

# Benefits of Polish Accession to the European Union for Air Transport

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**Abstract**—The main aim of this article is to present a balance of the decade of Polish air transport market in the European Union having taking into account selected entities of the aviation market. This article analyzes the functioning of the Polish air transport market after the Polish accession to the European Union. During the study two main areas were pointed: shipping activity and activity of the airports. The most important benefits of integration and the benefits of introducing of the open sky policy were indicated. The last part of the article presents the perspectives of development of air traffic.

**Keywords**—Air transport, airports, development air transport, European Union, Poland.

## I. INTRODUCTION

POLISH market for air transport services is a part of the European and global transportation system. Dynamic changes associated with the Polish accession to the European Union resulted in the rapid development of this segment of the market. Integration processes forced to adjust the Polish aviation law to EU conditions. On 1st May 2004, the market of air transport services was liberalized, while introducing three policy packages "open sky" [1]-[12]. These factors resulted in the rapid development of the market in terms of quantity and quality and at the same time resulted in adjusting Polish standards to EU and global requirements.

The main goal of this article is to summarize the balance of the decade of the Polish air transport market in the European Union taking into account some selected entities of the market.

## II. AIR TRANSPORT MARKET

Defining the air transport market the multifaceted aspect of its operation should be indicated, firstly we can define it as a place, secondly as a space, and thirdly as a process. Undoubtedly, characteristic feature of a market is to reach agreement on the completion of the transaction, where the main subjects are: the passengers, airlines, travel agencies, airports, institutions which create transport policies, aircraft manufacturers and manufacturers of equipment dedicated to air transport. In addition, there are a number of other external subjects affecting the functioning of the market. You can include them among other things: suppliers, banks, insurance companies, marketing consultants, local government, local community, media and competitors of other modes of transport.

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The main benefits of Polish integration with the European Union are:

- development of passenger service by air carriers,
- development of passenger service by airports,
- strong commitment of foreign air carriers,
- development of connections [13]-[15],
- competitive processes in the aviation market and between the branches,
- investment processes in air transport enterprises,
- greater involvement of regions in the development of air transport,
- changes in the behavior of passengers using air transport.

Although, the Polish airports from one year to another serve more and more passengers, Polish participation in shaping the European market is inconsiderable.

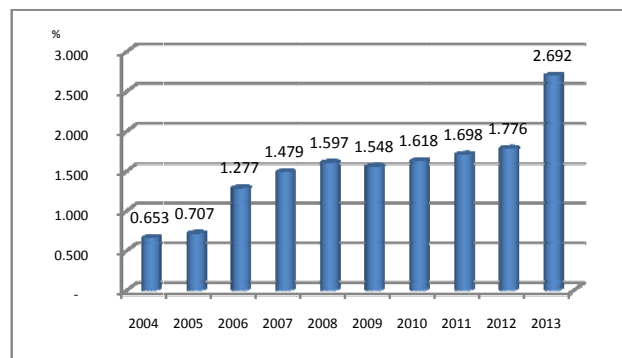


Fig. 1 Polish participation in the European aviation market

In 2004 Polish participation amounted to 0.653% and within 10 years there was more than a fourfold increase and it reached 2.692%. The biggest growth in Polish market share in the European structure was recorded in 2006- about 80%.

In the analyzed period the coefficient of air mobility of Polish society increases every year. The coefficient shows how many times a year the average resident of the European Union used the air transport. Table I shows the mobility factor for the European countries, while Fig. 2 presents this factor for Poland.

The countries presented in the ranking may be divided into three groups. The first -countries with a small population- they have high coefficients (above 6), countries with an advanced stage of development and stable growth of air traffic-coefficient (1.5-6), the other countries where the air market is developing.

