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# The analysis of passenger carriage in Polish air transport in 2011–2018 (part 1)

*Analiza przewozów pasażerskich w transporcie lotniczym w Polsce w latach 2011–2018 (cz. 1)*

## Abstract

The article (part 1) contains an analysis of Polish passenger transport in regular and charter traffic specifically relating to airports, cities and countries for the years 2011–2018. The aim of this article is to deepen the knowledge on this topic. The trend occurring in the examined period was analyzed and conclusions relating to the changing transport structure were made. The compilation of statistical data made it possible to carry out the analysis based on the available resources of the Central Statistical Office and the Civil Aviation Office. This enabled the current gap in literature to be filled, where previously information was compiled only for each year separately.

## Keywords:

air transport, airport, passenger, scheduled traffic, non-scheduled traffic

## Streszczenie

Niniejszy artykuł (część 1) zawiera analizę polskich przewozów pasażerskich w ruchu regularnym i czarterowym ze szczególnym uwzględnieniem: portów lotniczych, miast oraz przewoźników w latach 2011–2018. Celem artykułu jest pogłębienie wiedzy na ten temat. Zbadana została tendencja zachodząca w badanym okresie i wysunięto wnioski związane ze zmieniającą się strukturą przewozową. Zebranie danych statystycznych potwierdziło możliwość przeprowadzenia analizy opierając się na dostępnych zasobach Głównego Urzędu Statystycznego oraz Urzędu Lotnictwa Cywilnego. Dzięki temu została uzupełniona luka w literaturze, gdzie informacje zestawiono tylko dla każdego roku osobno.

## Słowa kluczowe:

transport lotniczy, port lotniczy, pasażer, ruch regularny, ruch czarterowy

JEL: L93

## Introduction

The aim of this article is to deepen the knowledge as well as to analyze air transport in Poland of scheduled and charter passenger traffic based on statistical data from 2011–2018. In the future, the analysis may also support decision-making in the areas of air transport and its infrastructure.

Airports in Poland are located all over the country, so that air connections to all major cities are available. The airports are usually located in close proximity to urban agglomerations. The number of Poles using air transport is increasing every year.

Recent years have intensified the growing popularity of low-cost airlines, offering low-cost European flights on popular routes with high occupancy throughout the year or seasonally. In a short period of time, the network of connections has expanded. Practically every Polish airport can be reached from London or Dublin, thanks to the Irish company Ryanair. A change in the structure of air transport is observed. Due to the growing importance of regional airports, access to them is being improved by the possibility of direct train or bus connections, which encourages more and more travelers to use this form of transport (Markusik, 2009; Krawczyk, 2011).

Throughout the last twenty years, air travel has become more accessible to a wide range of potential passengers. Of all the Polish air carriers, it is Polish Airline "LOT" that has for years occupied and continues to occupy the leading position. This is mainly due to legal conditions and financial possibilities. The emergence of transport operations by new independent operators has only taken place at the end of the twentieth century in the form of charter transport. In Poland, 43 carriers currently hold an Air Operator's Certificate. The vast majority of them only have a few aircraft and the flights are not regular. Polish passenger transport in regular and charter traffic was analyzed, specifying airports, cities and countries for the years 2011–2018. It is also recommended to read "The analysis of passenger carriage in Polish air transport in 2011–2018. Part 2" where the transport by carriers was also included and the forecast of traffic growth in the aviation market until 2035 was presented (Krawczyk, 2011).

Summarizing the objectives set out in the article — they were certainly achieved. The availability of statistical data enabled the carrying out of a detailed analysis showing the dynamics of passenger transport in the analyzed years in regular and charter traffic, examining Polish airports in turn, the most visited cities and countries and the air carriers whose services were used most often. The whole process allowed us to get closer and broaden our knowledge of air transport in Poland. In order to

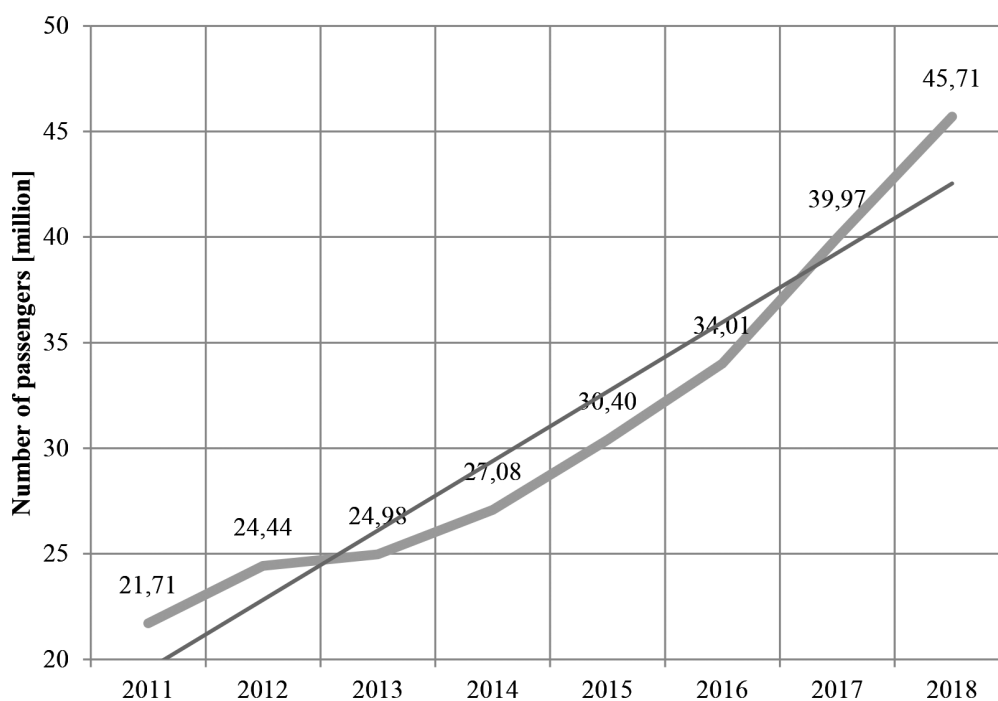
facilitate the reception of the analysis, the volumes analyzed are illustrated in numerous bar graphs. The annual analysis of passenger transport is carried out by the Civil Aviation Office. However, they concern only the examined year, and not the range of a few years, as carried out in this article, hence the need to fill this gap in the literature. It should be stressed that in the future such an analysis may serve as an auxiliary tool for decision making in the areas of air transport and its infrastructure (Rydzkowski, Wojewódzka-Król, 2009; Szymonik, 2013).

## Flights per airport

The studied period brought a very dynamic growth of passenger air transport. The number of passengers serviced over the years 2011–2018 increased by as much as 24 million. The development and modernization of existing and new airports had a significant impact on this phenomenon. In 2011, Polish airports serviced 21.71 million passengers in 246,000 operations, while in 2018 this figure amounted to 45.71 million in over 381,000 operations. Thus, over the past eight years, Poland has experienced more than a twofold increase in air traffic. The system of civil airports in Poland, used for passenger transport, currently includes 15 airports. The capital city airport serves the most

Figure 1

Carriage of passengers in scheduled and chartered air traffic in the analyzed years



Source: own study based on [www.ulc.gov.pl](http://www.ulc.gov.pl) (15.01.2021).

(17.73 million) passengers using air transport services.

Four new airports were built between 2012 and 2015. The airports of Warsaw–Modlin and Lublin were opened in 2012, while in 2015 the airports of Radom–Sadkowi and Olsztyn–Mazury were opened to the public. Every year an intensive upward trend is observed in each of these ports. Modlin airport will guarantee a reserve capacity and facilitated access allowing passenger traffic in Poland to develop freely in the coming years (Węgliński, 2019).

The smallest upward trend is displayed by the port in Zielona Góra, Lublin and Olsztyn. While the last two airports may explain the low performance in a relatively short period of time of their operation, the small changes in the port belonging to the Lubuskie voivodeship are caused by the port's transfer function. Only the airport of Warsaw Chopin can be reached directly from Zielona Góra. It is worth noting that at the end of 2017 the Radom–Sadkowi airport stopped providing scheduled flights and subsequently in 2018 it declared bankruptcy.

