perishable goods, temperature control service always belongs in the optimal shipping service combinations, which conforms to the airline's current operation in practice. (Hsu, Chen and Chen, 2013)

It is rather important to say that the list of empirical studies is not limited by the studies described in this chapter. However, there has not been that many researches in the field of air cargo transportation. There is a room for future studies, especially region-specific. Overview of literature for the Russian market is represented below.

1.3 Russia-specific practices and research gap

According to RBK Research 2014, nowadays in Russia there is no authority, which regulates cargo shipments through governmental transport system. Each type of transportation is regulated separately, so that there is no collaboration between players involved in the process. It is impossible to organize shipment in a way that it is mutually beneficial for all the parties taking part in the business. In 2012, the growth in market volume for air logistical services was estimated to be at the level of 6 %. (RBK Research, 2014)

However, currently the access to markets with regard to provision of complete route and operational rights is decelerated by numerous factors, including airport capacity and insufficient level of infrastructure. Despite certain improvements in the field of regulation of air transportation market in Russia, it should be acknowledged that the problems, related with establishment and operation of federal executive bodies authorized agencies in the field of air transpiration and governmental regulation, are not solved up until now. (Katyshev & Utepov, 2013)

Moreover, it is even the case that Russian air carriers, in general, can successfully compete with foreign ones. If we look at the profit structure, Russian companies have 54 % of profit from cargo shipment, whereas in Western companies it is not more than 30%. RBK Research 2014 claims that in 2012 that total market volume of Russian market was exceeding $ 12.7 billion. In terms of foreign trade, 58 % of all shipments are done by sea, 36 % - by railroad and about 4 % by road. Air transportation is more relevant for shipments inside Russian territory. Also, in maritime transport about 95 % of the Russian market is held by foreign companies. Although Russian market is growing, its potential has not been used to full extent. (RBK Research, 2014)

Despite the fact that freight forwarding is a growing market in Russia it has not been many studies in this area. Fisenko, 2011 discussed the problems and challenges of Russian transport and logistics. In his paper, there is a number of suggestions of how to increase efficiency of

logistics operation in Russia. The main issue here is the logistics problem of the delivery of goods by national transport system, especially in organizing and managing the railway, road and pipeline networks, as well as air transport, maritime and river transportation with the necessary infrastructure. In order to achieve that goal author suggests that companies need to use software for integration of their own materials and information and supply chain as a whole. In addition, efficient supply chain management leads to saving resources in various industries, not only 3PL market. (Fisenko, 2011)

The paper also suggests that Russian market has a room for forecasting and prediction activities. Accurate forecasts enable to anticipate and to organize accordingly resource allocation in order to face upcoming challenges instead of implementing expensive changes in capacities boot (redistribution) process and use of reserves. In a more general way, the logistical infrastructure remains the main problem in Russian market. The economy loses more than 1.8 trillion rubles form poor conditions of road infrastructure every year. This amount equals to about 2 % of GDP, which of course affects the cost structure of any business that uses transportation services. "The transport component in the cost of production in Russia has reached 20% or more", compared to less than 10% in developed countries. Such poor condition of road infrastructure leaves companies no other choice than use air as a type of cargo shipment. (Fisenko, 2011)

"Another problem is irrational development of goods and services distribution systems (the absence of a deliberate strategy of distribution systems in industry and commerce, lack of organized commodity markets at large and medium wholesale), inadequate and unstable rates of modern packaging industry development." (Fisenko, 2011, 35)

There are almost no empirical studies, specifically to Russian market. The one that has been done, is by Moser, Kuklinski & Weidmann (2014). They made a case study of third party logistics service providers in Russia. Initially authors have identified 15 companies that matched their criteria for research purposes ("country of origin, international business operations, significant local operations and at least ten years of operational experience in Russia"). Eventually, due to different reasons, the list of 3PL providers consisted of four companies. Those companies were Russian subsidiaries of four major 3PLs with Western European backgrounds. "All case companies had more than ten years of business experience in Russia, employed locally several dozens to more than 1.000 workers and provided services in the fields of transportation, contract logistics, value–added services, express deliveries and customs clearance using all modes of transport. " (Moser et al., 2014, 315)

Moser, Kuklinski & Weidmann used interviews as a data collection method for their case study. After those interviews, they compared the results to existing theoretical background from various articles and newspapers. "All interviewees highlighted *human resources* as a key resource for their operations in Russia." (Moser et al. 2014, 317) As a part of that problem, respondents also mentioned lack of transparency and big employee turnover rates. There is a gap in the educational sector, so western companies have invest in training of their employees. In the end of the analysis, researchers obtained the following findings, regarding financial, technological and organization resources:

- "Western companies in Russia can operate independently of the financial markets except for taxation aspects.

- Western companies in Russia adapt their financial resources primarily to the requirements of the political system.

- Western companies in Russia do not experience any major influence on their technological resources from any institutional context in Russia.

- Western companies in Russia can leverage their international organization structure to win international customers in Russia.

- Western companies in Russia have to adapt their international organization standards to attract local Russian customers." (Moser et al. 2014, 320)

Regarding asset management, it is hard for foreign companies to meet the requirements of both Russian system and their contracts with business throughout the world. In addition, there is a mismatch between the type of relationships between western companies and their customers and local suppliers. Usually, relationships with international clients are long-term and with local suppliers are short-term. In general, since Russia is a transaction economy, the highest influence have human resources and overall misbalance between the situation in Russian and in developed economies.

Research of Moser et al. (2014) was focused on the effect of transaction economy and involved case study of foreign companies that operate in Russia. There is a lack of research in air cargo transportation and especially for Russian market. This gap will be discussed below.

Research gap

Maloni & Carter (2006) have reviewed empirical studies in third-party logistics over 15 years. According to them, "much of the existing 3PL research assessed one geographical region, generally, the United States. Even rapidly developing economies throughout the world, especially in Asia and in China in particular, there is still a need for extended geographical scope in 3PL research, particularly to support practitioners as they expand import and export operations in other countries" (Maloni & Carter 2006). They also suggest that it would be reasonable to implement more theoretical studies, using various methods of data collection. It is hard to do an empirical study in 3PL market, due to its complexity. Moreover, when gathering data researchers face obstacle related to low response rates.

Feng et al. (2015) have also discussed the opportunities for potential research. It mostly relate to capacity management, terminal operations and supply chain coordination. The first topic that authors identify is capacity planning. "The available cargo capacity is uncertain because of many factors, such as aircraft payload, belly space, weather conditions, fuel weight, number of passengers on board, and passengers' luggage. This issue makes the forecasting of air cargo capacity a very complicated problem." (Feng et al., 2015, 325)

In addition, airlines are inflexible in terms capacities because quite often they use the same aircrafts for both passenger and cargo transportation. It is impossible to cancel the flight if there is a lot of room for cargo because passengers have to be served as well. "Airlines may address the imbalance in cargo demands by tying the capacities of the two types of routes and incentivizing forwarders to act in a desirable way." (Shiao et al., 2013, 168)

Amaruchkul et al. 2011 have researched pricing and contracting but there still plenty of opportunities for research in this area. Such as flexible and multi-leg contracts. Feng et al. (2015) have identified "three types of flexible contracts that are specific and are assumed to be potentially effective; these are dynamic orders with a high price, fixed orders with punishment, and overall fixed orders." (Feng et al., 2015, 327)There is a lack of studies on a larger scale, for example, for the entire network. Regarding airport terminal, authors suggest that "key parameters and cost functions for such a simulation can be derived by data mining. This study will be cross-methodological in nature. From another perspective, integrated operations of the cargo terminal can also be modeled as a stochastic programming problem." (Feng et al., 2015, 328)

Supply chain coordination was discussed in the previous part of the literature review. However, there is still a lot of opportunities for research. Demand forecasting a crucial part of

this problem. Hihara (2014) has established that "two most important players in an air cargo supply chain are the airlines and the forwarders. A great challenge that airlines face is demand estimation and capacity planning. An effective approach to improve capacity estimation is to make forwarders share their demand information." (Hihara, 2014, 89)

However, it is not necessarily good for air carriers. They might get unreasonably larger prices. "What complicates the matter is that in the air cargo industry, an airline usually works with multiple forwarders of a non-negligible size, and conversely, a forwarder collaborates with multiple airlines. This scenario differs from the situation in the goods supply chain literature and makes the mechanism design in the air cargo industry particularly interesting." (Feng et al., 2015, 328)

Due to complexity of the data collection process and problems that the research in Russia faces when it is needed to implement an empirical study, the focus of this particular paper would be more general. The author acknowledges that it is hard to do an empirical study in 3PL market, due to its complexity. Moreover, when gathering data researchers face obstacle related to low response rates. As Maloni and Carter (2006), Kiso et al. (2009), stated most of the research has been made specifically for USA. Since 2006, there has been a number of studies focusing on Asian countries, however almost nothing related to air cargo transportation in Russia. Therefore, the objective of this master thesis is to bridge this gap, by making a more general market study, using different methods of data collection.