TABLE I  
PASSENGER MOBILITY IN EU (2004-2013)

No.	Country	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1	Austria	2.247	2.400	2.523	2.768	2.873	2.611	2.810	2.991	3.088	3.047
2	Belgium	1.680	1.705	1.822	1.966	2.061	1.982	2.093	2.282	2.336	2.364
3	Bulgaria	-	-	-	0.802	0.854	0.782	0.831	0.903	0.931	0.972
4	Croatia	-	-	-	-	1.045	1.006	1.087	1.163	1.268	1.343
5	Cyprus	8.883	9.252	9.024	9.241	9.298	8.444	8.482	8.562	8.501	8.097
6	Czech Republic	0.976	1.105	1.191	1.277	1.298	1.186	1.170	1.206	1.118	-
7	Denmark	3.892	4.097	4.231	4.414	4.498	4.041	4.396	4.641	4.754	4.900
8	Estonia	0.725	1.025	1.135	1.283	1.348	1.004	1.036	1.435	1.662	1.484
9	Finland	2.258	2.358	2.558	2.741	2.802	2.596	2.657	3.046	3.047	3.053
10	France	1.654	1.720	1.790	1.886	1.917	1.827	1.901	2.023	2.068	2.109
20	Germany	1.646	1.769	1.870	1.990	2.020	1.929	2.031	2.144	2.223	2.245
11	Greece	2.673	2.781	2.948	3.122	3.077	2.938	2.873	2.993	2.839	-
30	Hungary	0.631	0.784	0.818	0.852	0.839	0.806	0.816	0.890	0.849	0.854
15	Iceland	6.500	7.191	7.596	8.002	7.104	5.753	6.411	7.734	8.576	9.940
14	Ireland	5.176	5.899	6.549	6.875	6.734	5.810	5.076	5.111	5.149	5.359
32	Italy	1.413	1.519	1.652	1.826	1.794	1.726	1.843	1.958	1.954	-
18	Latvia	0.464	0.832	1.117	1.429	1.682	1.878	2.196	2.458	2.325	2.363
16	Lithuania	0.292	0.427	0.547	0.676	0.794	0.586	0.727	0.882	1.054	1.172
17	Luxembourg	3.317	3.335	3.405	3.432	3.541	3.111	3.214	3.589	3.609	4.038
19	Malta	6.978	6.847	6.666	7.326	7.625	7.103	7.955	8.450	8.742	9.569
13	Netherlands	2.737	2.848	2.974	3.087	3.073	2.819	2.933	3.236	3.328	2.737
21	Norway	4.287	4.033	5.183	5.637	5.851	5.766	6.076	6.585	6.938	-
22	Poland	0.160	0.185	0.360	0.449	0.491	0.447	0.482	0.536	0.565	0.648
23	Portugal	1.759	1.932	2.095	2.309	2.386	2.282	2.434	2.608	2.674	-
24	Romania	0.148	0.163	0.231	0.327	0.389	0.391	0.436	0.480	0.481	-
25	Slovakia	0.201	0.283	0.395	0.415	0.483	0.362	0.349	0.335	0.289	0.288
26	Slovenia	0.524	0.609	0.663	0.748	0.820	0.700	0.675	0.663	0.568	0.615
12	Spain	3.050	3.319	3.422	3.651	3.534	3.208	3.300	3.539	3.413	3.376
28	Sweden	2.223	2.330	2.845	2.959	3.029	2.724	2.853	3.158	3.201	-
27	Switzerland	3.608	3.894	4.267	4.600	4.819	4.665	4.831	5.265	5.435	5.500
29	UE-27	-	-	-	1.604	1.609	1.508	1.557	1.640	1.652	1.261
31	United Kingdom	3.216	3.390	3.484	3.558	3.474	3.200	3.086	3.198	3.198	3.294

For Poland the coefficient in 2004-2006 was below 0.4, between 2008-2011 it reached a level of 0.5, but already in 2013 it far exceeded the level of 0.6 and amounted to 0.65. It is anticipated that in the next decade the coefficient will reach around 1.5.

