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COMPETITION WITHIN THE AIRPORT SYSTEM OF THE REPUBLIC OF CROATIA

ABSTRACT

The Republic of Croatia is extremely well covered by airports, especially in the coastal area. The catchment zones overlap both within the Croatian airport system and the adjacent airports in the neighbouring countries. Market liberalization has resulted in competition among several air carriers as well as in the competition among airports. The work analyses the conditions in air traffic, concentration on the air traffic market in Croatia and it analyses the competition by using multi-criteria method SMART.

KEY WORDS

airport system, catchment zones, tourism, competition, market liberalization

1. INTRODUCTION

The system of airports of the Republic Croatia consists of seven international airports included in the Act on airports and three airfields. The total passenger traffic at airports for 2006 increased by 12% which is above the average growth in Europe of 6.2%. The planned average annual growth in the number of passengers in the Republic of Croatia by the year 2020 is 6.3% [12]. The average annual growth in Europe for the period from 2005 to 2025 amounts to 3%. The traffic growth is related to market liberalization of air traffic, arrival of low-cost carriers and the increase in the number of tourists arriving especially to the coast and islands. The pre-condition for further growth is an efficient system of airports, balance between the supply and demand, as well as the competition within the system. The work analyses by means of multi-criteria approach the competition among the airports and the overall system. The condition on the Croatian air traffic market is analysed within the context of joining the European Union. The use of measures of concentration on the market considers the current trends. The application of the transport demand model, drawbacks within the system of Croatian airports have been observed.

2. ANALYSIS OF THE CONDITION IN AIR TRAFFIC

2.1 Market liberalization

By changing the Act on Air Traffic in 2004 the Republic of Croatia has accepted to a great extent the European guidelines in the air traffic market liberalization [13]. The market access is specially arranged by bilateral agreement (Horizontal Agreement, 2005) between the Republic of Croatia and the European Community, and by signing the multi-lateral agreement on the establishment of the European Common Aviation Area (*ECAA*). With the bilateral agreement the air carriers are accepted by the countries of the European Community regardless of their country of registration provided they are designated (*Community designation*) on a particular line. This agreement meant abandoning the practice of the previously limiting individual bilateral agreements with the EU countries and has enabled faster arrival of low-cost carriers Germanwings and HapagLoyd on the flights to Germany and easyJet and Wizzair on the flights to London. The total number of flights operated by low-cost carriers in the period from the beginning of flying in 2003 to 2006 increased to 36. The advent of low-cost as well as of other foreign carriers on the market reduced the share in the traffic of airports by the flag carrier Croatia Airlines (Table 1). The increase in the number of passengers flying Croatia Airlines, at Zagreb Airport, in the period from 2004-2006 amounted to 0.45% in spite of the increase of traffic of 9.6%.

By entering into force of the ECAA Agreement, the first phase allows third and fourth traffic free-

Table 1 - Passenger traffic and shares of air carriers at Zagreb Airport (2004-2006)

Air carrier	2004	Share	2005	Share	2006	Share
Croatia Airlines	1,041,501	74%	1,020,623	66%	1,050,823	61%
Other domestic	2.256	0%	8,659	1%	19,525	1%
Foreign	342,102	24%	426,249	27%	657,046	38%
Low cost	24,603	2%	95,988	6%	203,843	12%
Total	1,408,206	100%	1,551,519	100%	1,728,413	100%

Source: Zagreb Airport Statistics, 2006

Table 2 - Passenger traffic at Croatian airports in the period 1996 – 2006

Year	Airports (traffic in thousands)									Total
	ZAG	DBV	SPU	PUY	RJK	ZAD	BWS	LSZ	OSI	
1996	1000	134	504	34	4	13	28	0	0	1717
1997	1081	227	501	64	2	0	32	5	0	1912
1998	1107	279	522	67	7	0	26	0	0	2008
1999	1076	218	468	53	6	22	24	1	0	1868
2000	1146	392	540	67	12	26	28	6	0	2217
2001	1200	500	570	103	20	47	35	8	0	2483
2002	1203	507	617	140	50	49	32	8	0	2606
2003	1315	717	698	137	47	70	27	8	3	3022
2004	1408	881	789	156	57	75	26	9	3	3404
2005	1552	1081	934	208	122	87	22	10	3	4019
2006	1728	1120	1095	292	169	66	18	11	3	4502

ZAG-Zagreb; DBV-Dubrovnik; SPU-Split; PUY- Pula; RJK-Rijeka; ZAD-Zadar; BWS-Brač; LSZ-Lošinj; OSI-Osijek;

Source: Airport statistics, MMTPR, 2006

doms. In the second phase, full application of using the flying rights on the lines within the state territory of another country included in the ECAA Agreement (cabotage) will enter into force.