Chapter 2. Research design and methodology

The research and study methodology are crucial for the master thesis in terms structure and correct approach to data collection and analysis. The aim of the study is to analyze current problems and trends in air cargo transportation in Russia, identify industry-specific challenges and compare the results with theoretical framework, secondary data and global practices in air freight management. To achieve this goal, firstly, based on secondary data there will be an overview of Russian airfreight market structure, main players, volumes and changes for the last five years. In order to answer research questions, after that, there will be a survey amongst air carriers and freight forwarders in order to identify key challenges and trends.

The survey will contain online questionnaire and two structured interviews. The interviews with freight-forwarding companies is necessary to get a more in-depth understanding of the issue. In the end, there will be a discussion of the results based on comparing them with scientific articles mentioned in the literature review, and with modern practices and trends in the industry. In this chapter, these approaches and stage of empirical study and the mater thesis itself are discussed in more detail, first is secondary data analysis and then primary data collection and analysis.

Secondary data analysis

The research method consists of how the researcher collects, analyzes, and interprets the data in the study. Secondary analysis is a systematic method with procedural and evaluative steps, yet there is a lack of literature to define a specific process. (Creswell, 2009). Innovations in IT have allowed accessing, collecting and storing huge amounts of data and increased its

accessibility for research purposes. (Johnston, 2014) In any research, the time when the data is collected must be considered, so the period of data collection is paramount (Boslaugh, 2007). Therefore, only reports and material for the last 3 years will be used in order to get an up-to-date structure of the market.

In order to create an overview of the market structure, in the beginning of the next chapter, it is important to use reports, market analytics and statistical materials that are available online. With much regret, obtaining new data or implementing a more in-depth market analysis is impossible due to various circumstances, such as absence of access to data. Therefore, for triangulation purposes secondary data will be used, not primary. The goal of using secondary data, both theoretical that has been discussed in the previous chapter and practical is to widen the possibility of comparing the results of the study with different sources and more importantly, use it for creating the structure of the survey questionnaire.

Primary data

In terms of primary data further will be discussed a survey amongst air carriers and freight forwarders in order to identify key challenges and trends. The survey will contain online questionnaire and two structured interviews. The interviews with freight-forwarding companies is necessary to get a more in-depth understanding of the issue.

Data collection and questionnaire design

The first stage of the data collection is a survey questionnaire. The survey strategy is usually associated with the deductive approach. It is a usual and logical strategy in business and management research and is quite often used to identify various questions both quantitative and qualitative. Therefore, it is usually used for exploratory and descriptive research. In general, this study could be considered as descriptive, so this particular method fits perfectly. Surveys enable the researcher to collect of big amounts of data from a sizeable population in a most time and cost efficient way. Survey strategy is often implemented by using a questionnaire that is applied to a sample. It allows standardization of the obtained data and provides a lot of room and easiness to future analysis comparison. Moreover, the survey strategy is viewed as trustworthy by the public in general and is both relatively easy to analyze and to understand. (Franklin & Walker, 2014)

The survey strategy allows collecting quantitative data, which can be used in analyzing quantitatively using descriptive and inferential statistics. In addition, the data collected using a survey strategy can be used to suggest possible reasons for particular relationships between variables and to produce models of these relationships. Using a survey strategy gives more control over the research process and, when sampling is used, it is possible to generate findings that are representative of the whole population at a lower cost than collecting the data for the whole population. It is time consuming to ensure that the sample is representative, designing and piloting the data collection instrument and trying to ensure a good response rate. (Franklin & Walker, 2014)

Many researchers complain that their progress is delayed by their dependence on others for information. The data collected by the survey strategy is unlikely to be as wide-ranging as those collected by other research strategies. For example, there is a limit to the number of questions that any questionnaire can contain if the goodwill of the respondent is not to be presumed on too much. The questionnaire, however, is not the only data collection technique that belongs to the survey strategy. Structured observation, of the type most frequently associated with organization and methods (O&M) research, and structured interviews, where standardized questions are asked of all interviewees often fall into this strategy. (Saunders, 2009) Therefore, for this study on-line questionnaire and structured interview will be used for data collection.

The questionnaire design process started with the formulation of survey objectives and information requirements and continued with the following steps: - consult with data users and respondents; - review previous questionnaires; - draft the questionnaire; - review and revise questionnaire; - test and revise questionnaire; - finalize questionnaire. (Franklin & Walker, 2014)

Responding to a question is a complex process. Respondents must first understand the question. They must then search their memories or records to retrieve the requested information. After retrieving the information, they must think about the correct answer to the question and how much of that answer they are willing to reveal. Only then do they communicate an answer to the question. Each of these processes may be a source of error. (Saunders, 2009)

In this particular questionnaire there were used three types of questions: closed, open and two-choice. Closed questions are questions with multiple choice in general and have provided responses. Closed questions are usually answered by choosing one or more answers from provided responses. The possible responses listed for a question are called response categories. Closed or multiple choice questions with the possibility to choose more than one option are the majority of the questions listed. (Franklin & Walker, 2014)

Open questions are those where response categories are not provided to the respondent. The respondent provides an exact numerical figure or answers the question in his or her own words, which is either written down, in the case of self-enumeration, or recorded verbatim by the interviewer. Open questions should be followed by sufficient space to record the response. (Franklin & Walker, 2014) In this questionnaire, only two of the questions were open, in order to speed up the responding process.

The two-choice question is the simplest version of a closed question. Often it is a yes/no question and is used to split the respondents into two distinct groups. (Franklin & Walker, 2014) In this case, two-choice questions were only yes/no and related to the fact that respondents had to agree or disagree with a particular statement.

The questionnaire was designed based on secondary data in a form of a Microsoft word file and tested on two companies. The results showed that it would have been more efficient to use one of the online survey websites in order to increase the speed of the process and create a smoother and easier results analysis. In addition, the number of questions had been reduced from 15 to 10 because according to feedback companies do not want to spend more than 7-10 minutes answering the questionnaire.

The structure of the questionnaire is as follows:

1) What kind of goods are usually transported by air? (open question)

2) What are the main challenges of air cargo transportation market in Russia? (multiple choice, more than one answer possible)

   ✓ Low level of personnel qualification
   ✓ High price of shipment to long distances
   ✓ Cargo flow imbalance (overloading of Moscow port)
   ✓ Increased fees at airports
   ✓ High cost of ground handling
   ✓ Overall economic conditions (sanctions, exchange rates etc)
   ✓ Out-of-date aircraft fleet
   ✓ Decrease in number of airports
   ✓ Customs regulations
   ✓ Other (please specify)

3) What is the main strategy of balancing costs versus value and cost versus benefits for air carriers and forwarders? (open question)

4) The growth rates of air cargo transportation are decreasing. Is this tendency temporary? (multiple choice, more than one answer possible)

✓ No. Airfreight is losing the competition to other modes.
✓ Yes, but the reason is hard to identify
✓ Yes. Growth rates are decreasing because of economic crisis
✓ Hard to answer

5) What are the main current tendencies in the market? (multiple choice, more than one answer possible)

✓ Decrease in volumes of domestic shipment
✓ A shift towards international transportation
✓ Market is affected by the growth of online sales
✓ The main goal for freight forwarder is to keep the position in the market
✓ Other (please specify)