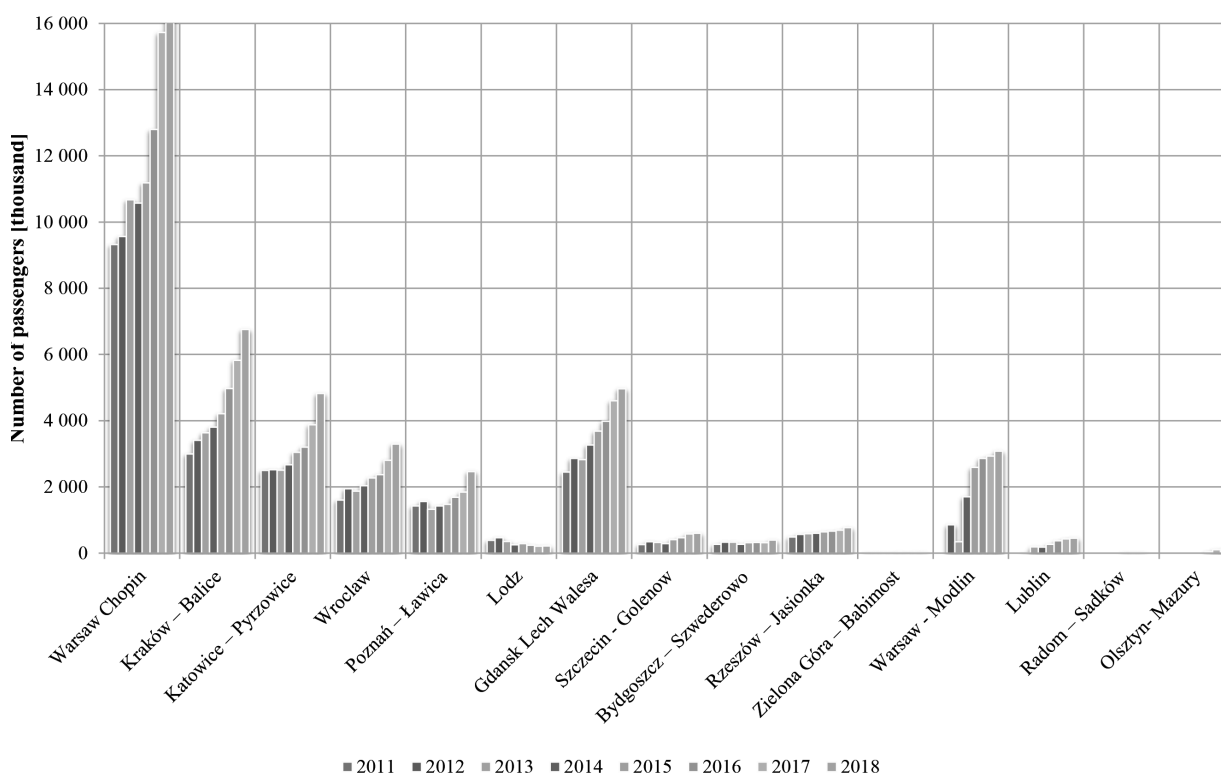
The number of total passenger traffic together with the designated trend line is presented in Figure 1, while traffic data for individual Polish airports is presented in Figure 2.

There has also been a change in the structure of air services. Due to the increase in air traffic at regional airports, the Warsaw Chopin Airport lost its status of a dominant airport when passenger figures for the whole transport market are considered. In 2011, regional airports served a total of 57% of passengers, while the Warsaw Chopin Airport served the remaining 43% of all passengers using Polish airports and since then a downward trend has been observed, except in 2013, when there was a sudden increase in the share of this airport. The smallest contribution to passenger transport was recorded in 2015. In the same year two new airports were opened in previously mentioned Radom and Olsztyn, which could have had a significant impact on such a noticeable decrease in passengers at the capital city airport (Nita, 2004).

When studying the development of air traffic, the average number of passengers per operation has been increasing steadily every year. In 2018 this value was 36% higher than in 2011. The increase in this ratio was significantly influenced by an increase in factors such as: the seat occupancy factor together with the average size of aircraft operated in Poland. The average aircraft capacity is shown in Figure 3.

Figure 2

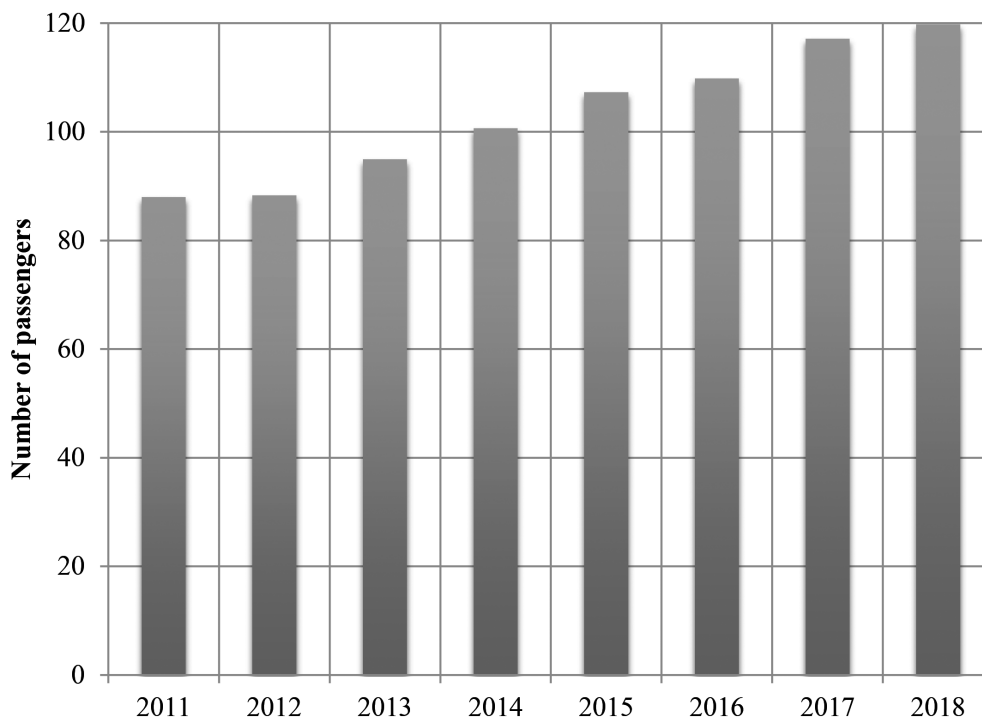
Airports in scheduled and chartered passenger air traffic in the analyzed years



Source: see Figure 1.

Figure 3

Average aircraft capacity in Poland over the years under study



Source: see Figure 1.

## Carriage per city

Poland maintains regular connections with 71 cities. The study presents the ten most popular cities in international regular passenger traffic. London turned out to be the city which passengers travelled most frequently to in the analyzed period. Comparing years at the extremes of the scale, passenger traffic in both directions to this British city increased by 76%. The second most frequently chosen direction of travel was Frankfurt. Taking into account the period of eight years, the positive dynamics was 62%.

The change in popularity of the other directions varied. The largest of them was recorded by Oslo with a record increase of 122% in total (on average +14% annually). High growth was also noted for Brussels, reaching 98% (on average +11% annually). Slight growth was observed among flights to Dublin (9% in total and 1% per year).

From a significant decline in 2017 Dortmund rose to more than four times the number of passengers the following year. In the 2017 ranking of the ten most popular cities in regular traffic, Rome and Dortmund were replaced by connections to cities with more than twofold growth: i.e. Stockholm (162% in total and 15% per year) and Amsterdam (150% in total and 14% per year).