Act on Airports (Official Gazette No. 19/98) defined the status of airports. Although the state retained the majority share in the ownership of 55%, the transfer of 45% to counties and units of local self-government of districts and cities has resulted in certain decentralization of airport management, and consequently an increase in the competitiveness among airports. The possibility of government subsidies has been retained through the budget means (capital support) for: expansion/improvement of airport infrastructure, establishment/improvement of airport safety and security standards and current support. The flag carrier Croatia Airlines receives subsidy for providing public service (*PSO - Public Service Obligation*). By adopting the acquis communautaire of the European Union, this type of subsidies is becoming a problem.

By passing the Rules of procedure on providing ground services and slots based on the European Directive 96/97, the procedure of harmonization with the European legislation in the part regarding airports has been continued. For the moment the air carriers, especially Croatia Airlines have not shown interest in independent performance of ground services, which is possible according to the Rules of procedure at three airports with over a million passengers per year.

2.2 Dependence of traffic on tourism

Traffic at airports in the Republic of Croatia over the period of ten years (1996-2006) increased from 1.7 million passengers to the present 4.5 million, which is an increase of 162% (Table 2).

The average annual growth in the number of passengers at airports amounts to 9.2%. In the same period the number of tourists arriving to Croatia increased from four million to ten million i. e. by 150% (Figure 1). There is a high level of interrelation between the number of passengers in air traffic and the number of tourists at the national level.

The crisis in the region in 1999 caused a significant fall in the tourist traffic. The terrorist attack on the USA in 2001 had a much lower influence since the transit traffic does not represent a great share in the total traffic.

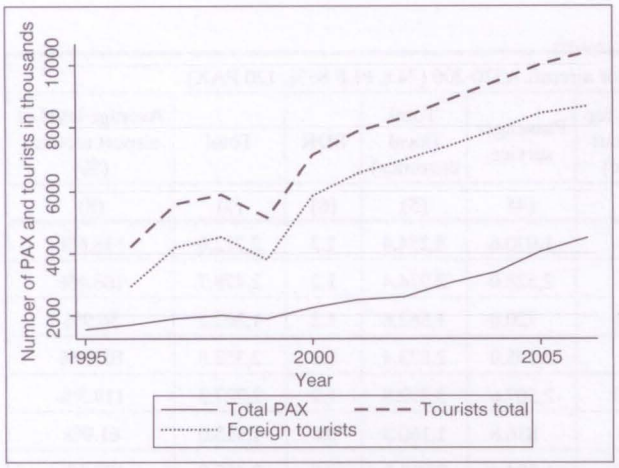

Figure 1 - The number of passengers and tourists at Croatian airports in the period from 1996 – 2006

Source: Statistics MMTPR, 2006

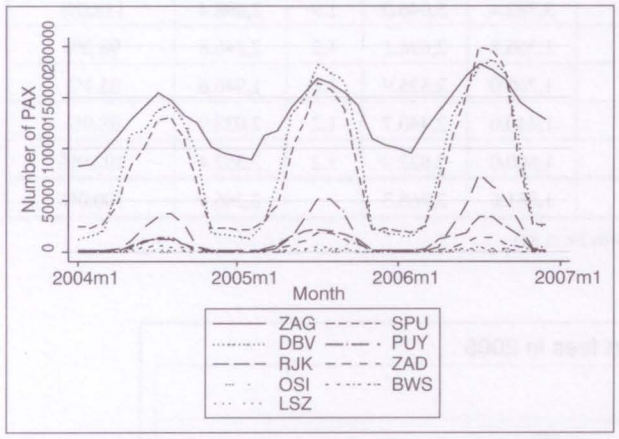

Figure 2 - Seasonal character of passenger traffic at Croatian airports

Source: Airport statistics, MMTPR, 2006

2.3 Seasonal character of operation

Dependence on tourism stipulates, especially in the coastal area, the seasonal character of passenger traffic at airports. High peak loads during the summer months especially at Split and Dubrovnik airports represent a significant problem regarding the limited capacities of manoeuvring areas and passenger terminals (Figure 2).

The analysis of key indicators of passenger traffic by means of diagrams with rectangle (minimum value, value of 25% - 75%, medial value and highest value) shows that Zagreb Airport has on the average the highest and the most uniform traffic over the year (Figure 3). Dubrovnik and Split Airports show substantial deviations from the average value. The least favourable range of value variations in passenger traffic is at Split Airport which has acquired the status of regulated airport and introduced higher prices in peak periods (Saturdays).

