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## **MAJOR TRENDS IN THE DEVELOPMENT OF AIRPORTS FROM CENTRAL AND EASTERN EUROPE AND BALTIC COUNTRIES**

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### **Abstract**

The economical and social development in the Central and Eastern Europe (CEE) after 2004, the admission of first 10 countries from this area in European Union has an important impact on the evolution of air transport in this area. The airline-airport relationship has developed and European airports compete to attract the services of airlines which can bring essential business development. These features of the air transport market have had a great influence on governmental policies for airport development in CEE and in Baltic Countries. In order to provide airports with strategic information for building development strategies, this paper presents a comparative analysis of the main parameters of capitals' airports development from CEE. The external and internal benchmarking approach focuses on macroeconomic parameters and airport operational parameters: airport connectivity, passenger traffic and aircraft movements. The target group is represented by capitals' airports from Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Republic of Moldova, Romania and Serbia.

By our analyse, we highlighted the correlation between economic and social evolution and air transport development and also the best practices of compared airports, which could be continued and improved for the same good evolution of air transport in CEE. Our research is focused on the evolution of the airport market and on the main challenges for the next period.

### **Keywords**

Airport development, airport connectivity, Baltic countries, benchmarking, Central and Eastern Europe, passenger traffic.

### **JEL Classification**

C80, L10, L93, O10, R40

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### **Introduction**

The main sources used for this analysis are the ACI Traffic Reports, ACI Reports on airport connectivity, ATAG Report, yearly reports of airlines, Eurostat data and previous analysis

undertaken by the authors. In the literature, there are articles (Adler et al., 2013), reports elaborated by ACI and ATAG on the development of air transport in Europe or in the world, but to the best of our knowledge this is the first comparative analysis of such magnitude focused on airport industry in Central and Eastern Europe and Baltic Countries.

The establishment of the single aviation market acted as a catalyst for the launch of new and innovative business strategies (e.g. the low-cost carrier (LCC)). The model is continually evolving and, in turn, is influencing the practices of the legacy airlines. The LCC model also changed airports policy investment, the airports' geography and their relations with airlines. Since 2004, after the accession of the first 11 CEE states to the EU, an interesting evolution has occurred on air transport in the region. This important political and economic moment, combined with the liberalisation of the air space and the boom of LCCs, led to important air traffic developments, especially on regional airports in CEE. In our paper, the analysis is extended, taking into consideration the economic context after the EU accession of countries from this region, and new indicators for the air transport market, such as connectivity, considered for the 2008-2019 period.

The purpose of the current article is to present our comparative analysis of the air transport trends, and market characteristics of the capitals' airports from CEE and Baltic Region, during the last 12 years in order to identify correlations between economical development and air transport evolution and to highlight the best practices which have contributed to the better successes, and furthermore to provide important elements for designing airport development strategies. The interest on airport policy in CEE and Baltic countries is because the passenger air transport in the region has had an increasing trend, maintaining significant potential for development (Zaharia and Pietreanu, 2019). For airports, the main challenges consist in the extent to which their airport and airline investment policies will use these opportunities for development, in the design of new alliances and in the geography of new routes.

The paper is structured in sections outlining the benchmarking approach, the economic context and the region market characteristics, the evolution of the operational activities in the analysed airports and its impact on the aviation market.

### **Airport benchmarking**

The benchmarking tool is applied on the development of the airports from the region to offer a useful state of the art for supporting the airport's strategic planning process in this region. Some authors developed an airport benchmarking methodology from an airport manager's perspective in which they assume that the airport intends to maximize revenues and minimize costs, or analyze small regional airports which frequently suffer from limited traffic given minimum fixed infrastructure requirements and insufficient revenues to cover their costs, using DEA in order to estimate the relative efficiencies of a set of 85 European regional airports over the last decade (Adler et al., 2013).

