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The Analysis of Passenger Air Transport Development in Poland over the Period 2010-2018

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Abstract:

Purpose: The aim of the conducted research was analysis of data regarding aviation activities in the field of passenger transport at Polish airports over the period 2010-2018.

Design/Methodology/Approach: The Analysis of the air travel segment referring passenger transport in Polish airports is based on available literature, analysis and statistical documentation of the air transport market for the years 2010-2018.

Findings: The Polish market of air services continues to be in a state of flux. The pace at which changes occur results from a combination of external and internal factors, which precondition the behaviour of air carriers and customers, and the operation of airports. When analysing air transport development forecast, we can see a further upward trend in the number of activities of all market participants. That said, in the near future we should be expecting an expansion of connections, erection of state-of-the-art infrastructure, new air services, and above all a growth of importance of Poland on the aviation map of Europe.

Practical Implications: Having regard to data included in the study, without a doubt the Polish aviation market should be considered a strongly developing one, having enormous potential ensuing not only from population mobility different EU standards, but also from demographic potential of Poland, gradual wealth gaining of the Polish society, and Poland's geographic location.

Originality/Value: A comparative analysis of the potential of selected air carriers and airports with respect to the volume of transported passengers and flights performed.

Keywords: Passenger, air transport, passenger air transport, aviation market development, market analysis, air transport in Poland, demand for passenger air transport.

JEL Code: N7, N70, R41, R42.

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1. Introduction

The eternal dream of flying had fired the imagination of many romantics and visionaries not only in the United States of America, France, Germany or the United Kingdom, but also in Polish lands. Daring projects had been developed, such as “flying dragons”, air ships not resembling the present day aircraft, or wings with the help of which some passionate men deemed lunatics made the first attempts to fly. It continued until the year 1910 when under unfavourable political conditions and with modest financial resources, our domestic constructors managed to build the first successful Polish airplane (Bondaryk *et al.*, 2018).

When over 100 years ago, on 1st January 1914, Tony Janus took a plane off the ground in Saint Petersburg, Florida, to complete the first passenger flight ever, he did not need an airport to do so for he could use the waters of the Tampa Bay. The only passenger on board paid 100 American dollars for this 23-minute flight. Soon, it became common knowledge that if aviation transport was to thrive, one would need airports equipped with both aircraft and passenger facilities. At that time, there were several airports within the territory of the present-day Poland, whose main purpose included military targets and airship navigation. The origins of civil aviation in Poland were associated with post (mail) transport delivered to the cities of Cracow and Lviv, which at that time were under foreign occupation. In 1919, there was an attempt to establish the National Association of Air Navigation, which later turned out to be unsuccessful. In 1920, the French-Romanian line CFRNA included Warsaw in its destination network.

At the same time, scheduled flights to the then German Szczecin were established. In 1921, the first scheduled Polish line passenger air connection was introduced. Aircraft flew from the Ławica airport in Poznań (the oldest active civil airport in Poland) to the Free City of Gdańsk and Warsaw. There is no trace now of the destination airports of the period, i.e. Gdańsk - Wrzeszcz and Warsaw - Pola Mokotowskie. The first years of aviation activity on the Polish territory were related, most of all, to goods and post transport, whereas the passengers constituted a mere addition. In 1921, two hundred and fifty flights were executed at the Warsaw airport, with only 195 passengers on board.

Over the 90 years of its history, the Polish aviation has developed significantly. In 1921, a Poznań-based company, Aerotarg, carried only 100 passengers. Over the period 1923 - 1930, approximately 150,000 passengers checked in at the two Warsaw airports. To illustrate the major change in the flying frequency, one should note that in the year 2014 the capital airport Okęcie served nearly 10.6 million passengers, and 27 million individuals across the country (Sipiński, Cybulak and Placha, 2016).

Aviation transport is a dynamically developing branch that over the past 10 years experienced unprecedented changes. Given their dynamics, we must not forget the events which contributed significantly to the current situation.

Until 1989, Polish air transport services were provided mainly by state-owned entities, with no opportunities for private entity development due to the influence of the central planning policy. A significant break-through in the Polish aviation transport development, which made it possible for a broader group of air operators to conduct activities in Poland, was Poland's EU accession, allowing internal law and regulations to be adapted to new market standards (European Parliament). Under the so-called third liberalisation package binding at the time, every community air carrier earned the right to unrestricted transport execution in Poland. Polish carriers have also acquired the same law in the European Economic Area (Official Journal of the European Union), (Council Regulation (EEC)). This is when a new flying era began - when a gradual reduction in the price of tickets occurred and when air carriers began to realize the untapped potential of the regions.