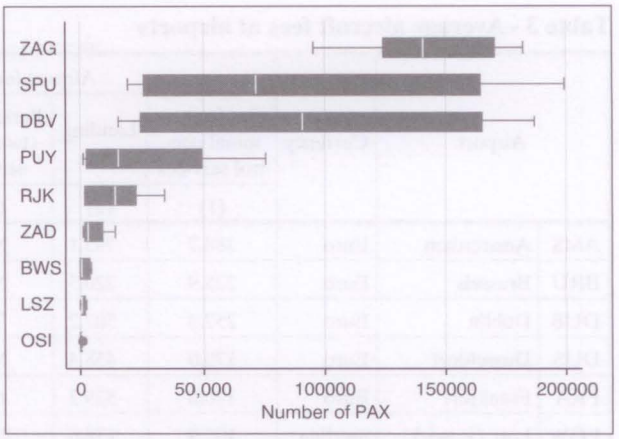

Figure 3 - Average and variability of passenger traffic at the Croatian airports (2006)

The increase in the productivity of airports compared to the airports of the European countries is possible in the first place by activities that stimulate increase in the traffic in the period from the beginning of November to the end of March.

2.4 Aircraft fees

Aircraft fees (landing fee and fee per passenger) at the Croatian airports are comparable to the prices at the European airports and are not specially regulated (Table 3). Since airports have a unique position, the regulation is usually done in case of the privatization of the airports i. e. in reducing the share of the state at airports or a significant deviation from the average in comparable airports. For comparison sake, the aircraft Airbus A320 has been considered, weighing 74 tons, with 85% load, that has over 50% operations at the Croatian airports. The data of the Transport Research Laboratory [11] have been used.

Differences in the approach to the calculation of the fees are possible in cases of separated fees for safety, noise or special government fees. The fees at hubs (above 25 million passengers) are on the average somewhat above the regional airport fees (traffic below five million passengers a year). The exception are airports with higher share of low-cost carriers such as Dublin (Ryanair base). Special discounts for a larger number of operations have not been taken into consideration. Zagreb Airport is approximately within the European average whereas Split Airport is 11% lower. Airport Council International classifies airports, according to the realized annual passenger traffic into four groups: more than 25 million passengers, 10-25 million, 5-10 million and regional airports with fewer than five million passengers a year (Figure 4). According to the mentioned classification all airports in the Republic of Croatia belong to regional airports.

Table 3 - Average aircraft fees at airports

Airport		Currency	Airport fees for aircraft A320-200 (74 t, PLF 85%, 120 PAX)							
			Fee for terminal control services	Landing fee	Parking fee (two-hour service)	Passenger service	Total (local currency)	SDR	Total	Average level of airport services (%)
			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
AMS	Amsterdam	Euro	388.7	795.1	NO	1,070.6	3,254.4	1.2	2,712.0	118.6%
BRU	Brussels	Euro	225.9	220.5	NO	2,528.0	2,974.4	1.2	2,478.7	108.4%
DUB	Dublin	Euro	257.3	507.2	78.1	720.0	1,562.6	1.2	1,302.2	56.9%
DUS	Dusseldorf	Euro	170.0	458.4	NO	2,195.0	2,823.4	1.2	2,352.8	102.9%
FRA	Frankfurt	Euro	170.0	529.2	66.0	2,507.6	3,272.8	1.2	2,727.3	119.3%
LGW	Lon. Gatwick	Sterling	102.9	178.6	22.0	856.8	1,160.3	0.8	1,415.0	61.9%
LHR	Lon. Heathrow	Sterling	102.9	415.9	100.6	1,394.4	2,013.8	0.8	2,455.9	107.4%
VIE	Vienna	Euro	270.4	772.9	NO	2,098.4	3,141.7	1.2	2,618.1	114.5%
CDG	Paris	Euro	267.2	382.9	178.6	2,382.8	3,211.5	1.2	2,676.3	117.0%
ZRH	Zurich	Swiss Fr.	632.6	631.0	NO	3,782.4	5,046.0	1.9	2,698.4	118.0%
SZG	Salzburg	Euro	237.1	1,092.2	NO	1,366.8	2,696.1	1.2	2,246.8	98.2%
LJU	Ljubljana	Euro	210.9	925.0	NO	1,200.0	2,335.9	1.2	1,946.6	85.1%
SPU	Split	Euro	186.7	814.0	NO	1,440.0	2,440.7	1.2	2,033.9	88.9%
ZAG	Zagreb	Euro	186.7	836.2	NO	1,800.0	2,822.9	1.2	2,352.4	102.9%
Average			243.5	611.4		1,881.6	2,768.3		2,286.9	100.0%

* *SDR- Special Drawing Rights* - unique unit currency (EUR/1.2; Sterling/0.82; Swiss Fr. /1.87)

