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Article

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Contemporary Economics

Provided in Cooperation with:

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Suggested Citation: Stanisław Szopiński, Tomasz; Nowacki, Robert (2014) : Plane Ticket Price Dispersion in the Online Selling System in Poland, Contemporary Economics, ISSN 2084-0845, Vizja Press & IT, Warsaw, Vol. 8, Iss. 2, pp. 207-218,
<https://doi.org/10.5709/ce.1897-9254.141>

This Version is available at:

<https://hdl.handle.net/10419/105429>

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Primary submission: 28.02.2014 | Final acceptance: 19.05.2014

Plane Ticket Price Dispersion in the Online Selling System in Poland

Tomasz Stanisław Szopiński¹, Robert Nowacki¹

ABSTRACT

Many authors have studied the influence exerted by tourism on the economy. Today, Information and Communication Technologies (ICT) are an important factor influencing competitiveness in the tourism sector and consumers' decision-making concerning tourism purchases. Along with the expansion of the European Union, the revolution in passenger air transportation has spread over new member states in Central and Eastern Europe, including Poland. The authors of this study analyzed ticket prices on Internet websites that aggregate offers from different carriers and on the websites managed by the carriers themselves, specifically studying offers for the most popular flight connections from F. Chopin airport in Warsaw to London, Frankfurt, Munich, and Paris. For each connection, the study examined flights operated by the Polish carrier, i.e., LOT Polish Airlines, and by a carrier originating from a destination country. The analysis of the particular coefficients illustrating the price dispersion for each flight operated by a foreign carrier in comparison to the offer from LOT Polish Airlines points to the conclusion that the tickets offered by the latter were marked by a much narrower price dispersion in contrast to the connections offered by foreign carriers on the same route.

KEY WORDS: e-tourism; ICT; airline ticket price; price dispersion; price discrimination; price competitiveness

JEL Classification: D120; F120; L81

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Changes on the World Market for Passenger Air Transportation

Air transportation was one of the most tightly regulated sectors of the economy for many years. In effect, the so-called national carriers established a monopolistic position in most countries, which resulted in high prices for air journeys and consequently, little interest in them from average consumers (Pijet-Migoń, 2012, p. 7). Nonetheless, technical progress and new tech-

nological solutions adopted in air transport, as well as legal and organizational changes, have contributed to the increased popularity of air travel (Pijet-Migoń, 2012, p. 7). Moreover, the development of the Internet and e-business has facilitated changes in the functioning of the air travel market (Grotte, 2013). The liberalization of this market also brought about change (Grotte, 2013; Pijet-Migoń, 2012, p. 33), a process that was initiated in the United States. Market liberalization in Europe was carried out on the basis of the American deregulation experience, although the two processes were ultimately considerably different. The provisions of the law created by the European Community were intended to prevent the negative consequences of deregulation experienced in America, chiefly the dev-

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astating competition (Pijet-Migoń, 2012, p. 33). The first observable difference between these liberalization processes in the air travel market was that in Europe, the process was carried out over more than a dozen years. Another difference lies in the scope of deregulation. In the US, it chiefly encompassed the market for domestic travel and only partially touched the activity of foreign carriers operating in the American market. In Europe, the international market was more fully liberalized, and it can be argued that the deregulation process went even further in that it allowed for cabotage (air connections operated by a foreign carrier on the domestic market), which remains prohibited in the United States (Pijet-Migoń, 2012, p. 33).

In addition to the expansion of the European Union, the revolution in passenger air transportation has spread to new member states in Central and Eastern Europe, including Poland. Its most easily observable manifestation was the emergence of low-cost carriers on the Polish market. After 2004, the number of passengers travelling by air increased considerably. Moreover, the number of international routes departing from both Warsaw and regional ports also grew. This dynamic development made it necessary to expand the airline infrastructure. As in Western Europe, air travel in Poland ceased to be reserved for the elite. This phenomenon was even referred to as the “democratization” of air transport (Pijet-Migoń, 2012, p. 8).

The Influence of ICT on the Tourism Sector

The development of Information and Communication Technologies (ICTs) constitutes the source of a technological shock that has shaken the foundations of the basic models of the production of information, knowledge, and culture, and has marked the beginning of a new period of socio-economic transformation (Benkler, 2008, p. 399). Furthermore, the expansion of modern technologies is gradually changing the manner of conducting business activities due to its influence over the relationships among companies, suppliers, and clients, as well as over production processes, cooperation with other companies, and financial activities (Castells, 2003, p. 77). The leading role among ICTs is occupied by the Internet, which offers unique possibilities in terms of information management. The Internet is a highly useful tool that facilitates the de-