In terms of the total market share of the cities taken into account, it amounted to 52% in 2011, exceeding the 48% share of other locations. The largest share had London with 16% and the smallest Rome with 2%. Seven years later, the dominance of the most popular cities gave way to non-leading cities with a 62% market share. The exact volumes of passenger transport of the analyzed cities with the percentage share in the years at the extremes of the scale are shown in Figures 4–7.

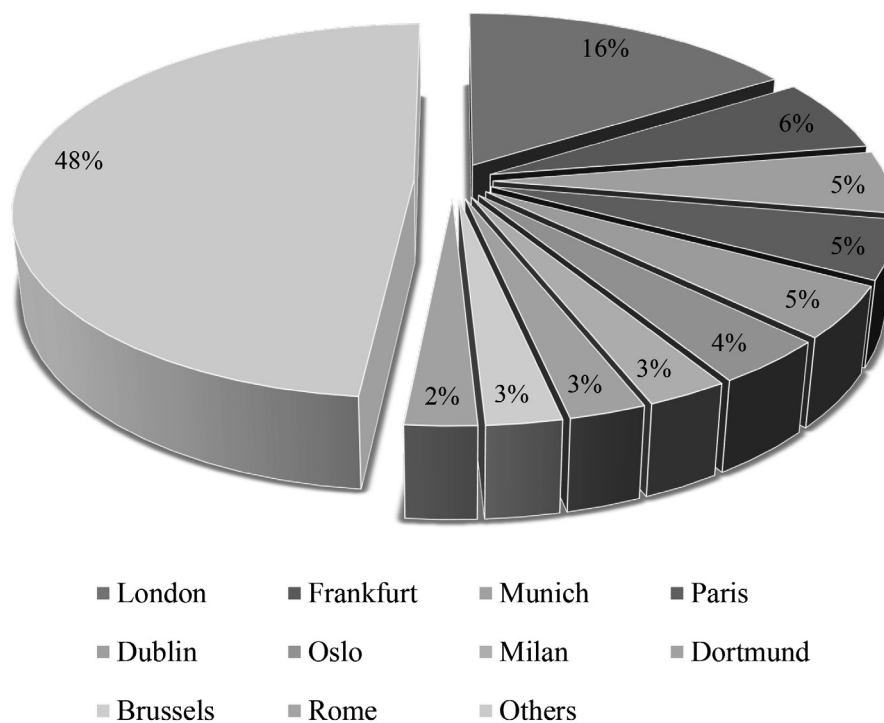
In international non-scheduled (charter) traffic, Polish airports in 2018 handled over two million more passengers than in 2011. Despite a noticeable drop in 2016, the Turkish city of Antalya is considered the most popular destination. Of the ten cities to which passengers flew the most in 2011, the highest growth was observed for: Rhodes (71% in total and 11% per year) and Palma de Mallorca (55% in total and 11% per year).

It is worth noting that despite the downward trend with the annual average dynamics, given in brackets, there is a plus sign in some cases. In the case of Sharm el-Sheikh below, the change from 2015/2016 was –47%, and from 2017/2018 +106%, hence the resulting discrepancies.

The sharp drop in flights to North Africa, especially Egypt, was due to the unrest in that part of the world at the time and the lack of alternative

Figure 4

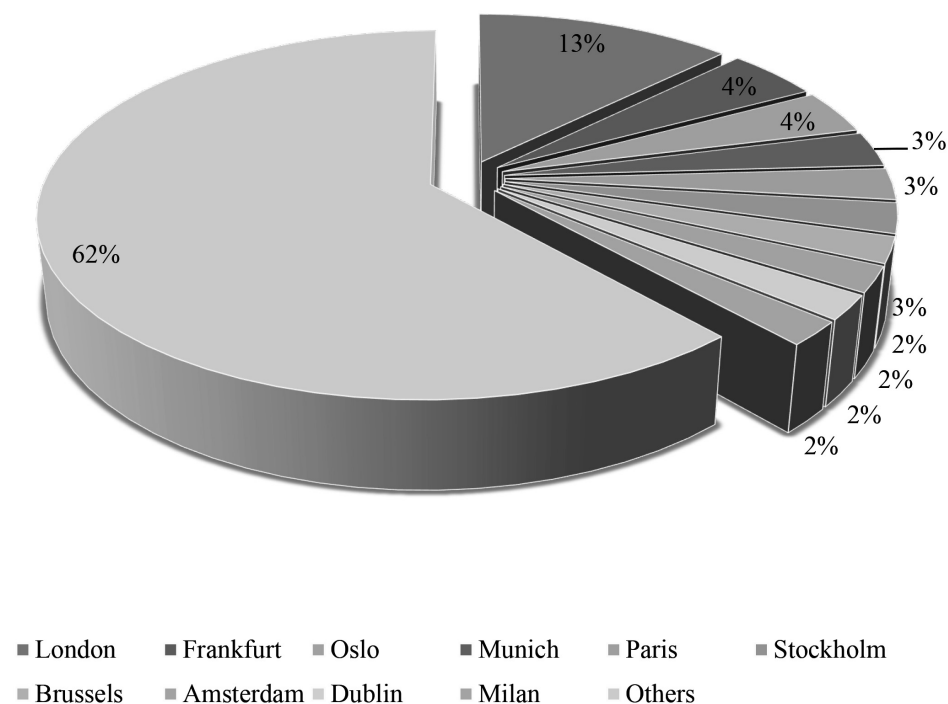
Share of the most popular cities in the scheduled flights aviation market in 2011



Source: see Figure 1.

Figure 5

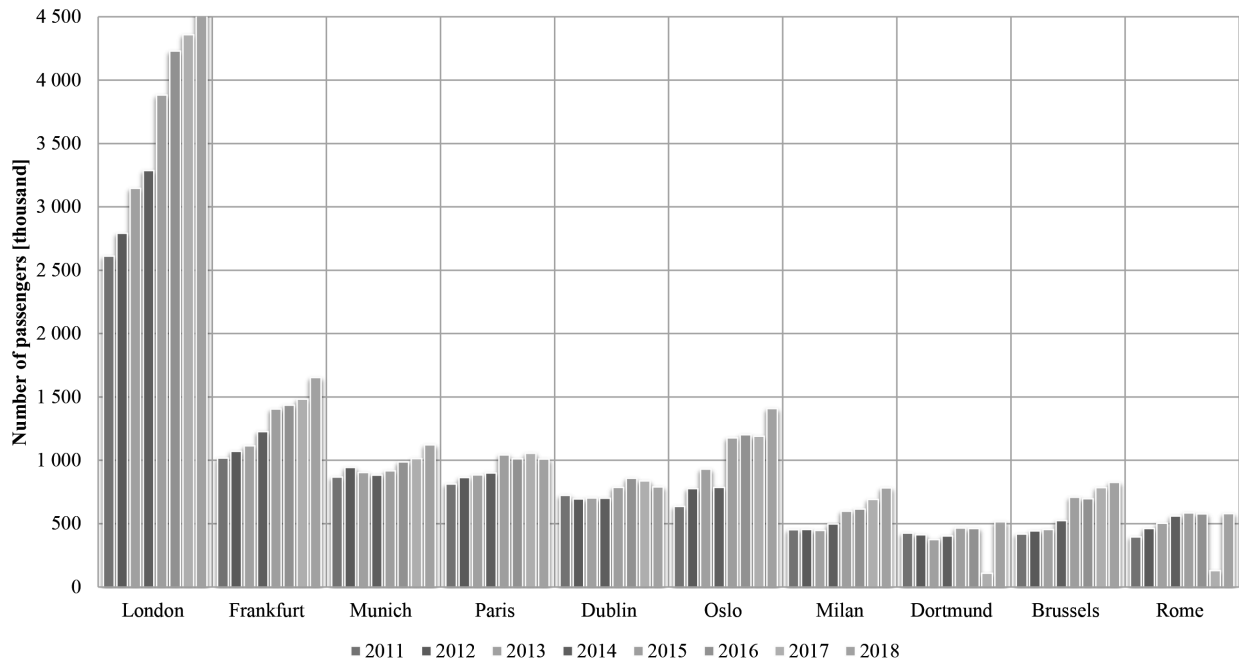
Share of the most popular cities in the scheduled flights aviation market in 2018



Source: see Figure 1.