Some subsequent events which had an impact on the development of the Polish air transport were: entering the Schengen area and hosting the World Cup, Euro 2012. Another major factor in the aviation sector development is, without a doubt, Poland's geographical location and demographic conditions. This is due to the fact that we are one of the largest countries in Europe, which makes our geographic location and air space highly important for the air traffic across the continent. Aviation transport in Poland shows a natural developmental tendency resulting from the need to improve the weak condition of the branch at the turn of the 20th and 21st century (Ruciński and Madej, 2016). In the year 2018, there was one national airport – Frederic Chopin's Airport in Warsaw, and 14 regional airports delivering scheduled passenger flights – Figure 1:

- Ignacy Paderewski Bydgoszcz – Szwederowo Airport,
- Lech Wałęsa Gdańsk – Rębiechowo Airport,
- Katowice – Pyrzowice Airport,
- John Paul II Kraków – Balice Airport,
- Lublin – Świdnik Airport,
- Władysław Reymont Łódź – Lublinek Airport,
- Olsztyn – Mazury Airport,
- Henryk Wieniawski Poznań – Ławica Airport,
- Radom – Sadków Airport,
- Rzeszów – Jasionka Airport,
- NSZZ Solidarność Szczecin – Goleniów Airport,
- Warszawa – Modlin Airport,
- Nicolaus Copernicus Wrocław – Starachowice Airport,
- Zielona Góra – Babimost Airport (Sipiński, 2017).

Amongst the airports presented in Figure 1, ten airports are of international significance.

Figure 1. Airports in Poland



Source: <http://lubie-latac.blogspot.com/p/blog-page.html>

2. Methodology

The subject of the research was passenger air transport in Poland and transport service demand. The main objective of the study was to analyze passenger air transport development in Poland over the period 2010-2018. The following research problem resulted from the presented research objective: What factors have had an impact on the development of air transport? The data employed in the study were source data from Polish airports published in the form of annual reports by the Polish Air Navigation Services Agency (PAŻP), the Civil Aviation Office (ULC), books and online on websites related to air transport.

To help improve one's understanding of the issue of air transport development in Poland and to attain the research goal, the following methods were applied: a comparative analysis of the potential of selected air carriers and airports with respect to the volume of transported passengers and flights performed, statistical methods. The data collected were evaluated with the use of Microsoft Office, above all Excel spreadsheets.

3. Material and Methods

3.1 Air Carriers on the Polish Aviation Market

In the years 2010-2016, Polish passenger air transport services were provided by traditional, low-cost, and charter carriers - Table 1.

Table 1. Air Carriers of Polish aviation market over the years 2010-2018

Carriers in 2010	
Traditional (network)	PLL LOT, LUFTHANSA GROUP: Lufthansa, Swiss, Wizz Air, Ausrtian, SN Brussels, Germanwings, AIR FRANCE/KLM GROUP: Air France, KLM, BA/IB GROUP: British Airways, Iberia, Aeroflot
Cheap Airlines	WizzAir, Ryanair, Easyjet, Norw Air Shuttle, Germanwings, Air Berlin
Charter Carriers	Enter Air, Travel Service, Small Planet, Airlines + EuroLOT, Nouvelair Tunisie, Air Cairo, Onur Air, Aegean Airlines.
Carriers in 2012	
Traditional (network)	PLL LOT +Eurolot, LUFTHANSA GROUP: Lufthansa, Swiss, Wizz Air, Ausrtian Airlines, SN Brussels, Germanwings, AIR FRANCE/KLM GROUP: Air France, KLM, BA/IB GROUP: British Airways, Iberia, Aeroflot
Cheap Airlines	Wizz Air, Ryanair, Lufthansa, easyJet, Norwegian Air Shuttle
Charter Carriers	Enter Air, Travel Service, Small Planet, Airlines + EuroLOT, Pegasus Airlines, Nouvelair Tunisie, Corendon Airlines, Nesma, Bulgarian Air Charter, Air Cairo, Onur Air, Ryanair, Aegean Airlines.
Carriers in 2014	
Traditional (network)	PLL LOT, LUFTHANSA GROUP: Lufthansa, Swiss, Wizz Air, Ausrtian Airlines, Germanwings, AIR FRANCE/KLM GROUP: Air France, KLM, BA/IB GROUP: British Airways
Cheap Airlines	Wizz Air, Ryanair, Lufthansa, easyJet, Norwegian Air Shuttle
Charter Carriers	Enter Air, Travel Service, Small Planet, Airlines + EuroLOT, Pegasus Airlines, EoroLot, Nouvelair Tunisie, Corendon Airlines, Nesma, Bulgarian Air Charter, Air Cairo, Bingo Airways, Onur Air, Air Go Egypt, SkyEurope, WizzAir, Ryanair, Aegean Airlines, Enter Air
Carriers in 2016	
Traditional (network)	Aeroflot, AeroSvit, AerLingus, AirBaltic, Air Berlin, Air France, Alitalia, Austrian Airlines, British Airlines, Brussels Airways, Belavia, Czech Airlines, El Al, Emirates Airlines, Eurolot, Finnair, KML, LOT, Lufthansa, Royal Air Maroc, SAS, Sprint Air, SWISS, TAP Portugal, Tarom, Turkish Airlines, Qatar Airways
Cheap Airlines	AirOne, Germanwings, Iceland Express, Jet2, Wizz Air, Ryanair, Lufthansa, EasyJet, Norwegian Air Shuttle, WOW Air
Charter Carriers	Enter Air, Travel Service, Small Planet, Airlines + EuroLOT, Pegasus Airlines, EoroLot, Nouvelair Tunisie, Corendon Airlines, Nesma, Bulgarian Air Charter, Air Cairo, Bingo Airways, Onur Air, Air Go Egypt, WizzAir, Ryanair, Aegean Airlines, Enter Air, SunExpress, FlyEgypt.
Carriers in 2018	
Traditional (network)	Lufthansa, Alitalia, TAP Portugal, LOT, Brussels Airways, Austrian Airlines, Qatar Airways, Finnair, Emirates Airlines, Swiss International Airlines, British Airways, Air France, SAS, KLM Royal Dutch Airlines, El-AL Israel Airlines, Aeroflot-Russian Airlines, Ukraine International Airlines, Finnair, Alitalia, Transavia Airlines.
Cheap Airlines	Jet2.com, Ryanair, Eurowings (Germanwings), Norwegian Air Shuttle, EasyJet, Aerolot-Russian Airlines, Lufthansa.
Charter Carriers	Wizz Air, Aegean Airlines, Enter Air, Ukraine International Airlines, Ryanair.