Through this research, the authors performed a macroanalysis of the national passenger traffic and airport connectivity and then a benchmarking of capitals' airports in the region. The method of research is the external and internal benchmarking applied for the period of 2008-2019. The benchmarking groups measurable parameters according to the area of airport activity: economic context and operational activity. In link with airport activity, the quality of community airline service is one of the key elements for the development of airport passenger traffic and for the dynamics of airport connectivity and it is closely related to the economic development of the region. The interest of airlines for an airport is generated by the growth of the country or of the region, the foreign investments and the labor market development. The diversification of the business model of airlines in FSC, LCC, ultra LCC and charter carriers has had an important impact on the development of traffic in CEE. The LCC model has changed the passenger target group and consequently, the policy, management and airports competition. LCC operating in an airport reflects a higher load factor, point to point

flights and minimum aircraft and terminal operations. So, the quality of airlines community contributes essentially to the market positioning of airports. The development of LCCs operating in regional airports has increased their traffic and determined important investments for airport development using significant amounts from EC and member states. Increased traffic together with airport investments and introduction of new destinations (which means better connectivity), have important contributions to economic development in CEE. Air transport favors and it is favored by economic development and globalization.

The target group of our analysis is represented by the airports of 11 capitals, from the 9 EU member states from and CEE and Baltic region: Bulgaria (5 airports), Croatia (9), Czech Republic (5), Estonia (5), Hungary (5), Latvia (3), Lithuania (7), Poland (14) and Romania (16) and from 2 non-EU countries from the region: Republic of Moldova (2) and Serbia (5). Geographically, the 9 EU member states cover apx. a quarter of the EU area (23.87%) and the 11 countries represent 11.67% of Europe's surface with a total of 78 airports.

The interest on airport policies in CEE and Baltic countries is because after the crisis in 2009, air traffic and airport connectivity increased significantly in this area. Consequently, aviation brings an important contribution to sustaining economic growth in the region, followed by an increasing role of the 11 countries in the global economy. The period analyzed by our research starts with 2008, one year before the crisis for having a normal economical year as reference. As the region hosts an important number of airports, it is interesting to know how efficiently these airports are used. For this, we use as indicators the average surface of country territory corresponding to an airport and the average number of passengers per airport in each country. One can notice that the biggest average surface is in Poland (22,335 km<sup>2</sup>), followed by Bulgaria with 22,180 km<sup>2</sup>. In terms of average number of passengers/airport, the most efficient use of airports is in Czech Republic, which recorded in 2019 the highest number of passenger 3,729,232/airport, while the lowest rate is reported by Estonia, with only 649,049 passengers. The positive aspect is that all countries, except for Croatia and Serbia show good dynamics with this indicator, maintain increasing trends in terms of average number of passengers per airport in the last years. By analyzing the number of airports, the average surface corresponding for each airport and the average number of passengers, we can conclude that the best policies for efficient airport use are in the Czech Republic and Poland (Zaharia et al., 2019).

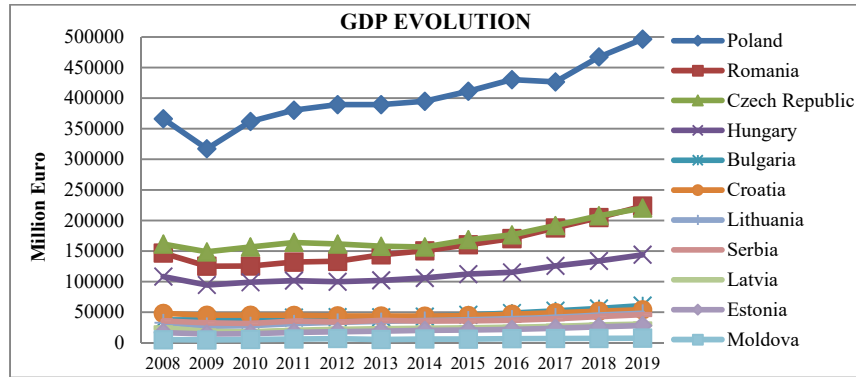
### **Economic context and market characteristics**

Economic development fosters air transport growth, which is a catalyst for economic development, Boeing estimating that 60 to 80% of air transport depends on economic growth and international trade (Delon, 2017). The existence of an airport in a region is one of the crucial elements that matter in multinational decision to invest in that region and the rate of economic growth is essential for designing the airport development strategy. For these reasons, the authors began the analysis with the economic context in order to understand the overall economic environment and policy development options.