Figure 6

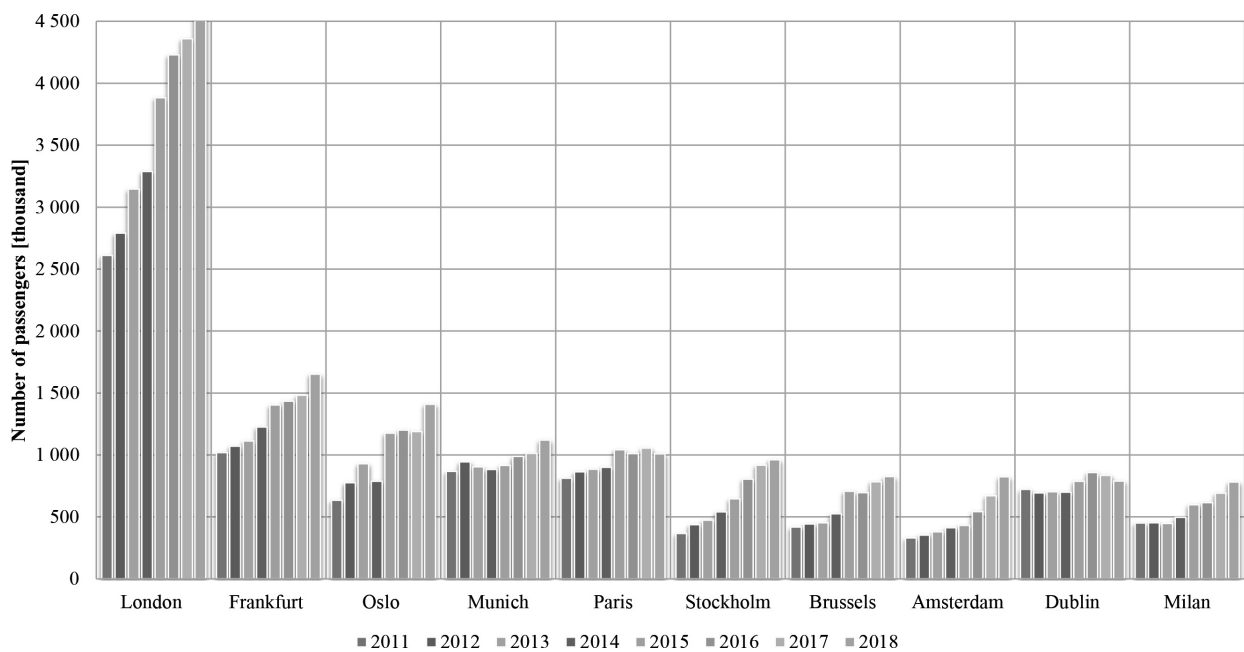
The most popular cities in regular traffic recorded in 2011 in passenger transport and passenger traffic in these cities over the years under study



Source: see Figure 1.

Figure 7

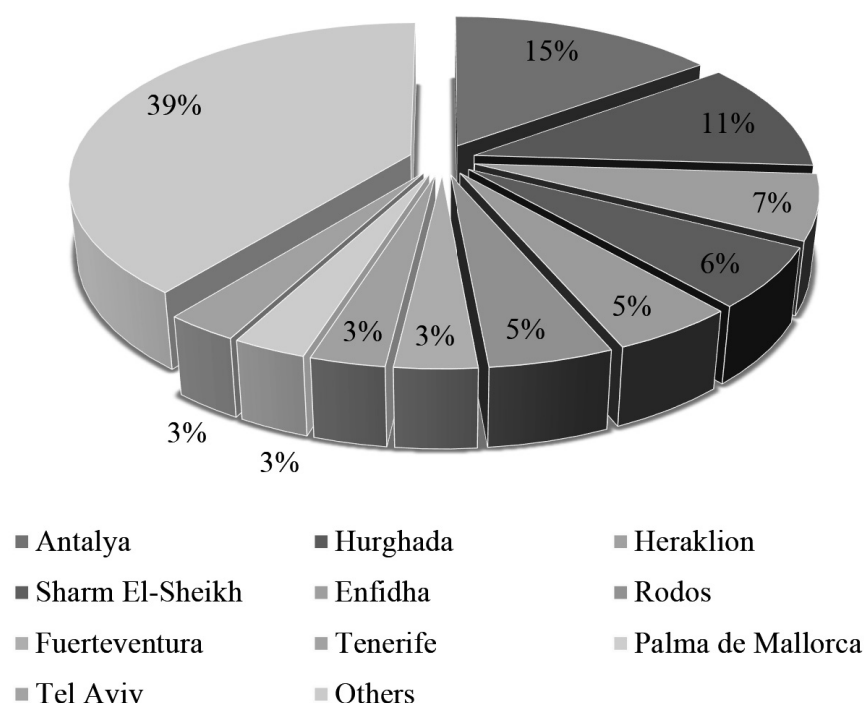
The most popular cities in regular traffic recorded in 2018 in passenger transport and passenger traffic in these cities over the years under study



Source: see Figure 1.

Figure 8

Share of the most popular cities in the charter aviation market in 2011



Source: see Figure 1.

and similarly priced offers. Thus, three of the other five leading cities saw a downward trend:

- Tunisian Enfidha, whose popularity has been rapidly decreasing from year to year (–85% in total and –23% annually),
- Egyptian resorts: Sharm el-Sheikh (–68% total and +7% per year) together with Hurghada (–32% total and +11% per year). In the following year we can see a spectacular increase in connections — positive dynamics in Sharm el-Sheikh amounted to 42%, and in Hurghada over 138%.

In the case of the Spanish islands, passenger traffic to Tenerife has increased every year (except for a slight decrease in 2017) in contrast to Mallorca, to which connections decreased between 2011 and 2014. The next two years were promising for Mallorca, with the exception of 2017, when a slight decrease was recorded. A year later, a 28% increase in the number of passengers carried was observed.

Looking at the list of the ten most popular destinations in international charter traffic in 2018, the places like Zakynthos, Burgas, Corfu, Chania and Varna appeared, replacing those that had a good reputation in 2011. Sharm el-Sheikh, Enfidha, Tenerife and Mallorca. Burgas became an unchallenged leader, achieving a fourfold increase

in the number of transported travelers (300% in total and +28% per year). Varna, as the second most popular Bulgarian region, recorded more than twofold increase (173% and +34% per year).

The Greek islands enjoyed great interest in 2018. Particularly Zakynthos with more than five times the number of passengers served (456% in total and +25% per year), as well as Corfu with more than three times the number of passengers served (284% and +22% per year) and Chania (274% and 18% per year).

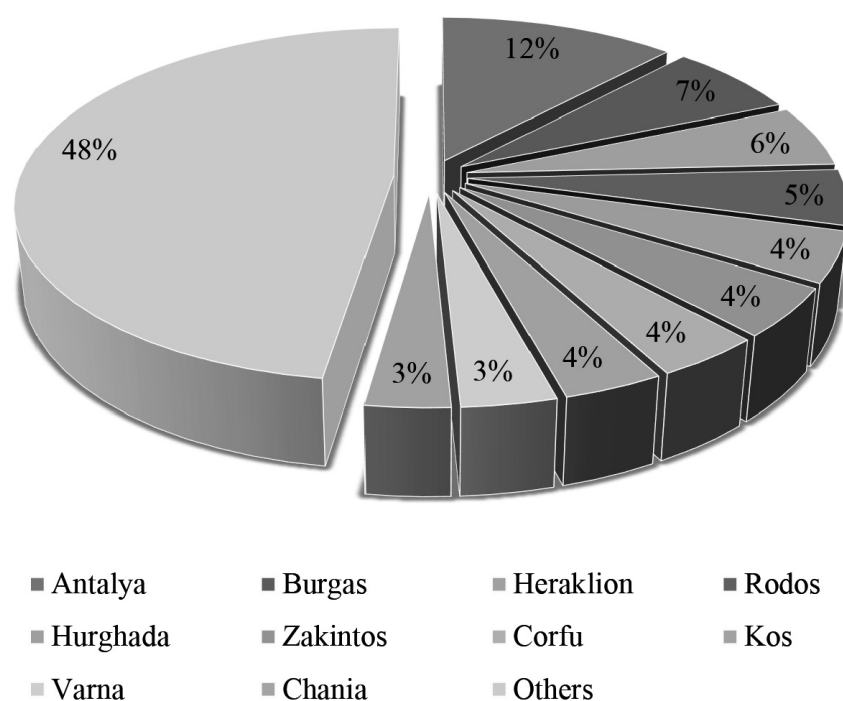
The total market share of the ten most popular cities taken into account was 61% in 2011. Seven years later the value dropped to 52%. The city that currently occupies the largest part of the market is Antalya with a 12% share and the smallest 3% is Greek Chania. The volume of passenger transport between 2011 and 2018 and the percentage market share are shown in figures 8–11.

