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Air transport development in Eastern Europe in relation to economic growth

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Abstract

Local analyses of air transport development must be supported by global vision and trends, since it is believed that global traffic will ultimately be evolving to a level equal to GDP growth, when the market reaches maturity. The authors perform a research on the main parameters of air transport development, which can be used for building strategies for an optimal management.
The paper is substantiated on the study of air transport growth and airport infrastructure according to the economic and social development of 7 countries (i.e. Romania, Bulgaria, Hungary, Greece, Poland, the Republic of Moldova and the Czech Republic) in Eastern Europe. Also, the effects on economic development are outlined by analyzing the forecasts that provide a complete picture of the anticipated evolution in the studied region and the main determinants of strategic development as well as the key factors influencing air traffic dynamics in Eastern Europe.

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Keywords: air transport, economic growth, Eastern Europe, forecast, infrastructure.

1. Introduction

Although the demand for air transport tends to grow faster than gross domestic product, it follows closely the evolution of GDP. This correlation between GDP and air traffic growth reflects market dynamics and the enhanced importance of air transport in the European economy (Zaharia, 2016).

The current research presents the major trends in air transport development according to the economic and social development of seven states from Eastern Europe. The study is based on specific data for a period of 12 years, i.e. 2005-2017 and the analyzed countries are: Romania, Bulgaria, Hungary, Greece, Poland, the Republic of Moldova

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and the Czech Republic. The targeted group consists of six EU member states and one country (Moldova) in the process of adhering to European Union. The criteria for choosing the target countries regard the economic context, the region's market characteristics and the airports-airlines relation and strategies for route development.

An extensive documentation regarding air transport development in Europe underlies the authors' research. Regulatory framework and the modalities to strengthen management at the airport were also considered.

In-situ discussions carried at airports in the studied countries helped the authors identify more easily the issues or the possible implications of the major trends in air transport development. Moreover, the study was accomplished by means of questionnaires sent to target groups consisting of professionals from the aviation industry or airline representatives, which were aimed at emphasizing the evolution of national companies, infrastructure development and optimal airport management. In order to better understand the state of development in each country, the study begins with the economic and social state of each country and a comparison between them.

2. Analysis of economic context and market characteristics

Air transport's role in the economic development of the East European region must take into account the benefits of an efficient air transport system. Thus, the industry must identify the future needs of air transport and the way to properly assess them. East European economy, political events and passengers' experience have led to changes in tourist flows, thus in the demand and supply of air transport.

Over the last 5 years, we have seen a significant increase in Eastern Europe on passenger traffic and the development of the aeronautical industry (European Commission, 2017). The countries included in the study (besides those already mentioned) are: Belarus, Slovakia, Slovenia, Ukraine and Russia. According to the latest data, from 2014 to present days, air transport capacity increased by 9-10% per year, (A. N. Ltd., 2016), (Maslen, 2015).

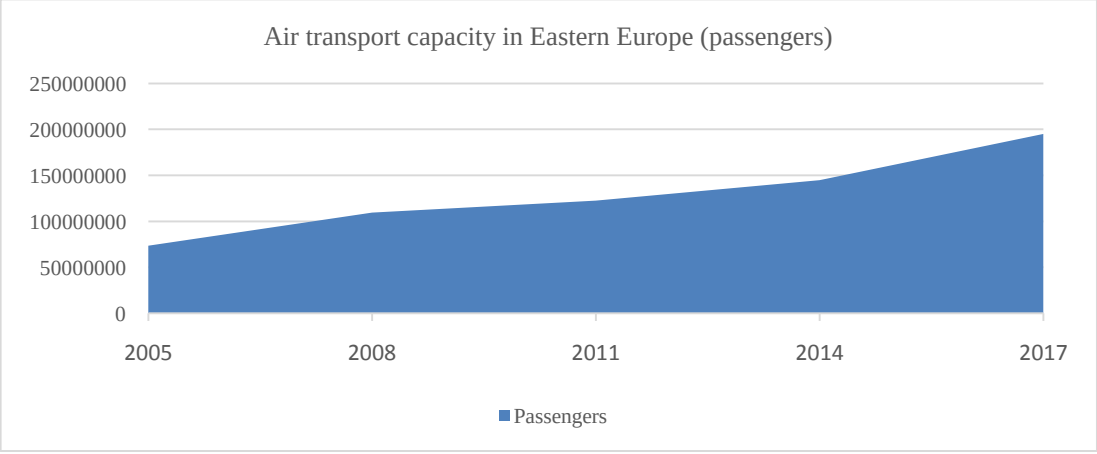

Fig. 1. Air transport capacity in Eastern Europe

For the analysis of the capture area, the authors used data such as: the projected evolution of the economy (GDP, incomes), socio-economic characteristics, air transport penetration, the development of traffic in Eastern Europe and the impact of other non-economic factors (competition with other means of transport, political and geo-political influences, constraints on airport capacity). The comparison of the economic status of the studied countries indicates for example, that Greece is in a serious economic crisis given the high unemployment rate in the country. The rest of the countries included in the study have followed a linear trend for Eastern Europe, in 2017 the Czech Republic having the lowest unemployment rate.

In 2017, Eastern Europe had a GDP of 3.66 trillion dollars, or 4% of the world's GDP. In terms of GDP per capita, Eastern Europe is rather disappointing because it is 46% below the international average. This study includes in addition from the states above mentioned, Azerbaidjan.

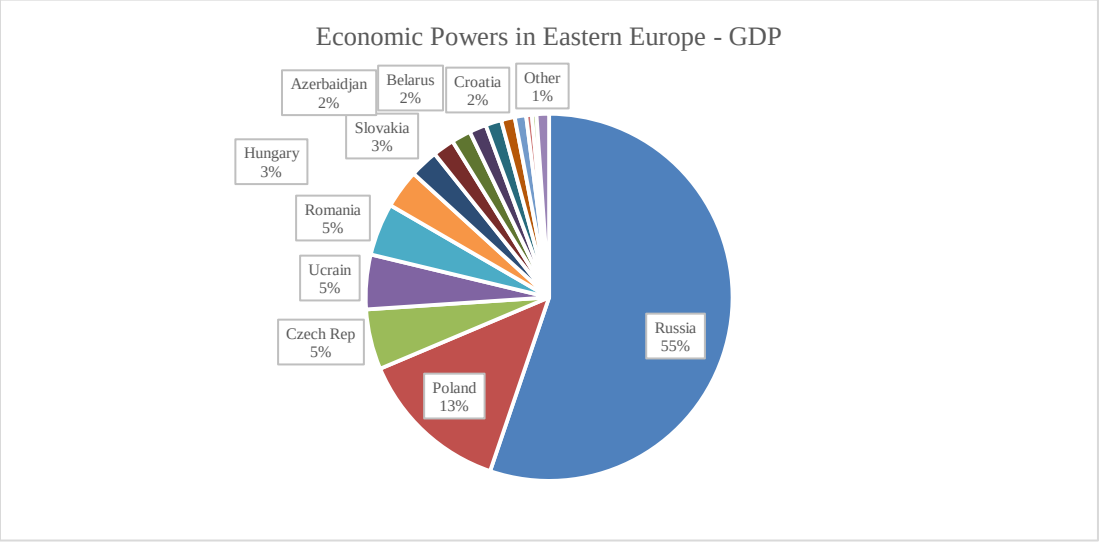

Fig. 2. Eastern Europe Economic Powers -GDP (NationMaster, 2018)

For example, in this regard, Romania ranks fifth in Eastern Europe, the GDP per inhabitant is not at all satisfactory, Romania being one of the last in Eastern Europe with 11,092 USD/citizen (NationMaster, 2018). Hungary ranks 6th in the region in terms of GDP, but regarding GDP per capita, Hungary occupies the third place, with a value of $ 19254 per capita (BusinessReview, 2018).