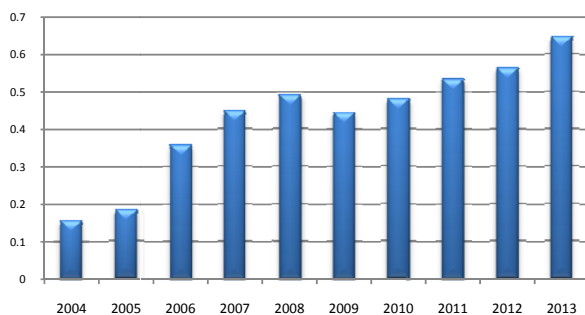


Fig. 2 Passenger Mobility in Poland (2004-2013)

### III. AIR CARRIERS ON THE POLISH MARKET

In 2013 the largest share in the Polish aviation market, according to the business model had low-cost carriers (market share 48.3%), network carriers- 40.7%, while the charter

carriers- 11% of the market. Since low-cost carriers entered the market in 2004, their share in the market increased from 26.55% in 2005 to around 54% in 2013. In 2005, they served about 2 million passengers (an increase of 100% compared to the year 2004 to 1,064 million passengers), while in 2010 they served nearly 9 million passengers and in 2013 11,901 million passengers. During 10 years low-cost carriers such as Wizz Air, Ryanair, EasyJet shaped their position in the Polish market. Those operators each year are high on the classification of the major carriers operating in Poland.

The second group is the network carriers, national carrier LOT Polish Airlines, together with its partnership EUROLOT and Lufthansa and SAS. While the low-cost carriers offer point-to-point connections, in the case of network operators they offer international connections to major hub airports (Frankfurt, Munich, Copenhagen, Amsterdam, London) and domestic destination from regional airports to Warsaw and between some selected regional airports.

In the first years after the integration of EU foreign carriers were playing major part in the Polish aviation market. In 2005 the share of foreign carriers in regular traffic accounted for 51.37% [16] and in 2013- 72.17%.

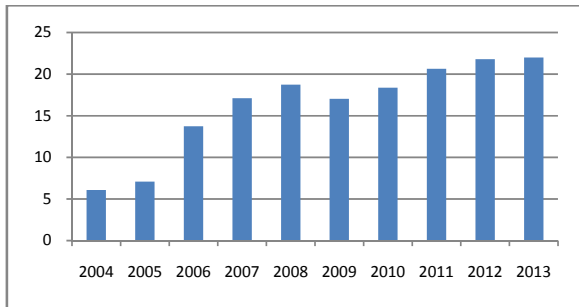


Fig. 3 Air transport of passengers in Poland (2004-2013)

In 2013, regular carriers operating in Poland served nearly 22 million passengers; it is about 3.59% more than in 2012 and more than three times more than in 2004.

The largest carrier operating in the Polish market in 2013 was Ryanair which transported 6.5 million passengers reaching nearly 30% market share and beating LOT Polish Airlines which in 2012 had the largest share of the market.

Since 2004, the number of air carriers operating on the Polish market and the number of direct connections increased.

TABLE II  
NUMBER OF AIR CARRIERS OPERATED IN POLISH AIRPORTS

Airport	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Bydgoszcz	1	2	2	2	3	2	1	2	2	2
Gdansk	4	6	9	12	12	7	7	9	10	9
Katowice	14	6	7	6	7	6	5	4	6	6
Krakow	13	16	17	21	24	19	16	16	13	13
Lodz	1	2	2	4	4	2	2	2	2	2
Lublin	-	-	-	-	-	-	-	-	-	2
Modlin	-	-	-	-	-	-	-	-	-	0
Poznan	5	10	7	7	9	6	4	8	8	7
Rzeszow	1	2	2	2	2	4	2	3	5	3
Szczecin	1	2	2	4	5	4	2	3	3	4
Warsaw	37	50	41	47	34	34	47	38	30	31
Wroclaw	3	7	8	9	8	7	3	7	6	7
Zielona Gora	1	1	1	2	1	1	1	1	1	1

TABLE III  
NUMBER OF DIRECT CONNECTIONS IN POLAND (2004-2013)