## Carriage per country

The number of all countries that can be reached from Poland amounts to 45. Against the background of selected ten countries in regular international traffic in 2011, as well as in subsequent years, the

Figure 9

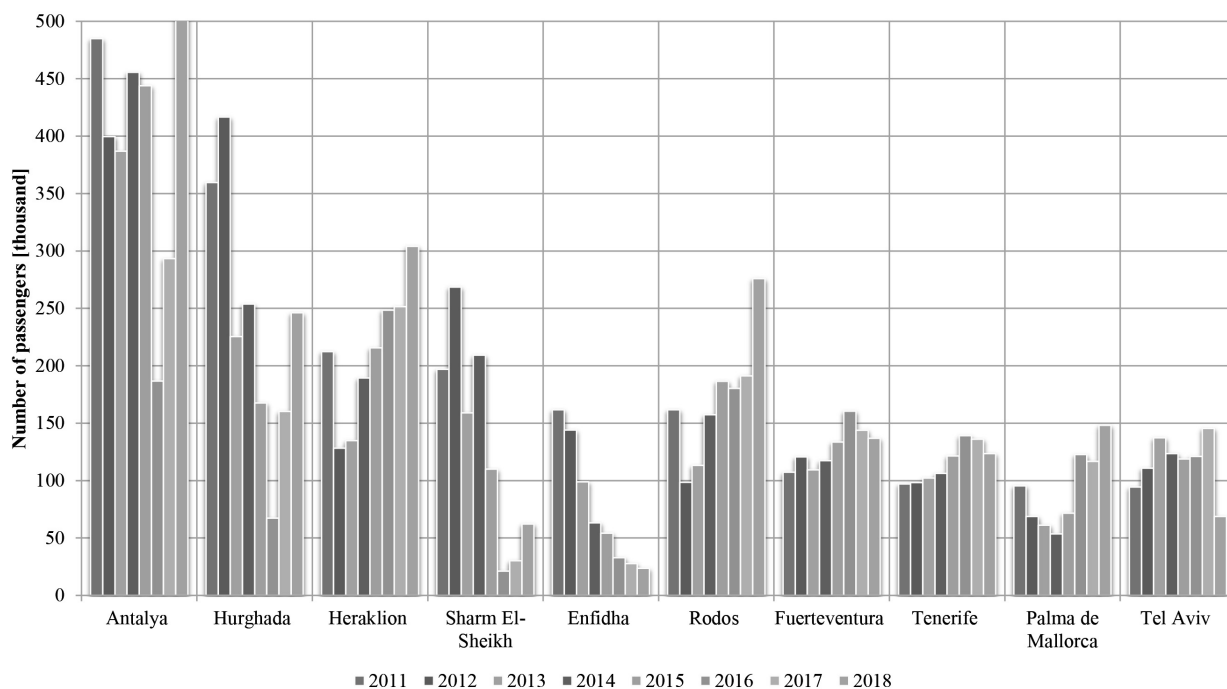
Share of the most popular cities in the charter aviation market in 2018



Source: see Figure 1.

Figure 10

The most popular cities in charter traffic in 2011 in passenger transport and passenger traffic in these cities over the years under study

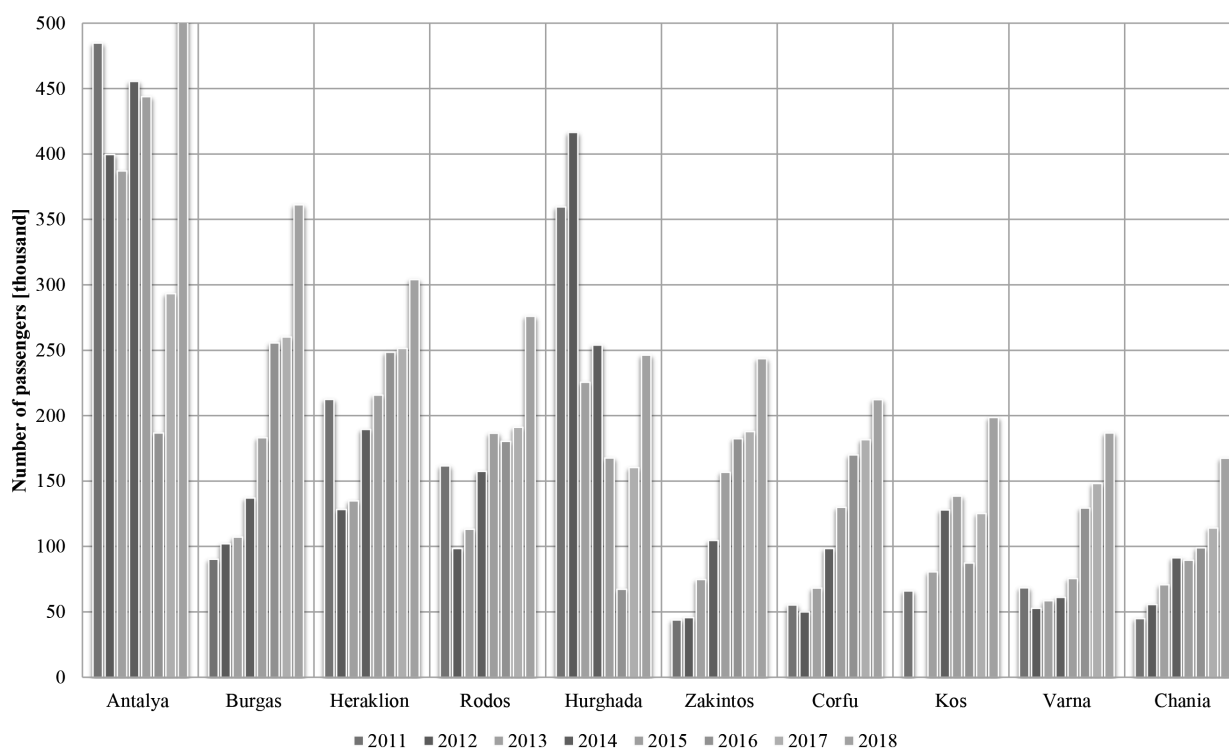


Source: see Figure 1.