Source:http://www.prtl.pl/linie_lotnicze_artykuly,1148,9;http://podroze.gazeta.pl/podroze/56,114158,13770930,Najlepsze_linie_lotnicze_2012_ktore_lataja_z_Polski.html ,
<https://forsal.pl/artykuly/840414,lot-ryanair-czy-wizzair-oto-najwieksi-przewoznicy-lotniczy-w-polsce.html> ,<http://www.prtl.pl/articleimg/Raport%20Rynek%20Lotniczy%202016.pdf>

3.2 Data on Passenger Transport at Polish Airports

In the past several years, aviation transport experienced unprecedented changes, due to which airports are no longer seen as “lonely islands” (Wąsowska, 2017). Thanks to the retrofitting of the fleet and airport, as well as excellent flying and ground staff service training, flights and air journeys are becoming more and more popular, convenient, and professional (Rucińska, Ruciński and Tłoczyński, 2012). Nowadays, more and more Poles treat airplanes as a common means of transportation. The times when the fliers were those seeking adventure, rather than well-off passengers or those in a hurry, are long gone. No one now gives their farewell before taking off the way one of the protagonist portrayed by Jerzy Waldorff did: We are flying to Poznań (...). - Remember, the will is in the left desk drawer (Sipiński, Cybulak and Placha, 2016).

In the year 2010, we could note a dynamic growth of the number of passengers served by Polish airports - a total of 20.466.876 passengers in commercial traffic, which is a rise of 8.1% with respect to the year 2009. Among the fastest developing regional airports were: Łódź – 32.5% increase in the number of passengers, Wrocław – 20.7%, Rzeszów – 18.7%, Gdańsk – 77.1%, and the Szczecin airport – 23.9%. The passenger growth dynamics observed across all regional ports was nearly 11%, which allowed them to increase their market share from 56.3% in 2009 to 57.7% in 2010 - Table 2:

Table 2. Passengers served by Polish airports over the period 2010-2018

Airport	2010		2012		2014		2016		2017	
	Number of served passengers	Market share %	Number of served passengers	Market share %	Number of served passengers	Market share %	Number of served passengers	Market share %	Number of served passengers	Market share %
Bydgoszcz	266480	0,7	330658	1,32	318817	1,05	322135	0,95	318 400	-1,2
Gdańsk	2208819	16,9	2826412	11,31	3676771	12,10	3963783	11,67	4 601 982	15,4
Katowice	2366410	2,8	2506694	10,03	3044017	10,02	3187526	9,39	3 877 235	21,1
Kraków	2839124	6,8	3636804	14,56	4208661	13,85	4974371	14,65	5 829 190	17,2
Lublin	5697	bd.	188723	0,76	264070	0,87	376755	1,11	429 164	13,9
Łódź	413392	32,4	353633	1,42	287620	0,95	241114	0,71	207 377	-14,0
Modlin	857481	bd.	344566	1,38	2589286	8,52	2859176	8,42	2 931 503	2,5
Olsztyn	-	-	-	-	-	-	41095	0,12	101 306	-
Poznań	1383656	12,0	1329331	5,32	1477318	4,86	1688818	4,97	1 842 660	9,1
Radom	-	-	0	0,00	670	0,00	9151	0,03	9 903	10,5
Rzeszów	451720	18,7	588148	2,35	641146	2,11	661497	1,95	691 708	4,5
Szczecin	268563	-2,9	322334	1,29	412162	1,32	465952	1,37	578 520	23,8
Warsaw	8666552	4,7	10669679	42,71	11186688	36,81	12791363	37,66	15 730 330	22,9
Wrocław	1598533	20,7	1873245	7,50	2269216	7,47	2370845	6,98	2 805 888	18,3
Zielona Góra	3627	28,9	12196	0,05	15550	0,05	8744	0,33	17 128	95,9
Total	20466876		24982623	100	30391992	100	33 986960	100,00	39 972 294	17,5