Source: ATRL 2006, airports

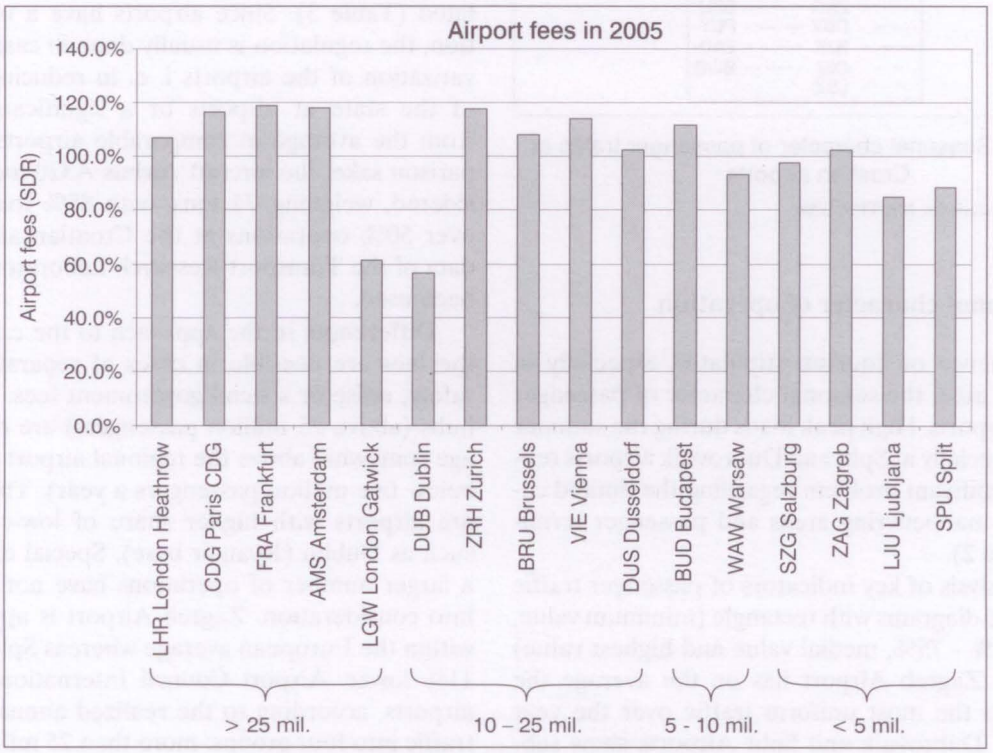

Figure 4 - Aircraft fees at airports

Source: TRL, 2006, airport price lists

Financial indicators of airport operation are positive compared to the European airports, but the quality of service lags behind the comparable airports (Figure 5).

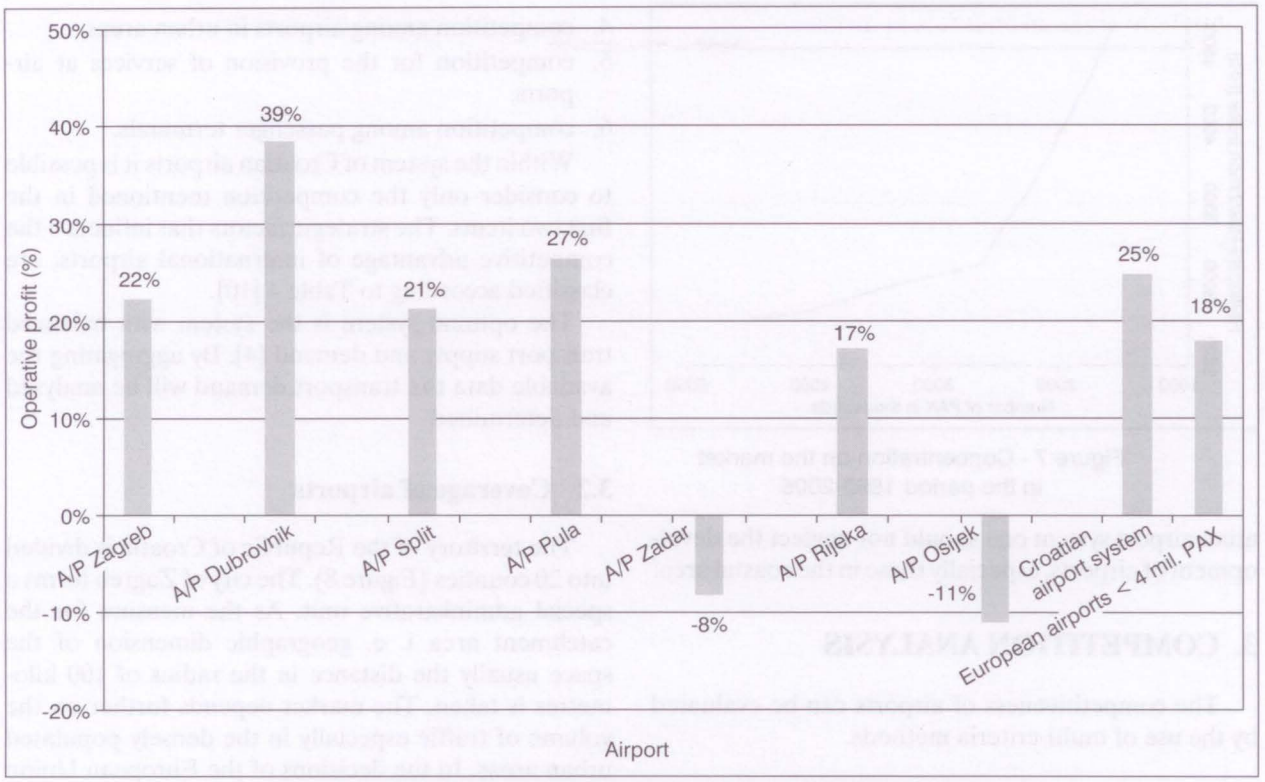

Figure 5 - Operative profit at airports of the Republic of Croatia

Source: TRL, HGK, Graham A., GAD Conference, Rome, 2006 [6]