Figure 11

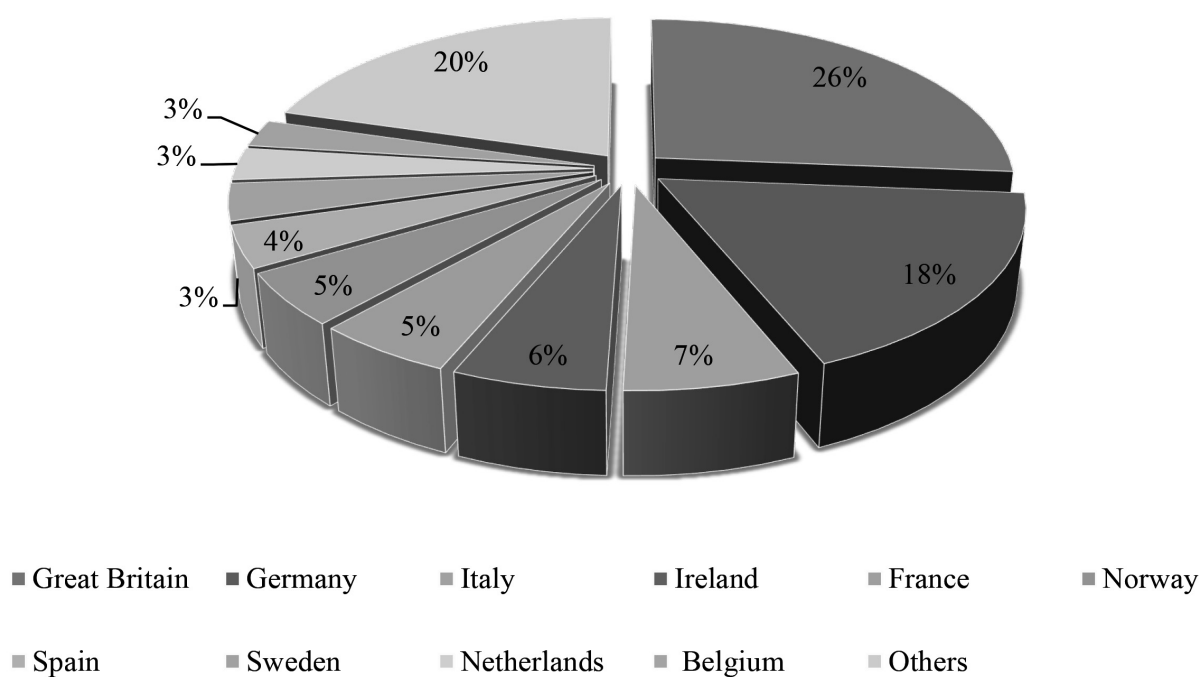
The most popular cities in charter traffic in 2018 in passenger transport and passenger traffic in these cities over the years under study



Source: see Figure 1.

Figure 12

Share of the most popular countries in the scheduled flights aviation market in 2011



Source: see Figure 1.

United Kingdom stood out in terms of the volume of passengers transported. With a significant advantage over other countries, it achieved a positive dynamics of 87% with an average annual increase of +9%.

It should be noted that in all the countries analyzed there was an upward trend, with the exception of Ireland, which recorded a slight decline in 2004. Taking into account the years at the extremes, some of them exceeded twice the number of passengers carried:

- Spain: 203% total, +21% per year,
- the Netherlands: 202% total, +18% per year,
- Sweden: 173% total, +18% per year,
- Norway: 172% in total, +6% per year,
- Italy: 127% in total, +17% per year.

An interesting phenomenon is the defending of positions by most of the countries in the lists of the most popular countries over seven years. This means that the United Kingdom, Germany and Italy invariably took the top three places, while the other six countries were in rotation within the top ten. In 2018, Ukraine was ranked ninth for the first time. In terms of percentage market share, the UK remains the leader with 22% market share, followed by Germany and Italy with 13% and 7% respectively. The number of passenger transport in each country and its percentage share is shown in figures 12–15.

The most popular country in international charter traffic in 2011 was Turkey with 682,000 passengers. Over the years 2011–2013 a decrease was observed due to political and social instability in North Africa. The biggest drop by –63% was recorded in 2015/2016. The breakthrough occurred in 2017/2018, due to more than doubling of the number of travelers.

Greece, despite a one-off fall of nearly 170,000 passengers in 2011–2012, has been steadily increasing in popularity every year, to the point where it was in first place since 2014 and maintains its position until the end of the period under review. The average annual change is +17% and +160% in total.

Bulgaria has a high performance in passenger transport, with the highest average positive annual dynamics of +20 with an in total result of +242% and Spain (+7% per year and +48% in total).

Egypt (–31% in total and +11% per year) was extremely volatile as well as Tunisia (–40% in total and +31% per year), from/to which passenger traffic alternately decreased or increased.

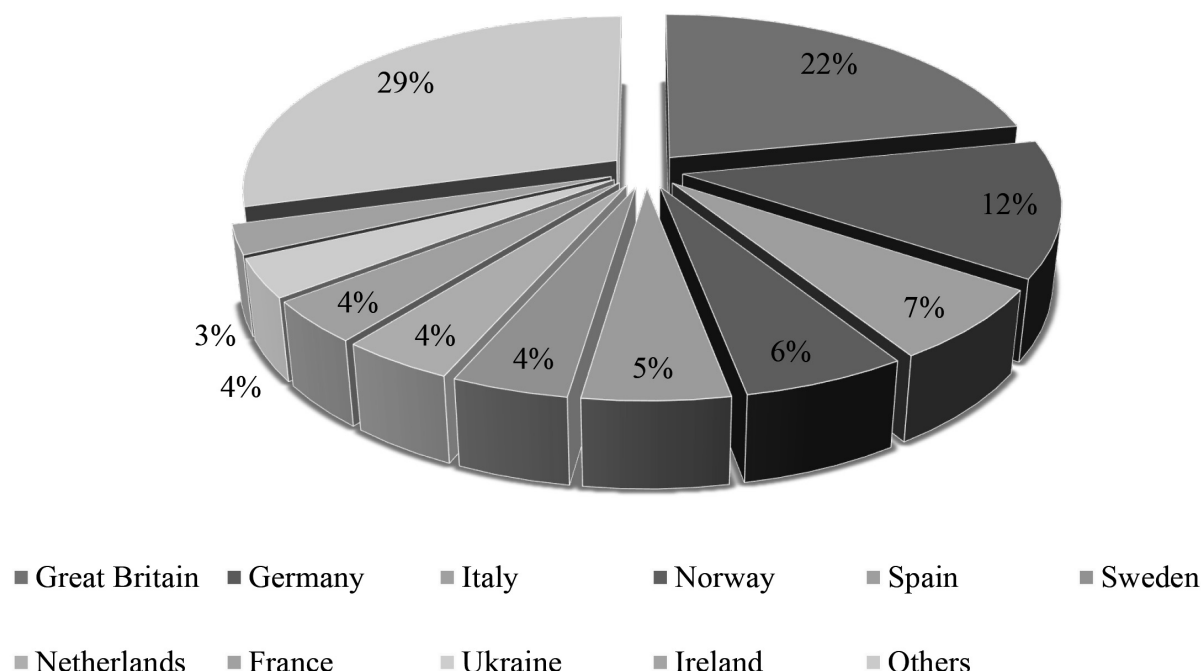
The changes in the other three countries were as follows:

- Cyprus: +125% in total, +18% per year,
- Portugal: +57% in total, +9% per year,
- Morocco: +25% in total, +9% per year.

Interest in Israel has fallen by –35% in total, –2% per year.