Source: https://www.ulc.gov.pl/_download/regulacja_ryнку/statystyki/4ql_2010.pdf; https://www.ulc.gov.pl/_download/regulacja_ryнку/statystyki/wg-portow/wg-portow-lotniczych-faktyczne-4-kw-201-2012.pdf; <https://www.ulc.gov.pl/pl/regulacja-ryнку/statystyki-i-analizy-ryнку-transportu-lotniczego/3724-statystyki-wg-portow-lotniczych>; https://www.ulc.gov.pl/_download/regulacja_ryнку/statystyki/IV_kw_2016/wg_portow_lotniczych-2016kw4_v2.pdf

As far as the scheduled traffic is concerned, Polish ports served 17.360 thousand passengers, i.e. 7.8% more than in the preceding year. The top five air carriers were: WIZZAIR (22.6%), RYANAIR (21.5%), Lufthansa (7.1%) and EASYJET (3.1%) – Table 3:

Table 3. Passenger flights by air carriers in Poland in the years 2010-2018

	Carrier	2010		2012		2014		2015		2016	
		Number of passengers	Share in %	Number of passengers	Share in %	Number of passengers	Share in %	Number of passengers	Share in %	Number of passengers	Share in %
1	Ryanair	3725271	29.05	4887084	23.03	6529373	27.95	8211803	30.76	9305729	13.32
2	Wizz Air	3920241	22.61	4185392	19.72	4500000	19.27	5818709	21.79	6594301	13.33
3	Lot Polish Airlines + EuroLOT S.A.	5036736	29.05	6175015	29.10	5778688	24.74	5488472	20.56	6812360	24.12
4	Lufthansa	1235390	7.13	1500875	7.07	1796727	7.69	1958067	7.33	2026494	3.49
5	Norwegian Air Shuttle	382933	2.21	375644	1.77	590537	2.53	791135	2.96	809483	2.32
6	EasyJet	529896	3.06	429071	2.02	497819	2.13	543198	2.03	667696	22.92

Source: Tłoczyński, Raport 2017. Rynek lotniczy. Published by: Eurosystem Jarosław Śleszyński, Warszawa, 2017, p. 38, 36.

The market share of the so-called low-cost air carriers has been stable since 2007 and oscillating slightly above 50% - Table 4:

Table 4. Transport operations of the largest low-cost air carriers in Poland 2010-2016

Carrier		Total LCC	Remainder	Norwegian Air Shuttle	easyJet	Wizzair	Ryanair
2010	Passengers in thous	8961	389	383	530	3926	3733
	Share in %	100	4.34	4.27	5.91	43.81	41.66
	Dynamics in comp. with preceding year in %	7.47		-32.09	-17.57	12.24	19.19
2011	Passengers in thous	8830	136	346	431	4077	3840
	Share in %	100	1.54	3.92	4.88	46.17	43.49
	Dynamics in comp. with preceding year in %	-1.46		-9.66	-18.67	3.84	2.86

2012	Passengers in thous	10058	182	375	429	4185	4887
	Share in %	100	1.81	3.73	4.27	41.61	48.59
	Dynamics in comp. with preceding year in %	13.89		8.52	-0.50	2.62	27.25
2013	Passengers in thous	11901	376	422	461	4057	6585
	Share in %	100	3.16	3.55	3.87	34.09	55.33
	Dynamics in comp. with preceding year in %	18.32		12.53	7.46	-3.06	34.75
2014	Passengers in thous	12683	567	590	497	4500	6529
	Share in %	100	4.47	4.652	3.92	35.48	51.48
	Dynamics in comp. with preceding year in %	6.57		39.77	7.93	10.91	-0.85
2015	Passengers in thous	16031	666	791	543	5819	8212
	Share in %	100	4.15	4.93	3.39	36.30	51.22
	Dynamics in comp. with preceding year in %	26.39	17.46	33.97	9.12	29.30	25.77
2016	Passengers in thous	18026	651	809	667	6594	9305
	Share in %	100	3.61	4.49	3.70	36.58	51.62
	Dynamics in comp. with preceding year in %	12.44	-2.25	2.28	22.84	13.32	13.31

Source: *Tłoczyński, Raport 2017. Rynek lotniczy. Published by: Eurosystem Jarosław Śleszyński, Warszawa, 2017, p. 38, 36; Tłoczyński, Raport 2015. Rynek lotniczy. Published by: Eurosystem Jarosław Śleszyński, Warszawa, 2015, p. 43; Tłoczyński, Raport 2016. Rynek lotniczy. Published by: Eurosystem Jarosław Śleszyński, Warszawa, 2016, p. 38.*

In 2012, the Polish air transport market noted a growth in the number of passengers served. The main factors contributing to such growth were:

- development of the low-cost carrier offer;
- dynamic growth of domestic air transport service offer;
- increased traffic related to EURO 2012.

In the year 2012, we witnessed a dynamic growth of the number of passengers handled by Polish airports – a total of 24.982.623 passengers in commercial traffic, which is a rise of 19.4% with respect to the year 2010. A significant increase in air traffic was observed by nearly all Polish airports – except for Katowice and Warsaw airports – a growth of 10.4% compared to 2010. Among the most rapidly developing regional airports were: Port Lotniczy Zielona Góra - Babimost – 77.1% increase in passenger numbers, Szczecin – Goleniów – 34.4%, Bydgoszcz-Szwedrowo – 22.3% and Wrocław-Strachowice – 21.5% - Table 2.