2.5 Concentration on the market of Croatian air traffic

Apart from the average increase in the number of passengers at the level of airport system (increase of 9.2% in the period from 1996 - 2006) there has been a decrease in the concentration on the Croatian market. The shares of airports on the market of the Republic of Croatia are presented in Figure 6. In 2006 Zagreb Airport occupies 38% of the market whereas in 1996 it occupied 58% of the market. Zagreb Airport has a significant market share, but one cannot conclude that it is in the leading position. Split and Dubrovnik Airports occupy approximately the same share on the market (about 25%). All the other airports occupy a total of 10% of the market.

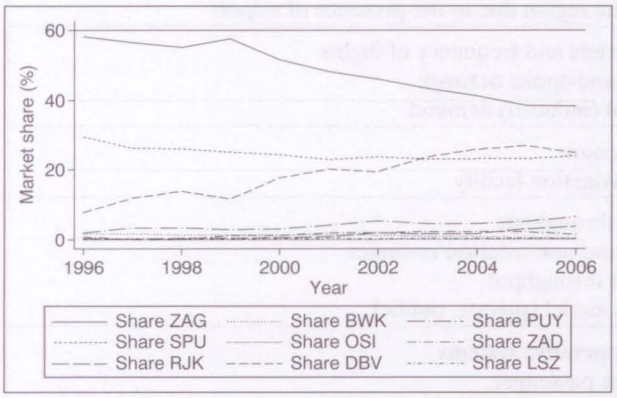

Figure 6 - Share of airport traffic on the Croatian market from 1996-2006

Source: Statistics of the Croatian airports

As measure of concentration on the market the Herfindahl-Hirschman Index (HHI) has been taken. In HHI the squared market share is taken *s* (*share*) thus emphasising the role of the biggest companies. For a particular industry (air traffic market of the Republic of Croatia) with *n* companies HHI is calculated:

$$HHI = \sum_{i=1}^{n} s_i^2 \qquad (1)$$

The lower the index the greater the competition on the market. HHI index is especially taken into consideration in case of some companies merging. When there is only one dominant airport such as is the case in Slovenia (negligible traffic in Maribor and Portorož) the index would be 10,000. This situation would exist in the Republic of Croatia if there were only one company (there were initiatives to establish an airport holding) for airport management.

The variation of the competition on the market can be observed over a period of time (Figure 7).

It is considered that the calibrated concentration on the market exists with HHI between 1000 and 1800 [8]. The reduction of HHI is the consequence of more uniform distribution and the development of regional airports and somewhat to the disadvantage of hubs. In the context of considering the development of the Cro-

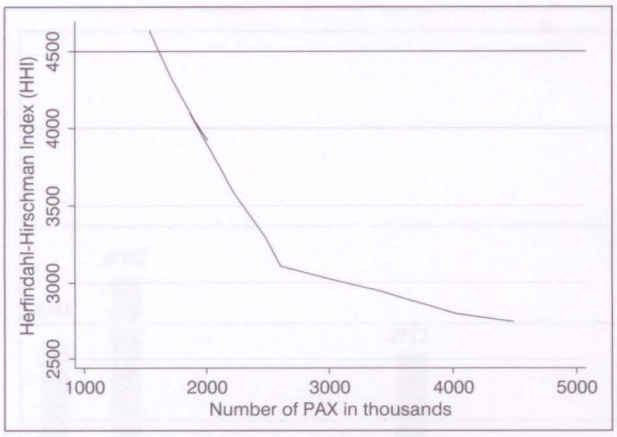

Figure 7 - Concentration on the market in the period 1995-2006

atian airport system one should not neglect the development of airports, especially those in the coastal area.

3. COMPETITION ANALYSIS

The competitiveness of airports can be evaluated by the use of multi-criteria methods.

3.1 Competition factors

The Airport Council International (ACI) has recognized the following forms of market competition [1], i. e. competition among airports:

1. competition in attracting new services (of new air carriers),
2. competition among airports whose catchment areas overlap,
3. competition for the role of a hub and for transfer traffic between hubs,
4. competition among airports in urban areas,
5. competition for the provision of services at airports,
6. competition among passenger terminals.