6) Do you agree with the following statement: "Due to contra-sanctions, the flow of goods has significantly changed its direction and perishable goods, which used to be transported from Europe by car, are now transported by air ". (Two-choice)

✓ Yes
✓ No

7) What in your opinion characterizes the multimodal opportunities of Russian transportation system? (multiple choice, more than one answer possible)
✓ Price and cost competition with other modes of transportation do not allow the necessary volumes of air cargo for airport infrastructure to develop
✓ Lack of logistics operators that are capable to organize cargo transportation with minimal price using multimodalism
✓ The lack of airport locations (especially in small towns)
✓ Other (please specify)

8) To what degree in your opinion the Air Feeder Service in Russia is developed. (multiple choice, only one answer possible)

✓ Well developed
✓ Almost not developed
✓ Not developed. The flight and delivery are separated.
✓ Other (please specify)

9) Do you think it is necessary to introduce international standard e-freight and paperless invoicing of transit cargo? (two-choice)

✓ Yes
✓ No

10) What do you think it is necessary to do in order to increase the attractiveness of air cargo transportation market in Russia? multiple choice, more than one answer possible

- ✓ To increase the number of spaces for aircrafts inside airports
- ✓ To increase airports' conditions
- ✓ To increase personnel qualification level
- ✓ To optimize the cost of service
- ✓ To develop the network of hub-airports and correlation of rail- and air transport
- ✓ Other (please specify)

In the first phase, a database containing information about Russian 3PLs was used. The selection process included companies offering differing ranges of services and more importantly using different modes of cargo transportation. This information was obtained through a number of secondary sources such as company websites, company reports, and articles in industry magazines. Including companies of differing size. The size of 3PL companies may have an impact on their opportunities to diversify the modes of cargo transportation. Finally, list of 124 companies was selected as output of this phase. In the second phase, an email and (or) enquiry was conducted to secure the acceptance of companies to participate in the questionnaire and to check both the breadth of service provided and the overall approach to decision-making.

The second stage of data collection is cased-based structured interview. Robson (2002) defines case-based study as 'a method of collecting data which includes an empirical analysis of a specific modern issue in its day-to-day environment using multiple sources of evidence'. Yin (2003) also mentions the importance of the environment. The debatable thing here is where are the borders of the modern issue itself and the environment in which it is operating on a daily basis. In this master thesis, the author uses more of a survey-based approach then a case study. It is important to highlight the difference between them. Although, the research is implemented within the environment the possibilities of exploration and understanding are more limited.

A single case is often used when it is important to highlight an outstanding issue or a very important one on the context of the research. The objective for having several cases refers to the situation when there is a need to identify whether the results of the first case are the same as others and there is a possibility to generalize the findings. For this reason Yin (2003) argues that multiple case studies are quite often more applicable the single case studies, because when you decide to use a single case study, you will have to justify your choice more strongly. Moreover, a well-implemented case study can allow the researcher to question an existing theory and provide a basis for future research studies. (Yin, 2003)

The terms quantitative and qualitative are used widely in business and management research to differentiate both data collection techniques and data analysis procedures. In order to

understand the difference between them it is worth mentioning that on refers to numeric and the other to non-numeric data. Quantitative method most often is described as a form of data collection and analysis that has numerical data as a result. On the other hand, qualitative is used predominantly as a synonym for any data collection technique (such as an interview) or data analysis procedure (such as categorizing data) that generates or use non-numerical data. (Yin, 2003)

However, it is worth noting that some authors, for example Tashakkori and Teddlie (2003), use the more generic term research design when referring to multiple methods. When deciding what research method to use, one can therefore either use a single data collection technique and related analysis procedures (mono method) or use more than one data collection technique and analysis procedures to answer your research question (multiple methods). Such practice is becoming more and more popular amongst management and business studies, when the same research may implement both quantitative and qualitative techniques and procedures in combination as well as use primary and secondary data. (Tashakkori & Teddlie, 2003)

The information-oriented process suggested by Flyvbjerg (2001) has inspired the approach used to select case companies. The author argued that in order to maximize the information potential from small samples, cases need to be selected based on expectations of their information content. This selection process has been organized into two phases: (i) choice of a preliminary set of companies and (ii) phone enquiry to determine willing to participate in the study. (Flyvbjerg, 2001)

The following definition of 3PL, adapted from the definition provided by Berglund et al. 1999, has been used in this study: "Third-party logistics are activities carried out by a logistics service provider on behalf of a shipper and consisting of at least transportation. In addition, other activities can be integrated into the service offering, for example: warehousing and inventory management, information-related activities, such as tracking and tracing, and value added supply chain activities, such as secondary assembly and installation of products" (Evangelista et al., 2013, 978)

To answer the two research questions identified in the previous section, a qualitative approach has been used based in the analysis.

A number of factors motivates the use of qualitative methodology in the context of this research. First, as shown in the previous section, the vast majority of papers published in this area have used quantitative methodologies, leaving the value of qualitative analyses largely untested. Qualitative methods such as case-based questionnaire analysis can generate new

insights (Seuring, 2008). Second, the main purpose of this research is explanatory and theory building in nature. Finally, the researcher argued that the survey method is an effective means of collecting in-depth information.

The interview will be carried out mainly to gain insights into main issues of air carriers and forwarders that were identified in the questionnaire. What seems to be the problem, how the company does balances cost against value and cost against benefits. In general, interviews are implemented in order to verify the results of the questionnaire and can be described as a tool of post-hoc analysis.

A multiple method approach was chosen for this research. One of the main benefits associated to the use of multiple methods is that the comparison of two or more data sources supports explorative investigations. The empirical analysis has been divided into the following four steps: company selection, interview protocol, data collection, analysis and interpretation

Company selection

In the first phase, a request to the Career Center of Graduate School of Management, St-Petersburg has been made. The goal was to find a company (companies) that are involved in air cargo industry and willing to participate in the study. The Career Center has contacted Cargo Terminal of Pulkovo International Airport in Saint Petersburg, which has agreed to assist with organizing thee interview.   Finally, two companies were selected as output of this phase. Two structured interviews were conducted at the company's offices at the Cargo Terminal facilities. The following paragraph will provide the interview protocol, the text of both interview could be found in the Discussion section of Chapter 3.

Interview protocol

The interviews were conducted using a structured data collection guide that was designed based on the literature review and the results of the survey. This interview tool included open and multiple questions relating to the following:

    1) general company information
    2) modes competition

3) balancing cost against value

4) balancing cost against benefits

5) multimodality and technology

6) market trends

7) market challenges

Data collection

The data collection guide was sent to the respondents in advance to allow them to familiarize themselves with the topic. The respondents were interviewed in face-to-face meetings at the company's office at the Pulkovo Cargo Terminal. It was agreed that company name would remain anonymous to encourage openness of response. Such information has been integrated with information obtained from other sources (e.g., company reports, article published on industry magazines, logistics website and portals). In this way, information was triangulated across data sources and thus improved the validity of the research.

Data analysis

The information were analyzed using an approach that involves comparing evidence and observing differences and similarities. The information collected from interviews has been recorded and transcribed. The analysis of interview transcripts followed the two approaches suggested by Easterby-Smith, Thorpe, and Jackson (2012): content analysis and grounded analysis. The former involves interrogating the data for constructs and ideas that have been decided in advance. The latter involves letting the data "speak for itself" and letting it guide the researcher towards an understanding of the data.