Airport	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Bydgoszcz	1	3	2	6	12	4	7	5	7	7
Gdansk	4	9	19	30	27	25	38	38	60	46
Katowice	4	16	20	30	30	32	29	32	29	40
Krakow	10	22	51	39	36	41	45	46	43	57
Lodz	1	1	4	6	11	6	7	7	10	9
Poznan	6	11	13	17	24	19	22	27	24	25
Rzeszow	1	3	2	4	8	9	11	10	11	13
Szczecin	2	2	2	6	8	4	5	7	7	9
Warsaw	52	40	40	66	82	84	88	88	74	100
Wroclaw	4	5	10	19	24	21	30	31	33	36
Zielona Gora	1	0	1	2	1	1	1	1	1	0

Between 2005 and 2006 the number of foreign connections increased, moreover carriers began to operate on routes omitting Warsaw, for example Gdansk - Wroclaw, Gdansk - Krakow, Wroclaw - Warsaw operated by Direct Fly. During this period the share of foreign connections in four main regional airports (Katowice, Krakow, Gdansk and Poznan) was more than 60% [17].

Between 2004 and 2007 most new connections were made in major regional airports, while between 2006 and 2009 most carriers invested in airports that were previously regarded as average and unattractive, for example Bydgoszcz and Rzeszow.

An important advantage of the development of air services market is a drop in prices caused by, among others, the emerging intra-industry competition and external competition. In the analyzed period there were several direct flights operated by at least two carriers, for example connections between Polish airports and London served by Wizz Air,

Ryanair, LOT Polish Airlines and British Airways, flights to Scandinavian countries (SAS, Norwegian, Finnair, LOT Polish Airlines, Wizz Air, Ryanair), on the South of Europe (Wizz Air, Ryanair, EuroLOT, LOT Polish Airlines, Alitalia). In this case, an important instrument of competition is time to conduct take-offs and landings at particular airports [18]. This factor is more important than price.

In addition to the regular carriage there was also the development of the charter carriage, the increased demand for tourist services is associated with high needs of travel agencies. While considering the regular market we can talk about a certain stability and well-established air carriers, in the case of carriers cooperating with tourism operators there are some fluctuations, changes, etc. Despite these changes the main tourist directions in the analyzed period of 10 years still remain: Egypt, Turkey, Tunisia, Greece, Spain. However, it is worth saying that at that time new directions appeared there: Kenya, Thailand, Dominican Republic, India.

## IV. POLISH AIRPORTS

In the last decade as a result of Polish integration with the European Union there has been the development of airports. In the analyzed period there were no major spectacular acquisitions, mergers or privatizations. Airport operators followed a program to align the standards to the global requirements; they also went through a number of programs to improve quality. The list of selected air investments and those which have an indirect relationship with the aviation

infrastructure are shown in Table IV.

Modernization of infrastructure, construction of new and expansion of old terminals is the effect of not only the increased quality of travelers and carriers, but it is also the result of demand for air services. A large range of supply of seats on the plane was also a response to the potential demand for air services. The number of served passengers and their participation in shaping the aviation market is shown in Table V.

TABLE IV  
MAIN INVESTMENTS IN POLISH AIRPORTS (2004-2013)

Airport	Direct air investments	Indirect air investments
Bydgoszcz	Construction of: passenger terminal, baggage check-in system	Reconstruction of: road system
Gdansk	Construction of: Passenger terminal, baggage check-in system, cargo terminal, taxiway; reconstruction of: apron	Construction of: hotel, rail system; reconstruction of: road system
Katowice	Construction of: passenger terminal, cargo terminal, runway; reconstruction of: apron	Reconstruction of: road system
Krakow	Reconstruction of: passenger terminal, taxiway, apron	Construction of: hotel; reconstruction of: road system
Lublin	Start airports, constructions of passenger terminal, taxiway, apron; reconstructions of runway	Construction of: rail system; reconstruction of: road system
Lodz	Construction of: Passenger terminal	Construction of: road system
Modlin	Start airports, constructions of passenger terminal, taxiway, apron; reconstructions of runway	Construction of: road system
Poznan	Construction of: passenger terminal, apron	Construction of: road system
Rzeszow	Construction of: passenger terminal	Construction of: road system
Szczecin	Construction of: passenger terminal; reconstruction of: runway, apron	Construction of: road system
Warsaw	Construction of: passenger terminal; reconstruction of: apron, taxiway, runway	Construction of: road system, rail system, hotel
Wroclaw	Construction of: passenger terminal, apron, taxiway	Construction of: road system
Zielona Gora	Reconstruction of: apron, taxiway	