Within the system of Croatian airports it is possible to consider only the competition mentioned in the first two items. The strategic factors that influence the competitive advantage of international airports, are classified according to Table 4 [10].

The optimal system is the system with balanced transport supply and demand [4]. By aggregating the available data the transport demand will be analysed and determined.

3.2 Coverage of airports

The territory of the Republic of Croatia is divided into 20 counties (Figure 8). The city of Zagreb forms a special administrative unit. As the measure for the catchment area i. e. geographic dimension of the space usually the distance in the radius of 100 kilometres is taken. The market depends further on the volume of traffic especially in the densely populated urban areas. In the decisions of the European Union in considering competition among airports an attitude has been taken that the area covered by certain airports is 100 kilometres for regional i. e. 300 kilometres for international passenger traffic. There is no geographic area within the Republic of Croatia that is not within the catchment area of an airport open to international traffic. There are significant overlapping catchment areas in cases of Pula – Rijeka, Rijeka – Zagreb, Rijeka – Zadar, Split – Zadar airports. Zagreb, Dubrovnik and Osijek Airports are within the lower criteria of coverage (300 km) of the Croatian airports

Table 4 - Classification of competition factors among airports

Strategic competition factors	
Spatial factors	Impact on the environment close to airport Airport access Development in the region due to the presence of airport
Demand factors	Number of air carriers and frequency of flights Condition of hub-and-spoke network Level of additional (induced) demand
Factors of facilities	Possibility of expansion Category of air-navigation facility
Management factors	Revenue per unit throughput Ratio of aviation and non-aviation revenues Net profit per unit throughput Airport operation model (private, public)
Service factors	Level of service / operative systems Terminal space per passenger Level of fees at airports Airport operational time

Source: Park, Y.: An analysis for competitive strength of Asian major airports, Journal of Air Transport Management 9 (2003) 353-360