In the case of Bulgaria, it occupies one of the last positions, but considering the GDP per capita, it is about the same level as Romania's, (i.e. $ 11841 per capita) (NationMaster, 2018). From an economic point of view, the Republic of Moldova is the weakest country in Eastern Europe, having a very small GDP per capita (i.e. $ 1,900 per capita) (Worldbank, 2018). On the other side, we can find Poland ranking first in Eastern Europe-considering the GDP, placing itself between Hungary and Romania in terms of GDP per capita and, there is no surprise that he Czech Republic, as one of the most developed post-communist countries, has an industry-based economy that concentrates almost 40% of the active population and secures the GDP as well. Even though Greece is in a crisis situation, the GDP is maintained on a fairly constant line, with $ 249 billion in 2017. The GDP per capita is quite high, namely $ 30598/capita (NationMaster, 2018).

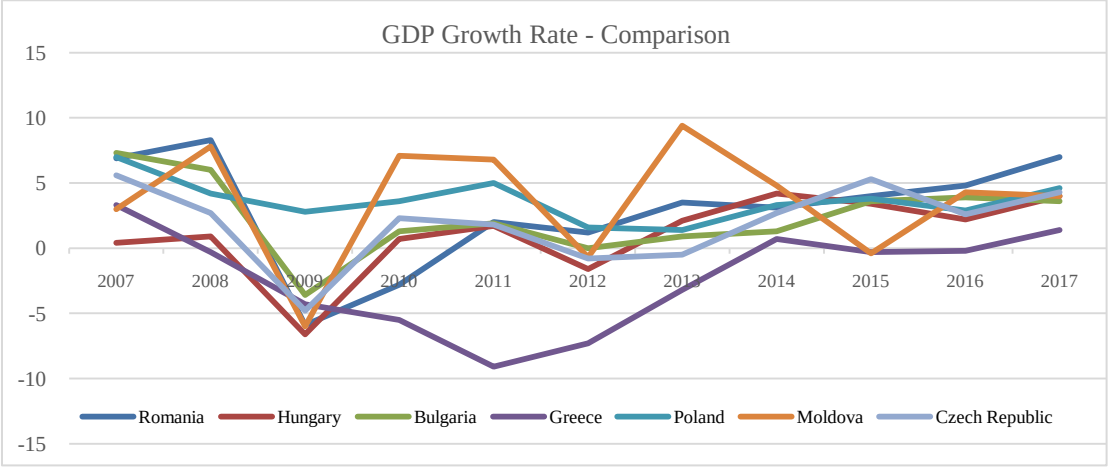

Fig. 3. GDP Growth rate – Comparison for studied countries

The chart shows that the highest rate of GDP growth was reached by Moldova in 2013 and the lowest rate was reached by Greece in 2011. The decrease in 2009 is due to the global crisis and affected all the studied countries. The most notable and least affected by the economic crisis is Poland.

Air transport is a field strongly influenced by external factors; the evolution of the economic situation has an important effect on the demand and evolution of air traffic. Nowadays, the area targeted in the authors' study does not present significant external influences (economical or political) that might completely deteriorate the forecasts and dynamic of air transport development.

On the other side, the impact of aviation on the global economy is significant, estimates showing that air transport has produced 2.7 trillion dollars, equivalent to 3.5 percent of the world's GDP, (ACI, 2017).

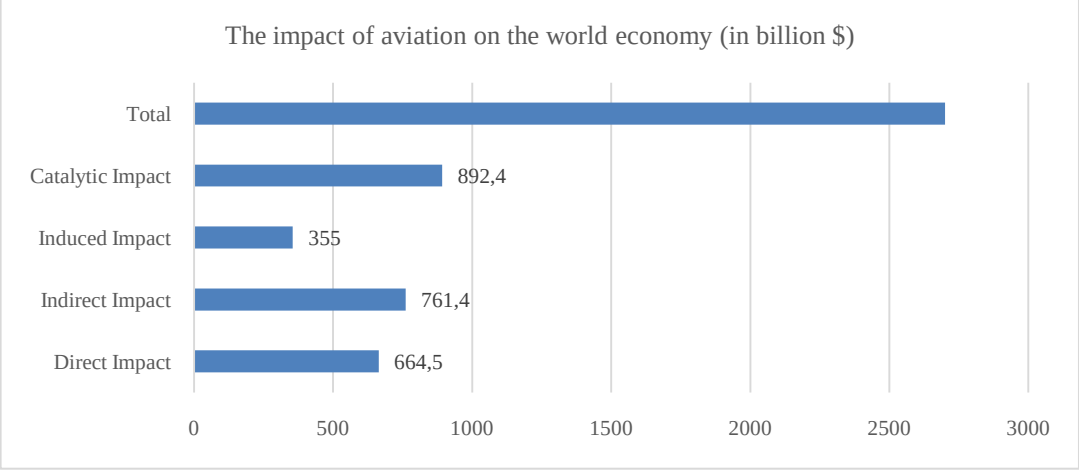

Fig. 4. The impact of aviation on the world economy (ACI, 2017)

The following chapters will show that the analyzed countries are diverse, not only from a social and economic point of view, but also from a demographic point of view; the states of the region are following different development paths and vary according to the speed of social or political transformation, urgent economic problems and organizational issues. The authors will exhibit the differences defining the target group and will also outline that various markets will experience diverse maturity rates over the following periods.

3. An overview of airlines business model in Eastern Europe

The following research on the development of business models of the airlines in Eastern Europe will mainly consider the operators that account for the highest capacity of all the airlines in the area, including Wizz Air and LOT Polish Airline.

This chapter presents aspects of the development and diversification of air transport services in Europe, including the estimation of air traffic potential and analysis of catchment area. The first step in predicting air transport activity is usually the study of historical data and the determination of traffic development trends.

Regarding the volume of international air transport, the largest increase was registered by the less developed countries that joined the EU or the candidate countries for accession. The growth rates partially reflect the activity of low-cost airlines and their search for new routes and bases for operations. Also, the important air traffic growth could be the result of a significant increase in the workforce migration from Eastern Europe to Western Europe (Zaharia, 2016).

