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The volatility of price offers of passenger airlines on the example of the Warsaw – Brussels route

Zmienność ofert cenowych przewoźników pasażerskich na przykładzie trasy Warszawa – Bruksela

Abstract. In the study, the authors dealt with the price offer of four air carriers on the Warsaw – Brussels route. There were two traditional carriers (LOT Polish Airlines and Lufthansa) and two low-cost carriers (Ryanair and Wizz Air). The analysis considered changes in the ticket prices for a flight on a specific day over six months. A diversified pricing policy was found. Low-cost carriers and Lufthansa changed prices frequently but to a small extent. On the other hand, the cost of a ticket on Polish airlines was gradually increasing, the fastest in the last month before the flight. To minimize the ticket price at PLL LOT, a reservation had to be made at least three months before the flight. The lowest price of a Lufthansa and Ryanair ticket occurred a month before departure. On the other hand, at Wizz Air, the final price was lower than that offered at the beginning of the study.

Key words: air communication, ticket prices, pricing policy

Synopsis. W opracowaniu autorzy podjęli problematykę oferty cenowej czterech przewoźników lotniczych na trasie Warszawa – Bruksela. Było to dwóch przewoźników tradycyjnych (PLL LOT i Lufthansa) oraz dwóch niskokosztowych (Ryanair i Wizz Air). W analizie uwzględniono zmiany cen biletu na lot konkretnego dnia w półrocznym okresie. Stwierdzono zróżnicowaną politykę cenową. Przewoźnicy niskokosztowi oraz Lufthansa zmieniali cenę często, ale w niewielkim zakresie. Z kolei koszt biletu w polskich liniach stopniowo rósł, najszybciej w ostatnim miesiącu przed lotem. W minimalizacji ceny biletu w PLL LOT należało dokonać rezerwacji minimum trzy miesiące przed lotem. Najniższa cena biletu Lufthansy oraz Ryanair wystąpiła na miesiąc przed wyjazdem. Z kolei w Wizz Air cena ostateczna była niższa od zaoferowanej na początku badania.

Słowa kluczowe: komunikacja lotnicza, ceny biletów, polityka cenowa

Introduction

Passengers, air transport, in the period before the pandemic, became more and more popular every year. Carriers increased the number of flights and connections and competed with the attractiveness of offers. Therefore, travelers could choose the lines based on various reasons, both price and non-price (comfort, transfers, luggage weight, departure and destination airport, etc.).

Four airlines dominate the Polish market, namely traditional carriers, i.e., LOT Polish Airlines and Lufthansa, and low-cost carriers, Ryanair and Wizz Air. Many destinations can be reached via these lines. However, they differ in the offered price of the air ticket and the proposed range of additional services. In the years before the pandemic, all these lines showed a growing number of passengers (see Figure 1).

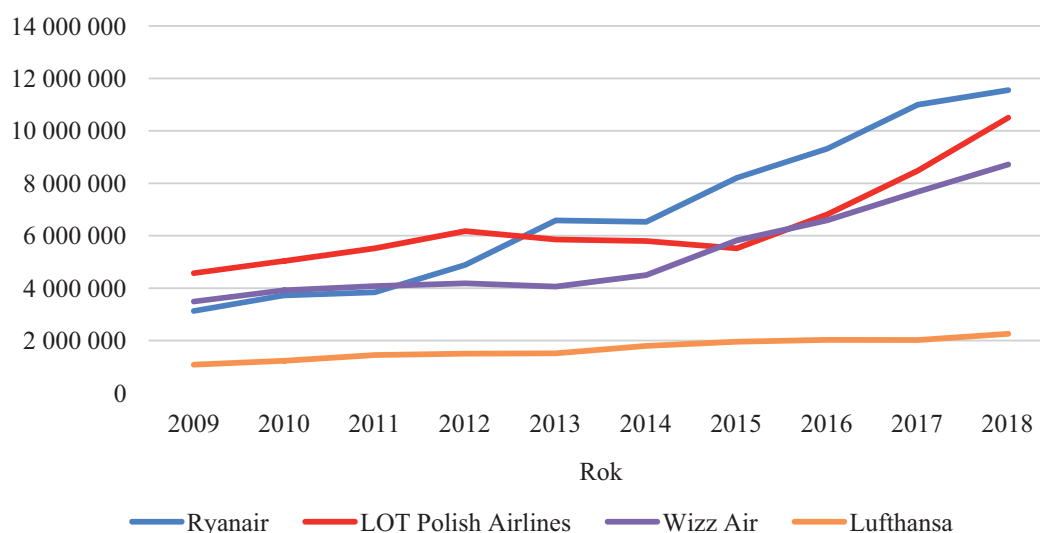


Figure 1. Number of passengers handled by major carriers at Polish airports in domestic and international regular traffic in 2009–2018