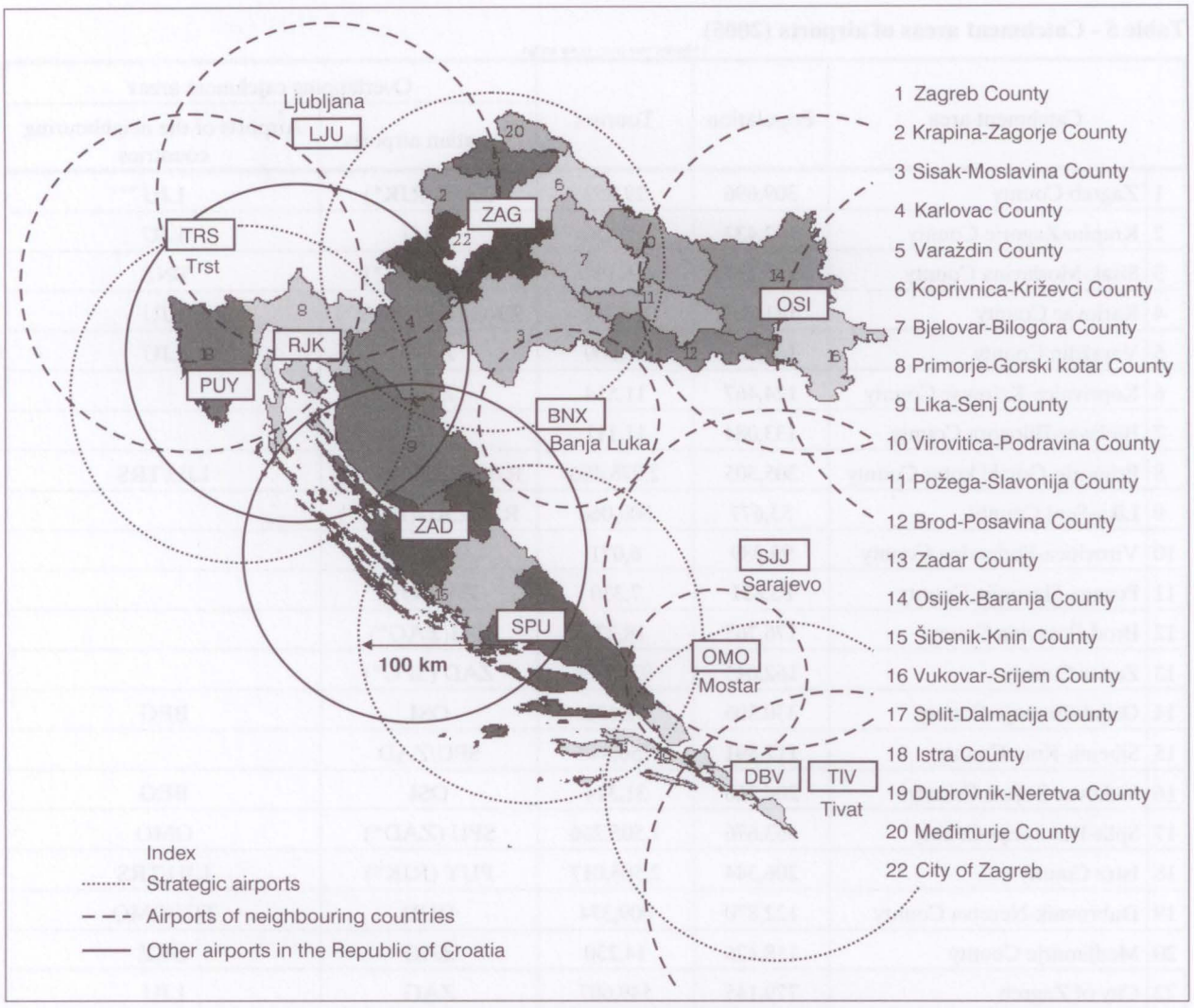

Figure 8 - Coverage of Croatian airports

but within 100 kilometres of the catchment areas of airports of the neighbouring countries (Ljubljana, Trieste, Tivat, Mostar, Belgrade). The success of the airports depends also on the number of inhabitants and the tourist potential of a certain area.

According to the 2001 census the City of Zagreb and the Zagreb County have a quarter of the population of the Republic of Croatia (Table 5). Taking into consideration the catchment area, Zagreb Airport covers an area with 48% of the population of Croatia. Dubrovnik Airport covers an area with only 3% of population, but it has a significant tourist potential. A larger number of tourists in a certain area indicates stronger action of the main components of the tourist industry: attractiveness, accommodation, transport, organization of tourist trips, organizations at destinations. In principle, the airports significantly participate in creating the tourist product.

The studies have shown that the access time to an airport has high importance in the competition among airports.

3.3 Use of multi-criteria method SMART

In the evaluation of the competitiveness of airports within the system of Croatian airports, using multiple criteria, SMART (*Simple Multi-attribute Rating Technique*) will be used. SMART technique improves the understanding of the problem and is often used with SWOT analysis [5]. The choice and total number of attributes depends on the availability of data and restrictions of the researchers. The demand is usually emphasised as an important factor of airport competitiveness.

In this simplified case of studying the competitiveness of airport systems the attributes according to Table 6 have been selected.

The attributes are evaluated by means of variables, i. e. measures. Data from Table 5 are used with remark that for areas where two airports overlap the total value of the variable is divided by two. The weights of individual variables are determined by the decision makers.

Table 5 - Catchment areas of airports (2005)

	Catchment area	Population	Tourists	Overlapping catchment areas	
				Croatian airports	Airports of the neighbouring countries
1	Zagreb County	309,696	29,852	ZAG (RJK*)	LJU
2	KrapinaZagorje County	142,432	36,436	ZAG	LJU
3	Sisak-Moslavina County	185,387	25,138	ZAG (RJK*)	BNX
4	Karlovac County	141,787	166,208	ZAG/RJK (PUY*)	LJU
5	Varaždin County	184,769	46,809	ZAG	LJU
6	Koprivnica-Krizevac County	124,467	11,514	ZAG	
7	Bjelovar-Bilogora County	133,084	11,111	ZAG	
8	Primorje-Gorski kotar County	305,505	2,076,456	RJK (PUY/ZAG*)	LJU/TRS
9	Lika-Senj County	53,677	300,060	RJK/ZAD(PUY*)	
10	Virovitica-Podravina County	93,389	6,071	ZAG/OSI	
11	Pozega-Slavonija County	85,831	7,330	ZAG/OSI	
12	Brod-Posavina County	176,765	18,277	OSI(ZAG*)	
13	Zadar County	162,045	931,509	ZAD (SPU*)	
14	Osijek-Baranja County	330,506	62,651	OSI	BEG
15	Sibenik-Knin County	112,891	750,840	SPU/ZAD	
16	Vukovar-Srijem County	204,768	31,314	OSI	BEG
17	Split-Dalmacija County	463,676	1,505,266	SPU (ZAD*)	OMO
18	Istra County	206,344	2,505,017	PUY (RJK*)	LJU/TRS
19	Dubrovnik-Neretva County	122,870	909,374	DUB	TIV/OMO
20	Medjimurje County	118,426	14,230	ZAG	GRZ
22	City of Zagreb	779,145	549,607	ZAG	LJU

Index
TIV-Tivat; OMO-Mostar; TRS-Trieste; BEG-Belgrade; LJU-Ljubljana; BNX-Banja Luka
* Secondary airport not included in calculation