TABLE V (A)  
AIR TRAFFIC IN POLISH AIRPORTS (2004-2013)

Airport	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Share in lcc market in 2004 [%]	Share in lcc market in 2012 [%]	Domestic traffic [%]	Share in market in 2013 [%]	Dynamic to 2012 [%]
Bydgoszcz	25	38	133	182	266	264	266	268	328	330	0	2.67	6.85	1.32	0.8
Gdansk	463	677	1249	1708	1930	1890	2208	2449	2861	2 826	11.9	16.7	12.44	11.31	-1.2
Katowice	579	1083	1438	1962	2402	2301	2366	2500	2518	2506	63.5	15.87	2.12	10.03	-0.5
Krakow	803	1564	2347	3042	2897	2658	2839	2994	3408	3636	15.4	21.88	8.33	14.56	6.7
Lublin	-	-	-	-	-	-	-	-	5	188	0	0	2.64	0.76	3212.7
Lodz	6	18	204	312	341	312	413	390	463	353	0	4.35	0.01	1.42	-23.7
Modlin	-	-	-	-	-	-	-	-	857	344	0	0	0	1.38	-59.8
Poznan	351	399	637	863	1256	1253	1383	1425	1 560	1329	12.8	8.73	6.07	5.32	-14.8
Rzeszow	70	91	206	274	320	380	451	487	562	588	0	3.73	21.26	2.35	4.5
Szczecin	90	101	176	227	293	276	268	258	347	322	1.22	1.74	24.04	1.29	-7.1
Warsaw	6085	7071	8101	9 268	9436	8278	8666	9322	9567	10669	9.6	13.75	10.62	42.71	11.5
Wroclaw	355	454	857	1267	1477	1324	1598	1 606	1942	1 873	5.7	10.59	14.03	7.5	-3.5
Zielona Gora	3	1	8	6	5	3	3	7	12	12	0	0	99.27	0.05	-0.8
Total	8835	11502	15362	19116	20628	18944	20466	21711	24435	24 982	13.3	41.59	9.71	100	2.2

Taking into consideration air traffic there are three groups of airports. Warsaw Chopin Airport is the main airport in Poland. Although there was a huge increase in the number of passengers between 2004 and 2007, in 2004 the share in passenger service decreased from 68.87% in 2004 to 42.71% in 2013. The share of huge regional airports (Krakow, Gdansk, Katowice, Wroclaw and Poznan) increased from 28.9% in 2004 to 48.72% in 2013. Similarly the share of the rest small regional airports increased from 2.23% in 2004 to 8.57% in 2013.

Important changes in the passenger service by Polish airports took place in 2012 for several reasons:

- Poland co-hosted the UEFA Euro 2012,
- for 4 months on the market there was a carrier OLT Express offering wide range of flights at a price of PLN100, he obtained more than 2% share in passenger air transport,
- two new airports were opened in Modlin and Lublin [19].

While in 2004, 179 th. passenger commercial operations were made to / from Polish airports, in 2005 there were already 204 th. The increase in the number of operations directly influenced the number of passengers served in airports.

Faster growth in the number of passengers than the number

of flight operations indicates that carriers were making changes in their fleet and optimizing network of connections in a different way. As a result indicators showing the use of seats in airplanes generally increased and thus unit costs of transport per passenger decreased.