Rysunek 1. Liczba pasażerów obsługiwanych przez głównych przewoźników na polskich lotniskach w ruchu regularnym krajowym i międzynarodowym w latach 2009–2018

Source: own study based on [Urząd Lotnictwa Cywilnego 2019a].

Ryanair showed the most significant dynamics in this respect, although LOT and Wizz Air were also very active. Only in the case of Lufthansa was the upward trend insignificant.

Research purpose and material

The research aims to identify trends in changes in ticket prices for six months and find the best time to book a flight. An additional goal was to compare the largest passenger carriers' price offers on the Polish market on the Warsaw – Brussels route.

While collecting empirical material, the Internet was used to monitor the price offer and the scope of services provided by the compared carriers. In order to identify trends

in changes in airline tickets prices, a survey was carried out, which lasted for six months (from July 15, 2019, to January 14, 2020) and consisted of daily checking the current values for a flight of one adult from Warsaw to Brussels, which was to take place in Wednesday, January 15, 2020 and was to be served by each of the four previously discussed airlines. The date and the cities were chosen deliberately so that visiting the place was not dependent on the weather, and it was a “working day” in both Poland and Brussels, thanks to which external factors did not overstate ticket prices. The earliest flight was selected when traditional airlines offered more than one flight on the route under study. Additionally, to standardize, the prices of tickets for the first offer in economy class are presented. To make the results as realistic as possible, the tickets were monitored at a fixed time around 20:00.

Research objects were selected on purpose. These were the four-passenger airlines with the highest share in the Polish market. To obtain answers to the formulated research problems, a comparative analysis (horizontal and vertical) was used.

Features of air transport

As part of air transport, mainly long-distance passenger transport is carried out, using aircraft of various sizes, from several to several hundred on-board seats [Kacperczyk 2016, pp. 172–173]. This segment accounts for approximately 70% of global air transport performance [Czownicki 1993].

Due to the high speed, this type is often chosen for the transport of mail, and the transport of goods is its smaller segment. Airplanes allow for a single transport of up to 250 t of goods, which is a small load compared to rail or sea transport, and the price for the transport of various types of products is high [Lewandowski et al. 2013].

Until the pandemic, air transport was the branch with the fastest pace of development, because it allows reaching destination very quickly, and is also the safest means of transporting goods. The advantage is an extensive spatial range, and air transport deliveries are characterized by high regularity and punctuality [Kacperczyk 2016]. Besides, the advantage for passengers is the convenience of travel and food during the flight. The airline offers a different standard of service, and the prices are different, which attracts both less and more demanding people.

Table 1. Advantages and disadvantages of air transport

Tabela 1. Zalety i wady transportu lotniczego

Advantages	Disadvantages
<ul style="list-style-type: none">• short transport times• high security (goods protection)• large spatial range• greater frequency of transports• regularity and timeliness of deliveries• convenience of travel• food during the flight• diverse standard	<ul style="list-style-type: none">• high transport costs (mainly freight)• aircraft load capacity is low• the least versatile branch of transport• unfavorable spatial distribution of transport points• the necessity to use other modes of transport• long clearance time

Source: own study.

The disadvantage of air transport is the high cost of transport, especially freight. It is also possible to distinguish the small payload of aircraft and the lowest versatility among the modes of transport. The location of airports makes it necessary to use an additional mode of transport, which significantly extends door-to-door delivery [Neider 2008]. Passenger transport is becoming cheaper, and the price depends on the date of the flight, carrier, and time of booking. The downside may be the long check-in time. The entire list of advantages and disadvantages of air transport is presented in Table 1.

