State University – Higher School of Economics
International College of Economics and Finance

Diploma paper

PRICE DISPERSION AND PRODUCT DIFFERENTIATION FOR ONLINE TICKETS: AN EMPIRICAL INVESTIGATION INTO RUSSIAN ONLINE TRAVEL AGENCIES

Done by:
Student of 4th year, 5th group
Muranova Ekaterina Alekseevna

Supervisor:
Sergey Vladimirovich Popov

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Contents

INTRODUCTION

Nowadays, many companies offer same products and services. It may seem really hard to compete in such an economy, where almost the same consumption bundle is offered. But nevertheless, new companies enter such markets and somehow find a way to sell their product. How do they do this? They use product differentiation. This concept refers to a marketing strategy where producers offer different combinations of key features and minor details, so that different customers segments are attracted.

Generally it is hard to find two completely identical products in an industrial market, which can be said to be perfect substitutes – usually they are distinguishable on certain characteristics (price, quantity, design, merchandise mark, etc). Differentiated products can be found on markets of heterogeneous products. Examples of differentiated products include automobiles, electrical household appliances, cigarettes, mobile phones. A differentiated product is characterised through a set of its properties: durability, quality, time of sale, location of the seller with respect to the customers, information accessibility of its properties and so on. Each of these properties can appear as a factor of product differentiation. Under conditions of perfect competition the product is homogeneous: every firm sells goods which are identical to any other good offered by any other firm in the market. Under conditions of monopolistic competition it is the product differentiation which provides a firm with market power. Differentiation of product denotes development of a number of notable properties of this product which deviate from other competitor's products (substitutes) and which consequently make this product more desirable for the consumers compared with the other goods of this class. Both the internal quality of the product – the modification of its internal characteristics and the external quality – its size, colour or packaging - can be the factors of product differentiation.

Differentiated products, according to F. Scherer and D. Ross[1], are such products that differ in physical qualities, level of service, geographical location, availability of information and subjective perception, and are clearly preferred by a certain number of consumers among competing products in the given price group. Firms in the market aim at differentiation as it allows them to set out a certain client base and to possess a certain amount of market power over it. Conversely firms producing perfect substitutes experience unlimited price competition.

Differentiation of the product takes place up to the time that the consumers consider different trademarks as imperfect substitutes. It can be distinguished between: 1) real, including

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[1] Industrial market structure and economic performance (3rd ed.), Scherer, F. M., & Ross, D. 1990

distinctions in the product quality, durability or other functional characteristics; 2) phantom, including differences in distribution channels of goods, for example when a seller of a low-quality product uses an upscale store to sell it. Differentiation of the product has certain distinctive properties, which can be divided into natural and strategic ones. Under natural differentiation this distinctive properties of the product are conditioned on its natural features. Strategic differentiation, on the other hand, forms a product diversity which is based on marketing efforts of companies focused on the creation of image of the brand, strong brands and public opinion regarding the public opinion in relation to the company and its products.

Furthermore, it is usually distinguished between two main types of differentiation:

- horizontal differentiation;
- vertical differentiation.

Vertical differentiation represents the space of products with the most desirable characteristics for each group of consumers (for example, preference for product's quality). Thus it can be said that products are vertically differentiated if all consumers choose to purchase the same product – one of highest quality given that they cost the same. The distinguishing property of horizontal differentiation is that if these products were offered at the same price, consumers would rank them differently. Therefore if a number of firms were offering different horizontally differentiated products at the same price, each would obtain a strictly positive market share.

Product differentiation leads to two main consequences:

1. product variety creates market power for the firm, as buyers committed to a product of a certain trademark or a certain firm can always be found. Therefore a firm can raise the product price without losing its customers.
2. differentiation is beneficial to the consumers themselves: when a firm enters the market with a new trademark they are faced with a greater product diversity which is can better fit their preferences. As a result product differentiation can be said to expand the consumer choice opportunities.

In this paper, I have chosen the air online travel agencies (OTA) industry as the setting for study because travel is an important online market and the product is complex, however at the same time it is fully describable, enabling products of differing qualities to be precisely and objectively compared. The choice of data gives the opportunity to investigate the role of product differentiation and price dispersion more precisely.

The data in this paper contains approximately 2100 ticket prices from same 175 flights, taken from 11 different Russian online travel agencies, the list of which can be found in Table 1 in the Appendix. Also in order to compare data, corresponding ticket prices was taken from airlines websites. The OTAs chosen include one of the most popular ones in the Russian market.

The general aim of this paper is to find if online travel agents quote the same prices as airlines in order to see if any price dispersion occurs. Logically thinking, it can be said that prices should converge, as search costs and operational costs on internet are pretty low, which means that OTAs should quote prices lower or equal to the airline company itself. In this paper collected data would show that generally this hypothesis is proven, although not for each OTA.

LITERATURE REVIEW

Extensive literature can be found on product differentiation and its application in the world economy markets. The debate on this topic started with Harold Hotelling's article 'Stability in Competition', which was published in The Economic Journal in 1929[2], and this work can be said to be one of the most influential studies on the topic of product differentiation and imperfect competition. In this article it was first suggested that product differentiation can be represented as a firm-location problem. The central conceptual idea this article had assumed is that consumers have heterogeneous tastes which means that each of them differs in what he or she considers to be the ideal brand among the set of available products. It is argued that for every seller there exists a group of buyers who will rather buy from him than from his competitors in spite of a difference in price.

Harold notes that if the seller increases his price by too much, he will gradually lose his business to the competitors; however if he increases his price only by a small amount, he would not lose all of his trade instantaneously. Why is this so? Hotelling explains that the possible reason of such phenomena could be that many customers would nevertheless prefer to trade with him because they live closer to his warehouse than to the others, or because they have a preference for how he runs his business, or because he is a relative or a friend, or because of a certain difference in the quality compared to the rivals product, or for a combination of different causes. So, it is assumed that the consumer preferences are asymmetric, meaning that if a consumer's ideal brand is "I" then he or she will prefer brands which are 'close' to "I" in terms of their characteristics than those being 'far' from it. In order to explain the asymmetric preferences assumption it is helpful to think of brands as being represented by points in a multidimensional space. Asymmetry will therefore simply denote that any certain consumer, who is recognized and located by virtue of what he regards to be an ideal set of some characteristics at some point in this space, will consider 'neighbouring' brands close to his 'location' to be very close substitutes. However the further that a brand is from the ideal point, the less close it is a substitute.

The idea of distant and close substitutes can be regarded as a realistic assumption when brands can be defined in terms of a few characteristics like geographical location or size – in such case it is essential to assume that a consumer who values one particular brand will also put a high valuation on a brand that is close neighbour in terms of characteristics. Under Hotelling's original formulation the product space is assumed to be a bounded line. Hotelling implemented

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[2] Stability in Competition, Harold Hotelling, The Economic Journal, Vol. 39, No. 153 (Mar., 1929), pp. 41 - 57

sequential price-then-location equilibrium, which essentially parted the pricing decision from the location one.

Another work was done by Lerner and Singer in 1937, which was called 'Some Notes on Duopoly and Spatial Competition'[3]. It was the first paper which suggested that a simultaneous price-and-location equilibrium existed, where each firm optimised over its own location and price given the locations and prices of all other rival firms. They assume that there exists an upper limit of the price that each buyer is prepared to pay for his or her unit of commodity and find that the value of this limit is of principal importance for the problem of determining the price, location and output of the producers. The authors also deduce that consideration of costs of movement is an import stabilizing influence since it is not in the interest of a seller to move unless the expected gain of such a move is sufficient to cover the interest on the cost of movement and the repayment of the expenditure over the expected period of the benefit.

One more important work that should be taken into consideration is the 'Monopolistic Competition with outside goods' by Steven C. Salop, which was published in the The Bell Journal of Economics in 1979.[4] In this paper Salop assumes the product space of the industry to be an infinite line or the unit-circumference of a circle. Although such assumptions are not realistic and make the empirical confirmation more difficult, they allow to ignore the "corner" problems of original Hotelling model and to obtain an industry equilibrium with identical prices by equally-spaced firms. A model suggested by Salop allows to examine questions of differentiation with a larger number of firms operating in the market and with the absence of industry entry barriers except for the input costs.

Consumers and firms are uniformly distributed along the circumference, which borders the city. The movements are happening similarly, without affecting the circle itself, as can be seen in Figure 1.[5] Consumer has an opportunity of purchasing any product brand of the given product range as well as the other product in case of it having a larger utility. The greatest utility is achieved when the consumer purchases his or her favourite brand. Utility function decreases as it is moved away from the preferred product.

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[3] Some Notes on Duopoly and Spatial Competition, A. P. Lerner and H. W. Singer, Journal of Political Economy, Vol. 45, No. 2 (Apr., 1937), pp. 145 - 186

[4] Monopolistic Competition with outside goods, Steven C. Salop, The Bell Journal of Economics, Vol. 10, No. 1 (Spring, 1979), pp.141 - 156

[5] Monopolistic Competition with outside goods, Steven C. Salop, The Bell Journal of Economics, Vol. 10, No. 1 (Spring, 1979), p. 144

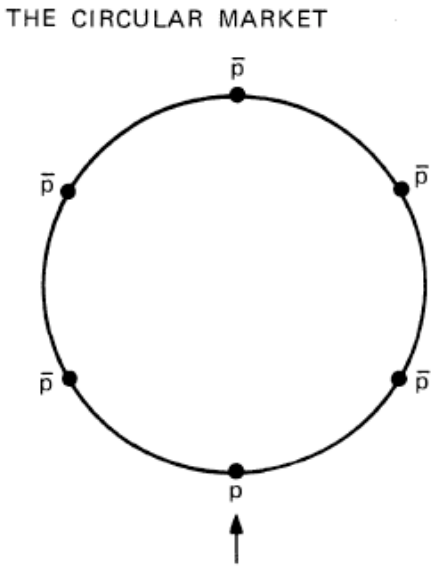

Figure 1 The Circular Market

The consumer's goal is to maximise the consumer surplus. When the prices are set high, firms appear at the monopolistic influence zone. Each firm acts as a local monopolist. As prices fall the larger number of consumers demand this product and the firms appears to be in competition. This is why the aggregate demand for goods is kinked. This paper goes beyond the explanations by Lerner and Singer who provide a rationalization of kinked demand curve in terms of symmetric "Nash" conjectural variations by deriving the industry equilibrium and analyzing its properties.