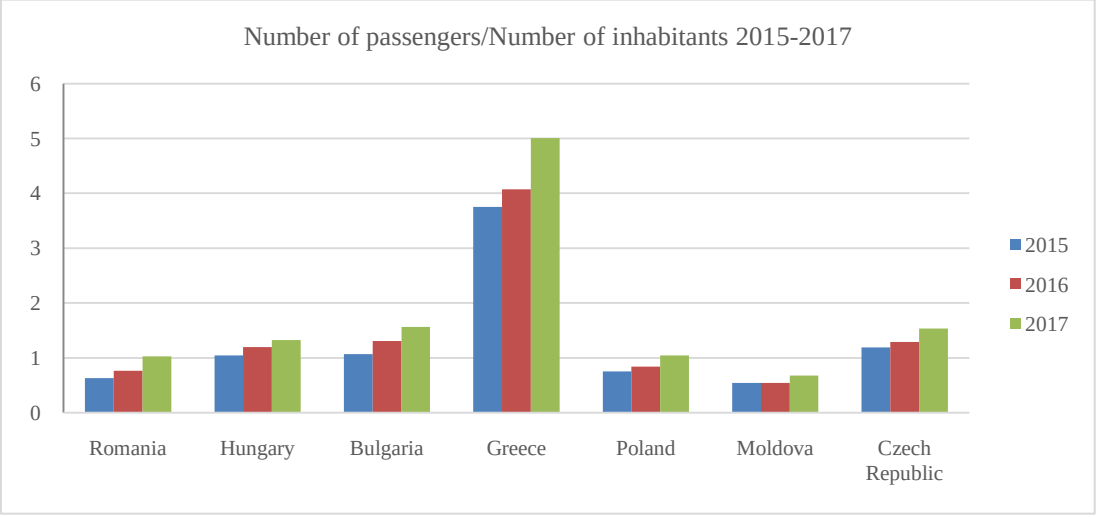

Fig. 5. (a) Number of passengers/number of inhabitants 2015-2017 – Comparison

The graph shows that in Eastern Europe passenger traffic is on the rise; Greece being a predominantly touristic country has most passengers/capita. The Republic of Moldova has fewer passengers, but this is not due to the fact that they are not in the European Union, but is caused by the low rate of GDP per capita and also, the traffic is influenced by high remittance. Thus, the eventual passenger traffic growth in Moldova might be the outcome of an increase in the migration of workforce (Zaharia, 2016).

Five years ago, Romania did not have a very satisfactory report on the passenger/capita ratio, but in 2015 things started to evolve more rapidly with the increase in air traffic. Also, from 2015 in Hungary and from 2014 in Bulgaria, an evolution can be noted, the ratio rising above 1, also due to the increase in passenger traffic.

2016 was an important year for Bulgaria and Romania in terms of air transport, they recorded the fastest-growing markets in Central and Eastern Europe considering passenger traffic; in Bulgaria, the annual growth rate was 25.4%, followed by Romania with 21.6% (OAG, 2016). The main factor behind this growth was the intensive dynamics demonstrated by the largest low-cost airlines in Bulgaria and Romania. Furthermore, in Bulgaria, the concessioner of the airports Burgas and Varna (Fraport Twin Star Airport Management AD), made the largest investment in the last decade. Due to these investments, passenger traffic grew at Burgas Airport by 51%, reaching 1,970,700 passengers in 2017 (Fraport-Bulgaria, 2018).

For comparison, the fastest growing EE markets, such as Hungary and Poland, recorded annual increases of 12.9% and 12.8%, respectively (OAG, 2016). On the other hand, countries where low-cost coverage is limited or seasonal and national airlines dominate the market, such as the Republic of Moldova, recorded modest growth rates well below 10%.

This section presents the evolution of national and major airlines in the studied area, outlining the increase in the number of airlines in Eastern Europe. One of the largest air transport markets in Eastern Europe is represented by Poland and Hungary, with LOT and Wizz Air airlines as dominant players (Airline Economics, 2016). The following table shows an analysis on the quality of services and performance of the two airlines, indicating different overall scores and rankings for the two operators.

Table 1. LOT and Wizz Air quality of service and performance analysis (2018)

Airline	On-time performance	Quality of service
LOT	7.90	6.30
Wizz Air	8.80	6.00

Regarding the domestic market, although it has not increased in the last year, we can note that Poland is the only

country in Eastern Europe with a considerable internal LCC capacity. On the international market, the main destinations include UK, Germany, Italy and Scandinavia (OAG, 2016).

On the other hand, Wizz Air is still adding capacity between European countries, over half of the increase is for Stansted and Luton-from airports in Poland, but also a strong growth considers destinations as Bristol and Birmingham.

3.1. Analysis of dominant LCC in studied countries and market penetration in Eastern Europe

The theoretical framework of this stage of the research defines the competitive advantage of low cost carriers and determines the strategic position that the low-cost business model holds in East Europe. Subsequently, the paper will outline a macroeconomic analysis of the European airline industry, which also has an impact on low-cost airlines. The current state allows an overview of the main important factors influencing the evolution of LCC and their level of influence.

The liberalization of air transport in Europe determined changes in aviation market, leading to the development of the LCC sector and modifying the airline-airport relationship. Market dynamics, airlines' adequate marketing strategies, changes in consumer behaviours and the migration of workforce have created the premises for an important development of LCCs (Zaharia, 2016).

The case study on the dominant LCC in the mentioned countries implies strategic analysis of the airlines, subsequently showing the competitive environment of the airlines at the level of East Europe and Romania, in particularly.

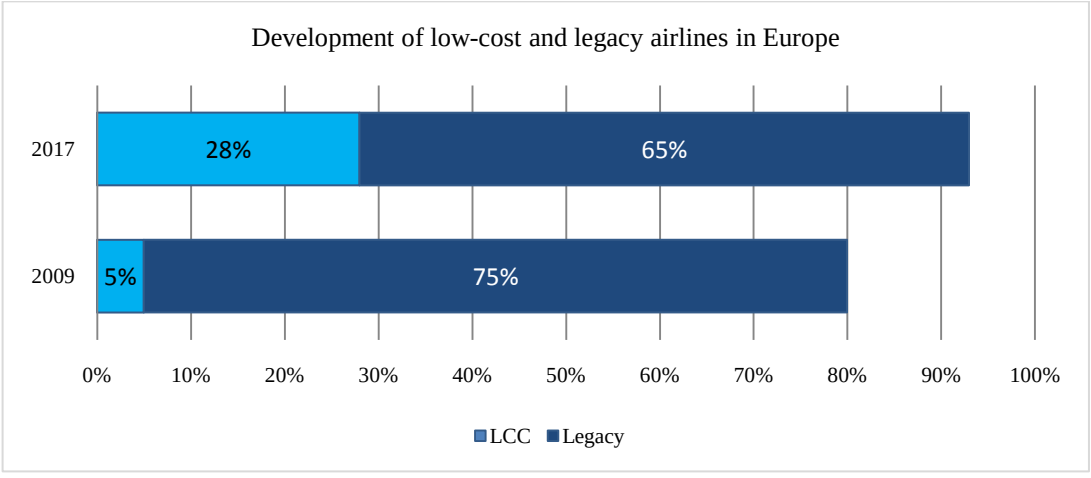

Fig. 6. Development of airline types in Europe 2009-2017

In the above mentioned region, the dynamic market is reflected in new routes, additional capacity, rapid changes and frequencies added by low-cost airlines. Lately, the share of LCC's capacities has increased, especially in Romania, Hungary or Poland. It is known however that the low-cost model can be the only growing sector in times of economic/political uncertainty (Eurocontrol, 2017), which can be the case for the analyzed states.