Characteristics of airports in Warsaw and Brussels

The surveyed carriers fly from different airports (see Table 2). In the case of the Warsaw – Brussels route, two ports serve each city. Traditional airlines, i.e., LOT Polish Airlines and Lufthansa, depart from Chopin Airport and arrive in Brussels – Zaventem. Wizz Air also departs from Okęcie but arrives at Brussels – Charleroi Airport. Ryanair, operated by the Warsaw-Modlin Airport in Poland, lands similarly. This means that passengers using the offer of Irish airlines have to cover the most significant distance from the center of the metropolis to the terminal, as Charleroi is 43 km from Brussels, and Modlin – about 42 km from Warsaw.

Table 2. List of airports in Warsaw and Brussels serving the largest carriers on the Polish aviation market

Tabela 2. Lista portów lotniczych w Warszawie i Brukseli obsługujących największych przewoźników na polskim rynku lotniczym

Place of departure				
Poland (Warsaw)				
Warsaw Chopin Airport (WAW)		Warsaw Modlin Airport (WMI)		
PLL LOT	Lufthansa		Brussels Airport (BRU)	Belgium (Brussels)
Wizz Air		Ryanair	Brussels South Charleroi Airport (CRL)	
Place of arrival				

Source: own study.

Warsaw airports are essential for air transport in Poland. Historically, the Okęcie airport was opened on April 29, 1934, to which passenger traffic was transferred from the airport in Mokotów. It was bombed during World War II, but traffic was quickly resumed. The reconstruction was provisional, and the new station was put into use after thirty years. In 1971, the port handled the first million passengers, and in 1979 this number exceeded two million – the modernization works, which resulted in the creation of Terminal 1. In 2006, Terminal 2 was put into operation, and nine years later, the reconstruction of the central and southern pier was completed. All these parts make up Terminal A. Besides. The port has a General Aviation Terminal for corporate and private aircraft. In 2001, the

airport was granted the patronage of Fryderyk Chopin, and since 2010 it has been officially called Chopin Airport, it is commonly called Okęcie [Sipiński et al. 2016]. The port serves cargo and charter carriers, but the largest group is scheduled. These include, among others, airlines such as Lufthansa, British Airways, Air France, Emirates, Qatar Airways, KLM, SAS, as well as LOT Polish Airlines, which have their main base there [Lotnisko Chopina Warszawa 2020a]. Chopin Airport is a significant transfer point, which is also indicated by the record result of 18.86 million passengers served in 2019. The main destinations include London, Paris, and Kyiv. The most popular carrier was Polish airlines, whose services were used by 10 million people [Lotnisko Chopina Warszawa 2020b].

The second airport located in Warsaw is Modlin. Information about its creation dates back to 1937, but the opening date is considered to be July 15, 2012, when a Wizz Air plane landed at the airport. It had a high development potential in the first period because, after less than two years of operation, it served a two-million passenger [Sipiński et al. 2016]. The main airport facility is a two-story terminal. The port cooperates with travel agencies and low-cost airlines, servicing short and medium-haul transports. Thanks to cooperation with Ryanair airlines, passengers can travel to over 30 cities in Europe [Warsaw Modlin Airport].

The origins of Brussels Airport date back to 1914 when German troops began building a hangar on Evere and Haren's territory. In April 1919, the first test flight to London was organized, which transported two people. Since then, regular passenger services have been introduced on this route and new destinations have been added. The port was divided into two parts – Evere – for military use and Haren – for civil, where the new terminal was used. During World War II, the German army invaded Belgium and began building an airport in Melsbroek, where civil aviation was later transferred. Due to the growing number of tourists visiting the country (after the war), the port became too small and in 1956 the construction of a new one was approved. After two years, the airport in Zaventem was handed over. Modernized continuously, it has become one of the fastest-growing and most modern international airports, connecting central Europe with many destinations worldwide [Brussels Airport 2020c]. Moreover, it is in the 23rd place of the most crowded airports in the old continent. It serves over 250 carriers and performs approximately 237,000 air operations annually. It is the home base for Brussels Airlines, Jetairfly, and Thomas Cook Airlines Belgium. The airport has a terminal divided into two halls – A, which serves all flights, and B, for flights only outside the Schengen area [Brussels Airport 2020b].