Another study was performed by Yasuhito Tanaka in 2001 which was published in the Economic Theory,[6] where he used a model according to Mussa and Rosen (1978) and Bonanno and Haworth (1998) to examine a sub-game perfect equilibrium of a two-stage game in a duopolistic industry with vertically differentiated products. He assumed that there exist a high and a low quality firms in the industry and in the first stage, firms choose their strategic variables – quantity or price, while in the next stage they settle the levels of their strategic variables. In his study he shows that the following result is obtained: in the first stage the quantity strategy dominates price strategy for both firms. This outcome is similar to the Singh and Vives' result that they have obtained in 1984[7], who showed in their investigation which was published in Rand Journal of Economics that in a duopoly with horizontally differentiated products in which firms can choose between a quantity and a price strategy and provided that the products are substitutes, a quantity strategy dominates a price strategy.

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[6] Profitability of Price and Quantity Strategies in a Duopoly with Vertical Product Differentiation,Yasuhito Tanaka, Economic Theory, Vol. 17, No. 3 (May, 2001), pp. 693 - 700

[7] Price and quantity competition in a differentiated duopoly, Singh, N. and Vives, X., Rand Journal of Economics 15, (1984), pp. 546 - 554

The theoretical investigation on the topic of price discrimination is fairly developed although the same can not be said about the empirical studies on this topic. This is one of the reasons why I find my choice of the topic quite relevant.

One of the empirical studies that have been made can be found in the work of Louis Thomas and Keith Weigel published in the Stategic Model Management Journal in 2000.[8] In their paper the authors test theories of product differentiation and firm capabilities using data from the U.S. automobile industry. In their investigation they use discrete choice models and test the descriptive validity of the mentioned theories on product establishment. They construct a distance measure in order to discover where managers locate new models in physical attribute space. Theories of product differentiation forecast that managers will locate new products away from own and rival products to reduce price competition. The firms that are more likely to locate new models away from those of rivals are the incumbents and large market share firms rather than entrants and small share firms. However theories which are based on firm capacity suggest that mangers will locate new products near the existing ones in order to take advantage of the firm's capacity. If managers follow both theories it can be argued that the managers will introduce new models nearer their own rather than those of the rivals. The outcomes from the U.S. automobile industry demonstrate that indeed managers are more likely to locate the new models near existing ones rather than those of rival manufacturers. The obtained results provide empirical support for both theories of firm capability and product differentiation.

Another interesting empirical study can be found in the work of Severin Borenstein and Janet Netz which was published in the International Journal of Industrial Organization in 1999.[9] It shows that we can use different characteristics of the differentiated products. In this study the authors examine a particular type of product differentiation in the airline industry – the scheduling of flight departure times with an intention to shed a light on the predictions of theoretical models. The authors argue that airline flight scheduling provides a natural although quite complex empirical test of spatial competition theories since the main theoretical findings have natural analogs in this market and what is more the endogeneity of the price determination has changed between the 1970s and 1980s which was the period when the airline industry has been deregulated. Borenstein and Netz use the data on the U.S. airline departure times from 1975 when fares were regulated and 1986 when fares were not regulated and empirically estimate the

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[8] Product Location Choice and Firm Capabilities: Evidence from the U.S. Automobile Industry, Louis Thomas and Keith Weigel, Strategic Management Journal, Vol. 21, No. 9 (Sep., 2000), pp. 897 - 909

[9] Why do all the flights leave at 8 am? Competition and departure - time differentiation in airline markets, Severin Borenstein, Janet Netz, International Journal of Industrial Organization, 17 (1999), pp. 611 – 640

effect of competition on differentiation. Simple descriptive statistic used in the study show that on a route with a given number of daily flights, departure times are less differentiated if the route is being served by the competitive airlines than if it is served by a single firm. In the econometric analysis the authors have attempted to control for other factors that might have an influence on the departure-time crowding and have found a negative relationship between product differentiation and competition which is significant both in terms of the size of this effect and statistically. These results may be considered as a demonstration of a competitive tendency towards reduced product differentiation, as presumed by Hotelling and others. However Borenstein and Netz argue that such a deduction is hard to adjust with the other estimated effects on differentiation.

Michael Smith and Erik Brynjolfsson carried out another empirical study in 2001 named 'Consumer Decision-making at an Internet Shopbot',[10] where they investigated the choice of consumers on various books from different retailers. What is particularly interesting about this study is that although each retailer offers same books and books are homogeneous products, consumers prefer to order them from well-known retailers – therefore it can be claimed that in this case the brand of the retailer is the key determinant of consumers choice. The authors find that consumers prefer Amazon, Barnes & Nobles and Borders to the competing retailers even though they are fully informed about product characteristics and prices of the rivals. What is more, it has been found that between these three retailers consumers prefer Amazon. One possible explanation of such result could be that consumers use the brand name as a signal of reliability in service quality. The fact that branding is important even for homogeneous products suggests that it will be even more important in internet markets for less homogeneous goods and services. This paper shows how shopbot data allows identify the drivers of the high level of dispersion: service quality and differentiated branding.

Another empirical investigation which has been made can be found in the work of Clemons, Hann and Hitt 'Price Dispersion and Differentiation in Online Travel: An Empirical Investigation' which was published in 2002[11]. They have found that different online travel agents offer different types of tickets and what is more, they offer them at considerably different prices. As a result, presence of horizontal product differentiation is suggested as different providers offer tickets of systematically different quality and it was found that price dispersion across

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10 Consumer Decision-Making At An Internet Shopbot, Michael D. Smith, Erik Brynjolfsson, MIT Sloan School of Management, Sloan Working Paper 4206-01, eBusiness@MIT Working Paper 101, October 2001

11 Price Dispersion and Differentiation in Online Travel: An Empirical Investigation, Eric K. Clemons, Il-Horn Hann and Lorin M. Hitt, Management Science, Vol. 48, No. 4 (Apr., 2002), pp. 534 - 549

online travel agents is reduced when controls for quality was included. Therefore even in a market with potentially low search costs and strong motivations for consumer search persistent price dispersion takes place between service providers. The possible explanation proposed by the authors was that search costs typical for traditional markets might start being replaced by new types of costs, like obliging the customer to “sign up” and provide his or her personal information in order to reduce the time needed to find and book flights in the future. Another key finding of this research is that service differentiation is the most important strategic part of online sellers offering access to heterogeneous goods.

CHAPTER 1. OVERVIEW OF THE INDUSTRY

In this section a general overview of the airline industry will be provided and the reasons why this particular industry has been chosen will be discussed. Furthermore, the emergence of online travel agencies will be discussed and an overview of the main online travel agencies operating in Russia will be given. I will also provide an application of the theory of search costs and product differentiation to the online travel agencies and discuss why the price dispersion and differentiation exists in the prices provided by the online travel agencies.

General Overview of the Airline Industry

Air travel industry has always gained a significant amount of attention from the consumers, who usually tend to devote a considerable amount of their time to finding the best suitable flights for them and comparing prices of different options available. Several decades ago, when the internet was not used as widely as it is now, it was common to use the travel agencies services and the price stated by the travel agents was rarely in question. Even if different agents stated distinct prices for the same ticket this price difference would be discharged due to the existence of the search cost: it is inconvenient for a consumer to visit all travel agents in order to understand what the base price of the airline ticket is; and the travel agents being perfectly aware of this take it into account when they introduce a mark-up over the base airline ticket price.

However with the internet becoming more popular the situation has changed. First of all, as the internet is extensively used to find the information, it is inevitable that the air travel industry has also expanded online. Customers now have an opportunity to find the required information about the ticket and the flight details on the airline website. Moreover, many travel agencies have also evolved online, which has made it even easier for the customers to simultaneously compare the prices from different airlines. It can be argued that the search costs have been remarkably reduced with the increased usage of internet services. As a result one would expect prices stated for the same ticket to be the same, or at least to converge, no matter if it is offered by the online travel agency or directly by the airline company. However it is quite unlikely to assume that the customers would be ready to pay for the the agent's search service as they could simply visit the airline's website and make the purchase there after finding what they have been looking for. It is more reasonable to suppose that in order to maintain their places in the market the online travel agencies would have to quote prices which are lower or equal to the airline itself.