A combination of both approaches was adopted. The transcript analysis employed involved four main stages (see Fig. 5):

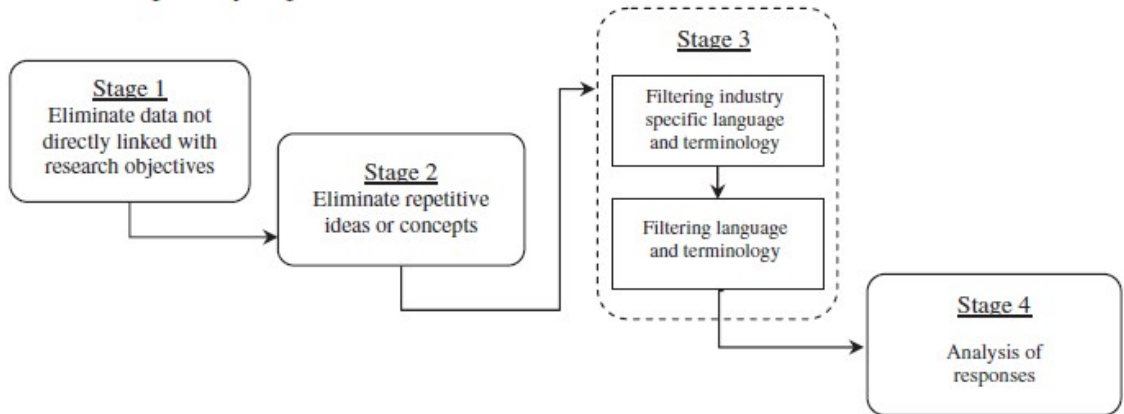The transcript analysis process.

Figure 5. The transcript analysis process

Source: Easterby-Smith, Thorpe, and Jackson (2012)

Stage 1 reflects the advice of Robson (2003) that good transcript analysis has to be aimed squarely at answering the research questions asked or addressing the overall research objectives. Stage 2 recognizes that repeated use of a particular word or phrase by a single respondent does not necessarily imply that the concept in question has particular importance beyond the specific environment in which that respondent is based. Stage 3 is essentially a two-stage process of linguistic filtering. The final stage involves the analysis of data based on and contrasting the main issues set out by respondents.

The final step was to compare the results of the survey with the results of the interview with secondary data in order to have two levels of results and achieve triangulation (see Fig 6).
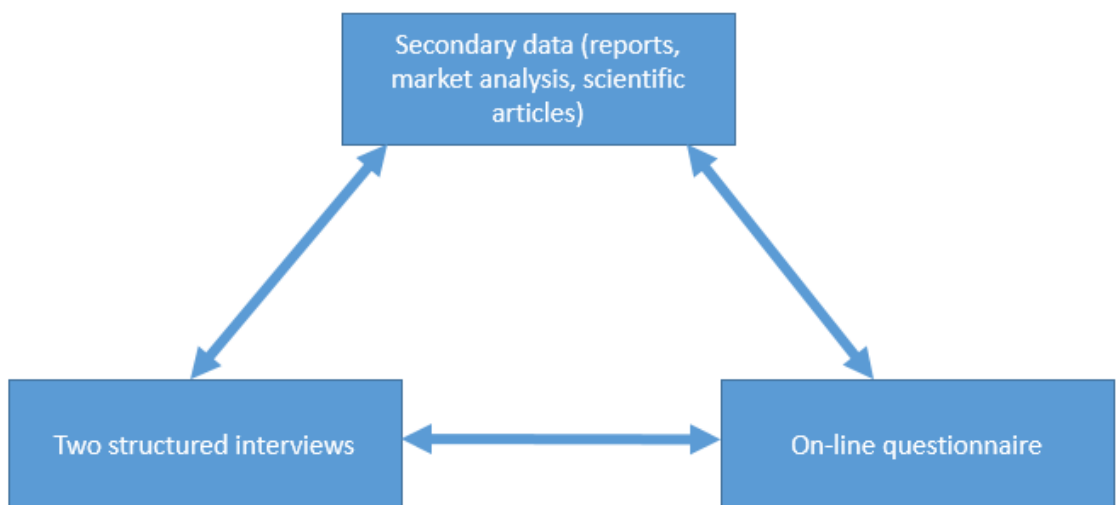
Figure 6. Data collection and validation.

Source: created by author

In next chapter, a full data analysis will be provided and discussed. The conclusions that can be derived from the findings will also be described subsequently. In addition, there will be an analysis of key themes and patterns in the data in order to identify crucial findings and to develop propositions and suggestions.

Chapter 3. Efficiency factors of air cargo transportation in Russia

3.1 Findings

Market structure

According to International Air Transport Association (IATA), the growth of international airfreight shipment in 2013 in comparison with 2012 was 3.6 %. Such positive dynamics were attributed to the development of Middle Eastern and European regions. In terms of Russian market, the situation was more pessimistic. The growth in 2013 in comparison with 2012 was only 1.6 %. The main players on the market had the following situation: AirBridgeCargo showed 17, 5 % growth rate, Aeroflot had 6, 8 % decrease in comparison with 2012. Such decline of Aeroflot could be explained by decision of company to temporarily stop using freight aircrafts. Top-5 air cargo companies in terms of freight turnover in 2013 are presented in Table 1 below. It

is important to say that top-5 carriers account for 88, 2 % of all air cargo in Russia. Market share of Russia in the world's air cargo transportation in 2013 was 2 %. 80% of Aeroflot volumes is general cargo, 10% perishable goods, animals, pharmaceuticals etc., and 10 %- post deliveries. S7 is mainly transporting fast moving consumer goods (FMCG), pharmaceuticals, foods, post deliveries and electronics. Sheremetyevo Cargo has a precise division of all goods transported internally by types: FMCG (32%), equipment (14%), clothes (12%), food (11%), and post (8%). (Russian Direct Investment Fund, 2013)

Table 1. Top-5 air cargo companies 2013

Company	Freight turnover, tkm
AirBridgeCargo	2976
Aeroflot	1093
Transaero	407
Volga-Dnepr	304
S7	85

Source: Russian Direct Investment Fund, 2013

In January-October 2015, according to Rosaviation report, Russian airlines transported around 870 000 tons, which is 3 % than in 2014. Absolute leader of the market AirBridgeCargo (Volga-Dnepr Group) held 58% of the freight and was the only air carrier that showed growth, however most of the cargo flow was transitional. AirBridgeCargo is a unique project for Russia, one of the biggest cargo airlines in the world and the majority of its cargo only gets to Russia during intermediate landing and is in no way related to Russian economy. The market share of the second carrier in international transit is 26 % in 2015 and 21%. Volumes of cargo shipments for the 10 months decreased by 14, 5% to 208 691 tons, international shipments (without transitional) remained at the same level. Market structure for 2015 is represented on Figure7 below. The reason for this in 2015 were increased exchange rate, decline of import, decrease in industrial production and drop in market volumes. Cargo transportation in general reflects the state of events of the economy and in general is affected by a number of macroeconomic factors. (FAVT, 2015)

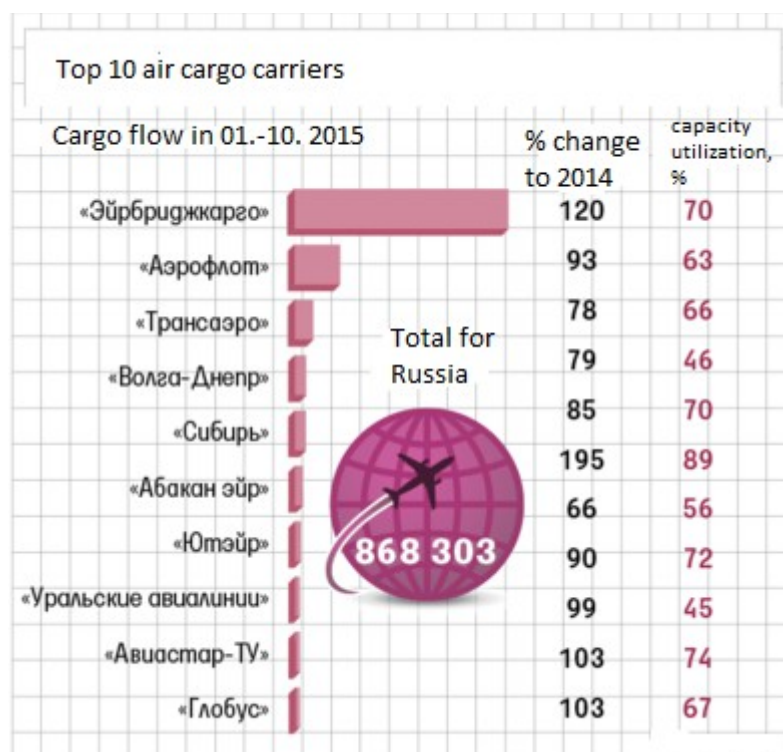| Top 10 air cargo carriers		
Cargo flow in 01.-10. 2015	% change to 2014	capacity utilization, %
«Эйрбриджкарго»	120	70
«Аэрофлот»	93	63
«Трансаэро»	78	66
«Волга-Днепр»	79	46
«Сибирь»	85	70
«Абакан эйр»	195	89
«Ютэйр»	66	56
«Уральские авиалинии»	90	72
«Авиастар-ТУ»	99	45
«Глобус»	103	74
	103	67