velopment and proper functioning of the economy. No distances, borders, socio-economic or cultural differences exist on the Internet. Both personal and technical interactions are equally available, and the role of the latter is constantly increasing. The development of the Internet has contributed to the emergence of a considerable number of new services comprising the management of information, for instance, services that allow shoppers to compare the prices and parameters of selected products in different online stores (Szopiński, 2008). Furthermore, the development of the Internet has changed the rules of the game for many companies operating in various market sectors, including tourism. Modern ICTs have provided new marketing and management tools for tourism (Buhalis, Law, 2008, pp. 609–623). The digitization of *all processes* and value chains in the tourism, travel, hospitality, and catering industries is called “e-tourism” (Buhalis, 2003, p. 76). E-tourism bundles together three distinctive disciplines, namely business management, information systems and management, and tourism (Buhalis, 2003, p. 77). According to Kabassi, e-tourism services may refer to services for selecting a destination, tourist attractions, accommodations, restaurants, routes, or all of the above, for the purpose of planning an entire trip (Kabassi, 2010).

The development of new information technologies, especially the Internet, has facilitated the formation of a new and better informed tourist who seeks offers that are exceptionally advantageous in terms of both time and money. Travel experiences may motivate consumers to personalize tourism services. Experienced travelers are more sophisticated in their searches and more often seek information on exotic destinations (Gaworecki, 2007, pp. 280-281). The Internet has exerted a considerable influence on the tourism sector and has contributed to bringing many new services to the market (Kabassi, 2010). According to Wang and Law (2007), the use of ICT generates additional time for out-of-home recreation activities and travel and increases consumers’ trip-making propensities. Individuals who are younger or who have a higher household income are more likely to be ICT users. Wang and Law’s (2007) findings further evidence of the complementarity effects of ICT on travel, suggesting that the broad application of ICT likely leads to more, not less, travel.

Price is the most important determining factor in whether a client who is interested in purchasing a tourism service will decide to make a reservation traditionally or via the Internet (Elhaj, 2012). According to research carried out on Polish consumers, the socio-economic factors determining the purchase of tourism services via the Internet are sex, income, job position, and the size of a respondent's place of residence (Szopiński, 2012, pp. 76-77). Consumers who employed the Internet for the purpose of seeking information on tourism services most frequently searched for price offers for such services (Szopiński, 2012, pp. 75-76).

Another phenomenon influencing the travel and tourism industry is the popularization of social media (Sotiriadis, van Zyl, 2013). Tourists use social networking websites to share experiences regarding tourism services (Fotis, Buhalis, & Rossides, 2011), and social media are thus becoming an increasingly important source of information for travelers (Xiang, Gretzel, 2010). Travelers place more trust in content produced by users than in content published on travel agencies' websites or mass media advertisements (Fotis et al., 2011). Consumers' opinions directly affect how markets operate. According to Freebairn, due to lower prices, the chief beneficiaries of the development of e-commerce are the end-users (Freebairn, 2001); however, this finding is not obvious in the context of Benkler's statement that the Internet has equipped both buyers and sellers with new tools that allow them to exert a mutual influence on each other (Benkler, 2008, p. 399). Consumers have been given the ability to share and seek information and opinions on goods and services through social networking websites, such as blogs, topical forums, websites that collect opinions on goods and services, and online auction sites, among others; in turn, sellers have obtained new abilities to monitor Internet users' behavior. Consequently, sellers are able to use dynamic prices (i.e., prices that vary according to the profile of the client interested in a product or service, with identification dependent on previous purchases, place of residence, or interest in a product or service measured by monitoring the time that a person devotes to viewing a page describing a product or service).

Paradoxically, the massive amount of information on goods and services available in an information so-

ciety causes difficulties for consumers, who are often unable to make conscious choices. Price comparison websites may contribute to solving this problem by providing offer comparisons and comprehensive recommendations; however, these websites have not been completely effective. Consumers do not necessarily trust them because the owners of these websites receive sales commissions as remuneration for rendering services. Furthermore, price comparison websites often provide no more than a fraction of the offers available on the market and thus do not present the entire range of offers, chiefly because price comparison websites only aggregate data on selected suppliers with whom they conclude agreements. Moreover, different search engines are based on distinct mechanisms for searching the offers available on the market. In order for comparison websites to be successful, they must compare non-price factors, such as product quality and post-purchase services (Gamper, 2012). Using comparison websites may be even more effective if services undergo comparison. Services may not be stored. By using the Internet, companies that offer transport services, for example, may more effectively reduce this problem due to the use of dynamic prices. Brynjolfsson, Dick, and Smith (2010) claim that, contrary to the common assumption, search intensity is not correlated with greater price sensitivity. Instead, consumers who search multiple screens put relatively more weight on non-price factors, such as brand.

Price Policies of Carriers and Middlemen in the Plane Ticket Trade: Literature Review

One form of price discrimination is "temporal" price dispersion. This form of price discrimination consists of the seller offering distinct prices depending on the period in which the consumer buys a given commodity or service (Varian, 1980). Price dispersion is present in both on- and offline stores. The factor that has a substantial influence on price dispersion is the number of reviews posted by clients (Petrescu, 2011). Nelson's results obtained using cross-sectional data indicate that the level of price dispersion is positively related to the price of the product and the number of sellers and is lower for goods that typically would be purchased several times a year (Nelson, Cohen, & Rasmussen, 2007). In the case of information overload or

conflicting information on the electronic market, price dispersion intensifies (Grover, Lim, & Ayyagari, 2006).