In 2012, six airports served more than one million passengers, whereas two other airports served more than 500 thousand passengers. Here, we should add that in 2012 in Poland two new airports were opened – in Modlin and Lublin.

The top five air carriers were: PLL LOT - top – app. 28% and Eurolot S.A. - 9% (as part of cruises performed for the benefit of PLL LOT). Ryanair - 23%, Wizzair - 20%, Lufthansa - 7%, and OLT Express - 3%, also held a significant market share. He recorded the greatest positive dynamics Ryanair (27%), PLL LOT and Eurolot S.A. (9%), Norwegian Air Shuttle (9%) and SAS (9%) - Table 3. The market share of the so-called low-cost air carriers has been stable since 2007 and oscillating slightly above 50% - Table 4.

In the year 2014, we observed a dynamic growth of passenger numbers served by Polish airports - a total of 20.466.876 passengers in commercial traffic, which is a rise of 8.1% with respect to the year 2009. Among the most rapidly developing regional airports were: Łódź – 32.5% increase in the number of passengers, Wrocław – 20.7%, Rzeszów - 18.7%, Gdańsk – 77.1%, and the Szczecin airport – 23.9%. The passenger growth dynamics observed across all regional ports was nearly 11%, which allowed them to increase their market share from 56.3% in 2009 to 57.7% in 2010 - Table 2. As far as the scheduled traffic is concerned, Polish ports served 17.360 thousand passengers, i.e. 7.8% more than in the preceding year. The top five air carriers were: WIZZAIR (22.6%), RYANAIR (21.5%), Lufthansa (7.1%) and EASYJET (3.1%) - Table 3. The market share of the so-called low-cost air carriers has been stable since 2007 and oscillating slightly above 50% - Table 4.

In 2016, Polish airports served nearly 34 million passengers, which was a growth of 12% with respect to 2015. Quoting the Minister of Infrastructure and Construction, Adnrej Adamczyk, we should underpin that it was yet another successful year in terms of the number of passenger flights. Without a doubt, Polish people fly more often and more willingly. Over the last 12 years, passenger volume increased by nearly four times, hence it is so important to create conditions which will meet the demands of the growing passenger transport market in Poland.

The leader in terms of the number of passengers served was Chopin Airport in Warsaw, with 12.8 million passengers (1.6 million more than in 2015), and of the regional ports - Kraków-Balice Airport, with nearly 5 million passengers. As emphasised by Piotr Samson – President of ULC: „Such good performance is mainly thanks to low-cost carriers - Ryanair and Wizz Air, and Polskie Linie Lotnicze LOT, which are actively expanding their flight network after restructuring” (Ziółek, 2017).

In 2018, Polish airports served 45.7 million passengers, which constitutes a 14% growth with respect to the year 2017. The leader among the Polish airports was the Warsaw Chopin Airport, which in 2018 provided services to 17.7 million passengers, which was a growth of 13% as compared with the previous year. This was the greatest increase in the quantitative level among all Polish airports – the airport served over 2 million passengers more than in the year 2017, as notified by the Civil Aviation Office in the following statement: In 2018, the Polish Airlines LOT again recorded the highest growth dynamics of all air carriers, transporting

over 2 million passengers more than the previous year, reaching a 24% growth dynamics.

The runner-up was the Katowice-Pyrzowice Airport, with 0.95 million passengers more than in the previous year (24% growth dynamics). It was followed by the following airports with outstanding results: Kraków-Balice (930 thousand passengers more, which was a growth of 16%), Poznań-Ławica (over 622 thousand passengers more – growth of 34%), Wrocław-Strachowice (488 thousand passengers – growth of 17%).

Amongst the carriers served at Polish airports in both domestic and international scheduled traffic, the first place was taken by Ryanair, which generated a 28.71% market share and transported 11.55 million passengers. The second was PLL LOT with a 26.09% market share and 10.5 million transported passengers. The third position was taken by Hungarian budget airlines Wizz Air, with a 21.66% market share and 8.72 million transported passengers.

In 2018, the volume of passengers transported in domestic traffic decreased by as much as 14%. Thus, Polish airports recorded results worse than the ACI Europe airports by 18 percentage points. PLL LOT transported the greatest volume of passengers and recorded an increase in the quantitative level of 325 thousand passengers, which constituted an 11% growth with respect to the year 2017.

In 2018, the number of passengers travelling as part of charter flights rose by 34%, i.e. by nearly 1.4 million people. The most popular destinations were Greece, followed by Turkey and Spain, with the highest quantitative increase reported by Turkey (by over 0.5 million passengers more and 140% compared to 2017).

An 18% of growth dynamics compared to the year 2017 was reported in international transport at Polish airports in the year 2018, which by over 11 percentage points exceeded the results of the airports associated with the ACI Europe. In addition, a 16% growth of the number of operations performed in the period was noted. This positive performance reflects scheduled transport, which carried nearly 5 million passengers more than in the year 2017, and charter flights, transporting nearly 1.4 million passengers more than in the previous year. The leader amongst the carriers in terms of the largest volume of transported passengers remains Ryanair. Nonetheless, the greatest growth dynamics was once again reported by PLL LOT (+1.7 million passengers and 31%).