Total for Russia — 868 303

Figure 7. Top 10 air cargo carriers

Source: FAVT, 2015

The basis of the business of international airlines is still the domestic market, which accounts for more than a half of all cargo volumes and creates unique competitive advantages for an international air carrier. Russian airlines cannot really depend on the domestic market because it is highly imbalanced. The majority of cargo airlines face this problem when opening new flight destinations. For example, in Norilsk for every 15 tons of inbound cargo there is only ½ ton of outbound cargo, so exclusively on-sided cargo flow. The map of major Russian airports with percentage of processed of total cargo flow is on Figure 8.

Figure 8. Cargo flow distribution in Russia

Source: Russian Direct Investment Fund, 2013

Questionnaire

The questionnaire was sent to 124 companies by e-mail and there are 31 responses recorded. The response rate is 25 %. The names of the companies that participated in filling in the questionnaire will not be mentioned due to confidentiality reasons, and are unknown to the author of the paper, because the survey was anonymous. Some of the questions had to be deleted from the results due to insufficient number of responses. For example, two open questions did not get enough responses, so it was decided to address them in structured interviews. The rest of the responses are shown below. Firstly, the most important questions on current challenges and trends are shown on Table 2 and 3.

Table 2. Challenges of air cargo transportation in Russia

Response options	%	Absolute number
High cost of ground handling	80,65%	25
Overall economic conditions	80,65%	25
Increased fees at airports	64,52%	20
Cargo flow imbalance	48,39%	15

Customs regulations	29,03%	9
High price of shipment to long distances	25,81%	8
Decrease in number of airports	25,81%	8
Low level of personnel qualification	16,13%	5
Out-of-date aircraft fleet	9,68%	3

Table 3. Trends of the market

Response options	%	Absolute number
The main goal for freight carriers is to keep the position in the market	93,55%	29
Decrease in volumes of domestic shipments	70,97%	22
Market is affected by the growth of online sales	29,03%	9
A shift towards international transportation	19,35%	6
Increasing security measures	19,35%	6

Players in air cargo transportation market in Russia consider high cost of ground handling, overall economic conditions and increased fees at airport as main challenges that they face when operating in the market. It is very important to highlight that at the same time level of personnel qualification, customs regulatory system and high price of shipment to long distance ae not viewed as a constraint to their business. At the same time, the main trends of the market according to results of the survey are to keep the position in the market and an overall decrease in volumes in shipments. The second trend is obvious and is backed by secondary data. The participants of the survey do not consider an increase of online sales as a driver of the market, but it seems be one to the author of the paper. The reasons for this discrepancy will be mentioned in the discussion section.

The topic of intermodality has also been addressed in the questionnaire and the responses are shown on Table 4. Respondents do not view lack of logistics operators with multimodal capabilities as a constraint to multimodalism in Russia, the infrastructural problems are much more important. To support that idea, operators consider price, cost competition with other modes preventing factors for infrastructural development, and increase in volumes. In addition, there is a lack of regional airports. Talking about Air Feeder Service in Russia, almost 75% of respondents view it as almost not developed (see Fig. 9).

Table 4. Multimodal opportunities of Russian transportation system

Response options	%	Absolute number
Price and cost competition with other modes of transportation does not allow the necessary volumes of air cargo for airport infrastructure to	96,77%	30

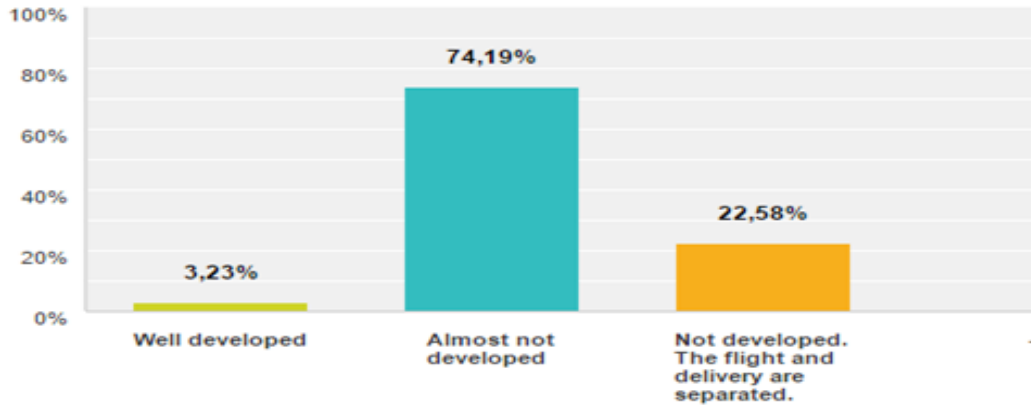|		
develop		
The lack of airport location (especially in small towns)	61,29%	19
Lack of logistics operators that are capable to organize cargo transportation with minimal price using multimodalism	38,71%	12

Figure 9. Air Feeder Service in Russia

Participants of the survey were also asked about the importance of introducing the e-cargo standard in Russia. The vast majority of respondents thinks it is necessary to do it (see Fig. 10)
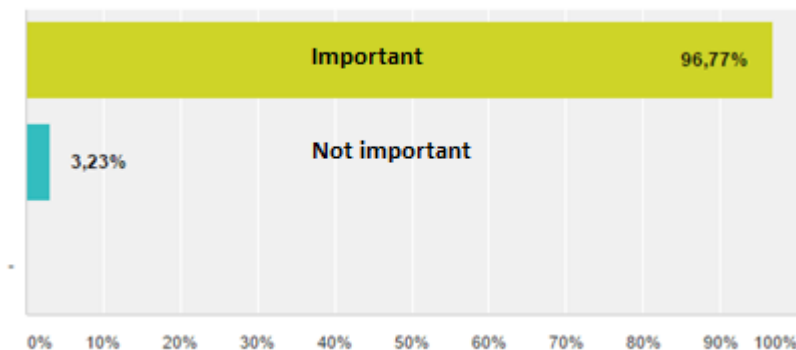

Figure 10. Importance of introducing e-cargo standard

The question related to ways of improvement and potential development has received the following responses (see Table 5). Freight forwarders and carriers mainly support the idea that improvement can be reached by optimizing the cost of service. This idea is almost the same as the one in Table 3 that companies only worry about cost-cutting opportunities. Improving the conditions of the airport is also viewed as a potential for the market, however these improvement again are not connected with increasing the number of aircraft parking spaces and runways, developing the network of hub-airports and correlation of rail- and air transport, increasing the

level of personnel qualification. Just using the results of the questionnaire it is hard to make a conclusion of what do respondents mean by improving the conditions of the airport, therefore that question was addressed during the interviews.