Let's take a closer look at the online travel agencies (OTAs) and how they operate. In order to understand how the OTAs emerged the concept of computerized reservation system should be discussed. A computerized reservation system (CRS) is a computerized system which main function is to keep and retrieve information and manage transactions related to the air travel. When the CRS was introduced, the purchase of tickets became much more simpler than it used to be with travel agencies and paper tickets. Now all airline companies had facilities which allowed customers to get their flight details, book the tickets and buy them online. Furthermore, the growth of the industry and increasing number of tickets sold online have resulted in creation of numerous OTAs which provide a point of contract via the World Wide Web to allow customers to search for suitable flights and fares and make a selection which is then booked and ticketed by the OTA. There exist a substantial number of OTAs representing online travel agents, traditional travel agents and airline companies. The operational process of an OTA is quite straightforward: it collects the information from the customer, departure and arrival cities or airports and preferred flight times. After that the OTA takes this request and some additional parameters set by the OTA and submits these to a CRS, which in turn examines appropriate flights from the collection of offerings from all airlines. Next the agent takes the collection of flights returned by the CRS, selects one or more flights which can be presented to the customer and sorts the final output. When the customer decides to buy the ticket, the OTA processes the booking with the CRS and receives a commission from the airline in return. It is important to note that OTAs have to pay the CRS a certain fee for each request, but they only raise revenue if the customer actually books a flight. Since, according to Machilis (1997), only a small number of customers actually make bookings through OTAs: just 1%-5% of browsers[12], it is important to target different groups of customers in order to attempt to increase their purchase probability so that OTAs' profits could be maximised.

The OTA setting has a number of individual competitive characteristics. First of all, OTAs can only select tickets from the available set provided by the airline companies – and for this reason they do not have the power to change the prices or other product features. OTAs compete for their customers by offering the best available tickets according to their preferences. In that way they try to offset the noncompetitive pricing by the airline companies. However it is costly for the OTAs to serve the potential clients and sometimes a comprehensive search through CRS may become too costly, so the OTAs may choose to specialize and concentrate on a limited number of segments. Any systematic deviation in ticket selection would indicate a horizontal form of differentiation among OTAs.

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12 Profits elude travel sites, S. Machlis, Computerworld, 1997, December 28, pp. 53 - 54

Second, as the good under consideration has multiple characteristics and consumers have heterogeneous preferences on these characteristics, all comparisons should be performed relative to one or more specifications of preferences. The preferences of consumers for airline tickets might be quite diverse, and the industry follows the practice of taking into consideration the two specific groups: time-sensitive business travelers and price-sensitive leisure travelers.

The benefits discussed above have made air travel industry a fine example of an online industry to analyse and it is possible that the composition of lower search costs with the existence of OTAs would lead to abolition of price dispersion online.

Russia has the largest online population in Europe, however the market for the OTAs is not as developed as it is in the USA or Europe, for example. Euromonitor International forecasts an increase in the volume of online-sales of travel services in the Russian market by almost 30% in the next five years. In 2011 its volume amounted to $5 billion with nearly two thirds accounting for flight and train booking.[13]

I will provide a description of some of the main OTAs launched and operating in Russia, which I will later use in my data collection.

Sindbad is one of the oldest Russian OTAs – it has been operating since 1998, has received a lot of awards since then. It offers the search function for airline tickets.

Aviasales.ru has been launched in 2008, it has sold 1,394,907 tickets at the moment of writing of this paper and the number increases rapidly[14]. In addition to offering a search function for airline tickets, the site also allows users to search for hotels.

Biletix.ru has been in the business since 2008 and offers quite a wide range of online services to its customers: starting from search of the airline tickets and train booking, the search and booking of the hotels and finally, the option to make the travel insurance on-line.

Eviterra only focuses on the search function for the airline tickets but it is planned to be expanded in the future to additionally offer search for hotels, car rental, insurance etc. Apart from the website Eviterra has their own service of booking located in their office in Moscow, so the customers are welcome to call and ask their questions.

The assumption of perfect information can not be applied to the real world. Asymmetric information refers to a situation when one party of transaction has more information than another. It is impossible for the buyer and seller to have full and correct knowledge about each other's wants and needs. Sellers have insufficient information to locate all the buyers to attain the highest selling price. Because of the large number of sellers in the market it is impossible for

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[13] http://www.forbes.ru/sobytiya/rynki/231409-gde-otdyhayut-rossiyane-i-skolko-oni-tratyat-za-granitsei

[14] http://www.aviasales.ru/content/o-proekte

the buyers to know the location of all the sellers and all the prices which are being offered for the product. The buyer has to undertake a search process in order to obtain the desired information about the sellers' prices and locations: he or she might have to visit a shop in order ask for the price of the product, or try to find the needed information on locations of the sellers in the internet. All of these are examples of search costs, which were considered earlier. It is not optimal to perform an endless search in order to be fully informed because of the increasing marginal costs and decreasing marginal benefits. Plus, the exploring of prices takes time and the situation in the market changes instantly: some sellers might enter or exit; the prices might be updated, which might result in the necessity of another search process. The buyer reaches the utility maximising amount of search by trading off the associated costs and benefits.

Therefore, as the buyer performs a limited amount of search or no search at all, firms can increase the prices with an incentive to trap the less informed buyers, which can explain the existence of price dispersion in the OTAs prices.

Application of the theory of search and product differentiation to OTAs

Bakos in his work 'Reducing Buyer Search Costs: Applications for Electronic Marketplaces' in 1997[15] noted that the internet has become an electronic marketplace which brought together sellers and buyers in a market. The benefits of such a market are obvious and numerous: to find a seller the only thing the buyer has to do is to type the name of the good that he is interested in and browse the website of the seller to find it. Even if the price of the product can not be found, he or she could call or visit the buyer so even in such case the locating of the buyer takes a few minutes to complete. Therefore the prices of different sellers are expected to converge on the internet, at least to a greater extent than can be observed in the physical market.

Bakos in 1997 emphasizes that electronic marketplaces influence different parameters of trade such as privacy, security, etc; his paper concentrates on the impact of reduced buyer search costs. The impact of electronic marketplaces was analyzed by developing models that incorporated search costs with a differentiated market with heterogeneous buyer tastes and seller product offerings. Reduced search costs have been found to have a significant effect on market equilibria. They led to higher allocation efficiency and very likely to lower prices and thus increased competition among sellers. This result makes the provision of electronic intermediation services an important market with potentially large rewards.

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[15] Reducing Buyer Search Costs: Applications for Electronic Marketplaces, J. Yannis Bakos, Management Science, Vol. 43, No. 12, December 1997

The travel industry has especially altered with the use of electronic market. As mentioned by Law, Leung and Wong in 2004[16], internet provides "an effective means for developing a single and sustainable electronic infrastructure for information gathering and business transactions for both travelers and suppliers". This results in lower costs for both parties.

Overall, it is essential for the competing OTAs to account for the search behaviour of their customers.

Generally, availability of information online at lower search costs should indicate that the electronic market for air travel is reasonably competitive and that airline companies and OTAs are expected to have the same price for the same products. It is nevertheless unclear why so many OTAs exist when they collect information about the same sellers and what is more, why do prices still differ between them when OTAs display same airline companies. A few studies have been devoted to examination of prices of airline companies and OTAs in the electronic marketplace. One example is the already mentioned work by Clemons, Hann and Hitt in 2002[17] which made an empirical research into price differentiation and dispersion in the online travel industry and found considerable price dispersion between different agencies with up to 28% variation. When the differences in ticket characteristics like number of connections or time departures were under control the dispersion decreased but was still high at 18%.

Stefan Klein in his work 'Web Impact on the distribution structure for flight tickets'[18] analysed the changing role of physical and online travel agencies with the increasing usage of the internet. He noted that the initial expectations for the enormous online revenues have been recently revised because it has become clear that many consumers simply consulted the internet for the required information but purchased the tickets offline. However he noted that the travel agencies had to go online in order to remain competitive. He also discussed the unique nature of relationship between the OTAs and airline companies who performed as suppliers but simultaneously as rivals. Airline companies often compete against OTAs by offering exclusive products or by cutting commissions. Therefore the dynamics in the online market do not straightforwardly imply a simple price convergence on the internet.

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16 The impact of the internet on travel agencies, Law R., Leung K. & Wong J., International Journal of Contemporary Hospitality Management, 16 (2), pp. 100 - 107

17 Price Dispersion and Differentiation in Online Travel: An Empirical Investigation, Eric K. Clemons, Il-Horn Hann and Lorin M. Hitt, Management Science, Vol. 48, No. 4 (Apr., 2002), pp. 534 - 549

18 Web Impact on the distribution structure for flight tickets, S. Klein, Information and Communication technologies in Tourism, 2002, pp. 219 - 228

CHAPTER 2. DATA AND METHODOLOGY

Choosing data and methodology is the central issue of any study. Every study heavily relies on the data, used in the analysis, so the data must be chosen extremely properly. Methodology should be chosen very properly as well. In this part of my work I will describe how the data has been chosen and collected and which models I have decided to use in order to analyse the data collected in order to show the effects of expansion of information on the internet prices.

Data Source and Collection Method

In order to make the analysis I have chosen 11 different Russian online travel agencies, the list of which can be found in Table 1 in the Appendix. The OTAs chosen include the large ones (like Trip.ru, Ozon.travel) and small ones (like Eviterra, Pososhok) in order to understand if the information provided by the different sized OTAs contrasts with each other. The OTAs chosen include one of the most popular ones in the Russian market. The main criterion for their selection was the fact that not only they operate in the Russian market, but that they have been launched in Russia.