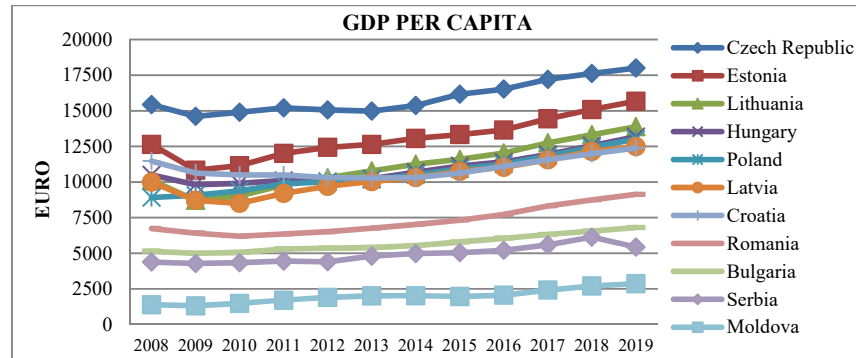
Good GDP dynamics (fig. no.1) has a positive impact on passenger traffic, having, in general, the same trend and influences positively the airport connectivity of a country, showing the potential of economy able to attract new foreign investments and, consequently, the tendency to increase the air transport in the region. The economic policy in the region was characterized by numerous reforms and national or foreign investments with important consequences on the economic situation of population and on air transport development. Concerning the GDP per capita (fig. no. 2), it does not have the same dynamics with passenger traffic as in the case of GDP, but this indicator is one of the main criteria of LCCs when choosing their markets. Emerging countries are preferred destinations of ultra LCCs.

Economists state that 1% of GDP growth represents 1.5% points of air traffic growth (Delon, 2017). It is not the case in CEE. Although the evolution of GDP has displayed the same trends

as the evolution of passenger and cargo traffic, generating further airport development, during the last 12 years, under the influence of the global financial crisis, we note that the usual relation between GDP growth and passenger traffic performance (Table 1) has changed in some countries.



**Fig. no. 1 GDP evolution in Eastern and Central Europe**  
 Source: based on data from Eurostat, 2019.  
 ‘Real GDP growth rate – volume’, Eurostat, 2020



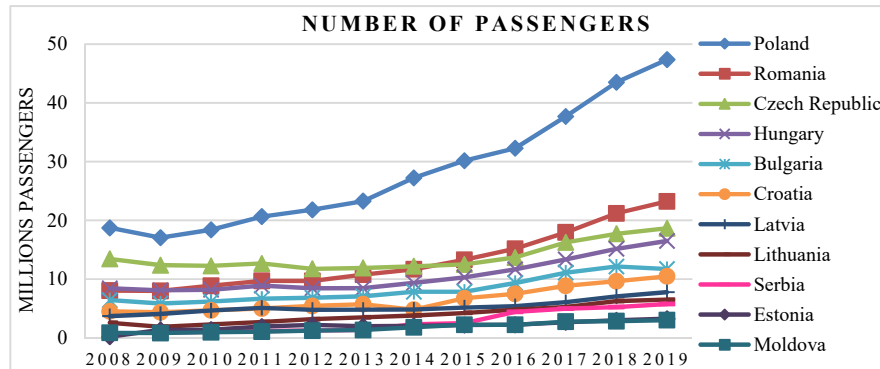
**Fig. no. 2 GDP per capita**

Source: based on data from Eurostat, 2020, Eurostat, 2020

From EU countries, the highest passenger traffic growth was recorded by Lithuania, followed, by Romania and then by Poland (fig. no. 3). In the case of Romania, Poland and Lithuania, both GDP and passenger traffic had the same trend. However, there are differences between the dynamic of GDP and those of passenger traffic. Although at the European level, GDP and passenger traffic have an increasing trend, we note a proportion gap between the dynamics of GDP and of passenger traffic during 2008-2019 in the analyzed region, mainly in Croatia, Serbia and the Republic of Moldova. For example, although the GDP of Serbia grew only by 24% between 2008 and 2019, the passenger traffic increased by 518% in the same period. This important increase could be one of the results of the strategic partnership from 2013, between Air Serbia and Etihad that acquired 49% stake in Air Serbia (Jat Airways) and management rights for a period of 5 years together with the policy of Nikola Tesla Airport of Belgrade on developing airport connectivity, but also the consequence of important emigration of work force.

This new relation between GDP and passenger traffic could be the reflection of the new market dynamics, changing consumer behaviors and increased importance of air transport in the European economy. The main reason for this weak correlation could be the important

workforce migration from Eastern Europe to Western Europe which have created the premises for an important development of LCCs and furthermore have turned air transport into a more popular means of transportation, using adequate marketing strategies.