Another airport serving the Belgian capital is Brussels South Charleroi Airport, whose history began in 1919 when the first Belgian flying school was established here. During World War II, this place was a landing strip, and after its end, it became a public airport. However, the airport was used primarily for private and training flights, as passenger traffic was negligible. On July 9, 1991, the port was officially named until today. A few years later, Ryanair opened the first route from the airport, and more lines followed suit. The number of served passengers was growing, which forced the construction of new terminals [Brussels South Charleroi Airport 2020a]. The port offers customers flights to nearly two hundred destinations in 53 countries. It regularly cooperates with nine airlines, among which the most flights are provided by low-cost carriers [Brussels South Charleroi Airport S.A. 2020c].

The airports tested are not identical. In both cities, however, you can see dominant facilities (in Warsaw Chopin Airport, and Brussels Airport in Brussels) and with less passenger service at 17.4% in Warsaw and 29.1% in Brussels (see Figure 2).

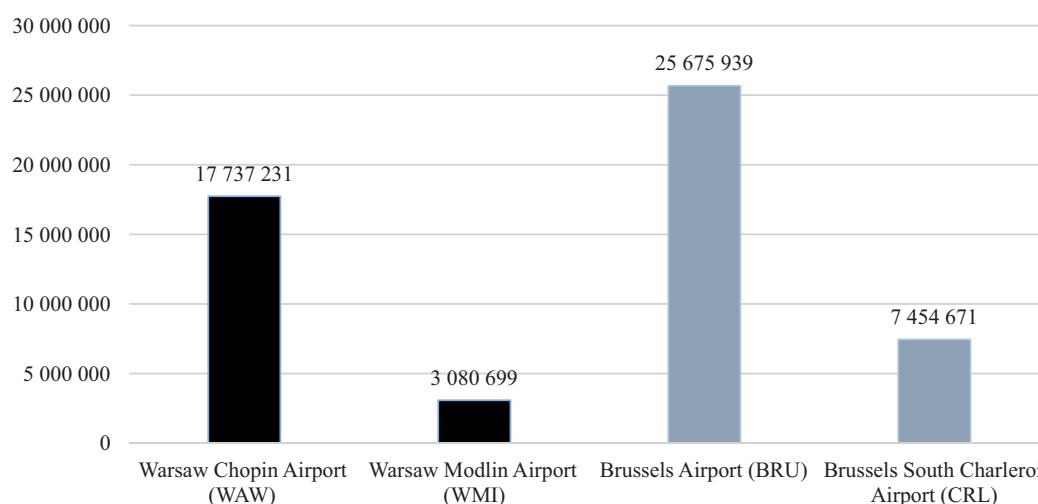


Figure 2. Number of passengers (people) served at the airports in Warsaw and Brussels in 2018
Rysunek 2. Liczba pasażerów (osób) obsługiwanych na lotniskach w Warszawie i Brukseli w 2018 roku
Source: [Urząd Lotnictwa Cywilnego 2019b, Brussels Airport 2020c, Brussels South Charleroi Airport S.A. 2020b].

Trends in price changes offered to passengers during the period considered

To identify the trends in airline tickets prices changes, a survey was carried out, which is presented in the initial part of the study. It lasted six months and consisted of daily checking the current values for a flight of one person from Warsaw to Brussels on January 15, 2020.

The first analysis concerns the Hungarian carrier Wizz Air. The plane was supposed to take off from Warsaw Chopin Airport at 05:45, but as a result of the delay, it was moved to 06:10. The flight took two hours and 10 minutes, and at 08:20, the passengers landed at their final destination.

Starting the test six months before the departure date, it was found that the basic tariff “Basic” was charged at PLN 209 and lasted 51 days until September 4. As part of the promotion, the carrier offered a price lower by almost 16.5%, reaching PLN 174.6. It was then reset to the previous value and held for the next 13 days. From September 18 to October 7, the price was PLN 169 and PLN 149 on the following day. On October 9 and 10, the ticket value was reduced again, this time to PLN 129. For the next week, the flight fee was PLN 109, i.e., almost 52% of the initial price. On October 18, so nearly three months before the departure date, the ticket value was reduced to PLN 59 and was kept almost permanently for 53 days with three exceptions. One of them was on Octo-

ber 29, when the carrier announced promotions and offered PLN 54.60 for the ticket. On November 29 and December 2, as part of the “Black Friday” and “Pink Monday” campaigns, choosing a Wizz Air flight could save on purchasing a ticket, paying PLN 54.20. For the next month, from December 10 to January 10, the price was reduced to PLN 39, and besides, on December 12, 2019, and January 8, 2020, as part of the special offer, it was even lower by PLN 0.40. It was then PLN 38.60, reaching the lowest value in the analyzed period. In the last four days before departure, the value of the ticket has increased again. On Saturday, January 11, the price was PLN 69, on Sunday and Monday PLN 129, and Tuesday PLN 169.