Table 5. Potential for development

Response options	%	Absolute number
optimize the cost of service	93,55%	29
increase airports' conditions	61,29%	19
increase personnel qualification level	32,26%	10
develop the network of hub-airports and correlation of rail- and air transport	19,35%	6
increase the number of aircraft parking spaces and runways	6,45%	2
stop all the operations with foreign carriers	6,45%	2

Apart from ways for improvement, companies were asked to forecast the future of the market and the responses are represented on Figure 11 below. More than a half think that volumes are decreasing because of the economic crisis and this tendency is temporary, however a third thinks that airfreight has completely lost the competition to other modes of transportation
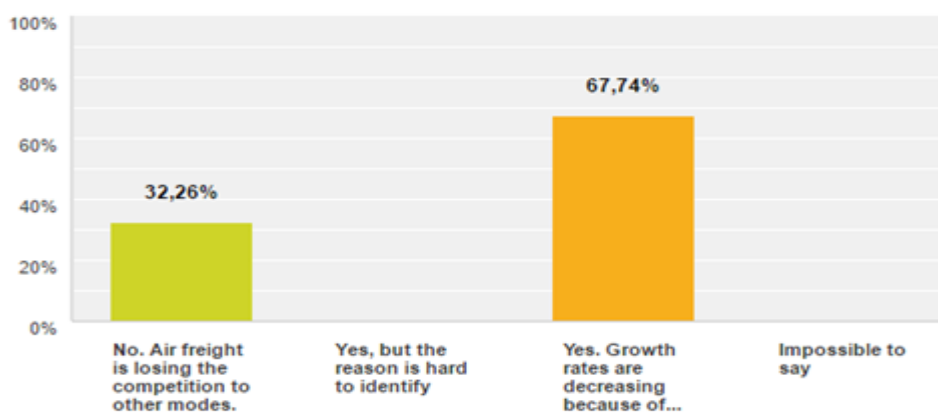

Figure 11. Volumes decrease tendency

Interview results

Interview 1.

The interview was conducted with a representative of a logistics and shipment company at the Pulkovo Cargo Terminal Office. The representative was a manager of that particular office. For confidentiality reasons is it going to be referred to as Company A.   The company's head office is located in Saint Petersburg. The interview lasted about 45 minutes and included questions that were described in Chapter 2. The interviewee was to elaborate on the questions asked in the questionnaire with a goal of verifying the results of the survey. Here is the transcript that has been recorded in the written form by the author of the master thesis:

The competition between different modes is sometimes "nominal". It mostly depends on type of the product and on the urgency of the delivery. If we disregard these conditions, in general in winter it is cheaper to deliver the goods by road for up to 2000 km and in summer for up to 3500 km. It is hard for airlines to compete with other modes in terms of volumes. Currently there is a trend of volumes decrease. In addition, the air cargo market in Russia is highly dependent on passenger market. Most airlines that ship cargo as well prioritize the passengers because they provide much more revenue. Airlines determine the number of flights and destinations and are not "client-oriented" in that sense. A good example here is that in Pulkovo there is only one flight to Yakutsk a week, so logistics companies and agents are forced to adjust accordingly.

The main methods for balancing the costs and benefits are the following:

- to provide discounts for increase/decrease of the delivery time;
- widening the network of destinations (airports lower the land handling cost for new destinations;
- Switching to other cargo terminals
- Reducing the number of staff to minimum
- For airlines : increasing the tariffs when using wide body crafts and economies of scale
- Reduction the rates of flight service

For 3PLs right now, the main method of balancing cost and value is diversification of their services and entering the market of additional services (i.e. door-to-door). In that sense multimodalism is a growing trend for 3PLs, especially international companies (like DHL, Pony Express) have good market capabilities. Air Feeder Service as it is in other countries does not exist in Russia. Although, there is a demand for it. It is not profitable for terminals to have their own car fleet, so in most cases the air transportation and delivery are separated. It is more beneficial in terms of cost for clients to organize the delivery themselves. In most cases, passenger aircrafts are used for cargo transportation. The terms are that one pallet cannot exceed 4 tons; therefore, for cargo higher in volume wide body crafts are necessary. However, in

Pullover Cargo Terminal only Emirates airlines possesses such aircrafts. In Moscow Aeroflot uses them as well. The introduction of e-freight standard and paperless transit goods invoices is good as a concepts but the representative of Company A does not consider this to happen any time soon and, moreover, it is highly unlikely.

The decrease of oil prices does not help to cut costs for logistics companies. The airline (air carrier) determines the tariff that includes fuel charge. Fuel charge almost does not affect the market. The airline sets the tariff due to market demand and capabilities. It changes very often with high volatility and fluctuations. Imbalance of cargo flows. The reason is that Moscow is a hub and has different level of intensity of flights and economies of scale, therefore quite often has lower prices, then say Pulkovo. Company A also considers the main goal for logistic companies is to keep the position in the market. The other trend is reduction of volumes. On average since last year, the weight for one invoice has decreased by 25 %.

The Company A was asked to name the main challenges as well:

- Imbalance of cargo flows. The reason is that Moscow is a hub and has different level of intensity of flights and economies of scale, therefore quite often has lower prices, then say Pulkovo.
- Increase in airport fees
- High cost of ground handling
- Terminal handling
- Overall economic conditions
- Underdevelopment of regional airports. However, this factor has the minor importance.
- The main factor is that all air cargo operations are connected with Cargo Terminals. Except for Moscow other destination have no competition and terminal have a monopoly position and can sets prices at whatever levels, this imposes additional challenges for forwarders and carries.

The overall potential of the market is hard to put into numbers. The market is mainly affected by macroeconomic circumstances and therefore in the nearest future it is hard to anticipate growth. It is extremely unattractive right now and almost all 3PLs that do use air transportation diversify their operations and provide a much wider range of services. Airlines to do not consider cargo as a main source of revenue and attend to passengers much more, leaving cargo as a "side" business.

Interview 2.

The interview was conducted with a representative of a freight forwarding company at the Pulkovo Cargo Terminal Office. The representative was a manager of that particular office. For confidentiality reasons is it going to be referred to as Company B. The company's head office is located in Moscow. The interview lasted about 20 minutes and included questions that were described in Chapter 2. The interviewee was to elaborate on the questions asked in the questionnaire with a goal of verifying the results of the survey. Here is the transcript that has been recorded in the written form by the author of the master thesis:

It is difficult to say there is mode competition; all else being equal air transportation is losing to other modes. Moreover, delivery times play a crucial role in this, choosing the mode depends on urgency and the value of the cargo. Company B also acknowledges high dependency of air cargo transportation on passenger route network and airlines consider passenger transportation as a main source of revenue. It is hard for airlines to compete with other modes in terms of volumes.

Since it is a monopolized market, many small and medium companies have no other choice but to diversify and apply cost-cutting technics in order to keep their position at the market. Such as, opening new destinations, cutting cost in terms of personnel and others. Companies have to diversify and provide discounts. Some of the freight forwarders switch to tourism and even start to sell tickets, because they are "short" money and are very liquid.

Almost all regional airports require a lot of investments for recovering and building the cargo handling infrastructure, for purchasing modern equipment and technologies. It is quite often, that airports do not have cargo terminals at all, and are forced to refuse the customer in cargo service because they do not have loading/unloading equipment, transportation tools (forklifts) and as a result no appropriate personnel. The e-freight standard is viewed as necessary but again impossible.

In 2015 Transaero remained the third air carrier in the country and all its cargo flows are going to be grabbed by Aeroflot. Transaero was damping and had much lower tariffs, now the situation is going to change. Therefore, Aeroflot is abusing its power by "ruining" Transaero. Company has also identified high cost of ground handling, terminal handling and overall economic situation as main challenges. Company B does not expect many changes in the nearest future and considered attractiveness of the market as low, the market is mainly affected by economic trends. Again, it is possible to say that for airlines passengers are far more important than cargo, which does not get a proper amount of attention.

3.2 Discussion

The main challenges of the 3PL companies in air cargo transportation market in Russia are high cost of ground handling, overall economic conditions, increased fees at airports, cost of terminal handling, monopolized market and underdevelopment of regional airports infrastructure. The results of the questionnaire survey are more or less the same, except interview companies also indicated terminal operations and monopolized market.

The relation between air cargo demand and economic activity has been very well documented in the literature (Kasarda & Sullivan, 2006; Chang and Chang, 2009) indicating that air cargo volume and GDP per capita are mutually interdependent and causal. The flow of airfreight in any country depends on the economic relations with other countries, more specifically export and import, the cost of transportation and rates of exchange. In this case, it is worth mentioning that airfreight transportation is a driving force of trade between economies, predominantly countries that are far away from each other. Exchange rates have played a crucial role in Russian market and have certainly affected the overall performance and cargo volumes.