**Fig. no. 3 Passenger traffic evolution in the analyzed countries**

*Source: based on data from Eurostat, 2020, Eurostat, 2020*

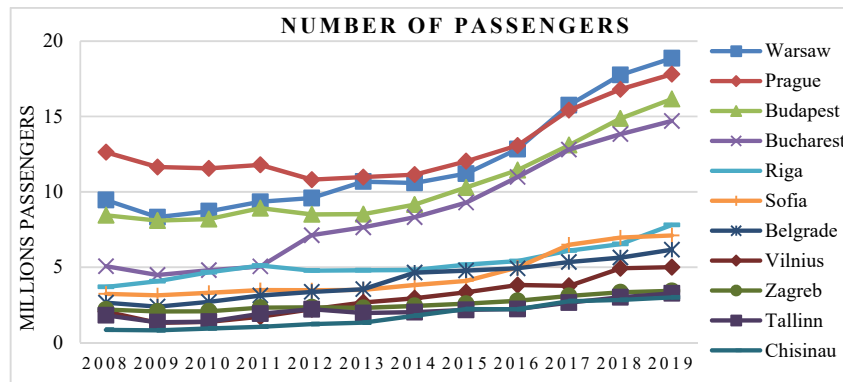
In all countries, important investments in airport infrastructure is a common characteristic of air transport policy. By building new terminals and modernizing airport movement areas, airports have created optimal conditions for a larger number of aircraft movements on peak hours and better passenger comfort. In the case of Poland, the important investments in airport modernization with significant use of EC funds were combined with a coherent policy of LOT and Wizz Air. As a result, Warsaw airport is becoming a hub for European and Asian destinations. In Romania, important investments were made in airport infrastructure development; while the national airline Tarom does not have a coherent strategy for the efficient use of such developments, the LCCs: Wizz Air, Ryanair and Blue Air took full advantage of it. Simultaneously, increased airport connectivity brings important economic benefits due to its impact on the long-term performance of the economy by enhancing the overall level of productivity. The evolution of airport connectivity in the region is an important opportunity and a real magnet for the localization of multinational companies.

An important driver for the air transport in the region is the size of the market and the foreign investments made according to the criteria: economic potential of the region and airport infrastructure. The investments of Etihad which acquired in 2013 49% stake in Jat Airways and management rights for a period of 5 years contributing to the development of Air Serbia and consequently to the passenger traffic increase and a better airport connectivity. Another beneficial change in the region, as a result of foreign investments, is the privatization of Zagreb Airport which was given to ZAIC Consortium (Zagreb Airport International Company), for a 30-year concession under the terms of a contract signed with the Government of Croatia. The main actor of the consortium is ADP, and the contract includes financing, design and construction of a new passenger terminal.

Aviation is indispensable for tourism, being a major driver for its development, particularly in economies where the other means of transportation are less developed. Globally, from 2014, more than half of international tourists (i.e. 54%) travel by air (Pappas et al., 2016). On the other hand, tourist destinations contribute to the increase of air transport passenger rates. A relevant example in the region is Croatia, where the tourist interest in summer destinations determines seasonal air traffic in this country. In Dubrovnik, for example, the monthly average traffic in summer is 20 times higher than for the winter period.

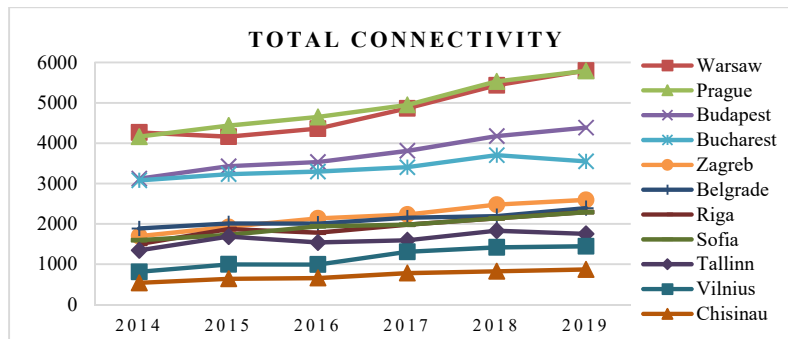
**Correlation between airport connectivity and passenger traffic**

The evolution of passenger traffic for capitals' airports during 2008-2019 (fig. no. 4) may be divided by two periods according to the evolution trend: 2008-2010 a period of decrease and instability and, after 2010, a period of modernization and consolidation with accelerated growth for the majority of airports. The correlation between passenger traffic and total airport connectivity (fig. no. 5) is proven by the ranking of capital city airports in 2019 which is approximately the same as when using the passenger traffic criterion.