Passengers who used the Wizz Go fare could purchase a ticket, the price of which in the analyzed period ranged between PLN 126.40 and PLN 334. On the other hand, by choosing Wizz Plus, the difference between the values was more significant, and the prices were in the range of PLN 176.40–401. Additionally, by being a Discount Club member, could save around EUR 10 on the ticket price, regardless of the package selected.

The second case concerns a flight operated by the German company Lufthansa. It connected with a transfer in Munich, so the time to get to Brussels turned out to be significantly longer than for other airlines. The plane took off at 6:00 from the airport in Warsaw, landed in Belgium at 10:05, and the flight itself took just over three hours.

Contrary to the previous carrier, the prices were not subject to large fluctuations. From July 15, 2019 to November 12, 2019, the difference between the lowest and the highest ticket value was PLN 12.13. During this period, however, passengers who purchased at the turn of August and September had to pay the most, while spending a maximum of PLN 1,121.61. On November 13, 2019, the price was reduced to PLN 1,098.41 and remained at a similar level until January 8, 2020, when it amounted to PLN 1,096.06. The ticket price increased significantly six days before the departure date. On January 9, the basic tariff was PLN 1,214.19, and a day later, PLN 1,214.52. For the next three days, the price did not change, amounting to PLN 1,332.35, and the day before the flight, it reached the highest value in the analyzed period, namely PLN 1,332.52.

Customers using the Lufthansa offer could choose two other packages from the economy class, which was similar to the discussed basic tariff in the analyzed period. On the other hand, a business class ticket's cost has increased significantly in the last fifteen days, reaching even over PLN 10,000. Additionally, the German carrier offered four more connections to the Belgian capital.

The third flight in the order of analysis was the LOT Polish Airlines connection. It was scheduled for 7:20 am, and after two hours and 15 minutes, the passengers arrived in Brussels.

As in the German carrier case, in the initial period of the study, ticket prices fluctuated only slightly. For the first 95 days, the primary tariff value difference was only PLN 0.09, and the average cost – PLN 229.44. On 18–21 and 25 October, the ticket price was around PLN 257.22. On the other hand, between October 22 and October 24 and again on October 26 –November 4, the price was the lowest and amounted to approximately PLN 227.15. Since then, the flight charges have gradually increased. First, they amounted to PLN 242.05 for three days, and then they increased to PLN 257.13 and remained at a similar level for the next nine days. On November 17, the price was raised again, this time to PLN 467.24, and on December 12, the value was already PLN 599.23. Nearly

a month before the departure date, the “price jump” was the biggest. Namely, the ticket had to be paid almost three times more than the previous dish, i.e., PLN 1,532.14, and a similar price was maintained until January 11. The next increase in costs occurred three days before the trip, and the most for the flight was on January 14, 2020, and exactly PLN 1,859.02.

In addition to the economy class, passengers could also choose a premium or business package. The cost of such a ticket was similar throughout the study and only increased a few days before departure. On January 15, 2020, customers could choose other Polish carriers' flights to Brussels, which included both direct and indirect ones.

The fourth airline is Ryanair, which offered the first and only connection on the surveyed day from Warsaw to Brussels at 18:45. The flight duration was identical to that of the Hungarian carrier and was 130 minutes.

The introductory fare price was continually fluctuating throughout the research period, and the difference in value up to five days before departure was PLN 54. At that time, the highest price ticket could be purchased at the beginning of the observation for PLN 97.74. On December 2, as part of the “Cyber Monday” campaign, the carrier offered a promotional price of PLN 19. On the other hand, passengers planning a trip on the day in question could most often come across a ticket for PLN 73. A steady increase in the price can be seen from 08/12/2019 when the tariff was reduced to PLN 39 and kept constant for a month. Then the ticket cost increased to PLN 73, and on January 10, it was already PLN 231. When purchasing at the weekend, PLN 379 had to be spent on the trip, PLN 456, on Monday, and PLN 673 on Tuesday. A few hours before the flight, the price was reduced to PLN 562.