I have collected the data for 25 different European routes for each of the OTAs under consideration for a period of one week, which have resulted in approximately 2100 observations. For each date-destination input into the OTA's search mechanism the lowest priced flight was chosen and the corresponding airline's website was then searched for the same destination and date and the price for the same flight were recorded. All fees and taxes have been included in the comparison and any fares in foreign currency were immediately converted in rubles using the current exchange rate. In order to minimise the price volatility the search on both OTA and airline websites took place during the same day. To simplify the search process, only one-way direct flights were considered. The class of service selected was economy. The period under consideration was chosen to be one week from September 16th 2013 to September 22th 2013 in order to enable the sufficient time for the completion of the data collection process and in order to get a reasonably random sample selection data without the effect of the summer holidays and vacations. The other reason for the selection of the week period was to take into account both weekday and weekend effects of the flight choice.

As it has already been mentioned, in my work I have chosen the cheapest prices for the 25 flights under consideration and they can found in Table 2 in the Appendix and in Figure 2. It can be seen that the cheapest tickets are provided by Tripsta – 59% of the whole sample and in

addition that some of the OTAs have not provided lowest priced tickets at all during the whole period under consideration – including Airtickets, Ozon.travel, Pososhok.ru and Budgetair.

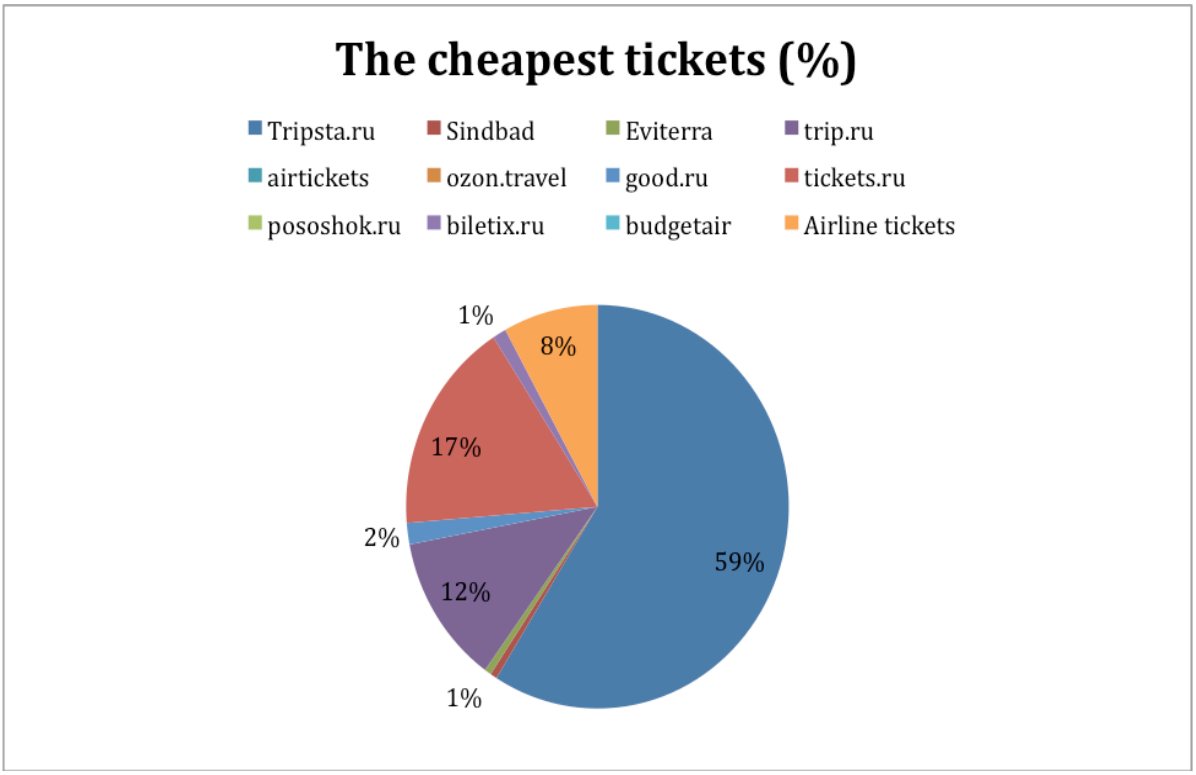

Figure 2 Cheapest tickets provided by the OTAs (in %)

In the data collected I have additionally considered the departure airports and the airline companies. The most popular airports for departure turned out to be Domodedovo International Airport (DME), Sheremetyevo International Airport (SVO) and Vnukovo International Airport (VKO). As can be seen in Table 4 in the Appendix, all of these airports are practically equally popular. This result is not very surprising as the departure airport is usually not considered to be the key criteria according to which customers choose the flight they need. The most popular airline companies can be found in Table 5 in the Appendix. From the Table 5 it can concluded that Aeroflot and Transaero, which are both Russian airline companies, are the most popular ones to have been chosen in the considered time period.

Another interesting conclusion that can be made from the collected data is how many tickets offered by the OTAs actually have lower prices than the tickets offered by the airline company itself. The percentage of the tickets with lower price than the price of the airline can be found in the Table 6 in the Appendix and in Figure 3. Tripsta, for example, offers lower priced tickets than the airline tickets price in approximately 82% of the time, while Budgetair does so only in about 6% ot the time. On average the OTAs offer lower prices that the airline company does in 47.8% of the time.

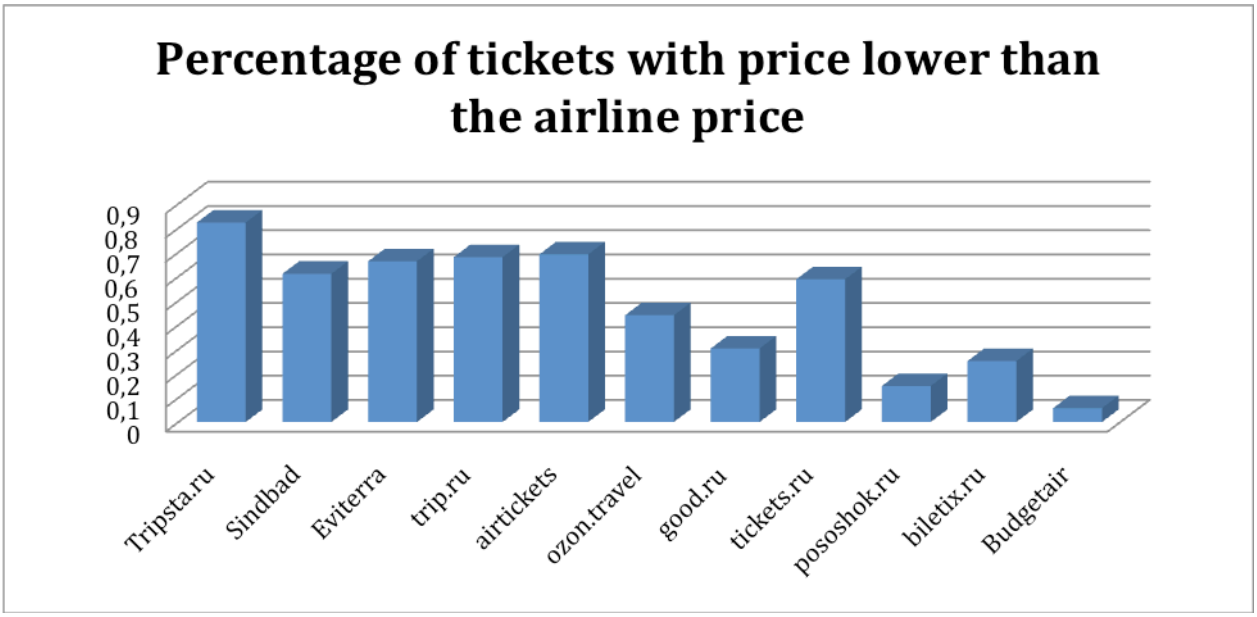

Figure 3

An interesting finding from the collected data was that sometimes the price offered by the airline itself was in fact lower than the prices offered by all of the OTAs. This usually happens when the airline decides to make a special offer and lowers the ticket price significantly.

Methodology

In this paper, three different models explaining the effects of spread of information on the internet prices and thus the consumer's search behavior will be introduced and analyzed using the data, including the Bertrand Equilibrium, Two Price Equilibrium (Salop & Stiglitz, 1977) and Vertical Product Differentiation.

The first model under consideration is going to be the Bertrand Equilibrium. Firms can compete based on their choices of quality, prices and quantities. The Bertrand model investigates the interdependence between rivals' price decisions. The assumptions of the original model are that there exist 2 firms in the market, which produce homogeneous goods; firms set prices simultaneously and each firm has the identical constant marginal cost c. Under these assumptions, the equilibrium for each firm will be to set the same prices which will equal to the marginal cost. The equilibrium in this case is shown in Figure 4.[19]

However, the assumptions used in the model are quite extreme and there exist a number of reasons why the equilibrium might not hold for the airline industry: first of all, because of the product differentiation and secondly, because of the existence of the search costs. The Bertrand

[19] Introduction to Industrial Organization, Cabral, Luís M. B., MIT Press, 2000, p. 104

model can be extended to include product differentiation but the main result that the price is driven to marginal cost will no longer hold. In addition, with the inclusion of the search costs there might exist other equilibria apart from the competitive price – the monopoly price or even price dispersion can become the equilibria.