The leader of the airports with the largest growth of charter traffic passengers was the Katowice-Pyrzowice Airport, recording +525 thousand passengers and 36% growth when compared to 2017. A growth of 66% - 318 thousand passengers - and the second place in terms of the passenger volume was recorded by the Poznań - Ławica Airport. The airport which followed in the third position was the Wrocław - Strachowice Airport, generating +202 thousand passengers and a 73% growth. A

modest fall in charter transport was reported only by the Lublin Airport. The top destinations in the year 2018 were the United Kingdom, Germany and Italy. The leader in the number of transported passenger was Ukraine ((+541 thousand passengers and 72% growth), then Germany (450 thousand passengers and 11%) and Israel (+319 thousand passengers and 65% growth). The largest drop was reported with respect to Ireland, when Aer Lingus terminated its Dublin flights - Table 5.

Table 5. The number of passengers served at Polish airports on international flights by countries in the years 2010-2018.

Country	Item	2010	Item	2012	Item	2014	Item	2016	Item	2018
		Number of passengers		Number of passengers		Number of passengers		Number of passengers		Number of passengers
United Kingdom	1	4 225 226	1	4 625 164	1	1 315 738	1	1 802 725	1	1 959 892
Germany	2	2 906 465	2	3 091 698	2	789 419	2	892 002	2	1 109 110
Norway	6	689 804	4	1 034 997	3	385 736	3	431 264	4	513 943
Italy	3	1 061 057	3	1 174 519	4	319 780	4	407 888	3	535 869
France	5	760 370	6	900 282	5	256 139	6	285 303	9	328 495
Ireland	4	963 765	5	907 901	6	217 295	9	258 693	10	245 676
Sweden	8	501 566	8	641 716	9	187 348	7	277 091	8	344 082
Spain	7	556 760	7	680 697	7	194 015	5	313 794	5	410 740
Holland	9	415 837	9	593 578	8	187 443	8	267 925	7	375 860
Denmark	12	303 761	11	419 357	11	124 124	11	150 948	13	182 389
Belgium	11	395 911		444 333	10	149 936	10	176 441	11	206 467
USA	10	401 984	12	340 384	15	63 016	14	84 685	15	126 518
Ukraine	15	219 583	13	311 820	13	67 610	12	126 643	6	382 514
Switzerland	14	245 016	15	282 221	12	69 664	13	104 685	14	134 145
Russian Federation	16	202 311	16	280 678	16	61 750	15	81 750	18	98 957

Source: D. Tłoczyński, *Raport 2012. Rynek lotniczy*. Published by: Eurosystem Jarosław Śleszyński, Warszawa, 2012, p. 24;

https://www.ulc.gov.pl/download/regulacja_ryнку/statystyki/calý_rok_2015/wg_krajow_regularne-2015kw4_v2.pdf;

https://www.ulc.gov.pl/download/regulacja_ryнку/statystyki/IV_kw_2016/wg_krajow_regularne-2016kw4_v2.pdf; https://www.ulc.gov.pl/download/regulacja_ryнку/statystyki/2018/4-kw-2018/wg_krajow_regularne_kw42018.pdf

With respect to the scheduled flights, the biggest rise was recorded by the Warszawa - Okęcie Airport, transporting over 1.8 million passengers, which was a growth of 13%. It was followed by the Kraków - Balice Airport (+926 thousand passengers and a growth of 16%). The third position was taken by the Katowice - Pyrzowice Airport, (+423 thousand passengers and a 17% growth). Some decrease was reported only in the Radom - Sadków and Łódź - Lublinek Airports (Oksiuta, 2019).

Unchanged for many years, the top destinations of regular flights are: United Kingdom, Germany, Norway, and Italy – Table 5. A more noticeable change was recorded in charter flights, where the following countries come first in terms of popularity: the Mediterranean and the Black Sea countries, i.e. Greece, Spain, Bulgaria and Italy. In turn, the popularity of Turkey, Egypt, Morocco, and Tunisia is dropping (Derewienko, 2017).

3.3 Data on Passenger Air Transport Development Prospects in Poland

The development of air transport in the upcoming 15-20-year perspective is of key importance to Poland. It is an undisputed fact that the Polish transport network is capable of growing, and this potential should be exploited in the above period. Passenger air transport is potentially the most dynamic element of development in the 2010-2030 perspective. According to the estimates of the Civil Aviation Office (ULC), the growth dynamics in the period 2010-2030 will reach an average of 5.1% - Table 6.