Passengers could also use the “Plus” and “Flexi Plus” packages for the selected flight. Their prices fluctuated similarly to the basic tariff, reaching a maximum of PLN 773.11 and PLN 840, respectively.

Differences in price formation by the surveyed airlines

When comparing the level of prices of airline tickets offered by selected carriers, one can notice many differences in their formation over the analyzed period (Figure 3). The first thing that should pay attention to is price fluctuations. With low-cost airlines, they were frequent, with one value only for a short time. However, the situation was different from traditional carriers. The Lufthansa ticket price changed almost every few days, but the differences were slight, even imperceptible at such a high cost.

On the other hand, fluctuations in PLL LOT were the smallest, and for the first three months, the price was at a similar level. Moreover, the value of tickets of the German, Hungarian and Irish carriers increased and decreased in the analyzed period. However, the price offered by Polish airlines, except for five days in October, was increasing. Moreover, this value started to rise more than two months before the departure date – this also distinguished LOT from its competitors, whose steady growth was only visible in January.

Significant differences can also be noticed in the price of tickets. A significant disproportion occurs in the case of the value of the trip with German lines. However, it is

The volatility of price offers...

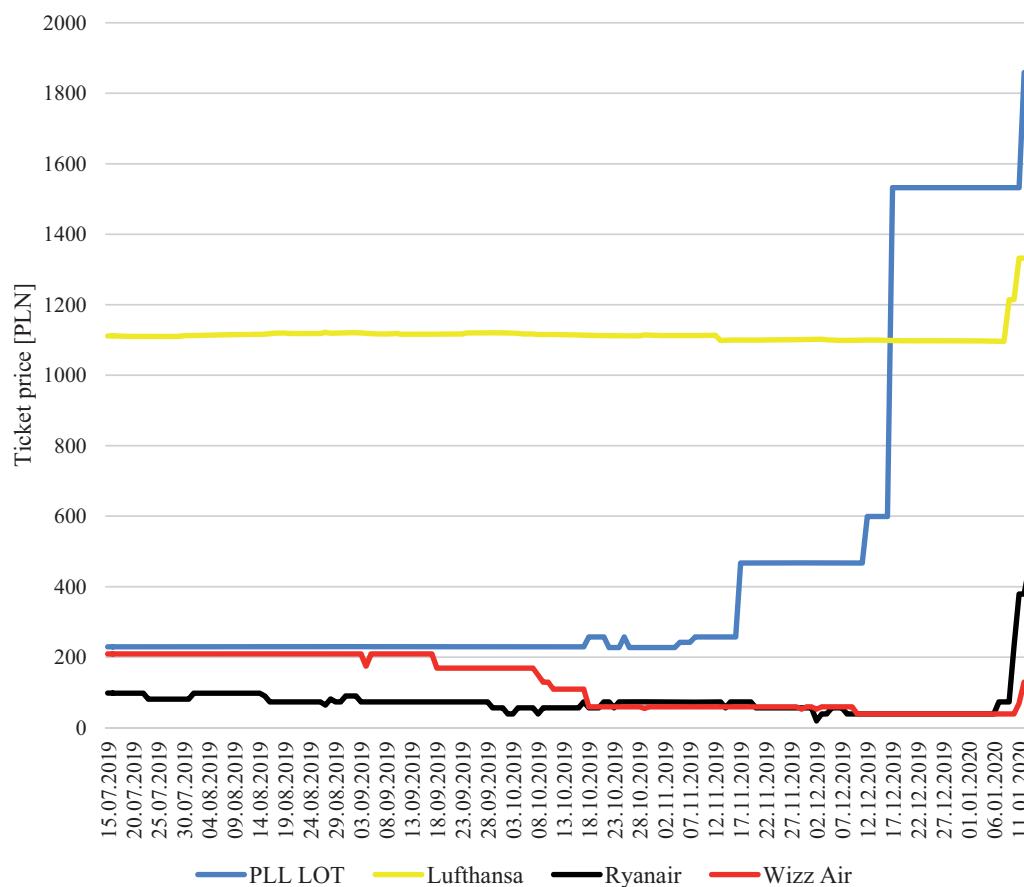


Figure 3. List of ticket prices of the largest carriers on the Polish aviation market from July 15, 2019 to January 14, 2020