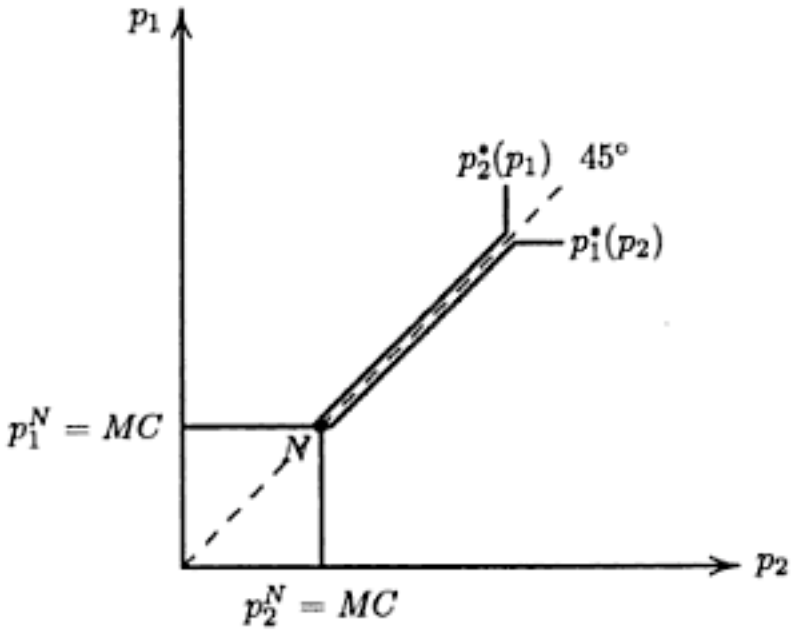

Figure 4 Bertrand Equilibrium

Data in this paper is going to be tested on convergence to Bertrand Equilibrium as a possible result of lower online search costs.

Now let's switch to the Two Price Equilibrium which was presented in a research by Salop and Stiglitz in 1977[20]. In their work they have introduced an alternative explanation for the existence of price dispersion in the market. The main assumptions are that consumers have different costs of becoming perfectly informed and that it is the existence of this costs which lead to an equilibrium in which prices are not perfectly competitive. It is also assumed that firms have increasing marginal cost and U-shaped average cost curves. They assume that each consumer has the choice of the two following actions: either performing search at a cost of c and thus becoming fully informed of location of the shop with the minimum price and making the purchase there; or performing no search and making their purchase at a randomly selected shop and paying a certain expected price. The behaviour of the firm can be presented by Stackelberg strategy where the firm takes into account how its chosen prices affect consumers decision or by Nash equilibrium with respect to the prices of the rival firms.

[20] Bargains and Ripoffs: a model of monopolistically competitive price dispersion, S. Salop & J. Stiglitz, Review of Economic Studies, 44, 1977, pp. 493 – 510

In the model which can be presented in Figure 5[21], low-price shops sell Q_L (where $Q_L = (1-\alpha)\frac{L}{N}$) at P_L, while the high-price shops sell Q_H (where $Q_H = (\frac{\alpha}{\beta}+1-\alpha)\frac{L}{n}$) at P_H, with $Q_H < Q_L$. All of the shops earn zero profit as price is equal to average costs (P=AC). In equilibrium, consumers with lower search costs c_1 choose to become informed and to purchase from P_L shop, while consumers with higher search costs c_2 choose to remain uninformed and will therefore make purchase at a shop selected randomly and will end up paying either P_L or P_H.

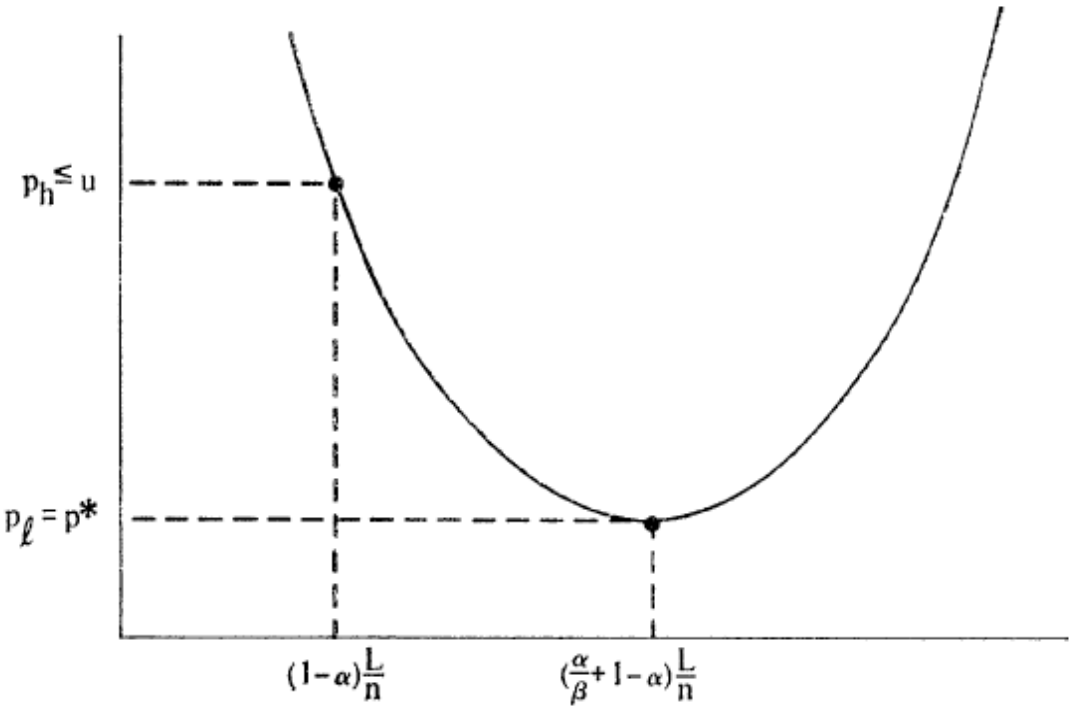

Figure 5 Two-Price Equilibrium

In equilibrium the following result is gained: P_L should be equal to the competitive price p^* and $P_H = p^* + \frac{c_2}{1-\beta}$, where β is the proportion of total shops which are low-price in equilibrium.

The data which has been collected suits the described above model and its implementation might be able to help to explain the existence of the price dispersion. Two methods are going to be used for this purpose: the OTA-induced Price Dispersion method and

[21] Bargains and Ripoffs: a model of monopolistically competitive price dispersion, S. Salop & J. Stiglitz, Review of Economic Studies, 44, 1977, p. 506

Airline-Induced Price Dispersion method as it has been done in the investigation done by Margaret Samahita in 2011[22].

OTA-induced Price Dispersion

To seize the effect of each OTA on the mark-up, dummy variables OTA according to Table 7 which can be found in the Appendix are used in the following regression equation:

$$P_{OTA} - P_{AIR} = \alpha + \sum_{i=1}^{11} \beta_i * OTA_i + \varepsilon \quad (1)$$

In order to examine the effect of the airline companies in the pooled data, the two most common airlines – Aeroflot (AE) and Transaero (Tr) are included as dummy variables in the following equation:

$$P_{OTA} - P_{AIR} = \alpha + \sum_{i=1}^{11} \beta_i * OTA_i + \lambda_1 * AE + \lambda_2 * TR + \varepsilon \quad (2)$$

It is also reasonable to examine for vertical differentiation between flight selections. So I will include another dummy variable EXC for flights which cost more than 7.000 RUB which has been found to be the median in my data. Such flights represent "exclusive" flights because of the distance or the flight quality. The main purpose of the inclusion of this dummy is to avoid taking the variable P_{AIR} directly as an explanatory variable which would have resulted in perfect autocorrelation with the dependent variable in which P_{AIR} is also present.

$$P_{OTA} - P_{AIR} = \alpha + \sum_{i=1}^{11} \beta_i * OTA_i + \lambda_1 * AE + \lambda_2 * TR + \delta * EXC + \varepsilon \quad (3)$$

In the process of data collection I have noticed that there exist certain tickets that cost much more than the others (more than 30.000 RUB) and can be regarded as the outliers in the data, so, in order to protect from their possible negative influence, I will also include them as dummy variables in the following model:

$$P_{OTA} - P_{AIR} = \alpha + \sum_{i=1}^{11} \beta_i * OTA_i + \lambda_1 * AE + \lambda_2 * TR + \delta * OUT + \varepsilon \quad (4)$$

In order to determine the existence of possible relationships between a certain OTA and Airline company, interaction terms have also been included to the regression model. However because of the limited number of allowed explanatory variables only Aeroflot and Transaero the two most quoted airline companies are used:

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[22] Price Mark-Ups and Dispersion for Online Air Tickets: An Empirical Investigation into Scandinavian Online Travel Agencies, Margaret Samahita, Master Essay I, Lund University

$$P_{OTA} - P_{AIR} = \alpha + \sum_{i=1}^{11} \beta_i * OTA_i + \sum_{i=1}^{11} \lambda_i * OTA_i * AE + \sum_{i=1}^{11} \delta_i * OTA_i * TR + \varepsilon \quad (5)$$

Airline-Induced Price Dispersion

For each OTA it is supposed that the existing price difference is in addition partly dependant on the airline company mentioned, for example because of the special commission agreements between them. I will take into consideration only the few most mentioned airline companies in the following model which can be found in Table 8 in the Appendix.

Therefore, the regression equation for Aeroflot (AE) is:

$$P_{OTA} - P_{AIR} = \alpha + \beta_1 * AE + \beta_2 * TR + \beta_3 * S7 + \varepsilon \quad (6)$$

The day of flight might also be a possible explanatory variable which could help to explain the difference between the prices. I will include the dummy variables of most mentioned airlines and dummy variables of flight days. Taking Aeroflot as an example one more time, the regression equation would be:

$$P_{OTA} - P_{AIR} = \alpha + \beta_1 * AE + \beta_2 * TR + \beta_3 * S7 + \varphi_1 * MON + \varphi_2 * WED + \varphi_3 * FRI + \varphi_4 * SAT + \varepsilon \quad (7)$$

Finally, the vertical product differentiation should be considered. Vertical product differentiation takes place when all consumers choose to purchase the same product of the highest quality given that all the products cost the same. In order to analyse for existence of vertical product differentiation based on ticket prices I am going to use the pooled data, which will be separated in two groups – the first group will contain the base airline prices exceeding 7,000 RUR and the second will include the base airline prices lower than or equal to 7,000 RUR. In order to measure the dispersion we will use the following formula of the Coefficient of Variation: $C_v = \frac{\sigma}{|\mu|}$.