Table 6. *Projection of the volume of served passengers and passenger operations in Poland until 2030*

Year	Number of passengers (in thous)	Dynamics	Number of passenger operations	Dynamics	Mobility rate*
2010	20469	8.14%	241036	1.23%	0.54
2011	21608	5.56%	244937	1.62%	0.57
2012	23455	8.55%	261416	6.73%	0.62
2013	24765	5.59%	271602	3.90%	0.65
2014	26050	5.19%	283453	4.36	0.68
2015	27754	6.54%	296260	4.52%	0.73
2016	29531	6.40%	309592	4.50%	0.78
2017	31362	6.20%	323214	4.40%	0.83
2018	33243	6.0%	337112	4.30%	0.88
2019	35171	5.80%	351271	4.20%	0.93
2020	37141	5.60%	365322	4.00%	0.98
2021	39147	5.40%	379204	3.80%	1.04
2022	41182	5.20%	392855	3.60%	1.09
2023	43241	5.00%	406605	3.50%	1.15
2024	45403	5.00%	420836	3.50%	1.21
2025	47492	4.60%	434724	3.30%	1.27
2026	49677	4.60%	449070	3.30%	1.33
2027	51862	4.40%	462991	3.10%	1.39
2028	54144	4.40%	477344	3.10%	1.46
2029	56418	4.20%	491187	2.90%	1.53
2030	58788	4.20%	505431	2.90%	1.60

Source: https://www.ulc.gov.pl/_download/wiadomosci/06_2011/prognoza_ulc_2011.pdf

*social mobility rate = the ratio of the number of passengers served at airports in a given country to the country's population.

Consequently, in the year 2030, passenger flights will increase to 59,127,000 compared to 23,614,000 in the year 2012, which constitutes a growth exceeding 250% in the 18-year perspective.

With reference to the statement by Piotr Samson, President of ULC, emphasising that the current ULC prognosis foresees a triple market increase in 2030 - the Polish airports in 2017 will serve a total of 39 million passengers, i.e. approximately 15% more than in the year 2016. The analysis of the last year of air transport operations clearly demonstrates that only in the first half of 2017, Polish airports were visited by more than 17 million passengers, which was a growth of 17% with respect to the analogous period in 2016, and a faster air traffic growth than expected. Therefore, the President of ULC underpinned the problem of traffic capacity which may occur in the future across the airports of the central Poland. The above tendency does not affect regional airports serving less than 1 million passengers, as some of them may struggle with being economically viable *“...The main drive behind such a dynamic growth will be to catch up with the Western European states. The mobility rate in Poland is at a much lower level than in the “old” European Union states”*. The mobility rate in Poland is 0.67, whereas in the United Kingdom - 3.4, France - 2.15, and Ireland - more than 5.7 (ULC). The President of ULC says that despite a lower than average in Europe flying frequency, the Polish aviation market for several years in a row have seen an increase in performance, which is the basis for conducting new foresight studies until the year 2035 - Table 7.

According to the latest foresight study for aviation traffic in Poland until 2035 developed by the Civil Aviation Office (ULC) and data presented in Table 7, it is estimated that Polish airports will check in over 94 million passengers per annum, which will translate into still wider disparities among individual airports.

Previous forecast assumed that Polish airports would be used by approximately 60 million passengers. In line with the current assumptions, the annual passenger volume will reach 79.9 million in the year 2030, and 94.5 million in the year 2035.

Table 7. *Projection of the volume of passengers and passenger operations in Poland until 2035*

Year	Number of passengers (in thous)	Dynamics	Number of passenger operations (in thous)	Dynamics	Mobility rate*
2015	30392	12.3%	283	5.5%	0.79
2016	33987	11.8%	310	9.4%	0.88
2017	39300	15.6%	339	9.4%	1.02
2018	42758	8.8%	363	7.1%	-
2019	46271	8.2%	2.25	6.3	-
2020	49853	7.7%	408	5.9%	1.33
2021	53439	7.2%	431	5.6%	-
2022	56634	6.0%	452	4.8%	-
2023	59466	5.0%	470	3.9%	-
2024	62440	5.0%	488	3.9%	-
2025	65312	4.6%	506	3.6%	1.75

2026	68316	4.6%	525	3.6%	-
2027	71185	4.2%	542	3.3%	-
2028	74175	4.2%	560	3.3%	-
2029	76994	3.8%	578	3.1%	-
2030	79920	3.8%	596	3.1%	2.19
2031	82637	3.4%	613	2.9%	-
2032	85446	3.4%	631	2.9%	-
2033	88352	3.4%	650	2.9%	-
2034	91356	3.4%	669	2.9%	-
2035	94462	3.4%	689	2.9%	2.62

Source: https://ulc.gov.pl/_download/regulacja_ryнку/statystyki/prognozy/prognoza_2017.

When presenting the new foresight studies, the President of the Civil Aviation, Piotr Samson, said “... *Our forecast assumes that the growth will oscillate between 6 and 9% in the coming years, and it will be 3 to 5% in the long term. This is more than IATA forecast assume (from 3 to 5%). This is the result of a low base*”.

According to data supplied by ULC, there will be a gradual decrease in the rate of growth and in the year 2017 it will be 15.6%, in 2018 – 8.8%, in 2019 – 8.2%, Between 2020 and 2023 – up to 5%, in 2029 – 3.8%, and between 2031 and 2035 – 3.4% annually.