Table 2. LCC share analysis 2006/2016 (OAG, 2016)

Country	Low cost share (2006)	Low cost share (2016)
Romania	34%	52%
Hungary	29%	60%
Bulgaria	20%	34%
Poland	46%	54%

With respect to the relationship of low-cost operators with airports, the desire of LCC to have a low turnaround time (typically from 25 minutes to 40 minutes, (Sørensen, 2015), (de Neufville, 2008)) is often compromised by delays caused by congestion. For example, at Henri Coandă Airport, for Wizz Air the turnaround time can reach 45 minutes, compared to Varna airport where it reaches only 25 minutes.

For the studied region, a change in the operating principles of low cost operators can be observed, by using the main airports to attract passengers of traditional airlines; an enlightening example being given by Henri Coandă (Romania) or Budapest (Hungary) airports. More so, the operator is being seen as an advantageous alternative to legacy airlines in recent years, due to a diversification of passengers, to the rising living standards in Eastern Europe and to the increase in the number of new routes to Western Europe.

3.2. Analysis of Romanian market with respect to TAROM, Blue Air and Wizz Air airlines

The Romanian market can be considered one of the most dynamic and fast-growing in Europe, prepared to reach 20 M passengers in 2018 (AnnaAero, 2018).

Tarom, Romania's national airline registered 2.4 million passengers in 2017 with similar traffic as in 2016 and 2015, while its low-cost competitors reported double-digit growth (Tiron, 2018), (Tarom, 2017). In 2016, the airline lost to BlueAir the second position in the ranking of the largest airline companies by the number of passengers transported on routes to/from Romania. In the same year (i.e. 2016) Blue Air transported nearly 3.6 million passengers, while in this competition, Wizz Air performances translated into 5.5 million passengers to and from Romania (Marica, 2017). Thus, BlueAir is in a strong competition on the Romanian low-cost segment with the Hungarian company Wizz Air, which dominates the market due to the fact that national carriers are in a weak position.

In respect to the fleet, the low-cost operator BlueAir also has a superior position than the national airline Tarom, which has a mixed fleet. In 2016, Blue Air introduced 25 new routes and expanded its fleet (CAPA, 2017). With this important investment, the airline now operates 3 more aircrafts than Tarom; with a total of 26 units, 17 having the modernized interior, while the rest will undergo a modernization process shortly (BlueAirWeb, 2018). There is a reason for this situation; in its history, Tarom made unfortunate choices, one of these regards the acquisition of four Airbus A318-111 aircrafts with a capacity of just over 100 seats. The low capacity has led to high unit costs for passenger transport, while most European airlines use continental flights with a capacity of around 200 seats to get low costs. With a 21 aircraft fleet in Romania in the last years, Wizz Air is ranking 35.5% market share, Blue Air 16.9% and Tarom 15.0% (Innovata, 2018), (Wizz Air, 2018).

Wizz Air caught a huge advantage in countries like Romania, where road and rail infrastructure is in general underdeveloped and, for example, a trip from Bucharest to northern city Cluj-Napoca takes about eleven hours by train, compared to just 55 minutes by air. In addition to that, the prices are not very different.

But the two airlines (i.e. Blue Air and Wizz Air) are beginning to compete on the Romanian market with one of the LCC giants worldwide (i.e. Ryanair), which is expanding in the region and aims a strong entry on Romanian airports, even targeting domestic flights. In the Romanian market analysis described above, in 2018 the low cost operators mentioned, occupied the following positions: Wizz Air led by 56.0% share, followed by Blue Air with 26.7% and Ryanair's 14.4% share (Wizz Air, 2018).

Table 3. Analysis of LCC Ryanair and WizzAir performance worldwide (2017)

LCC	Number of flights	Number of routes
Ryanair	8,373	1,581
WizzAir	1,859	550

However, Wizz Air has an advantage over its main competitor Ryanair, the first operator having the lowest costs with employees, as most of its bases are in countries from CEE; thus human resources can be paid according to the salaries in respective countries, which are lower compared to those in Western Europe.

The authors' previous analysis shows that there is still a significant growth opportunity in Eastern Europe and attracting low-cost operators, possibly even setting up their operating bases while making sustained efforts to carry out marketing activities (in order to develop new business models) represent conditions for achieving the objectives of increasing the number of passengers in Eastern Europe.

4. Development of airport infrastructure according to economic growth

Air transport is an important employer, generating about 62.7 million jobs worldwide, of which: 9.9 million of direct impact, 11.2 of indirect impact, 5.2 million of impacts, 36.3 million of the catalytic impact, (ACI, 2017).

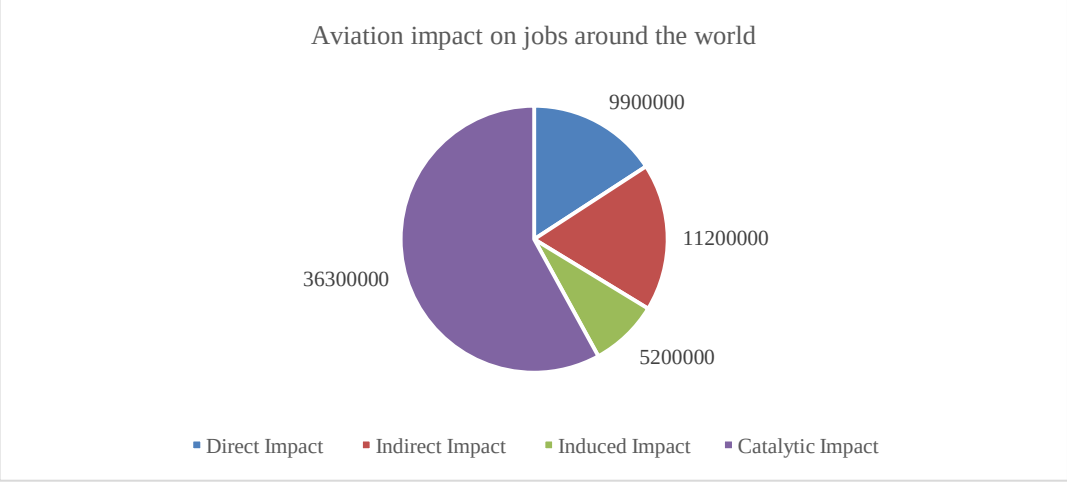

Fig. 7. The impact of aviation on jobs (ACI, 2017)

The volume of infrastructure investments in Eastern Europe was undoubtedly stimulated by the increase in trade and the investments in the area. While rising imports and exports require appropriate communication and transport modes, the latter have been a profitable investment, as they would allow the rapid transport of goods and people. In this context, air transport has fully committed to the dynamics described above, this representing a major objective of national economic strategies as well as private and public investment.