CHAPTER 3. EMPIRICAL RESULTS

Bertrand Equilibrium

As it has already been mentioned in the methodology section, first of all I have analyzed the data to see if the prices converge to Bertrand Equilibrium. The formula used in this section is the simple formula of variation, which is calculated as standard deviation divided by mean.

$$\text{Coefficient of Variation: } C_v = \frac{\sigma}{\mu}$$

Using all 2100 observations collected from all 175 flights, the average coefficient of dispersion was calculated to be 4,286% for each flight. This result suggests that prices actually do converge to a Bertrand Equilibrium. What are the possible explanations of such an outcome?

It can be argued that the firms might not want to raise the prices by large amounts because of the possibility of loss of the customers, who would simply prefer to use the other company's services. What is more, they will not set their prices lower than their marginal costs as this would result in negative profits. With an application to the electronic marketplace the convergence of prices to Bertrand Equilibrium could be explained by the intense competition between the OTAs and the fact that there is no determined leader and at the same time the presence of a large number of players. The possible reason why there are no clearly defined leaders in the Russian market might be the fact that the existing OTAs are comparatively new and that the OTA business is only in the beginning of its process of developing. It should also be noted that there exist a significant number of websites like www.skyscanner.ru which give an opportunity to compare the prices offered by the OTAs simultaneously: the customer simply chooses the details of the flight he or she is interested in and the website shows all the alternatives available from the different OTAs. As a consequence the purchaser becomes fully informed of all the possible sellers and prices. Individuals who are informed about the existence of such websites would not waste their time to visit different OTAs websites to compare the prices introduced, therefore the search costs are lowered even more.

George Stigler in his work 'The Economics of Information'[23] suggested that price dispersion could be considered to be a measure of ignorance in the market. If it was possible for the purchaser to search and become fully informed of all the potential prices and sellers, prices would converge in the market according to Bertrand equilibrium. He argued that no firm would risk to lose all of it's customers by raising its price and that setting the price less than the

[23] The Economics of Information, George J. Stigler, The Journal of Political Economy, Vol. 69, No. 3. (Jun., 1961), pp. 213 - 225

marginal cost would yield negative profits. This is what basically happens in industry we consider in this paper. The application of this theory on the internet has been widely covered in the literature and a number of investigations conclude that prices in the internet converge due to the low cost of search, supporting the results. One of such studies is Erick Brynjolfsson and Michael Smith's work[24] which was published in 2000 and which empirically analysed characteristics of Internet as a market for two categories of homogeneous goods – CDs and books. In their analysis they have used a data set of approximately 8,500 price observations and compared the pricing behaviour of 41 Internet and standard retail outlets. They have found that the prices on the Internet are 9-16% lower – depending on whether taxes and shipping costs were included in the price. They have also discovered that the levels of price dispersion significantly depend on the measures employed: when they compare the prices posted by different Internet retailers they have found substantial dispersion - Internet retailer prices differ by an average of 33% for books and 25% for CDs. Despite that, when they weighted these prices by proxies for market share, they have found that dispersion was lower in Internet channels than in conventional ones.

Salop and Stiglitz's Two-Price Equilibrium Model

The next model under consideration in this paper is Salop and Stiglitz's Two-Price Equilibrium Model. The data can be explored in order to determine which factors lead to dispersion in the mark-ups across the OTAs. In order to do so we have followed the OTA-induced Price Dispersion and Airline-Induced Price Dispersion as has been described in the methodology part.

OTA-induced Price Dispersion

The regression models (1) - (4) in the form that they are presented in the methodology part occurred to have a problem of multicollinearity, so I have excluded the intercept in order to get rid of the multicollinearity or the dummy variable trap. This trap refers to the situation where in regression all the dummy variables are included, with their sum equal to 1, which results in perfect multicollinearity. The regressions were built with the help of EViews 7 and the results obtained for regression equation (1) can be found in Table 9 in the Appendix as an example.

The following results presented in Table 13 have been obtained for regression models (1) - (4) after the intercept has been excluded:

[24] Frictionless Commerce? A comparison of internet and conventional retailers, E. Brynjolfsson & M.D. Smith, Management Science, April 2000, vol. 46, no. 4, pp. 563 - 585

Table 13 Results for Pooled Model Regressions (1) - (4)

	Model (1)	Model (2)	Model (3)	Model (4)
OTA_1	-455.7701	-298.5771	-366.6365	-298.5771
OTA_2	93.13218	250.3252	182.2658	250.3252
OTA_3	14.91954	172.1125	104.0532	172.1125
OTA_4	-155.3678	1.825156	-66.23417	1.825156
OTA_5	36.75862	193.9516	125.8923	193.9516
OTA_6	185.5057	342.6987	274.6394	342.6987
OTA_7	112.5805	269.7734	201.7141	269.7734
OTA_8	-322.0057	-164.8128	-232.8721	-164.8128
OTA_9	307.9828	465.1757	397.1164	465.1757
OTA_{10}	242.0575	399.2504	331.1911	399.2504
OTA_{11}	572.2586	729.4516	661.3923	729.4516
AE		-475.2692	-509.9505	-389.7175
TR		-122.2908	-139.8866	-122.2908
EXC			146.3275	
OUT				-502.6166
Adjusted R-squared	6.4%	9.3%	9.7%	10.5%
Durbin-Watson stat	1.329835	1.258907	1.290055	1.258166

The following conclusions from the results on Model (1) can be made: the lower is the coefficient, the lower is the price that the OTA offers compared with the airline company. It can be seen that overall Tripsta.ru (OTA_1) has the lowest level of mark-ups, while Budgetair (OTA_{11}) has the highest level of mark-ups. This can be also shown on the following Figure 6:

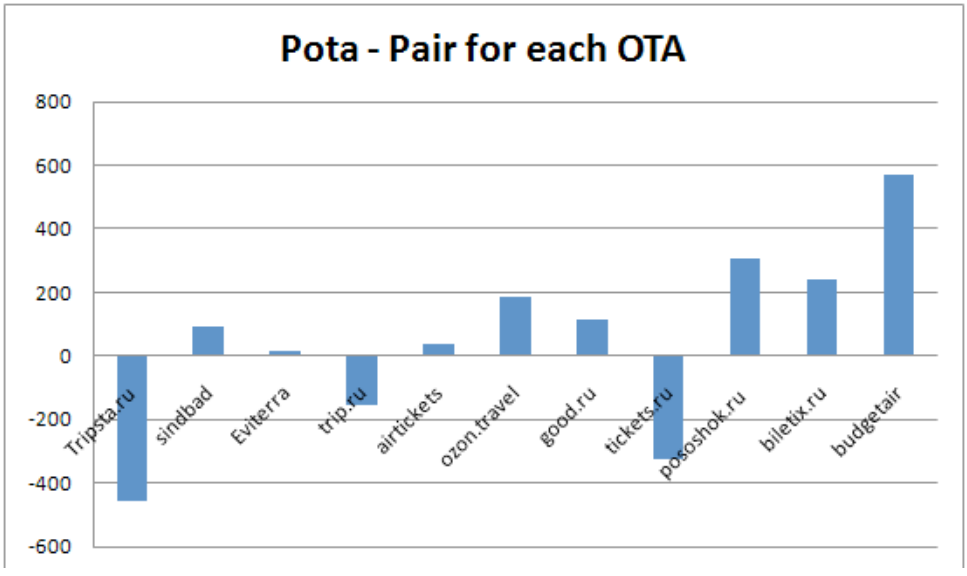

Figure 6 Level of mark-ups for each of the OTAs

From Model (2) it can be seen that Aeroflot and Transaero have negative coefficients, therefore for this airline companies OTAs offer lower airline ticket prices than the airlines themselves. The possible explanation for this could be the fact that OTAs have favourable agreements with the airline companies and the OTAs try to sell the tickets that they get from the airline companies at a lower price. It should be noted that Aeroflot tickets are offered at a lower price (on average on 475 RUR lower) than the Transaero tickets (on average on 122 RUR lower).

Coefficient of EXC is positive in the results for Model (3), therefore the conclusion can be made that OTAs offer higher prices for these tickets on average by 147 RUR than the airline company itself.

OUT coefficient turned out to be negative in the Model (4), which might indicate that for the airline tickets that are considered to be outliers and whose price is greater than 30.000 RUR, OTAs offer prices lower than the airline companies (on average by 502 RUR).

From all four models under consideration the results on Adjusted R-squared are given. Model (1) gives $Adj.R^2_1$ = 6.4%, Model (2) gives $Adj.R^2_2$ = 9.3%, Model (3) gives $Adj.R^2_3$ = 9.7% and Model (4) gives $Adj.R^2_4$ = 10.5%. Adjusted R^2 is used as it adjusts for the number of terms in a model. Simple R^2 increases when a new term is added to a model, but Adjusted R^2 increases only if the new term improves the model more than would be expected by chance. In addition adjusted R^2s are used to control for increased explanatory power simply due to a higher number of regressors' so choice of Adjusted R^2 seems to be more appropriate in this case. It can be seen that Adjusted R^2 has increased from model 1 to model 4, which means that each new regression has more explanatory power.