Between 2004 and 2008 the dynamics of air traffic was higher than the dynamics of air operations but in 2009 despite a marginal increase in air operations as compared to 2008-1.2%, the number of served passengers decreased by 8.2%. This situation was caused the economic crisis during which the carriers in 2008 reduced the supply of services, increasing it slightly in 2009, while the effects of the crisis taking into consideration the demand- there was decline in air traffic in 2009.

In the analyzed period the increase in the number of passengers significantly exceeded the growth in the number of passenger operations, which resulted in an increase in the number of passengers per one operation. This means that more operations were performed by aircraft with a larger number of seats than in previous years. Due to large differences in the dynamics of the performed operations and served passengers, the indicator presenting the use of the seats on board increased. The number of passengers per one operation at airports is shown in Fig. 4.

The dynamic growth in the number of passengers per one operation between 2004-2013 was associated with the development of regular and charter connections. This is due to the large share of international transport (85-90%) and its service made by large aircraft (above 100 seats), while the local and selected international regional flights were operated by small aircraft (40-75 seats). In addition to regular and charter flights little business traffic has the influence on the indicator - General Aviation operated by aircraft with maximum 20 seats.

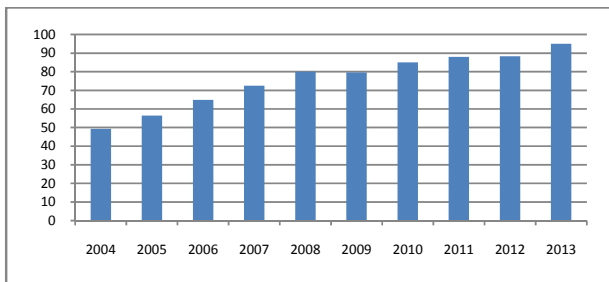


Fig. 4 Number of passenger per one aircraft operation

The Civil Aviation Authority in its survey regarding the growth in air traffic in Poland assumed systematic growth and development of that process. This forecast was made on the basis of historical time series, the projected real GDP growth in the country, and taking into account the factor of mobility in the EU-15. In that period random, single events were not included (e.g. terrorist attacks, epidemics, sudden increase in interest in air transport, etc..).

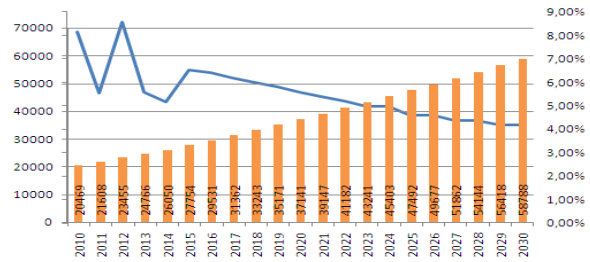


Fig. 5 Forecast and dynamic air traffic in Polish airports to 2030

Polish market for air services will systematically and fairly evenly be developing by the year 2030. The diversity of the market will continue increasing; the segmentation of the market will also increase [20]. The progress of aviation technology and means of IT communication, the intensification of globalization processes in all areas of management and increasing mobility of the society will foster those processes. The dynamic development of transport will be accompanied by an intensive process of adapting the infrastructure and quality of aviation services and additional services demanded by the users.

## V. CONCLUSION

Certainly the Polish aviation market should be defined as the one which is growing strongly, having huge potential resulting not only from deviating from EU standards of mobility of Polish society, but also the social potential, GDP growth and economic position of Poland.

For this purpose independent research institutions determine the impact of air transport on the economy using four indicators: direct, indirect, induced and catalytic, which grows year after year. The relationship between the development of the regions and the development of airports is more and more noticeable. Airports increase the catchment area, lead a number of projects at various levels adjusting the air transport services to all segments of the market.

It should be noted that in Poland in 2004-2013 there was:

- triple increase in air passenger traffic,
- increase of more than 1.5 in performed air operations,
- increase in the air mobility indicator,
- dynamic growth in airline network,
- decrease in ticket prices,
- process of modernization and investment in airports,
- increased the intensity of competition.

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