Table 4. Infrastructure quality analysis for the 7 countries in the target group

Country	Position in Europe - Infrastructure quality	Global Position - Infrastructure quality	IATA report rating - Infrastructure quality
Romania	33/42	66	4/7
Hungary	25/42	41	4/7
Bulgaria	31/42	62	-
Greece	18/42	31	4/7
Poland	28/42	47	4/7
Moldova	-	-	-
Czech Republic	21/42	37	4/7

Hereinafter, the research regarding the development of airport infrastructure according to economic development will only consider the largest and most important airports in each country.

4.1. Airport infrastructure investments in Romania

Romania, Hungary, Bulgaria and the Czech Republic can be considered quite similar with respect to the ratio of inhabitants/number of airports; the only difference is that the Czech Republic's population is growing. It is important to mention that the population of Romania has steadily decreased since 2007 to the present; this situation is due to population migration to Western Europe as a consequence of Romania's economic and political situation. Due to the drop in the population, there is also a decrease in the number of passengers/airports.

The air transport sector has made a significant contribution to Romania's economy. The 29,000 direct employed people in the field of air transport produced about $ 1.1 billion, while the 42,000 indirect employees produced about $ 1 billion (IATA, 2017).

From the point of view of the air transport infrastructure, Romania ranks 33th out of 42 in Europe and 66th in the world. IATA offered Romania a 4/7 score for infrastructure and a score of 8/10 for price competitiveness (IATA, 2017).

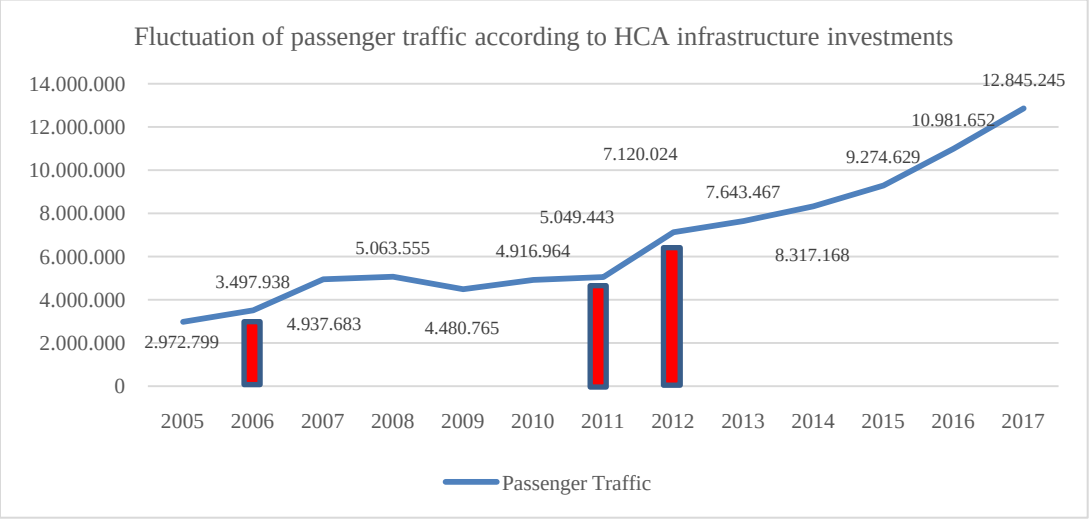

Fig. 8. Fluctuation of passenger traffic according to HCA infrastructure investments, 2005-2017

Regarding passenger flow, the investments made at Henri Coandă International Airport (HCA) had a positive impact on the airport. The first major investment was made in 2006 when the connecting body between International Departures and International Arrivals/Domestic Flights terminals was inaugurated. This led to a 41% increase in passenger traffic in 2007.

The second major investment was made in 2011, when a new boarding area was built, followed by the opening of the new departure terminal. As a result of these investments, in 2012 the airport had an important passenger growth, namely 42%. Following the biggest investments in the 2011-2012 period, the airport increased its profit from 67,659,156 RON in 2012 to 234,536,426 in 2016, (i.e. in the period 2012-2017 the airport had a profit increase of about 346%).

4.2. Airport infrastructure investments in Hungary

Hungary has 14,000 employees in the field of air transport which produced about $ 780 million and the 14,000 employees working indirectly for the aviation industry produced about $ 480 million (IATA, 2017).

In terms of airport infrastructure, Hungary ranks 25th out of 42 in Europe and 41st place in the world, having a 4/7 score for infrastructure quality and 7/10 for price competitiveness (IATA, 2017).

Following the ambitious project with the "Skycourt" terminal from 2009 to 2012, passenger traffic at the Ferenc Liszt Budapest Airport started to increase. In 2011, the airport was fully privatized, so after the investments, the airport had a profit of around 14 million Euro by the end of 2015 (Budapest Airport, 2017). In particular, for the period 2007-2015, the airport was in a major development program and the 325 million Euro investments led the airport to an increase of approximately 14 million passengers in 2017 (Budapest Airport, 2017).

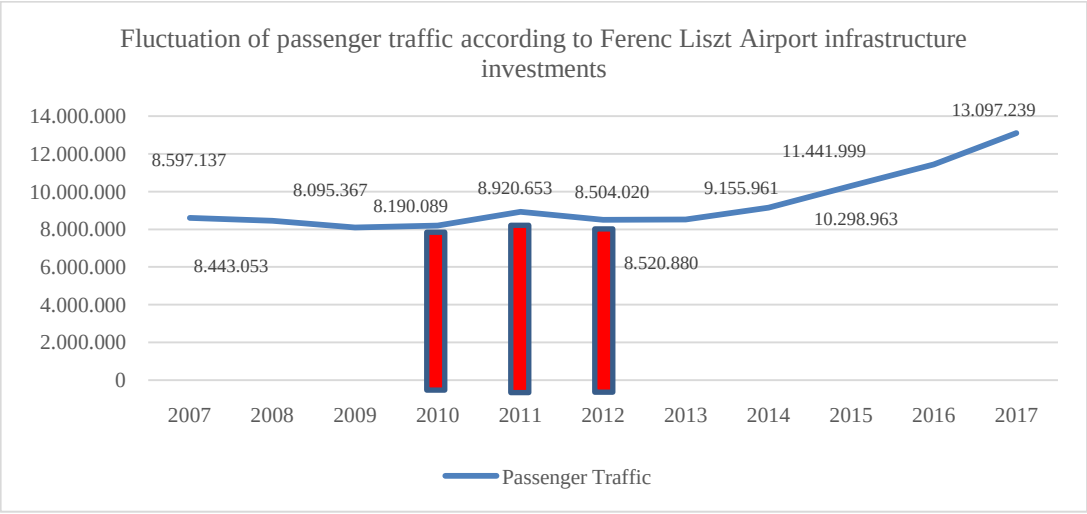

Fig. 9. Fluctuation of passenger traffic according to Ferenc Liszt Airport infrastructure investments, 2005-2017

4.3. Airport infrastructure investments in Bulgaria

The population of Bulgaria has declined over the last 10 years, rising from 10 million to 9.7 million in 2017 (Worldometers, 2018); however, the passenger number grew most in the last three years, reaching 11 million in 2017 (Eurostat, 2017).