Air carriers adopt various price strategies. The closer the departure date, the higher the ticket prices on a given route (Bilotkach, Gorodnichenko, & Talavera, 2010). Carriers may change plane ticket prices according to the number of days between departure and return (Alderighi, Cento, & Piga, 2011), one way that airlines can differentiate between clients in terms of their price elasticity.

One of the factors allowing for price differentiation is the seller's market power, which makes it possible to categorize clients according to their price elasticity of demand. Consequently, clients who wish to purchase a plane ticket shortly before take-off are perceived as being characterized by a lower price elasticity of demand. The seller, who is aware of the lack of a product substitutes resulting from a high monopolization of the market, offers the client making the late purchase a higher price than that offered to a client buying a ticket in advance (Gaggero & Piga, 2011). According to Lott and Roberts (1991), apart from the client's varied price elasticity of demand, the differences in prices for plane tickets may be explained by the cost of preserving a particular number of tickets in order to ensure their availability.

Research carried out by Brunger and Perelli (2009) has shown that the primary motive leading to the decision to use the Internet to find plane ticket offers was not price; rather, purchasing plane tickets online was perceived as an experience in itself. Internet users gained control due to the possibility of making a decision at the time of purchase: "If you don't like the price, wait a couple of days and go back on," or "Start looking early. I keep looking until I absolutely can't wait any longer" (Brunger & Perelli, 2009). Paradoxically, for some respondents, the 'impersonal' Internet search process has enabled, facilitated and/or reinforced a rich set of social interactions centered on the travel decision (Brunger & Perelli, 2009). Respondents identified four categories of differences between searching for plane tickets online and traditionally: increased control, greater search breadth, improved efficiency of communication and improved search involvement. Search breadth and control were the primary reasons for adopting the Internet. Both improve the range of the search across multiple websites and across time

and the thoroughness with which the search can be carried out. Communications efficiency includes both the switch from an oral to a visual medium and the convenience of shopping from one's home or office on one's own schedule. Both attributes improve the efficiency of the search. Furthermore, search involvement encourages diligence and thoroughness. Consequently, Internet searches are deeper and more extensive (Brunger & Perelli, 2009).

In fact, clients making ticket purchases via online travel agencies (OTAs) pay lower fares for similar journeys than those who buy tickets through traditional travel agencies, although the fees and range of services offered by airlines are the same across all distribution channels. This is caused by the Internet Price Effect (IPE). This phenomenon may emerge due to differences in the characteristics of clients who make purchases on the Internet versus in traditional travel agencies. For instance, clients using traditional travel agencies are more often members of a Frequent Flyer Program and buy tickets that do not involve additional fees for making changes, such as altering the departure date (Brunger, 2010). Bachis and Piga (2011) have analyzed the price strategies of low cost carriers and presented evidence of differing prices being posted by the same e-seller on the same website at the same time for exactly the same product.

Global distribution systems (GDSs) and OTAs have been providing critical intermediation services for the air travel services industry. Technological developments have facilitated price comparisons for consumers, and consequently, service providers have suffered losses. In order to protect themselves from further reductions in profit, they attempt to differentiate their offers by means of adding or eliminating certain elements of the offer (Granados et al., 2012a; Granados et al., 2012b).

The characteristic feature of services rendered by airlines is the commoditization of an offer. Carriers must undertake action in order to differentiate an offer (Rothkopf, Wald, 2011). The demand for plane tickets purchased for the purpose of a business trip is less elastic than the demand for plane tickets purchased for the purpose of leisure travelling (Brons, et al., 2002). Business travelers are willing to pay more for a plane ticket because it is important for them to be able to change their travel plans (Brons, et al.,

2002). Moreover, the further the client purchasing a plane tickets travels, the weaker their price elasticity due to the lack of alternative means of transport on longer routes (Brons, et al., 2002).

Low-cost **carriers** have become essential actors supplying nationwide and continental air services, and currently represent 31% of intra-European **air-line** seats (Dobruszkes, 2013). The introduction of low-cost carriers (LCCs) to the market has given a boost to incoming tourism by air. The case of Norway is readily available as an example (Lian & Denstadli, 2010).

Kim, Xu, and Gupta (2012) showed that perceived trust exerted a greater influence than perceived price on the purchase intentions of both potential and regular customers of an online store. The study also showed that perceived price influenced purchase decisions by regular clients more significantly than prospective customers. Perceived trust, on the other hand, was more influential in the purchase decisions of potential clients.