Figure 13

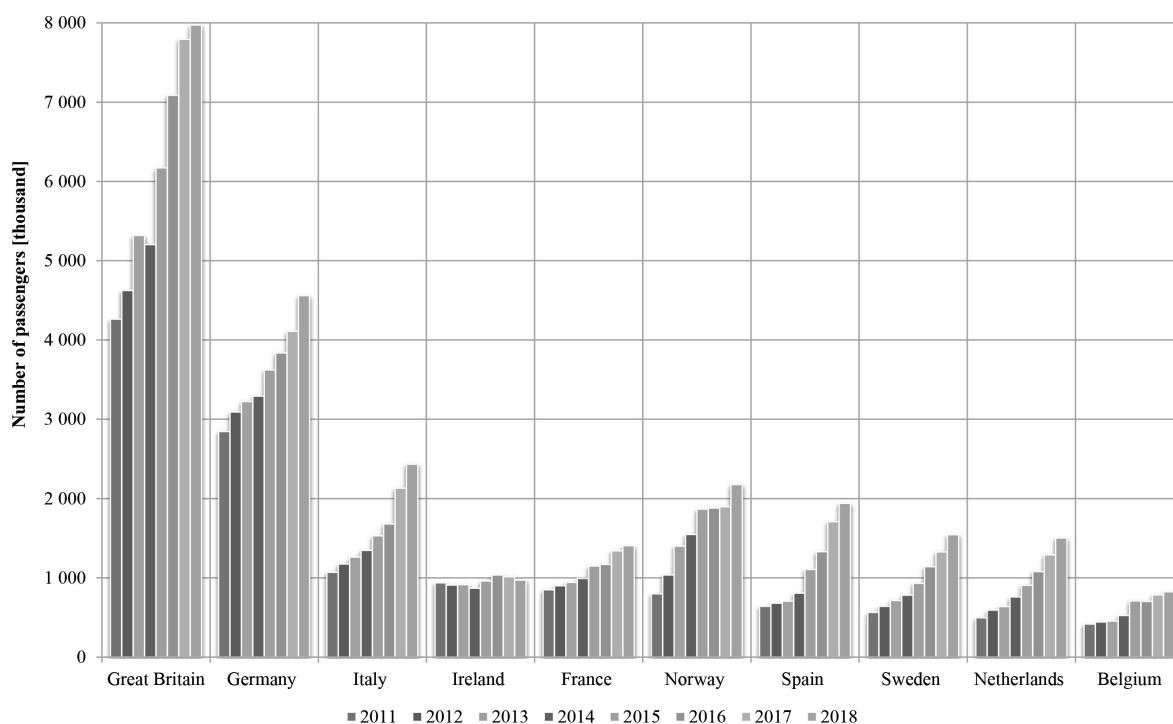
Share of the most popular countries in the scheduled flights aviation market in 2018



Source: see Figure 1.

Figure 14

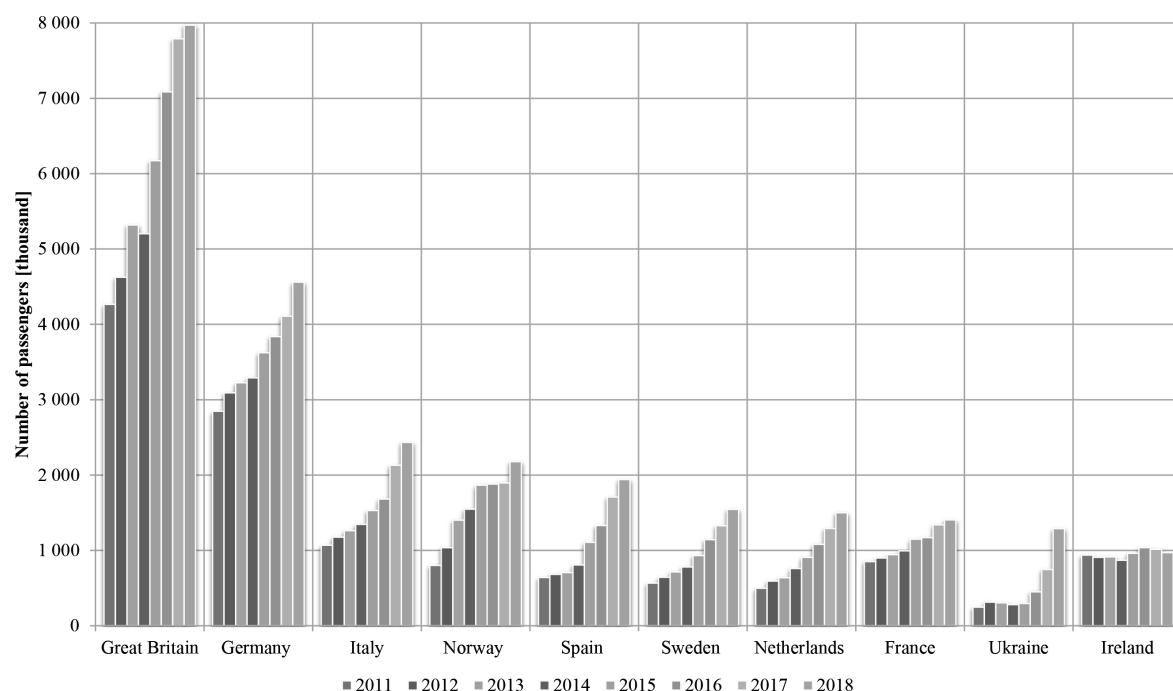
The most popular regular traffic countries in 2011 in passenger transport and passenger traffic in these countries over the years under consideration



Source: see Figure 1.

Figure 15

The most popular countries in regular traffic in 2018 in passenger transport and passenger traffic in these countries over the years under consideration



Source: see Figure 1.

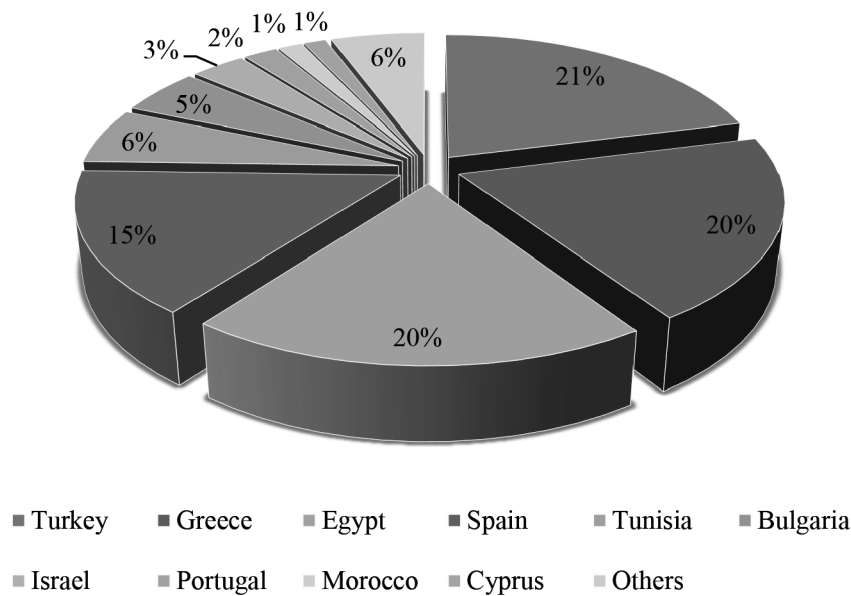
In 2017, Morocco disappeared from the list of the ten most popular countries, along with Tunisia, in favor of a progressive increase in traffic to Albania and Italy. It is worth looking at the phenomenon of dynamically growing number of links to Albania, whose popularity has only become noticeable since 2015 with only 5.6 thousand passengers served. Three years later, almost twenty-fold growth was

recorded for the link to/from Albania. While the number of connections to Italy has tripled.

In 2011, the market share of the ten selected countries prevailed over those not listed in the top ten. Similarly, in 2017, despite the doubling of the market share of the remaining countries, the predominance of the most popular countries asserted its position. The volume of passenger

Figure 16

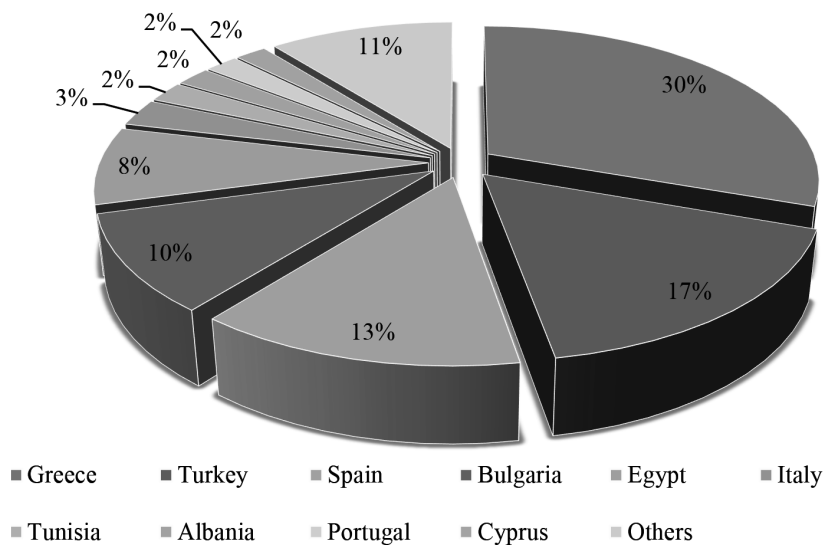
Share of the most popular countries in the charter aviation market in 2011



Source: see Figure 1.