**Fig. no. 4 Passenger traffic for capitals' airports (2008-2019)**

Source: based on data from ACI Europe, 2019, ACI 2019



**Fig. no. 5 Total connectivity by capitals' airports (2014-2019)**

Source: based on data from ACI Europe, 2019, ACI 2019

Good connectivity leads to increased productivity by fostering investments and innovation, improvement of business operations and a new labor market strategy, enabling companies to attract high quality employees from a larger labor market and to operate on a larger economic market. The consequence is a more favorable environment for foreign investments, often leading to more conducive global business environment. Better connectivity together with a bigger number of seats offered, are a catalyst for the development of national, regional and global economy. The values of airport connectivity provide a qualitative and quantitative indication of how an airport links to the rest of the world. The connectivity is measured by a dimensionless coefficient, using NetScan model (ACI, 2015). Airport connectivity is very sensitive to the evolution of dominant airlines. The case of Budapest airport stresses the effect caused by the disappearance of the dominant airline Malev, which led to an important decrease in connectivity and passenger traffic in 2013- 2014. Since 2015, the development of LCCs Wizz Air and Ryanair which operated 74 destinations using high capacity aircrafts, has

led to an important increase in total connectivity and in passenger traffic (Zaharia, 2016). In Hungary, 99.3% of the traffic is concentrated in the Budapest Airport.

In terms of aircraft movements (fig. no. 6), after 2010, Warsaw, Bucharest, Riga and Chisinau have had continuous increasing values, Sofia, Talin and Zagreb have maintained approximately the same values. Prague and Budapest, between 2012-2016, have had an important tendency to decrease the number of aircraft movements followed by an increase after 2016 without reaching the value of 2008. These variations, correlated with the increased number of passengers and with better connectivity, indicate that the policy of airlines operating in these airports is to use aircrafts with higher capacity, having in parallel a good load factor (higher than 90%), as is the situation of LCCs. For LC, the average load factor is in general between 75% and 78.8% (Goldstein, 2018).

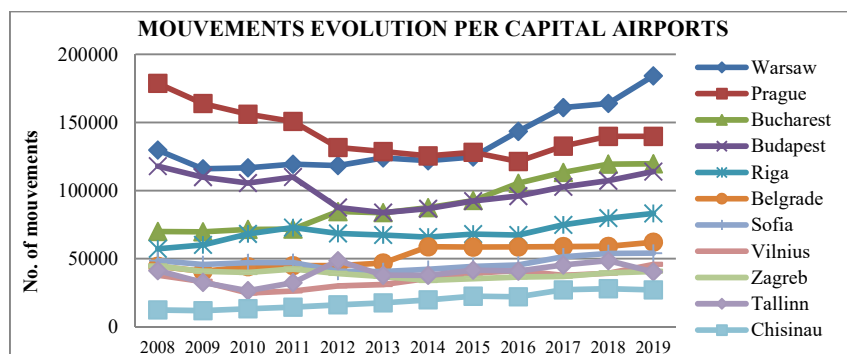


Fig. no. 6 Dynamics of aircraft movements in capital city airports (2008-2019)

Source: based on data from ACI Europe, 2019, ACI 2019

In Table no. 1, we present the synthesis of the correlation between economic context and air transport development using as indicators the number of passenger reported to the population, and airport connectivity reported to 100000 inhabitants. These data could give information of the life level and air transport development. We can observe that the leader from an economic point of view is the Czech Republic with the higher GDP/capita; and from air transport development, the Baltic countries Latvia and Estonia are better situated. Estonia is from all points of view: GDP/capita, passengers/inhabitant number and airport connectivity in the first three ranked countries.