Research on the relationships between plane tickets' price dispersion and the competitiveness of the market for air transport allows room for various conclusions. According to a study conducted by Borenstein and Rose (1994), price dispersion occurs on routes marked by greater competitiveness or lower flight density. On routes serviced by more than one carrier, the average price dispersion between companies is smaller than the average difference in prices paid by various customers on the same route to one carrier. If the number of carriers increases but the total number of connections on a given route remains unchanged, the price dispersion widens. However, an increased frequency of flights on a given route narrows the price dispersion (Borenstein & Rose, 1994). In contrast, Gerardi and Shapiro (2009) claimed that an increase in competition on a route reduces price dispersion considerably in a market with a diverse structure of business clients and leisure travelers. Furthermore, Obermeyer, Evangelinos, and Püschel (2013) presented research results revealing a non-monotonic relationship between price dispersion and competitiveness. Analyzing the European market, they discovered an inverse U-shaped relationship between the degree of competition and the magnitude of price dispersion for economy-class flights.

Sengupta and Wiggins (2012) studied this issue in order to compare price dispersion by way of analyzing

transactions concerning the purchase of plane tickets made online and offline. They revealed that price dispersion is lower in the online market than in the offline one. Another study indicates that various online travel agents offering plane tickets set different prices for identical tickets (Lin, Chen, & Song, 2009).

Airlines with a large number of loyal clients are not willing to use OTAs such as Expedia or Travelocity. Some carriers, like Southwest Airlines and Ryanair, do not use OTAs because, among other things, they may control prices offered to loyal clients on their own websites (Koo, Mantin, & O'Connor, 2011).

An airline's reputation may also influence the choice of an offer. Consumers are willing to pay more if a corporation's reputation is better (Graham & Bansal, 2007) or if the manner of presenting ticket prices is superior (Palmer & Boissy, 2009). Research conducted in Spain showed that the main predictors of the intention to purchase plane tickets online are, in order of relevance: habit, price saving, performance expectancy, and facilitating conditions (Escobar-Rodríguez & Carvajal-Trujillo, 2013).

Sam and Tahir (2009) provided valuable insight on the direct impact of website quality factors towards the online purchase intention of plane tickets. To improve consumers' online purchase intentions, service providers should provide service with empathy and enhance customers' trust.

Research Methodology

In order to analyze the level of price dispersion in the case of plane tickets in Poland, the prices of tickets posted on websites aggregating offers from various carriers (namely, the following seven price comparison websites: www.airfly.pl, www.lotnicze-bilety.pl, www.skyscanner.pl, www.biletti.pl, www.lataj.pl, www.aero.pl, and www.centrumlotow.pl) and on websites owned by the carriers themselves were analyzed. The most popular flight connections from F. Chopin airport in Warsaw to London, Frankfurt, Munich, and Paris were included in the study. In 2012, these were the most popular international destinations for Polish air travelers (Urząd Lotnictwa Cywilnego, 2013). For each connection, plane tickets from Warsaw's F. Chopin airport were sought on 7 April 2014 with a return date of 14 April 2014. Only point-to-point flights with no changes were taken into account. Moreover, only the

Table 1. Comparison of plane ticket price dispersion on the most popular routes

Indicator	Warsaw-London- Warsaw	Warsaw-Frankfurt- Warsaw	Warsaw-Munich- Warsaw	Warsaw-Paris-Warsaw
	WAW-LHR-WAW	WAW-FRA-WAW	WAW-MUC-WAW	WAW-CDG-WAW
POLISH CARRIER	LOT			
minimum price	639.00	470.00	472.00	671.00
maximum price	777.00	598.00	600.00	760.00
range	138.00	128.00	128.00	89.00
mean price	708.62	523.87	525.75	694.29
standard deviation	45.46	42.14	42.43	39.09
coefficient of variation	6.42	8.04	8.07	5.63
skewness	0.213	1.00	1.01	1.304
kurtosis	-0.633	0.256	0.211	-0.373
CARRIER FROM DESTINATION COUNTRY	BRITISH AIRWAYS	LUFTHANSA	LUFTHANSA	AIR FRANCE
minimum price	691.00	472.00	552.00	573.00
maximum price	1274.00	579.00	762.00	877.00
range	583.00	107.00	210.00	304.00
mean price	859.38	523.29	678.58	658.62
standard deviation	175.05	40.3	67.39	94.11
coefficient of variation	20.3	7.70	9.93	14.28
skewness	2.336	0.704	-0.9	2.19
kurtosis	6.199	-0.729	1.895	5.314

cheapest tickets offered by carriers for point-to-point flights on the routes mentioned above were included in the study.

For each connection, the study covered flights operated by the Polish carrier, i.e., LOT Polish Airlines, and by a carrier originating from a destination country, namely British Airways for London, Lufthansa for Frankfurt and Munich, and Air France for Paris. In order for the results to remain comparable, the same comparison websites were used and all data were collected on 13 January 2014. The analysis sought to answer the following research questions:

- What is the extent of price dispersion between the Polish carrier and the carriers from other countries?
- How high is the level of the coefficient of price variation for each destination under analysis from the point of view of the comparison of carriers and of the direction assumed on a given route?