For Bulgaria, there are no specific aviation statistics, so the tourism/transport branch was studied.

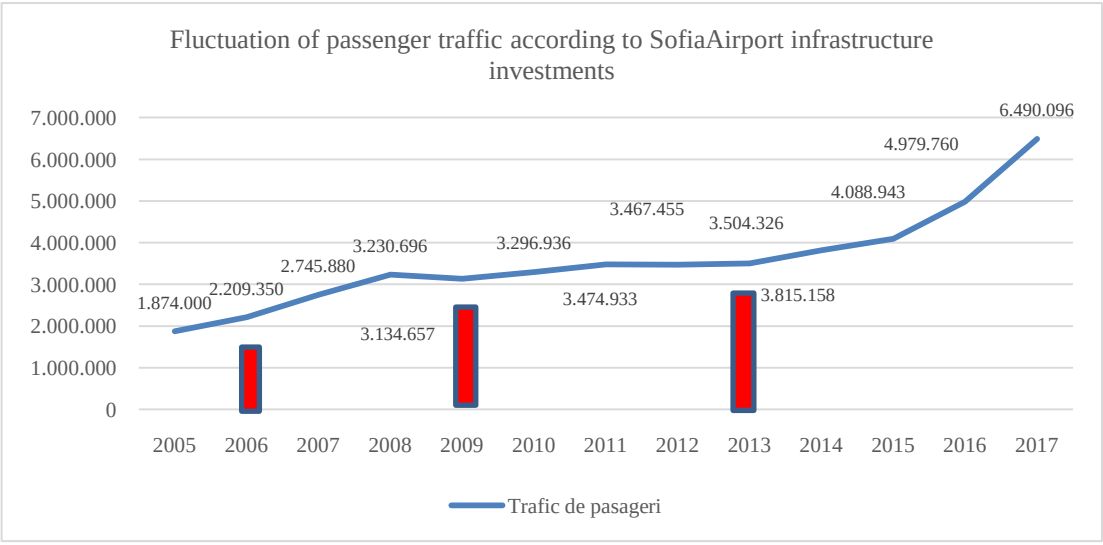

Fig. 10. Fluctuation of passenger traffic according to Sofia Airport infrastructure investments, 2005-2017

In 2006, Sofia Airport inaugurated a new runway with a length of 3600m, allowing in addition 20 aircraft movements per hour (Sofia Airport, 2018). This has led to a substantial increase in passengers in 2008 exceeding the threshold of 3 million.

In 2009, following a project to protect the environment, a noise protection panel was launched at the aircraft engine test platform. In the same year, the extension of Terminal 2 was also inaugurated as a result of the increase in passenger traffic by approximately 42% between 2006 and 2009.

After 2013, Sofia Airport had a significant increase in the number of passengers, reaching 6,490,096 passengers in 2017 (Sofia Airport, 2018). In the period 2013-2017 the airport had a passenger growth of approximately 85%.

4.4. Airport infrastructure investments in Greece

Greece has a large number of airports, due to the fact that it is mainly a tourist destination, but in 2012 due to the global crisis, Greece's tourism industry was significantly affected. It ranks 18th out of 42 in Europe in terms of quality of air transport infrastructure and the 31st place in the world, having a 4/7 note for Infrastructure (IATA, 2017). Also, studies show that the total number of 57,000 direct and indirect employees in the industry produced about $ 4.8 billion (IATA, 2017).

In 2012, AIA launched the largest photovoltaic plant, a project of 8 MWp and 160,000 square meters, costing 20 million Euro and is projected to provide an annual energy consumption of 20% (11 million kWh) (AIA, 2018). The photovoltaic park will reduce CO_2 emissions by at least 10,000 tones/year for a period of at least 25 years. This investment is a major environmental benefit; as a comparison, 1,500,000 trees would be required to absorb the same amount of CO_2 every year.

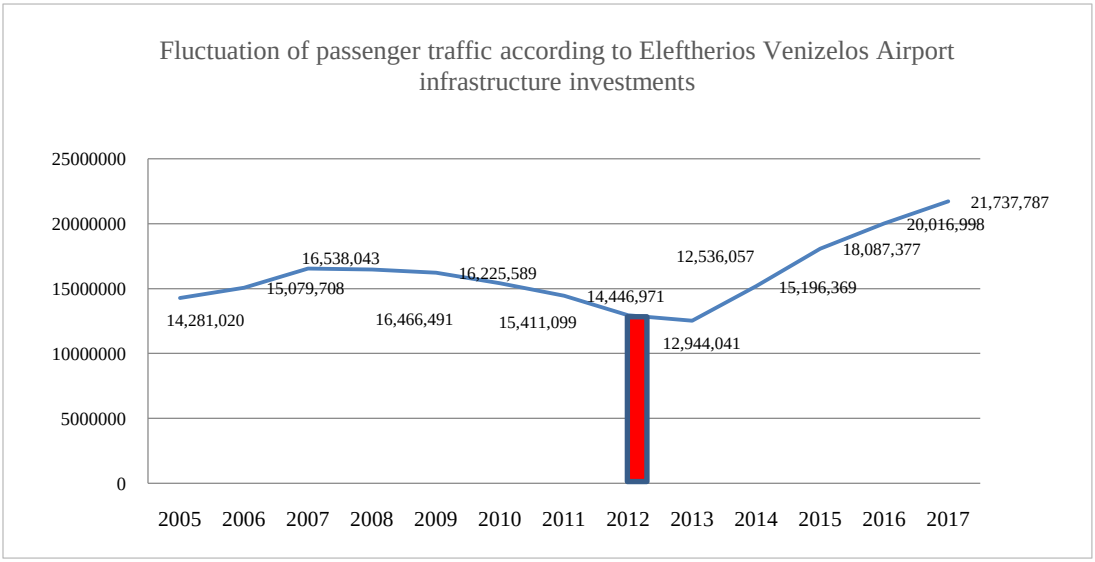

Fig. 11. Fluctuation of passenger traffic according to „Eleftherios Venizelos" Airport infrastructure investments, 2005-2017

In 2016, three new airlines and ten new routes were added to the airport network, while 18 LCCs provided services to 59 cities around the world. Overall, in 2016 the number of flights at the airport was 189.1 thousand and recorded a 7.4% increase over the previous year's levels (Athens International Airport, 2016). Both domestic and international flights recorded an increase of 6.4% and 8.1%, respectively. Finally, in 2016, Athens had a direct connection with regular services, with 125 destinations (92 of them international) in 48 countries, operated by a total of 60 carriers (Athens International Airport, 2016).

4.5. Airport infrastructure investments in Poland

Occupying the 28th place out of 42 in Europe in terms of quality of air transport infrastructure, Poland was given 4/7 points for infrastructure and 9/10 for price competitiveness (IATA, 2017). It has a total of 84,000 employees in the field of air transport which produced about $ 3.5 billion (IATA, 2017).