Figure 17

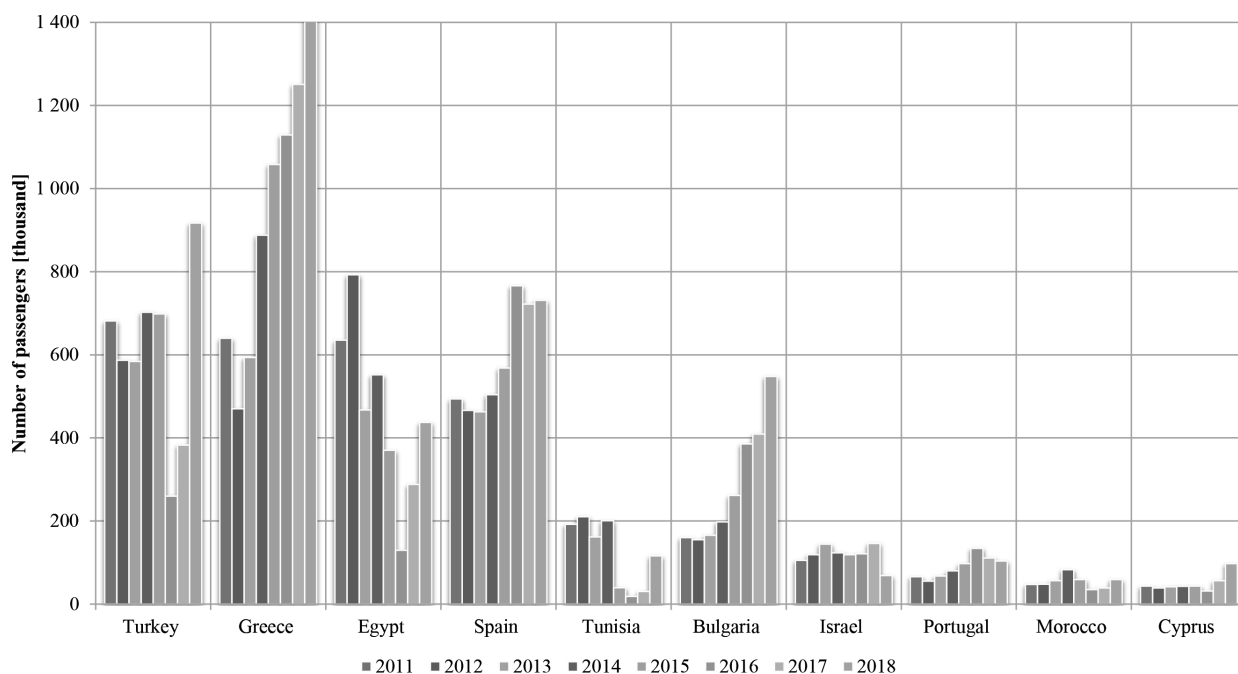
Share of the most popular countries in the charter aviation market in 2018



Source: see Figure 1.

Figure 18

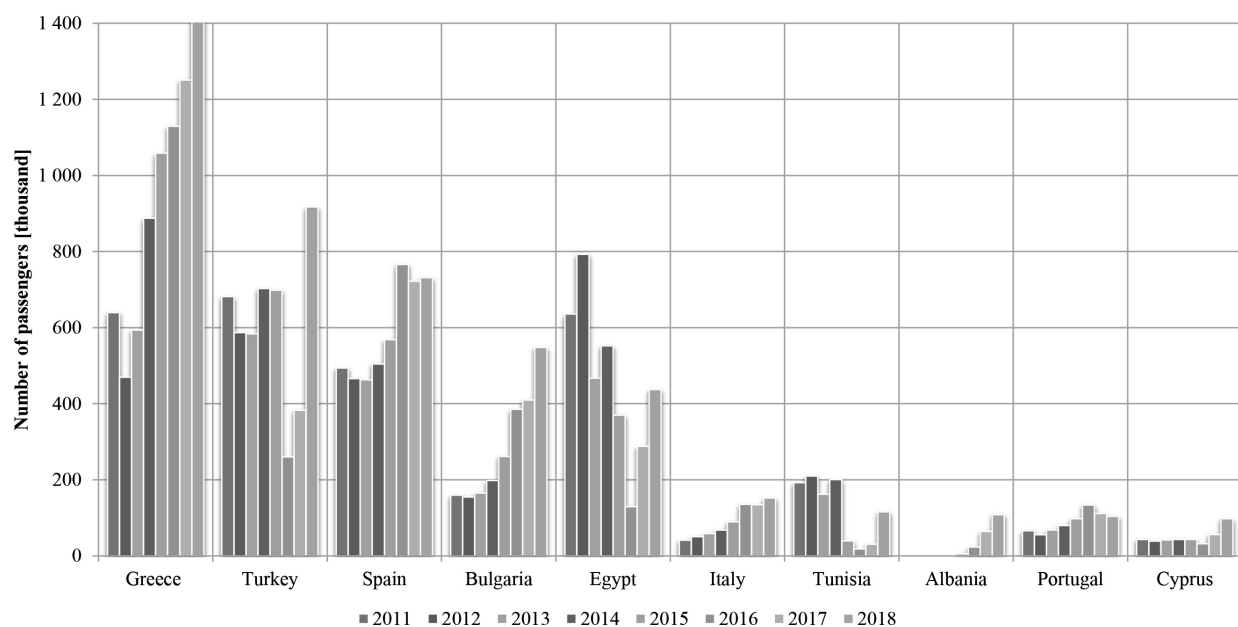
The most popular countries in charter traffic in 2011 in passenger transport and passenger traffic in these countries over the years under review



Source: see Figure 1.

Figure 19

The most popular countries in charter traffic in 2018 in passenger transport and passenger traffic in these countries over the years under review



Source: see Figure 1.

transport in 2011–2018 and their respective market shares are shown in figures 16–19.

## Conclusions

The years 2011–2018 resulted in a very high increase in passenger transport, the number of which more than doubled. Of all airports, the capital city airport of Warsaw Chopin serves the largest number of passengers annually with a 39% market share. Every year, each of the newly established airports experiences an intensive upward trend.

As the most visited city in regular international traffic, London proved unchallenged, as it is one of the largest centers to which Poles emigrate. Frankfurt is an important transport hub, thanks to its central location. Interest in the Scandinavian region increased. The biggest decline was observed in the connections to Dublin and Paris. The airports in Stockholm and Amsterdam more than doubled in size, and in recent years more and more Poles have also been travelling to these airports for work abroad.

The most popular city in the international charter market is Turkish Antalya, which, despite having a single crisis in 2016, once again took the top place. The decline in interest in the North African region was caused by the unstable peace situation occurring at that time. Moreover, there were no alternative offers for these destinations. The Greek islands of Zakynthos, Corfu and Chania were very popular in 2018. Burgas became an unquestioned leader, tripling the number of travelers transported.

Of the ten countries in international regular traffic between 2011 and 2018, the United Kingdom was in first place with a 22% market share. It should be noted that in all analyzed directions there was an upward trend. There has been an increased interest in transport to/from Ukraine due to the influx of students and economic immigrants. In the international charter traffic Turkey was the most popular in 2011. However, between 2011 and 2013 there was a decrease. The popularity of Greece grew every year until it became the most visited country in 2014 and defended this position invariably until 2018. Moreover, Poles eagerly flew to Bulgaria, Spain or Italy. Since 2015, an extraordinary interest in Albania was observed.

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