Basic indicators allowing for the appraisal of the level of price dispersion were employed in the analysis of the results, namely, the minimum and maximum values, the range, arithmetic mean, standard deviation, coefficient of variation, skewness, and kurtosis.

Research Results

The analysis of the results presented in Table 1 points to the existence of a relatively high price dispersion for plane tickets, despite the fact that the highest possible comparability of offers was preserved. In particular, the biggest differences are observable between price offers submitted by the middlemen, which sometimes differ considerably from the prices set directly by the carriers. One of the factors explaining this phenomenon may be the fact that they employ different price lists for fees referred to as transaction- or service-related.

A comparison of flight prices offered by LOT Polish Airlines on the routes under analysis reveals that

a journey to London is the most expensive, which holds true both for prices offered directly by the Polish carrier (738.00 PLN) and the average prices offered by the middlemen (708.62 PLN). Flights to Germany, on the other hand, are considerably cheaper – the difference in price for a flight to Frankfurt and Munich in comparison to a flight to London amounted to approximately 200 PLN, with the prices for both German destinations being comparable.

The value range was the highest for the flights to London (138.00 PLN), while the ticket prices for flights to Paris were much less dispersed, with a range of only 89.00 PLN. The difference between the particular price offers and the mean was approximately 40 PLN. The lowest standard deviation (39.09 PLN) was observed for the flight to Paris, and the highest (45.46 PLN) for the flight to London. The greatest variance in prices was found for the connection to Munich, where the coefficient of variance reached 8.07%. A comparable level was also observed for Frankfurt (the difference was merely 0.03 of a percentage point). The coefficient was substantially lower for London (6.42%) and Paris (5.63%).

Analyzing the degree of price concentration with the use of kurtosis, one may notice that in the case of connections with London and Paris, the concentration of price offers is relatively low. The negative value of kurtosis testifies to this, especially in the case of London. This means that the offered prices go from one extreme to another and the price deviates from the mean considerably. In the case of connections to Germany, kurtosis assumed positive values, which denotes a strong concentration of price offers and a small number of offers deviating from the mean price.

As far as foreign airlines are concerned, sharp fluctuations in prices are observable, first and foremost, in the offers from British Airways: the range amounted to 583 PLN, with the maximum price being as much as 184% of the minimum price. The prices offered by the particular Internet middlemen differ from the mean price by an average of 175.05 PLN or 20.3%. The area of transvariation for typical offers ranged between 684.33 and 1034.43 PLN. The coefficient of skewness indicates that there is a clear right-skewed asymmetry of price distribution, and a high positive value of kurtosis points to a great concentration of offers around the mean price.

Ticket prices for flights operated by Air France to Paris are marked by lower dispersion. The range amounted to 304 PLN, and with a standard deviation of 94.11 PLN, which allowed us to identify the area of transvariation for typical offers ranging from 564.51 to 752.73 PLN. The distribution was also characterized by a strong right-skewed asymmetry and high kurtosis, denoting a high concentration of offers around the mean.

As far as the connections to Germany operated by Lufthansa are concerned, indicators revealed much lower levels of dispersion. This is particularly true for the connection to Frankfurt, characterized by the lowest range (107 PLN), standard deviation (40.30 PLN), and coefficient of variance (7.70%). The distribution in this case is right skewed and kurtosis assumed a value close to zero, which is characteristic for a normal distribution (-0.729) with a small number of offers significantly deviating from the mean price. It is the only foreign connection for which kurtosis was found to be negative.

Dispersion is slightly higher in the case of ticket prices for flights to Munich, as revealed by the coefficients. The range is almost twice as great (210 PLN), and the standard deviation indicates that typical offers deviate from the mean price by 67.39 PLN on average, or 9.93%. Kurtosis is positive and its value is fairly low (which points to a slightly greater concentration of offers than in the case of a normal distribution). The distinctive characteristic of the distribution of ticket prices on this route is left-skewed asymmetry.

Having analyzed the prices for flights operated by LOT Polish Airlines and the selected foreign carriers (on the basis of direct offers from the airlines), it is easy to see the great differences between the coefficients obtained for the different carriers, although they are not stable tendencies. An analysis of the mean prices reveals that the offer from LOT Polish Airlines is:

- cheaper in comparison to London (91% of the price offered by the British Airways) and Munich (76%);
- the same in the case of Frankfurt (100%); and
- more expensive for Paris (105%).