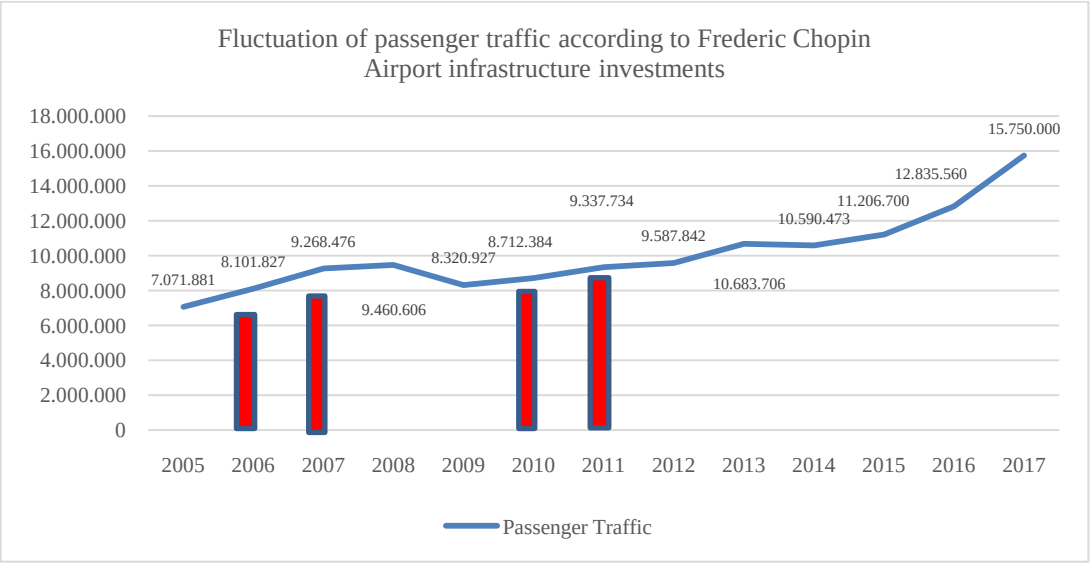

Fig. 12. Fluctuation of passenger traffic according to Frederic Chopin Airport infrastructure investments, 2005-2017

In 2006, the arrival area of the new terminal was inaugurated, while the departure level was opened at the end of 2007 after a long delay due to certification issues. This investment was followed by an increase of 14.4 % of passenger traffic.

Since July 2015, the airport has been run by the state-owned Polish Airports (PPL), which is owned and managed by the Ministry of Infrastructure and Development in accordance with the 1987 Act (Polish Airportst, 2018).

4.6. Airport infrastructure investments in the Republic of Moldova

In the Republic of Moldova the ratio of inhabitants/number of airports is the highest because the country has only one international airport. In this country, like in Bulgaria, there are no specific aviation statistics, so instead, the tourism/transport branch was studied by the authors.

In 2014 AVIA INVEST started the expansion and reconstruction of the Chişinău International Airport terminal. The project foresees the extension of the terminal by 3860 m², but also the reconstruction of 11 000 m² of existing space. Thus, the works will cover a total area of 15 000 m² (Chişinău Airport, 2017).

In 2016 a new segment of the arrival area at Chisinau Airport was in use. The aerodrome arrival area expanded with a new two-story building of 2740 m2. On April 28, a segment of the arrivals hall with a total area of 1150 m² was put into use.

The first reconstructed segment of the Chişinău International Airport runway was reopened in 2017. Reconstruction of the landing/take-off runway is an important stage of the extensive development and modernization. In the same year, Avia Invest build the second runway at Chişinău Airport. As a result, continuing the implementation of the landing/take-off (3590 m) rebuilding plan, Avia Invest has found the optimal solution to make it possible to operate non-stop flights (Chişinău Airport, 2017). Thus, the suspension of air flights and restriction of air traffic on Chişinău Airport will be avoided.

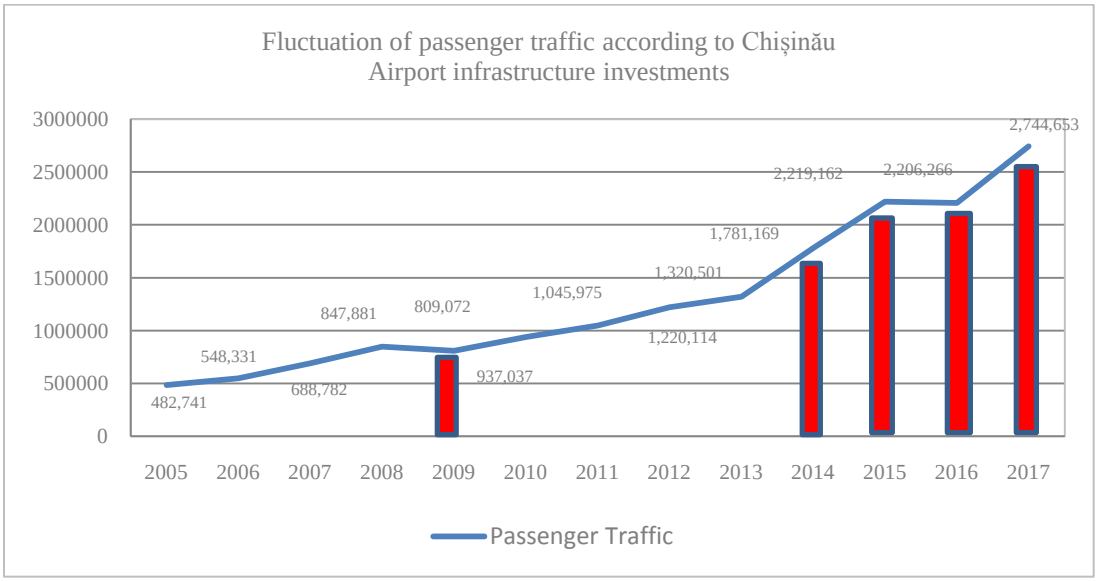

Fig. 13. Fluctuation of passenger traffic according to Chișinău Airport infrastructure investments, 2005-2017

4.7. Airport infrastructure investments in the Czech Republic

Lastly, the Czech Republic ranks 21th in Europe in terms of quality of air transport infrastructure and 37th in the world, with a 4/7 note for infrastructure (IATA, 2017). Regarding aviation direct contribution, the 24,000 employees produced about $ 870 million, while the 18,000 indirect employees produced $ 110 million less (IATA, 2017).

In September 2005, the public part of the North 2 Terminal (now Terminal 2) was officially opened and started to be used for flights in the Schengen area. After full completion in January 2006, 27 gates were used and passenger capacity increased by about 30%. In May 2012, a general overhaul on RWY 06/24, which had been in operation since 1963, began. Reconstruction took place in several stages and ended in 2014.