The four models under consideration also give result on Durbin-Watson test, which can be found in Table 1. This test is used for detection of autocorrelation in series data, and it's null hypothesis is whether autocorrelation is equal to zero. If positive autocorrelation takes place, the Durbin–Watson statistic will tend to be less than 2, and if there is negative autocorrelation, it will tend to be greater than 2. In this paper the DW statistics in all four models are slightly above 1, therefore positive autocorrelation is present, which is quite unsurprising taking into the account that the data used is much alike. As a rough rule of thumb, if Durbin–Watson is less than 1.0, there may be cause for alarm; however this is not what happens in our situation.

In order to determine the existence of possible relationships between the particular Airline company and OTA, interaction terms have been introduced in the regression model. With the inclusion of interaction terms and regressing equation (5) the results have showed that the model is ineffective as the p-values are high and therefore the model's coefficients are

insignificant. However it should also be noted that the Adjusted R-squared has slightly increased to 10.6%.

Airline-Induced Price Dispersion

When regressing the model (6) and (7), I dealt with the problem of multicollinearity. In this case in order to get rid of multicollinearity we have excluded the dummy variable for S7 and therefore now intercept coefficient can be considered as the coefficient which stands for S7. The results can be found in Table 10 in the Appendix. The results obtained show that S7 offers better priced air tickets than the OTAs as the coefficient is positive.

The regression equation (7) is the price difference regressed against the dummy variables of most quoted airlines and the dummy variables of days of flight. In the regression for model (7) the coefficients for days are found to be insignificant. Adding dummy variables for days also does not add much explanatory power to the model. Days of flight are later on excluded from the rest of the regression equations. It can be noted that for Fridays and Saturdays OTAs offer on average lower ticket prices than for other days, meaning that airlines on their websites ask for a higher price for flights on Saturdays and Fridays on average.

Vertical Product Differentiation

The final step in this paper analysis is the calculation of vertical product differentiation. To analyze the vertical product differentiation based on airline tickets price, the pooled data is used which is separated in two groups: first group (1) with the base airline ticket price exceeding 7,000 RUR and the second group with the base ticket price less than or equal to 7,000 RUR. According to Eric Lehmann's conclusions in his work 'Pricing behaviour on the web: Evidence from online travel agencies'[25], as the expected savings from the search are greater for highly priced goods, they tend to be more searched on the internet. Therefore controlling for vertical product differentiation should lead to more severe price competition and thus less dispersion. Once again the coefficient of variation is used to measure price dispersion, now for the pooled data:

$$C_v = \frac{\sigma}{|\mu|}$$

[25] Pricing behavior on the web: Evidence from online travel agencies, Erick E. Lehmann, Empirica, 30, pp. 379 – 396, 2003

The descriptive statistics for Price of OTA and the corresponding mark-up Price of OTA less Price of Airline can be found in Table 12 in the Appendix. As it can be seen from the Table 12 the coefficient of variation for the Group Two is lower in absolute terms than the coefficient of variation in Group One, which disposes the conclusions of Lehmann work. But anyhow it can be said that online airline tickets industry is controlled for vertical product differentiation, which leads to more severe price competition and thus less dispersion. This happens because competition in the not "exclusive" section is fiercer, as more reasonably priced section of tickets is more popular between clients, leading to a lower dispersion of tickets offered by OTAs.

It should also be noted that the mean for the second group turned out to be negative, which can be interpreted by the fact that the prices for the tickets offered by OTAs are lower than the prices offered by the airline companies. This could be explained by the fact that the tickets which cost less than 7,000 RUR are usually sold for the established routes and that the OTAs may have certain favourable agreements with the airline companies about them, so it is easier for them to offer even lower prices. And fierce competition can again be an explanation to negative mean of the second group, as some OTA offer more popular budget tickets price lower that airlines in order to attract new clients. Sometimes OTA do that even below break-even.

CHAPTER 4. DISCUSSION AND OPEN QUESTIONS

In this paper it has been found that price dispersion between the prices offered by the OTAs and the prices offered by the airline companies is only 4,286% for each flight, which is not a very large number, however dispersion still takes place. Moreover, the results showed that prices are in general lower on OTA rather than on airline websites.

One of the explanations could be that should not be forgotten is that there exists a special relationship between the OTAs and airline companies who are at the same time suppliers and competitors. OTA generally negotiate cheaper fares with specific airlines directly. This happens because OTAs sign an agreement with the airline, which is called "Model Agency Agreement". It contains the interest rate commissions earned by the agency for each ticket sold. For example Aeroflot percent commission on tickets from 1 June 2013 is 4%[26] both for "economic class" and “business class”. Earlier Aeroflot paid their agents a commission of 7% on "economic class" tickets and 9% on "business class". This change means that OTA profits will surely be lower when selling Aeroflot tickets. But anyway, this commission allows OTA to sell ticket below airline price, so it would receive a lower commission from the airline, but on the other hand will attract customers.

OTA’s prices in this paper indicated that Tripsta.ru has the lowest level of mark-ups, while Budgetair has the highest level of mark-ups. As all agents face the same conditions from airlines, this can mean that Tripsta.ru on average attract customers by getting lower commission from airlines, while Budgetair on average gets the full commission and even tries to gain some more profit by selling tickets with a premium.

Other results gained in the empirical part showed that Aeroflot tickets are offered at a lower price (on average on 475 RUR lower) than the Transaero tickets (on average on 122 RUR lower). It happens because Transaero commission (3%) is lower than Aeroflot, so OTA can offer lower prices for Aeroflot tickets and still generate some revenue. Data also showed that S7 website offers better priced air tickets than the OTAs, and it happens because S7 commission for 30 main destinations is 0,1%[27].

Data in this paper showed that generally prices converge between different OTAs, and as it was said in empirical part, it happens because of very low search costs in the Internet. The websites like www.skyscanner.ru or www.aviasales.ru give an opportunity to compare the prices offered by the OTAs simultaneously, so the purchaser becomes fully informed of all the possible

[26] http://www.atorus.ru/news/press-centre/new/21936.html
[27] http://www.kommersant.ru/doc/2209373

sellers and prices. This leads to the situation where OTA offer generally same low prices in order to not lose their customers.

The fact that the online tourism industry in Russia is only in the process of developing should also be taken into consideration when the empirical investigation into Russian OTAs in being made. As it has been noted by brand manager of Budgetair, one of the OTAs considered in this paper, in the last few years the size of the Russian market of online travelling has increased in 4,5 times.[28] She has also mentioned that this tourism segment is still shaping and that compared to the traditional channels of sales its percentage ratio is approximately 10-15%.

Regarding the commissions, Dmitry Gorin, CEO of the company "VIP service", thinks that “the commission will be cleared”. In Europe and the U.S. already most airlines abandoned any existing commissions. “But in Russia it will be a needless restructuring of the market” – he stressed out – “Agents will have to work anyhow, so the emphasis will be shifted to the consumer. Additional fees will be introduced - an average of € 10-20 per ticket agents will be introduced to compete in terms of service, quality of service”. For instance, Sergey Bogachev, who heads the "Aviation Center" thinks that in his company fees for the tickets would have to be increasedin any case, in particular, the Corporate segment." He added that in the absence of a guaranteed return from ticket sales market consolidation can be expected.[29]

This paper concludes that prices are generally determined by the very fierce competition in OTA sector. But as commissions will be lowered, it can mean that agents will try to develop new services, such as hotels booking or car rentals. This will be a completely new market, as now agent will try to help will help passengers find the best offer, whenever before OTA tried to help airlines to sell more tickets. This will mean new techniques of price differentiation and new strategies to attract new clients.

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[28] http://www.euromag.ru/catalogs/tickets/29077

[29] http://www.kommersant.ru/doc/2209373

CHAPTER 5. CONCLUSION

The issue of product differentiation and price dispersion for products sold online has become attractive to the researchers with the growth of the use of the internet by the consumers. One of the main consequences of the internet being used more heavily was the expansion of online travel agencies. The aim of this study was to understand whether online travel agents quote the same prices as airlines in order to see if any price dispersion occurs. The air travel industry is a good example of an online industry to analyse and it is possible that the composition of lower search costs with the existence of online travel agencies would lead to abolition of price dispersion online.

In order to make my analysis in this paper I have chosen 11 different Russian online travel agencies. I have collected the data for 25 different European routes for each of the OTAs under consideration for a period of one week, which has resulted in approximately 2100 observations. This data was collected in order to examine three different models explaining the effects of spread of information on the internet prices and thus the consumer's search behavior, including the Bertrand Equilibrium, Two Price Equilibrium Model (following the OTA-induced Price Dispersion and Airline-Induced Price Dispersion) and Vertical Product Differentiation.

The average coefficient of dispersion was calculated to be 4,286% for each flight. This result suggests that prices actually do converge to the Bertrand Equilibrium, explaining fierce competition in the OTA market.