If, however, mean prices for particular flights are taken into account (i.e., both the offer of the airlines and the middlemen are included in the study), the re-

relationship between ticket prices for flights operated by LOT Polish Airlines and the foreign carriers has the following features:

- London – 82% (it is the only significant difference in comparison to the prices offered directly by the carriers);
- Frankfurt – 100%;
- Munich – 77%; and
- Paris – 105%

An analysis of the coefficients presenting the variety of price offers for the particular flights operated by foreign carriers in comparison to the offer from LOT Polish Airlines shows that, apart from mean prices, the greatest discrepancies are observable in the values of kurtosis and the coefficient of variance. Prices from the Polish carrier are marked by a much higher concentration around the mean (the maximum difference between the values of kurtosis is 0.889 for the ticket prices offered by LOT Polish Airlines and, for the sake of comparison, 6.928 for the ticket prices offered by British Airways, Air France, and Lufthansa) and a much lower differentiation of the area of transvariation for the typical values (for instance, a maximum difference between the values taken by the standard deviation is only 6.37 PLN, while it is 134.75 PLN for the foreign carriers; the range between the coefficients of variance amounts to –1.65%, compared to 12.40% for foreign carriers).

Discussion and Limitations

The results of this research reveal significant price dispersion occurring with respect to plane tickets for the most popular flight connections offered between Poland and four European cities via the Internet. It is difficult to draw a single conclusion for the reasons behind such a huge differentiation. The transparency of the market for plane tickets is limited because in addition to airlines' direct distribution channels, Internet middlemen (offering plane tickets), who may make use of different options for construing an offer (by, de facto, adding additional services), also operate on the market. Because the buyer cannot access the full picture of offer comparability, possibilities for using practices connected with price dispersion arise.

Price is becoming an important tool for shaping a competitive advantage and it is exploited in a very

flexible manner, which is typical of the Polish service sector as a whole. Research shows that over 60% of service companies in Poland consider price to be one of the three key factors determining competitiveness (Nowacki, 2012, p. 54). The price policy – along with introducing new brands to the market and improving a product's usefulness – is also the marketing area where companies often adopt innovative solutions (Nowacki, 2010, p. 64-65). After advertising, price management is also considered companies' most important instrument for promotional action, regardless of companies' size or the sector in which they operate (Strużycki, 2011, p. 65).

Research concerning marketing strategies adopted in the market for passenger air transport in Europe is lacking. Studies of the American and Asian markets prevail, while the European market is different. For instance, productivity is dissimilar. An analysis of research results regarding the European and American market between 2001 and 2008 showed that European airlines had been more effective. The results of productivity growth between individual years also indicated that for most years, European airlines performed slightly better than other airlines (Assaf, Josiasen, 2012). Thus the following question arises: when is price dispersion lowest and when is the highest? In order to provide an answer to this question, future research might focus on a comparative analysis of weekdays, certain months, and significant holidays such as Christmas or Easter. Another question is: if the period between purchasing a ticket and the departure date is shortening, is the dispersion of prices for plane tickets growing narrower or wider?

Conclusions and Recommendations

Older consumers are currently a large and growing group in the European Union, which creates business opportunities for many entrepreneurs, including those offering tourism services via the Internet (Gonzalez, Paliwoda, 2006). Nevertheless, online tourism service providers continue to ignore them. As European integration continues (by way of the reduction of barriers to the free movement of persons and residents' growing affluence) and the Internet becomes more and more widespread (facilitating business or private relations), the frequency of the use of e-tourism services by persons active on the labor market, students, and

pensioners may become even greater. Research carried out by Law, Leung, and Wong (2004) points to a conclusion that both web-based and traditional distribution channels for tourism services face a bright future. According to Lee and Lin (2005), in order for online stores to enhance customers' purchase intentions, they should develop marketing strategies that will more correctly address the trustworthiness, reliability, and responsiveness of web-based services.

It would be interesting to conduct research on the dispersion of prices for plane tickets over a longer period of time. Furthermore, changes in the dispersion of prices for the most popular flights occurring in tandem with the shortening of the period between the moment of price registration and the departure date could undergo analysis according to the carrier that operates each flight. Price dispersion between carriers with respect to the most popular routes and particular months or weekdays could also be studied, assuming that the period between the moment of price registration and the departure date is inflexible.