Rysunek 3. Cennik biletów największych przewoźników na polskim rynku lotniczym od 15 lipca 2019 roku do 14 stycznia 2020 roku

Source: own study based on the obtained research results.

a connecting flight, which partly explains the discrepancy. Other carriers' prices in the first part of the study were much lower and similar, and more significant differentiation can be noticed only in the second half. It is also worth analyzing the differences between the starting price and the final price. The Lufthansa ticket value increased by almost 20%, Ryanair almost seven times, and LOT Polish Airlines eight times. Wizz Air was the only carrier whose price the day before departure was lower than the starting price by PLN 40. LCC, unlike traditional ones, also offered passengers promotions. Ryanair lowered the ticket price as part of "Cyber Monday", and on the Wizz Air website, it was possible to purchase at a bargain price six times.

Carriers need to balance two strategies when pricing their tickets. The first is to fill airplanes as much as possible, i.e., to offer a relatively low price to passengers whose purpose is leisure. Such action is aimed at persuading them to buy a ticket well in advance. Revenue maximization is also essential, and this strategy is implemented

shortly before the planned flight date. It is addressed to business customers who make reservations shortly in advance, and the key aspects are frequency of connections, convenient location of the port, or amenities at the airport. The ticket price for these people becomes less important; therefore they are willing to pay more [Walków 2017].

The surveyed airlines also follow these strategies, which can be seen in Figure 3. Customers buying tickets in advance will pay much less than in recent days. In the case of Ryanair, Wizz Air, and Lufthansa, by booking several months before the departure date, the trip's cost turned out to be higher than that up to one week in advance. Passengers visiting their families abroad plan long-distance flights much earlier. They must have a specific seat on the plane, which means accepting the current flight price without waiting for a possible discount.

However, the pricing strategy of the airlines depends on the applied business model, on which the tariff policy depends. Each carrier has internal IT systems and profit managers who modify its thresholds. Prices are set individually for each route and are the result of many variables. These activities are top secret and constitute the company's secret [Cybulak 2012].

Summary and conclusions

The conducted research allowed us to formulate several conclusions.

1. One of the criteria differentiating the compared lines is the ticket price. Taking the Warsaw – Brussels route as an example shows many differences in their shaping. For LCCs and Lufthansa, there were frequent but minor fluctuations in prices. On the other hand, LOT Polish Airlines remained at a similar level for the first months. Moreover, the prices of the German, Irish and Hungarian carriers both increased and decreased. On the other hand, the cost of a ticket on Polish airlines was gradually increasing, the fastest in the last month before the flight.
2. Although all airlines have analyzed the introductory offer in economy class, there were also differences in the flight itself's value. Initially, LOT Polish Airlines' prices, Ryanair and Wizz Air were at a similar level, and only in the second half of the study, more significant disproportions appeared. By contrast, the cost of a Lufthansa ticket was significantly higher already six months before the date of travel. However, this discrepancy is explained by the fact that it was the only connecting flight. It is also worth noting that only LCC in the analyzed period lowered ticket prices as part of various promotions. Traditional carriers did not even participate in such popular campaigns as "Black Friday" and "Cyber Monday".
3. If anyone wanted to take advantage of the cheapest LOT Polish Airlines offer, they need to make a reservation at the earliest, i.e., at least three months before the planned date of departure. On the other hand, the lowest price of a Lufthansa and low-cost ticket occurred a month before the trip and lasted about 30 days, after which there was a sharp increase. The most significant difference between the fee proposed half a year before and the final one occurred at the Polish carrier, where an eightfold increase was recorded. What is more, the final value even exceeded the price of the German carrier's ticket by over PLN 500. On the other hand, Wizz Air

turned out to be the only one whose final price was lower than that offered at the beginning of the study.

4. The higher the amount that has been allocated to the ticket, the more excellent the choice of potential carriers. However, in the times before the pandemic, the budget was not a problem because anyone could fly to many places for a few dozen PLN. Moreover, tickets purchased in advance are often cheaper. Therefore, people who already have a trip planned should think about making a reservation in advance. In contrast, there are many promotions at LLC, and the ticket's value a few weeks before the flight can turn out to be very low. Therefore, consumers who do not have specific plans as to the place and date are advised to observe the connections, as it is possible to find a desirable offer.

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