To quote the President of the Civil Aviation: *Poland will have arrived at the mobility rate of 2.6 trips per year per individual by the year 2035. The increase is due mainly to social enrichment. Nowadays, the mobility rate in Poland is 0.9. In this respect, we are now chasing the Western Europe, with its average mobility rate is more than 3 trips per annum per individual.*

Moreover, there will also be an increase in the number of aviation operations, from 339 thousand in 2017 to 689 thousand in 2035. This estimate signifies that the average passenger volume per flight will grow from 116 this year to 137 in 2035. Over the coming five years, there will be no change in the structure of traffic with respect to individual airport share. The Warsaw Chopin Airport will have a 35-40% share at national level, which will have a direct impact on the number of passengers handled in the year 2022 – 22 million travellers. Large regional airports will account for 55-60% of all traffic. The share of smaller regional airports (Rzeszów, Łódź, Lublin, Bydgoszcz, Szczecin, Babimost, Szymany and Radom) will be slowly decreasing, to reach ca. 5% in the year 2022. All of the above presented airports will not reach the total volume traffic of 3 million passengers in the year 2022.

Evaluating above data, it is worth to cite Piotr Samson, who stated as follows: *Small regional airports will be growing, but will remain of minor importance. Carriers will not be interested in flying from there on a large scale, instead they will focus on large airports where their passenger volumes are greatest. The division into aviation Poland A and Poland B will reinforce. Small airports, even in the long run, will face profitability issues.*

The Cracow Airport has the greatest growth potential of all the regional ports, with over 8 million passengers to be handled in 2022. However, the airport has the most limited facilities, both in terms of the runway and the terminal, which involves large investment in its development. In the year 2022, the Gdańsk Airport is to handle over 7 million passengers, Katowice - circa 7 million, Wrocław - slightly more than 4 million, Modlin - less than 4 million, and Poznań - slightly over 2 million (Sipiński, 2017).

The above forecast was created on the basis of government plans and strategic prognosis, the inflation goal of the NBP (2.5%), Euro to PLN exchange rate maintained at the level of ca. 4.2, and population growth in accordance with the growth forecast by the Central Statistical Office (GUS). The analyses did not cover potential effects of one-off events, such as climate factors, volcano eruptions or terrorist attacks.

3.4 Factors Affecting Aviation Development

Sipinski (2017) further mentions the following main factors which have an impact on the dynamic development of aviation in Poland: lower prices of aviation fuel, growing competition, and activity of some air carriers, including PLL LOT. When considering the remaining elements which increase air traffic in Poland, we should bear in mind, above all, that we are dealing with a developing market - a market which is still trying to catch up with the more mature markets of the Western Europe. Other factors include: economic development of the country, increase in population's wealth, demographic evolution, development of transport infrastructure (including airports, and a prospective construction of a central airport (CA)), development of substitutive transport branches (mainly high speed rail (HSR)), development of domestic lines and airports (including PLL LOT in the context of the construction of the central airport or further evolution of the carrier together with the Warsaw Chopin Airport), development of the airspace structure and the elements of air traffic management, a possibility of emergence of a new investor strategic to PLL LOT (reinforcement of the domestic carrier in terms of capital and economy), regional hub-oriented (CA or the Warsaw airport) market structure changes, progressing expansion of low-cost air carriers and the state's and European Union's transport development policy, mainly involving the development of the Trans-European Transport Networks (TEN-T) (Madej and Ruciński, 2015).

4. Conclusions

The Polish market of air services continues to be in a state of flux. The pace at which changes occur results from a combination of external and internal factors, which precondition the behaviour of air carriers and customers, and the operation of airports. When analysing air transport development forecast, we can see a further upward trend in the number of activities of all market participants. That said, in the near future we should be expecting an expansion of connections, erection of state-of-

the-art infrastructure, new air services, and above all a growth of importance of Poland on the aviation map of Europe (Rucińska, 2015). Having regard to data included in the study, without a doubt the Polish aviation market should be considered a strongly developing one, having enormous potential ensuing not only from population mobility different EU standards, but also from demographic potential of Poland, gradual wealth gaining of the Polish society, and Poland's geographic location.

The Polish market of air transport features considerable growth potential. Therefore, when planning its development, one ought to account for top quality standards of modernity, safety and reliability, which will increase social trust and, consequently, demand for aviation services. The accountable institutions (including the state) should make efforts to work out a good position for the branch in the European transport structure and, above all, in TEN-T. Development planning must incorporate the need to include the Polish air transport into the multi-modal transport system of both the domestic and the European network. Any investment in infrastructure ought to cater for a balanced and sustainable development, which ensures systematic growth of availability and accessibility of the branch. Admittedly, these aspects are highlighted in the strategies of regional airport development, which are to induce mobility, entrepreneurship and economic activity of the Poles.

The Polish market of air transport must develop also in the global dimension via continued participation in the strong and strategic alliance, which grants access to the world-wide network of aviation links. PLL LOT's plans for development are crucial in that aspect. To supplement them, it is necessary to determine the role of the central airport in Warsaw as part of the CA construction scenario, and a possible expansion/increase of developmental abilities, should the scenario lacking CA be followed. Such a strategy will allow one to reach the envisaged 56-70 million of flying passengers in the year 2030 (Madej and Ruciński, 2015).

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