References

- Alderighi, M., Cento, A., & Piga, C. A. (2011). A case study of pricing strategies in European airline markets: The London - Amsterdam route. *Journal of Air Transport Management*, 17 (6), 369-373.
- Assaf, A. G., & Josiassen, A. (2012). European vs. U.S. airlines: Performance comparison in a dynamic market. *Tourism Management*, 33 (2), 317-326.
- Bachis, E., Piga, C. A. (2011). Low-cost airlines and online price dispersion. *International Journal of Industrial Organization*, 29 (6), 655-667.
- Benkler, Y. (2008). *Bogactwo sieci. Jak produkcja społeczna zmienia rynki i wolność [The Wealth of Networks: How Social Production Transforms Markets and Freedom]*. Warszawa: Wydawnictwa Akademickie i Profesjonalne.
- Bilotkach, V., Gorodnichenko, Y., & Talavera, O. (2010). Are airlines' price-setting strategies different? *Journal of Air Transport Management*, 16 (1), 1-6.
- Borenstein, S., & Rose, N. (1994). Competition and Price Dispersion in the U.S. Airline Industry. *Journal of Political Economy*, 102 (4), 653-683.
- Brons, M., Pels, E., Nijkamp, P., & Rietveld, P. (2002). Price elasticities of demand for passenger air travel: a meta-analysis. *Journal of Air Transport Management*, 8 (3), 165-175.
- Brunger, W. G., & Perelli, S. (2009). The impact of the internet on airline fares: Customer perspectives on the transition to internet distribution. *Journal of Revenue & Pricing Management*, 8 (2-3), 187-199.
- Brunger, W. G. (2010). The impact of the Internet on airline fares: The 'Internet Price Effect'. *Journal of Revenue & Pricing Management*, 9 (1-2), 66-93.
- Brynjolfsson, E., Dick, A., & Smith, M. (2010). A nearly perfect market? *Quantitative Marketing & Economics*, 8 (1), 1-33.
- Buhalis, D. (2003). *eTourism: Information Technology for Strategic Tourism Management*. London, UK: Prentice Hall.
- Buhalis, D., & Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet - The State of Tourism Research. *Tourism Management*, 29 (4), 609-623.
- Castells, M. (2003). *Galaktyka Internetu. Refleksje nad Internetem, Biznesem i Społeczeństwem [The Internet Galaxy: Reflections on the Internet, Business and Society]*. Poznań: Dom Wydawniczy Rebis.
- Dobruszkes, F. (2013). The geography of European low-cost airline networks: a contemporary analysis. *Journal Of Transport Geography*, 28, 75-88.
- Elhaj, M. (2012). Factors that contribute to consumers' perceptions of online and traditional travel reservation systems. *Anatolia: An International Journal of Tourism & Hospitality Research*, 23 (1), 118-122.
- Escobar-Rodríguez, T., & Carvajal-Trujillo, E. (2013). Online drivers of consumer purchase of website airline tickets. *Journal of Air Transport Management*, 32, 58-64.
- Fotis, J., Buhalis, D., & Rossides, N. (2011). Social Media Impact on Holiday Travel Planning: The Case of the Russian and the FSU Markets. *International Journal of Online Marketing*, 1 (4), 1-19.
- Freebairn, J. (2001). Some Market Effects of E-Commerce. *Singapore Economic Review*, 46 (1), 49-62.
- Gaggero, A. A., & Piga, C. A. (2011). Airline Market Power and Intertemporal Price Dispersion. *The Journal of Industrial Economics*, 59 (4), 552-577.
- Gamper, H. (2012). How Can Internet Comparison Sites Work Optimally for Consumers? *Journal of Consumer Policy*, 35 (3), 333-353.