A study by de Lima et al. (2007) in Brazil has shown that the most relevant aspects found in their survey are related to price and cost reduction, but with a certain focus on the need for planning by airlines and by airport administrators in order to create better operating conditions. Air cargo agents stated their difficulties in dealing with Brazilian airlines because of the lack of infrastructure. This results in an unbalanced game between national and international agents. National and international airlines complain about the lack of airport infrastructure and about the air traffic control, unable to handle their operations in a more rapid and efficient way, thus resulting in higher costs.

Therefore, the results of this study show similar results, high cost of ground handling, increased fees at airports and cost of terminal handling are all related to infrastructural problems. The main trend of the market according to results of the survey is to keep the position in the market, so again price and cost reduction is viewed as the factor of primary importance. The cost reduction strategy involves opening new destinations, because airport lower the land handling costs for new destinations. However, this only relates to airlines not to freight forwarders. Airlines can use economies of scale when using wide body aircrafts by increasing tariffs or switch to other cargo terminals. The last thing is possible for Moscow Aviation Unit (MAU). For forwarders the strategy is to reduce the number of staff to minimum, which not a very surprising way and is not industry-specific at all. Some companies postpone the projects or extend them in

time because of the world economy, sanctions against Russia and the contra-sanctions, devaluation of ruble and drop of oil prices, capital outflow and decrease of investment activity

It is very important to highlight that at the same time level of personnel qualification, customs regulatory system and high price of shipment to long distance are not viewed as a constraint to their business. The participants of the survey do not consider an increase of online sales as a driver of the market, but it seems be one to the author of the paper. Perhaps, respondents do not have the overall picture of the market and probably do not work closely with online orders, so this discrepancy is understandable. In addition, the low level of personnel qualification is not a challenge for companies in the market. A study by Moser et al. (2014) of western companies, operating in Russia showed that all interviewees highlighted human resources as a key resource for their operations in Russia. As a part of that problem, respondents also mentioned lack of transparency and big employee turnover rates.

Another very interesting and surprising result is that customs regulatory system is not considered as a challenge by participants of the survey and interviewed companies. However, in literature (Fisenko, 2011) and many other materials on the market custom is viewed as a major constraint for effective logistics in Russia. Not transparent system of customs regulations prevents air cargo transport from exploiting its main competitive advantage – speed. The price goes up as well, and the client is forced to search for alternative modes of delivery, often at the expense of preserving the quality of goods. Of course, there are some minor attempts to solve this issue; however no practical results can be noticed so far. For example, creation of Customs Union between Russia, Belarus and Kazakhstan did not result in any improvement.

It is hard to give a clear explanation on what are the reasons for such result. The author of the paper attributes two above mentioned discrepancies personnel qualification level and customs regulations, to lack of interest of freight forwarders and airlines to develop and improve. As it became clear during market analysis, Russian air cargo industry is monopolized, so companies do not have the incentives to develop and do not see any other improvement measures except for cost-cutting strategy.

The problem of monopolism is indeed a very important one. The segment of oversized cargo is dominated by AirBridgeCargo and sized cargo by Aeroflot. In 2015 Transaero remained the third air carrier in the country and all its cargo flows are going to be grabbed by Aeroflot. Transaero was damping and had much lower tariffs, now the situation is going to change. According to S7, passenger airlines that carry cargo in the luggage compartments and cargo carriers are not competitors. Volga Dnepr has developed a route network according to

effectiveness of cargo flows, they carry oversized cargo. Passenger airlines form their route network according to passenger flows and cargo is just for filling the empty space. Aeroflot is, on the contrary, views cargo carriers as competitors, because cargo airlines have lower frequency of flights and are less effective in delivering special types of cargo (perishable, urgent and with very high quality).

According to Daft & Albers, 2013 and Lohmann & Koo, 2013 it is important to look at the business model and value proposition of the carrier. Cargo airlines are losing to Aeroflot mainly because of less expanded route network, service quality (frequency and timetable convenience) and opportunities to ship cargo of special requirements. Volga-Dnepr is mainly focusing on charter flights of oversized freight – it is the segment where passenger airlines are not represented, such specialization is based on relatively low utilization of its capacities (around 46%, market average 67), often aircraft is moved to a cargo-uploading place without commercial load. AirBridgeCargo thus is partially a competitor for passenger airlines, because they also ship batches of freight that do not require special delivery conditions (FMCG, cosmetics, equipment etc.)

AirBridgeCargo is the only big company in Russian Federation that regularly offers cargo transportation. Its growth can be explained by extensive and expanding the network and development of business in major international markets – North America, Europe and China. In general, import of air cargo in Russia is expected to decline or remain at the level of 2015; the same trend is anticipated for internal airfreight. Russian air carriers are not expected to show any positive trends and there is no ground for growth. A part of the costs of AirBridgeCargo is formed in the ruble zone, for example part of salaries and taxes, therefore devaluation of ruble is helps the company to be more competitive in international market.

There is no competition in the market, which is the main problem of the industry. Attracting multimodal operators, foreign companies and creating competition amongst airports could double current cargo flow. For example, Emirates are already using Domodedovo as transit hub on the route Dubai-Moscow-Frankfurt-Dubai. Development of air cargo transportation is connected to overall economic recovery and increase of demand for retail goods. In the long term, it might be possible to change global trade routes and to use Russian airport infrastructure for cargo warehousing, for example on the route Asia-Europe. Increase the number of parking spaces for aircrafts the number and quality of runways seem to be not helpful measures probably because the market is not used to its full capacity and such measures can only help in a saturated market or to attract international carriers.

The topic of intermodality has also been addressed in the questionnaire and two interviews. Respondents do not view lack of logistics operators with multimodal capabilities as a constraint to multimodalism in Russia, the infrastructural problems are much more important. To support that idea, operators consider price, cost competition with other modes preventing factors for infrastructural development, and increase in volumes. In addition, there is a lack of regional airports. Therefore, again infrastructural problems remain as the major ones.

Multimodality should be one of the main directions of governmental programs in terms of development of air cargo transportation segment. It is necessary to create multimodal cargo terminals with modern management technologies. Cargo aviation facilitates industrial and economic growth of the country by ensuring fast cargo delivery to remote destinations. Thus, the government of Russia should pay attention to development of cargo transportation. Today there is a problem of multimodalism and a vicious circle has appeared: pricing strategy of regional airports is not flexible, at the same time price competition with other modes of transportation does not allow to form cargo volumes sufficient for infrastructure development.

Many topics of transportation forums were related to the key trend of cargo transportation, which is development of multimodal cargo hubs. It is a logical idea because decrease of logistics costs is a key factor of investment attractiveness. The world experience shows that in order to succeed in building cargo hubs there must be the following three stages: governmental support, innovation (including IT), effective airport management. Synergy of those three aspects gives the basis to attracting investment into the industry. Undeveloped logistics and country territory size are the main reasons for excessive prices on imported goods and transport services. The share of logistical costs in Russia's GDP is 19%, which is twice as high as in USA or Germany. In the result, logistical cost are on average 28% of the price of the product, whereas in developed countries it is not more than 10%. Modern logistics that assumes the delivery of the cargo from the primary sender to the end receiver is built on multimodal schemes and logistics operator is responsible for delivery time, cost, cargo security and documentation. It is necessary to make a transition to a totally new level of industry development, and according to some opinions, Russia has the potential to do it. Firstly, it is the geographical location of the country as a basis for development of transitional cargo flows.

Currently there is a rather high demand for transit cargo flows but Russia is not fully competitive yet in this field because it cannot provide foreign clients with convenient and fast service. Mainly due to undeveloped ground infrastructure of airports and a series of unsolved issues relate to regulatory support of cargo transportation. The main competitors of Russian airports are rapidly developing airports of the Middle East, India and Central Asia. (Valdes,

2015) In addition to chain of hub-airports. They are needed first and foremost in Khabarovsk, Krasnoyarsk, Novosibirsk and Vladivostok in order to shift the imbalance of cargo flows from Moscow.