Regardless of the efficiency of the internet in reducing search costs, prices for the same ticket do not necessarily converge online. Certain mark-ups below or above the airline companies' price take place when OTA search engines are used. The consistent nature of the price mark-ups can be explained by Salop and Stiglitz's 1977 Two Price Equilibrium Model, where different search ability across customers is responsible for different search efforts. Customers having low search cost will want to be completely informed and will perform search actions and will therefore purchase their tickets from the lowest price seller. However others with large search costs will not put in the effort to search at all and then their ticket price will depend on where they will decide to purchase their tickets. Two Price Equilibrium Model in this study showed the difference in price given by OTA and by airlines itself. The analysis showed that some OTA offer prices significantly lower prices, whereas other OTA even offer prices which are higher than airlines are offering on their websites. Though search costs in the Internet are low for every customer, they still do exist. This leads to the situation when some group of customers don't put enough effort in search and they buy the first tickets available (from such OTA like good.ru, pososhok.ru, budgetair), when other group of customers search for the lowest

price and buy the cheapest tickets they can find (from such OTAs as Tripsta.ru, trip.ru, airtickets).

Finally, the investigation for vertical differentiation has led to the following result: online airline tickets industry is controlled for vertical product differentiation, which leads to more severe price competition and thus less dispersion. This result showed that competition in budget tickets section is fiercer, as they are more popular between clients, leading to a lower dispersion of tickets offered by OTAs.

Our results additionally show that service differentiation is a key strategic component of online sellers offering access to heterogeneous goods. This could be explained by the fact that by taking advantage of consumer's heterogeneity in tastes and their uncertainty in the quality offered by sellers, online travel agencies can mitigate price competition by segmenting the market. Nevertheless it is important not to forget that in the setting under consideration differentiation strategies are not without costs – and our results propose that some of inefficiency in the selection process could be explained by imperfect implementation of differentiation strategies.

In conclusion, it should be noted that although this study has attempted to explore and explain the price differences across the online ticket prices, it has not asked nor answered all the key questions. This study is only the basis for a further research of price dispersion and product differentiation for online tickets in the context of Russian online travel agencies. As it can be seen, Russian OTA market will experience some major changes in future, as commissions for OTA are already falling down, which means that new techniques of price differentiation will be introduced. This can be an idea for the further investigation.

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APPENDIX

Table 1. List of OTAs under consideration

	OTAs
1.	Tripsta.ru
2.	Sindbad
3.	Eviterra
4.	Trip.ru
5.	Airtickets
6.	Ozon.travel
7.	Good.ru
8.	Tickets.ru
9.	Pososhok.ru
10.	Biletix.ru
11.	Budgetair

Table 2. List of flights chosen for the data collection

	Flights
1.	Moscow - Munich
2.	Moscow - Tel Aviv
3.	Moscow - Vienna
4.	Moscow - Riga
5.	Moscow - Lisbon
6.	Moscow - Kiev
7.	Moscow - Ljubljana
8.	Moscow - Athens
9.	Moscow - Geneva
10.	Moscow - Tallin
11.	Moscow - Brussels
12	Moscow - Zagreb
13.	Moscow - Krakov
14.	Moscow - Berlin
15.	Moscow - Oslo
16.	Moscow - Frankfurt
17.	Moscow - Madrid
18.	Moscow - Rome
19.	Moscow - Saloniki
20.	Moscow - Venice
21.	Moscow - Istambul
22.	Moscow - Paris
23.	Moscow - Malaga
24.	Moscow - Helsinki
25.	Moscow - Paphos

Table 3. The cheapest tickets out of 175 flights under consideration

OTA	Cheapest tickets (out of 175 flights)
Tripsta.ru	103
Sindbad	1
Eviterra	1
trip.ru	21
airtickets	0
ozon.travel	0
good.ru	3
tickets.ru	30
pososhok.ru	0
biletix.ru	2
Budgetair	0
Aviacompany	14

Table 4. Departure Airports Observations

Airport	Airport Observations
DME	65
SVO	56
VKO	54

Table 5. Airline Companies Mentions

Airlines	Airlines Observations
Adria Airlines	7
Aegean Airlines	12
Aeroflot	47
Aigle Azur	7
Air Berlin	4
Air Moldova	1
Air Baltic	1
Brussels Airlines	7
Lufthansa	5
S7 airlines	20
Swiss	7
TAP Portugal	5
Transaero	41
Turkish Airlines	8
UIA	1
UTair	2

Table 6. Percentage of tickets with lower prices than the airline company's price

OTA	Percentage of tickets with price lower than the airline price
Tripsta.ru	0.822857143
Sindbad	0.611428571
Eviterra	0.662857143
trip.ru	0.68
airtickets	0.691428571
ozon.travel	0.44
good.ru	0.302857143
tickets.ru	0.588571429
pososhok.ru	0.148571429
biletix.ru	0.251428571
Budgetair	0.057142857

Table 7. Dummy Variables for OTAs

OTA	Cheapest tickets (out of 175 flights)
Tripsta.ru	OTA_1
Sindbad	OTA_2
Eviterra	OTA_3
trip.ru	OTA_4
airtickets	OTA_5
ozon.travel	OTA_6
good.ru	OTA_7
tickets.ru	OTA_8
pososhok.ru	OTA_9
biletix.ru	OTA_{10}
Budgetair	OTA_{11}

Table 8. Most quoted airlines for each OTA (number of quotes)

OTA	Most mentioned #1	Most mentioned #2	Most mentioned #3	Total mentions
Tripsta.ru	Aeroflot (47)	Transaero (41)	S7 Airlines (20)	108
Sindbad	Aeroflot (47)	Transaero (41)	S7 Airlines (21)	109
Eviterra	Aeroflot (48)	Transaero (41)	S7 Airlines (20)	109
trip.ru	Aeroflot (47)	Transaero (41)	S7 Airlines (20)	108
airtickets	Aeroflot (48)	Transaero (41)	S7 Airlines (19)	108
ozon.travel	Aeroflot (47)	Transaero (41)	S7 Airlines (20)	108
good.ru	Aeroflot (47)	Transaero (41)	S7 Airlines (20)	108
tickets.ru	Aeroflot (47)	Transaero (41)	S7 Airlines (20)	108
pososhok.ru	Aeroflot (47)	Transaero (40)	S7 Airlines (20)	107
biletix.ru	Aeroflot (50)	Transaero (44)	S7 Airlines (13)	107
Budgetair	Aeroflot (47)	Transaero (41)	S7 Airlines (21)	109

Table 9. Eviews regression results for Model 1

Dependent Variable: POTA_PAIR
Method: Least Squares
Date: 06/18/13 Time: 23:17
Sample: 1 1914
Included observations: 1914

Variable	Coefficient	Std. Error
TRIPSTA_RU	-455.7701	79.84539
SINDBAD	93.13218	79.84539
EVITERRA	14.91954	79.84539
TRIP_RU	-155.3678	79.84539
AIRTICKETS	36.75862	79.84539
OZON_TRAVEL	185.5057	79.84539
GOOD_RU	112.5805	79.84539
TICKETS_RU	-322.0057	79.84539
POSOSHOK_RU	307.9828	79.84539
BILETIX_RU	242.0575	79.84539
BUDGETAIR	572.2586	79.84539

R-squared	0.064573
Adjusted R-squared	0.059658
S.E. of regression	1053.233
Sum squared resid	2.11E+09
Log likelihood	-16031.04
Durbin-Watson stat	1.329835

Table 10. Regression results for Model 6

Dependent Variable: POTA_PAIR
Method: Least Squares
Date: 06/18/13 Time: 23:41
Sample: 1 1914
Included observations: 1914

Variable	Coefficient	Std. Error	t-Statistic
C	214.6522	34.72971	6.180650
AE	-475.2692	58.42223	-8.135076
TR	-122.2908	61.12391	-2.000703

R-squared	0.033779
Adjusted R-squared	0.032768
S.E. of regression	1068.186
Sum squared resid	2.18E+09
Log likelihood	-16062.04
F-statistic	33.40469
Prob(F-statistic)	0.000000

Table 11. Regression results for Model 5

	Model (5)
TRIPSTA_RU	-418.5814
SINDBAD	280.9535
EVITERRA	190.2791
TRIP_RU	201.3837
AIRTICKETS	150.9535
OZON_TRAVEL	392.9884
GOOD_RU	183.6279
TICKETS_RU	87.98837
POSOSHOK_RU	360.0698
BILETIX_RU	312.4767
BUDGETAIR	619.0349
TRIPSTA_RU*AE	-34.58882
SINDBAD*AE	-537.5705
EVITERRA*AE	-476.4280
TRIP_RU*AE	-1102.065
AIRTICKETS*AE	-411.2939
OZON_TRAVEL*AE	-392.9884
GOOD_RU*AE	-183.6279
TICKETS_RU*AE	-1268.265
POSOSHOK_RU*AE	-238.3464
BILETIX_RU*AE	-312.4767
BUDGETAIR*AE	-270.3115
TRIPSTA_RU*TR	-118.1747
SINDBAD*TR	-180.8559
EVITERRA*TR	-198.0596
TRIP_RU*TR	-250.6764
AIRTICKETS*TR	-13.14861
OZON_TRAVEL*TR	-430.0372
GOOD_RU*TR	-91.01815
TICKETS_RU*TR	-286.1103
POSOSHOK_RU*TR	52.17413
BILETIX_RU*TR	59.35252
BUDGETAIR*TR	111.3554
Adjusted R-squared	10.6%

Table 12. Dispersion Statistics for Groups 1 and 2

	Group 1 (Price > 7000 RUR)		Group 2 (Price < 7000 RUR)	
	Price of OTA	Price of OTA – Price of airline	Price of OTA	Price of OTA – Price of airline
Mean	15624,44720	220,70600	5178,00471	-173,32038
Standard Deviation	9018,12251	1104,05685	1152,66395	746,50479
Coefficient of Variation	0,57718	5,00239	0,22261	4,30708
Number Of observations	982	982	853	853