- Gaworecki, W. (2007). *Turystyka [Tourism]*. Warszawa: PWE.
- Gerardi, K. S., & Shapiro, A. (2009). Does Competition Reduce Price Dispersion? New Evidence from the Airline Industry. *Journal of Political Economy*, 117 (1), 1-37.
- Gonzalez, A., & Paliwoda, S. (2006). Segmenting the Older Consumer for Online Travel. *Marketing Review*, 6 (4), 331-348.
- Graham, M., & Bansal, P. (2007). Consumers' Willingness to Pay for Corporate Reputation: The Context of Airline Companies. *Corporate Reputation Review*, 10 (3), 189-200.
- Granados, N. F., Kauffman, R. J., Lai, H., & Lin, H. (2012a). Decommoditization, Resonance Marketing, and Information Technology: An Empirical Study of Air Travel Services amid Channel Conflict. *Journal of Management Information Systems*, 28 (2), 39-74.
- Granados, N. F., Kauffman, R. J., Lai, H., & Lin, H. (2012b). À la carte pricing and price elasticity of demand in air travel. *Decision Support System*, 53 (2), 381-394.
- Grotte, J. (2013). Budget Tourism - Transition Economy. *International Journal of Business Insights & Transformation*, 6 (2), 104-109.
- Grover, V., Lim, J., & Ayyagari, R. (2006). The Dark Side of Information and Market Efficiency in E-Markets. *Decision Sciences*, 37 (3), 297-324.
- Kabassi, K. (2010). Personalizing recommendations for tourists. *Telematics and Informatics*, 27 (1), 51-66.
- Kim, H. W., Xu, Y., & Gupta, S. (2012). Which is more important in Internet shopping, perceived price or trust? *Electronic Commerce Research and Applications*, 11 (3), 241-252.
- Koo, B., Mantin, B., & O'Connor, P. (2011). Online distribution of airline tickets: Should airlines adopt a single or a multi-channel approach? *Tourism Management*, 32 (1), 69-74.
- Law, R., Leung, K., & Wong, J. (2004). The impact of the Internet on travel agencies. *International Journal of Contemporary Hospitality Management*, 16 (2), 100-107.
- Lee, G. G., Lin, H. F. (2005). Customer perceptions of e-service quality in online shopping. *International Journal of Retail & Distribution Management*, 33 (2), 161-176.
- Lian, J., & Denstadli, J. (2010). Booming Leisure Air Travel to Norway - The Role of Airline Competition. *Scandinavian Journal of Hospitality & Tourism*, 10 (1), 1-15.
- Lin, P., Chen, C., & Song, M. (2009). Price dispersion of online air tickets for short distance international routes. *Service Industries Journal*, 29 (11), 1597-1613.
- Lott, J. R., & Roberts, R. D. (1991). A Guide to the Pitfalls of Identifying Price Discrimination. *Economic Inquiry*, 29 (1), 14-23.
- Nelson, R. A., Cohen, R., & Rasmussen, F. (2007). An Analysis of Pricing Strategy and Price Dispersion on the Internet. *Eastern Economic Journal*, 33 (1), 95-110.
- Nowacki, R. (2010). Innowacyjność w zarządzaniu marketingiem [Innovation in Marketing Management]. In R. Nowacki, (Ed.), *Innowacyjność w zarządzaniu a konkurencyjność przedsiębiorstwa [Innovation in Management against Competitive-ness of a Company]*. (pp. 47-82). Warszawa: Difin.
- Nowacki, R. (2012). Konkurencyjność przedsiębiorstw usługowych w Polsce [Service Enterprise's Competitiveness in Poland]. *Handel Wewnętrzny*, 1(336), 51-59.
- Obermeyer, A., Evangelinos, C., & Püschel, R. (2013). Price dispersion and competition in European airline markets. *Journal of Air Transport Management*, 26, 31-34.
- Palmer, A., & Boissy, S. (2009). The effects of airline price presentations on buyers' choice. *Journal Of Vacation Marketing*, 15 (1), 39-52.
- Petrescu, M. (2011). Online price dispersion - more than imperfect information. *Journal of Product & Brand Management*, 20 (7), 541-548.
- Pijet-Migoń, E. (2012). *Zmiany rynku lotniczych przewozów pasażerskich w Polsce po akcesji do Unii Europejskiej [Changes on the Passenger Air Travel Market in Poland after Accession to the European Union]*. (Rozprawy Naukowe Instytutu Geografii i Rozwoju Regionalnego 25). Wrocław: Uniwersytet Wrocławski.
- Rothkopf, M., & Wald, A. (2011). Innovation in Commoditized Services: A Study in the Passenger Airline Industry. *International Journal of Innovation Management*, 15 (4), 731-753.
- Sam, M. F. M., Tahir, M. N. H. (2009). Website Quality and Consumer Online Purchase Intention of Air Ticket. *International Journal of Basic & Applied Sciences*, 9 (10), 20-25.

- Sengupta, A. & Wiggins, S. N. (2012). Comparing Price Dispersion on and off the Internet Using Airline Transaction Data. *Review of Network Economics*, 11 (1), (n.d.) DOI: 10.1515/1446-9022.1244.
- Sotiriadis, M. D., van Zyl, C. (2013). Electronic word-of-mouth and online reviews in tourism services: the use of twitter by tourists. *Electronic Commerce Research*, 13 (1), 103-124.
- Strużycki, M. (2011). Konkurencja jako obszar działań reklamowych – podstawy i uwarunkowania [Competition as Advertising Activity – Basis and Conditions]. In R. Nowacki, M. Strużycki (Eds.), *Reklama w procesach konkurencji [Advertising in Competition Processes]*. (pp. 21-66). Warszawa: Difin.
- Szopiński, T. (2008). Rozwój Internetu a konkurencyjność podmiotów na wybranych rynkach usług [Development of the Internet against Competition of Entities on the Selected Markets for Services]. In S. Lis, T. Szot-Gabryś (Eds.), *Przedsiębiorczość i Innowacje – Problemy, Koncepcje, Wyzwania [Entrepreneurship and Innovation – Problems, Concepts, and Challenges]*. (pp. 211-220). Kielce: Stanisław Staszic University of Arts and Science in Kielce.
- Szopiński, T. (2012). *E-konsument na rynku usług [E-Consumer on the Market for Services]*. Warszawa: CeDeWu.
- Urząd Lotnictwa Cywilnego [Civil Aviation Authority]. (October, 2013). *Analiza Rynku Transportu Lotniczego w 2012 roku w Polsce [Aviation Market Analysis in 2012 in Poland]*. Retrieved from http://www.ulc.gov.pl/_download/regulacja_ryнку/analiza_ryнку_2012.pdf
- Varian, H. R. (1980). A Model of Sales. *American Economic Review*, 70 (4), 651-659.
- Wang, D., & Law, F. Y. T. (2007). Impacts of Information and Communication Technologies (ICT) on time use and travel behavior: a structural equations analysis. *Transportation*, 34 (4), 513-527.
- Xiang, Z., Gretzel, U. (2010). Role of social media in online travel information search. *Tourism Management*, 31 (2), 179 – 188.