As a good example of how to increase the cargo flow, it is possible to mention the Dubai airport. In 4 years, they almost doubled its cargo flow due to special policies of the government, business support and significant investments in development of airport infrastructure. They also created free economic zones, introduced modern technologies and started using intermodal logistics with different modes of transport. Not that many years ago, this was the case particularly with Dubai Airport in the United Arab Emirates that use its competitive advantage, which is geographic position, placed halfway between Europe and Asia, and airport free trade zone to attract companies looking to invest in the Emirates. Nowadays, Dubai Airport is the largest air cargo center in the Middle East and one of the largest re-export hubs in the world. (Yamaguchi, 2008)

Because of the contra-sanctions, cargo flows significantly changed and manty types of perishable goods that have previously been transported by car are not shipped by air. However, not all types of cargo can be transported by air (i.e. coal). The situation on the market could deteriorate in the recent future, because warehouses in airports are half-empty. Despite the fact that in some cases in became more profitable to use airplanes, it is only applicable to the part of the companies with rapid financial turnover. Therefore, it is less sensitive to exchange rate volatility. For example, during delivery time of sea transportation, which is around 30-50 days, exchange rate can change by 15-20%.

In March 2013, IATA approved Multilateral e-AWB Agreement, that allows airlines and freight forwarders use the common electronic invoice. It is not mandatory to use such system but it is risky not to, because clients will not view them as competitive in a new business environment and companies can just be forced out of the market. IATA highlights the fact that e-Cargo will provide benefits not only for airlines but the entire supply chain.

Russia still is not on the top of the list in terms of air cargo transportation volumes; therefore, introduction of electronic cargo technology (e-cargo) is a way to go. It is worth mentioning that introduction of paperless documents and IATA e-freight standard in 2014 was a priority for Ministry of Transportation of Russian Federation but this study has not found any results of its implementation. The e-cargo system also includes air cargo invoice (e-AWB), domestic cargo invoice (HAWB) and security system (e-CSD). Domestic cargo invoice is for multimodal consolidated shipments air-car. The vast majority of respondent think that it is

necessary to introduce e-cargo standard in Russia, but according to interviews, this is very unlikely to happen in the nearest future. However, the economic benefits from introducing e-cargo are represented below on Table 6.

Table 6. Economic benefits from introducing e-freight

	Sender	3PL	Terminal agent	Airline
Document processing, time reduction, %	38	51	50	30
Document processing, cost reduction, %	38	38	27	29

Source: Miksa, 2013.

Potentially it might be possible to develop transitional points, in which air and railroad are connected, and may be even river- and seaports. Such system of cargo delivery (port-station-airport) can significantly decrease the cost of logistics and provide shorter lead times. Those systems are already used in big international airports: Dubai, Singapore and Hong Kong. According to Sheremetyevo cargo, the percentage of domestic freight increased from 30 to 38 % and therefore the share of international freight declined. Aeroflot in 2016 is planning to significantly increase volumes, mainly because of subsidiaries, upcoming football World Championship of 2018, the leave of Transaero and governmental programs of region development, including Crimea.

Decrease of domestic air cargo transportation will continue or even strengthen if there will not be any stabilizing measures. The growth of international cargo shipments depends on

transitional flights of Russian airlines, does not depend on cargo volumes of Russian economy, and therefore is an indirect indicator of industry development.

3.3 Contribution, limitations and future research

This master thesis has identified key challenges that air cargo carriers face in Russia and trends of market in the context of current economic circumstances. Mainly the challenges are related to overall economic condition and its affects. It is possible to say that according to the results of the study the major problem is related to infrastructure. In that sense, practical contribution of the paper is to shift the focus from analyzing the issues of 3PL in Russia to analyzing the possibilities and opportunities for infrastructure development.

The study's findings contribute to a better understanding about the key features of air cargo transportation market in Russia as an emerging market. The introduced framework allows for a systematic analysis of interrelations between institutions and firms' resources – its structured approach is particularly promising for further examinations in transition economies and emerging markets at large (e.g. cross country/industry analyses). The study's results offer insights for air carriers in Russia in general and for 3PLs and other primarily business–to–business driven service industries in particular. Yet, a generalization of the proposed interrelations between institutions and firms' resources is hardly defensible – especially when accounting for distinct industries and their differing institutional environments. Thus, it remains to be explored whether the findings are industry– or Russia–specific or might represent patterns to be found in other transition economies or emerging markets in general.

This master thesis raises a question whether passenger route network has an impact on air cargo transportation routes. Passenger operations seem to be important for Russian air carriers and worldwide (Gardiner and Ison, 2008) but "not a significant factor in the airport choice for scheduled freighter operations in Europe" (Kupfer et al., 2016, 65). There is an opportunity for future research to prove or disprove this dependency. In addition, the level of personnel is important for western companies operating in Russia but not for Russian air carriers. The most important constraint of logistics in Russia according to Fisenko (2011) is the problem of customs regulations. The results of this study suggest that Russian air cargo carriers do not view customs regulations as a challenge to their business. Future research might focus on these discrepancies, observational and empirical studies often provide different results. Author of this paper attributes these results to the limitations of the survey and to monopolized market that does not establish any incentives for companies to invest in their personnel.

Future research can also focus on cross-regional studies of companies in emerging markets in in order to generalize the results within the scope of the world's air cargo industry. As a part of potential cost reduction schemes it might be interesting to research of supply chain integration in air cargo industry in emerging markets and demand forecasting. However, in Russia it is hard to justify a research on capacity management, which a very popular topic amongst researchers worldwide, because the amount of volumes right now does not give such possibility.

Owing to work force and research possibilities, the questionnaire survey was conducted via e-mail and the number of responses was relatively low. A large sample would ensure greater validity of the findings in reflecting the actual situation. In addition, the interviewees' background has to be noted: the inquiry for participating in the questionnaire has been sent to companies' e-mails and there was no requirement for a particular company position of the participant.

Conclusion

This master thesis researched the area of air cargo transportation in Russia and identified key factors that affect its efficiency. Understanding these factors is important in terms of achieving the goal of making the Russian market a transit of cargo flow between Europe and Asia. The industry has quite a few problems and economic crisis also has to be taken into account, especially in terms of its impact on the industry and challenges that it has created. Understanding the trends, where the whole industry is going is a crucial in terms of improving the current state of events.

This study was focusing on one market, in particular, and has extended the scope of research on air cargo transportation. Many of the previous studies in this area were focusing on one particular territory or region, mainly the United States of America and there was a lack of research specifically on Russian market. Due to complexity of the data collection process and problems that the research in Russia faces when it is needed to implement an empirical study, the focus of this particular paper was more general.

According to the results of the study, the companies in the market attribute the problems of the industry to macroeconomic and infrastructural factors. In terms of infrastructure, price and cost competition with other modes of transportation does not allow the necessary volumes of air cargo for airport infrastructure to develop.

From the questionnaire and the interviews, it is possible to conclude that there is a lack of understanding amongst companies how to improve the current conditions and efficiency. The only solution that seems plausible to cargo forwarders is cost-cutting technics. This master thesis has also reviewed scientific literature on air cargo transportation and many of current studies are related to demand forecasting, revenue and capacity allocation management. After examining the structure of the Russian market, it is possible to conclude that these topics are less relevant to Russia due to market specifics. In other words, the status of competition in the market can be described as a form of monopoly, which deprives the companies, especially small- and medium-sized of incentives to innovate and develop more cost-efficient schemes.

One of the surprising results of the empirical study is fact that customs regulatory system is not considered as a challenge by participants of the survey and interviewed companies. However, in literature and many other materials on the market custom is viewed as a major constraint for effective logistics in Russia. It is hard to give a clear explanation on what are the reasons for

such result. It could be attributed to lack of interest of freight forwarders and airlines to develop and improve in a monopolized market. In addition, they became used to this environment and perhaps do not view it as a problem anymore.

As it was mentioned before, there are some opportunities for future research in this field. This master thesis could potentially be used as a basis for cross-regional studies of companies. It is important to generalize the results within the scope of the world's air cargo industry and implement different studies in emerging markets in order to identify similarities and patterns of freight shipment structure of emerging markets. Although, some of the modern research topic are hard to justify for Russian market due to its specifics.

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