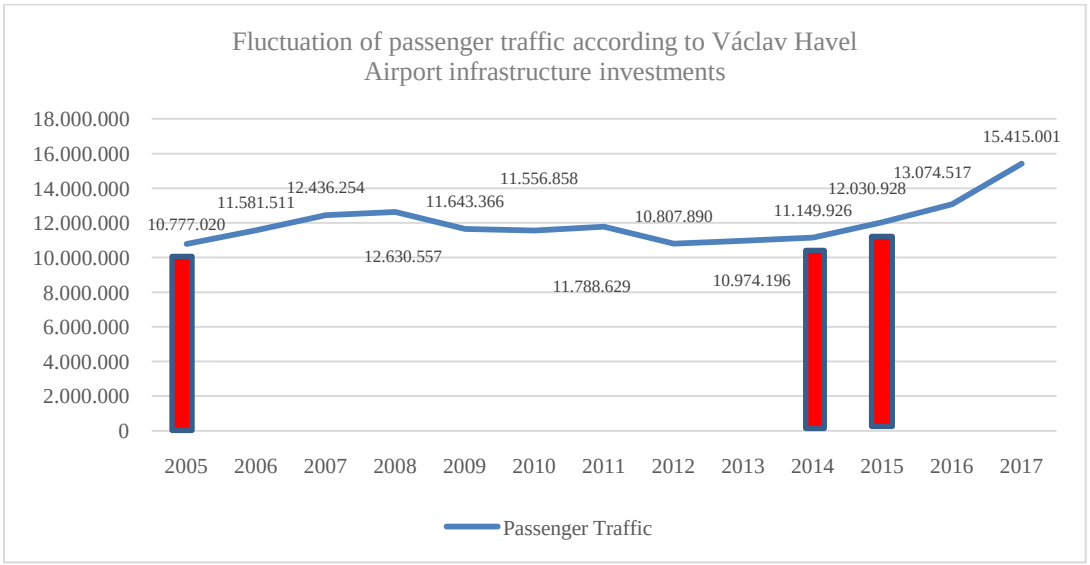

Fig. 14. Fluctuation of passenger traffic according to Václav Havel Airport infrastructure investments, 2005-2017

The chapter was meant to emphasize that there is a significant difference in the level of development of airport services and infrastructure between the analyzed countries. The division of Eastern Europe states in terms of the characteristics of different airports after adherence to the EU is mostly due to direct financial support or private investment in recent years.

One of the basic conditions for achieving the objectives of increasing the number of aircraft movements and passengers according to the present study involves making investments in the airport infrastructure to ensure the safe processing of the number of forecasted passengers.

4. Conclusions

The paper examines air transport development and forecasts in Eastern Europe, concepts that play an important role for airlines, airports and other operators in the field due to the rapid development of air transport in recent years, which has led to airport congestion in a very short time (even for those airports with high capacity). The best solution to meet this challenging demand is to identify the region's activity forecasts for more than 20 years to propose the improvements needed to meet the planned demand.

It has been found that different markets will experience different maturity rates over the following period. The analyzed countries are approaching maturity while, on some markets in the developing countries, the process is just beginning.

The analysis of the current socio-economic environment in Eastern Europe, as well as the evolution of air traffic in the studied countries shows that the region has potential for development and to contribute to the economic growth of the whole continent. However, in order to exploit opportunities for development, the analyzed region needs to improve and modernize air, road, rail and intermodal transport infrastructure. In this context, air transport forecasts play an important role, becoming the key to meeting the challenges and fulfilling the objectives of air transport development.

References

ACI Airport Council International, Aviation Benerfits, 2017.

AIA, Athens International Airport S.A. Data, 2018.

Airline Economics, Poland dominates Eastern European market with record capacity growth, OAG, Aviation News, March 2016.

A. N. Ltd, Poland dominates Eastern European market with record capacity growth, OAG, 2016.

AnnaAero, Romania’s traffic set to smash 20m in 2018; Wizz Air still #1; Domestic market now the biggest, Airline Network news and analysis, March 2018, [online]: https://www.anna.aero/2018/05/15/romania/

Athens International Airport, Athens International Airport Elefterios Venizelos, Annual Report 2016.

BlueAirWeb, BlueAir the biggest Romanian carrier, 2018, [online]: https://www.blueairweb.com/en/gb/BlueAir-the-biggest-Romanian-carrier/

Budapest Airport, Budapest Ferenc Liszt International Airport Data, 2017.

BusinessReview, Investments, 2018, [online]: http://business-review.eu/investments/

CAPA, Centre for Aviation, Romania aviation 2: LCC Blue Air overtakes TAROM to be nation's biggest home-grown airline, 2016, [online]: https://centreforaviation.com/analysis/reports/romania-aviation-2-lcc-blue-air-overtakes-tarom-to-be-nations-biggest-home-grown-airline

Chișinău Airport, The new concept of Chisinau International Airport terminal!, 2017, [online]: http://www.airport.md/news-en/5922/

de Neufville, R., Low-Cost Airports for Low-Cost Airlines: Flexible Design to Manage the Risks, Transportation Planning and Technology, Massachusetts Institute of Technology, 2008.

Eurocontrol, The rapid rise of low-cost carriers, June 2017.

European Commission, Annual Analyses of the EU Air Transport Market, Final Report, March 2017.

Eurostat, Key figures on Europe, Statistical Book-Key figures, 2017.

Fraport-Bulgaria, Burgas Airport, 2018, [online]: https://www.fraport-bulgaria.com/Home/tabid/36/language/en-US

IATA, The importance of air transport to Romania, The air transport sector makes a major contribution to the Romanian economy, IATA Oxford Economics, 2017.

Innovata, Data analysis, Travel Data and Solutions, 2018.

Marica, I., Romanian airline Blue Air plans to carry over 4 mln passengers in 2017, Jan. 2017, [online]:https://www.romania-insider.com/romanian-airline-blue-air-plans-to-carry-over-4-mln-passengers-in-2017/

Maslen, R., Analysis: Airports in Eastern Europe - The Biggest and Fastest Growing Gateways, 2015.

NationMaster, Economy-GDP: Countries Compared, 2018.

OAG, Schedules Analyzer data, 2016, [online]: https://www.oag.com/analytics/schedules-analyser.

Polish Airports, Polish Airports State Enterprise, 2018, [online]: https://www.polish-airports.com/en/%E2%80%98polish-airports%E2%80%99-state-enterprise.html.

Sofia Airport, Airport Data, Sofia International Airport, 2018, [online]: https://www.sofia-airport.bg/en/business/airlines/airport-data

Tarom, Tarom Company, 2017, [online]: https://www.tarom.ro/en/tarom-company.

Tiron, M., Compania aeriană de stat Tarom a rămas la doar 2,4 milioane de pasageri în 2017, deşi concurenţii low-cost au reuşit să raporteze creşteri cu două cifre, Ziarul financiar, March 2018.

Sørensen, T., An analysis of the European low fare airline industry - with focus on Ryanair, Master's thesis, M.Sc. in EU Business & Law, Aarhus School of Business.

Zaharia, S.E., Major trends in the relation airport-airliners in the Central and Eastern Europe, Proceedings of International Conference on Air Transport - INAIR 2016, Vienna, November 2016, ISBN 978-80-554-1273-3, Vienna 2016.

Worldbank, The World bank in Moldova, Country Context, 2018.

Worldometers, Current World Population, 2018, [online]: http://www.worldometers.info/world-population/

Wizz Air, Annual Reports and Accounts, Wizz Air Holdings PLC, 2018.