Table no. 1 Correlation between GDP, connectivity and passenger traffic by number of inhabitants on the 11 major airports

Cuntry	Capital (Airport)	GDP per capita 2019	Traffic Pax 2019	Total Connectivity 2019	Pax/ Inhabitants 2019	Total Connectivity / 100 000 inhabitants
Poland	Warsaw Chopin	13 010	47 358 549	10,780	1,23	27,9
Romania	Henri Coanda, Aurel Vlaicu	9 130	23 237 241	4,944	1,20	25,5
Czech Republic	Václav Havel Prague	18 000	18 646 160	5,909	1,74	55,3
Hungary	Budapest	13 180	16 485 684	4,385	1,70	45,3
Bulgaria	Sofia	6 800	11 710 622	3,045	1,67	43,5
Croatia	Franjo Tudman	12 380	10 458 272	5,316	2,53	128,7
Latvia	Riga	12 490	7 770 445	2,292	4,08	120,2
Lithuania	Vilnius	13 880	6 503 486	1,160	2,36	42,1
Serbia	Belgrade Nikola Tesla	5 430	5 753 517	2,390	0,66	27,3
Estonia	Tallinn	15 670	3 245 244	1,751	2,45	132,1
Moldova	Chisinau	2 856	2 996 486	869	0,74	21,5

Source: based on data from Eurostat, 2019, Eurostat, 2020 and ACI, 2019

## Conclusions

Traffic growth in the region is due especially to the LCCs which have modified the air transport market and the competition between airports for attracting new airlines and opening new routes. The network expansion of LCCs routes will continue to add new destinations and more frequencies, with the intention to tackle long hauls routes as well. These LCCs development strategies began to change the geography of routes leading already to the increase of traffic on regional airports to the detriment of hub airports. The EU enlargement and the EU regional policy also contributed to this.

Although there are systemic social and economic differences and the demand for transport is different in each country, the air transport market has many similar characteristics in the region: the demand is growing fast; the population has small or medium purchasing power; there is a mix of private and government-owned airlines and airports; airports are professionally managed; markets are competitive. Airports and some airlines are profitable and this is related to the growth of the local market, to the beginning of its maturity and to improved government policies. The outcomes of this market transformation are: lower prices, improved efficiency and profitability resulted from the price-cost dynamics.

The direct intercontinental airport connectivity is not enough developed and there is no important hub in the region. In the forthcoming period, a priority of CEE countries should be to improve intercontinental connectivity. Due to its strategic geographical position, Bucharest Airport, already a hub for the Sky Team Alliance could turn into a more important hub with opportunities for routes towards Asia and Africa.

## References

- Adler, N., Ülkü, T. and Yazhemy, E., 2013. Small regional airport sustainability: Lessons from benchmarking. *Journal of Air Transport Management*, 33, pp.22–31.
- Adler, N., Liebert, V. and Yazhemy, E., 2013. Benchmarking airports from a managerial perspective. *Omega*, 41, pp 442-458.
- ACI, Airport Council International – Europe, 2019. *European airports report slower passenger growth & declining freight in 2019*, Brussels. [pdf] Available at: <<https://www.aci-europe.org/media-room/235-european-airports-report-slower-passenger-growth-declining-freight-in-2019.html>> [Accessed at 18 February 2020].
- ATAG, 2019. *Aviation benefits beyond borders Air Transport Action Group*, [online] Available at: <<https://aviationbenefits.org/downloads/aviation-benefits-beyond-borders/>> [Accessed 24 March 2020].
- Delon, E., 2017. 100 Ans de transport aérien et de mondialisation. *Capital, Dossier spécial*, 13, pp.56-57.
- Eurostat, 2020. *Passenger data/Real GDP growth rate – volume*, [online] Available at: <<https://ec.europa.eu/eurostat/web/products-datasets/>> [Accessed 19 March 2020].
- Goldstein, M., 2018. *The Most Crowded Airlines: Load Factor Hits All-Time High*, Forbes, [online] Available at: <<https://www.forbes.com/sites/michaelgoldstein/2018/07/09/meet-the-most-crowded-airlines-load-factor-hits-all-time-high/#109a767154fb>> [Accessed at 13 February 2020].
- Pappas, N. and Bregoli, I. eds., 2016. *Global dynamics in travel, tourism, and hospitality*. Advances in Hospitality, Tourism, and the Services Industry (AHTSI) book series. Hershey, PA: Business Science Reference.
- Zaharia, S.E., 2016. Major trends in the relation airport – airliners in the Central and Eastern Europe. In *Proceedings of International Conference on Air transport*, INAIR 2016, pp.143-151.
- Zaharia, S.E. and Pietreanu, C.V., 2019. Air transport development in Eastern Europe in relation to economic growth. In *15<sup>th</sup> World Conference on Transport Research*. Mumbai, India, May 2019.