Source: Statistics MMTPR, 2006

Table 6 - Value of variables

Factor	Measure	Airport						
		ZAG	SPU	DBV	PUY	RJK	ZAD	OSI
Demand	Number of inhabitans (100km)	2,137,910	520,122	122,870	206,344	403,237	245,329	801,649
Space	Access time	10	25	20	6	17	7	20
Demand	Number of tourists (100km)	814,502	1,880,686	909,374	2,505,017	2,309,590	1,456,959	118,943
Demand	Number of operations daily	105	44	39	21	8	13	2
Service	Size of passenger terminal (m^2)	14,000	10,880	12,000	12,000	4,685	1,147	4,685
Management	Revenue per work load unit (HRK)	153	139	125	164	92	136	174

Source: Statistics MMTPR, airports

An example of determining the function of value for the access time as the measure of spatial factor of competitiveness is presented in Figure 9. First, the most desirable (v (6) = 100) and the least desirable value (v(25) = 0) are selected. The next step is the estimate of value which is in the middle of the previous values (v(10) = 50). This value does not necessarily have to be one of the offered ones. The values of individual factors are determined on the basis of thus determined function of value (Table 7). In the same way, the values for all factors of competitiveness are determined (Figure 10).

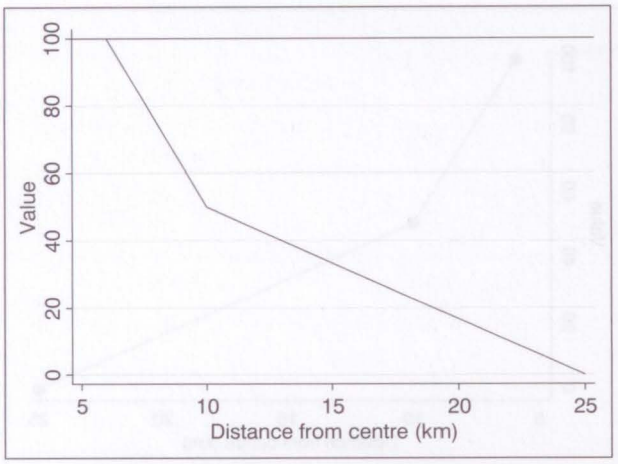

Figure 9 - Construction of value function during the approach

For m attributes follows:

$$\text{aggregate value} = \sum_{i}^{m} \text{value}_i \times \text{weight}_i \quad (2)$$

The relation between the existing competitive position of individual Croatian airports and the existing passenger traffic is presented in Figure 11. The balancing of the transport supply and demand at the level of the airport system is an important element of the development strategy of the airports in the Republic of Croatia. Zagreb Airport, as the airport serving the capital has the highest role in the development of air traffic especially in case of higher quality usage of tourist potential.

Split Airport as the central airport in the coastal part has the most uniform distribution according to all criteria that justify the growth of the number of passengers of 17% in 2006.

In spite of several years of lagging behind, Rijeka and Pula airports were among the first recognized as potential by the low-cost carriers. Since they are relatively close, significant market competition is to be expected in the future. High aggregate value of Pula indicates that other competition factors need to be considered as well. Dubrovnik Airport uses maximally its position of the only connection towards the South of Croatia. The traffic at Dubrovnik Airport shows high dependence on tourism. It proved sensitive to disturbances (Figure 6) in the air traffic industry, but also the development strategy of Dubrovnik as an élite destination (high prices). There are significant possibilities of increasing the efficiency of Zadar and Osijek airports.

Due to competition with Split Airport, Zadar Airport features a slower growth but because of its unique traffic capacities (two runways, the possibility of expansion in the military part) a more important role may be expected in the future. Because of very few tourist arrivals (1%), and poorer traffic connections Osijek Airport is at the moment ranking lowest within the airport system of the Republic of Croatia.

4. CONCLUSION

By analysing the basic criteria of market competition within the system of the Croatian airports, it may be concluded that there is competition within the system which is a pre-condition for harmonization with the European trends as well as further development of air traffic in the Republic of Croatia. There is no significant concentration of air traffic only at one single airport. Considering the system of airports in Croatia without any significant influence with the environment one can observe that there are significant potentials of airports in Pula, Rijeka, Zadar and Osijek. In further research, the system of airports can be analysed in interaction with the adjacent systems in the neighbouring countries regarding the catchment area.

Table 7 - Values and weights in assessment of airport competition

Factor	Measure	Starting weight	Norm. weight	Airports						
				ZAG	SPU	DBV	PUY	RJK	ZAD	OSI
Demand	Number of inhabitans (100km)	100	23	100	55	0	25	50	30	65
Space	Access time	90	21	50	0	18	100	25	85	18
Demand	Number of tourists (100km)	70	16	20	50	25	100	80	35	0
Demand	Number of operations daily	60	14	100	50	40	20	10	15	0
Service	Size of passenger terminal (m^2)	60	14	100	50	75	50	15	0	15
Management	Revenue per work load unit (HRK)	50	12	75	48	45	80	25	50	100
		430	100							
Aggregat				73.6	40.5	29.1	62.1	36.3	38.4	32.6

Source: Statistics, HGK, MMTPR, airports

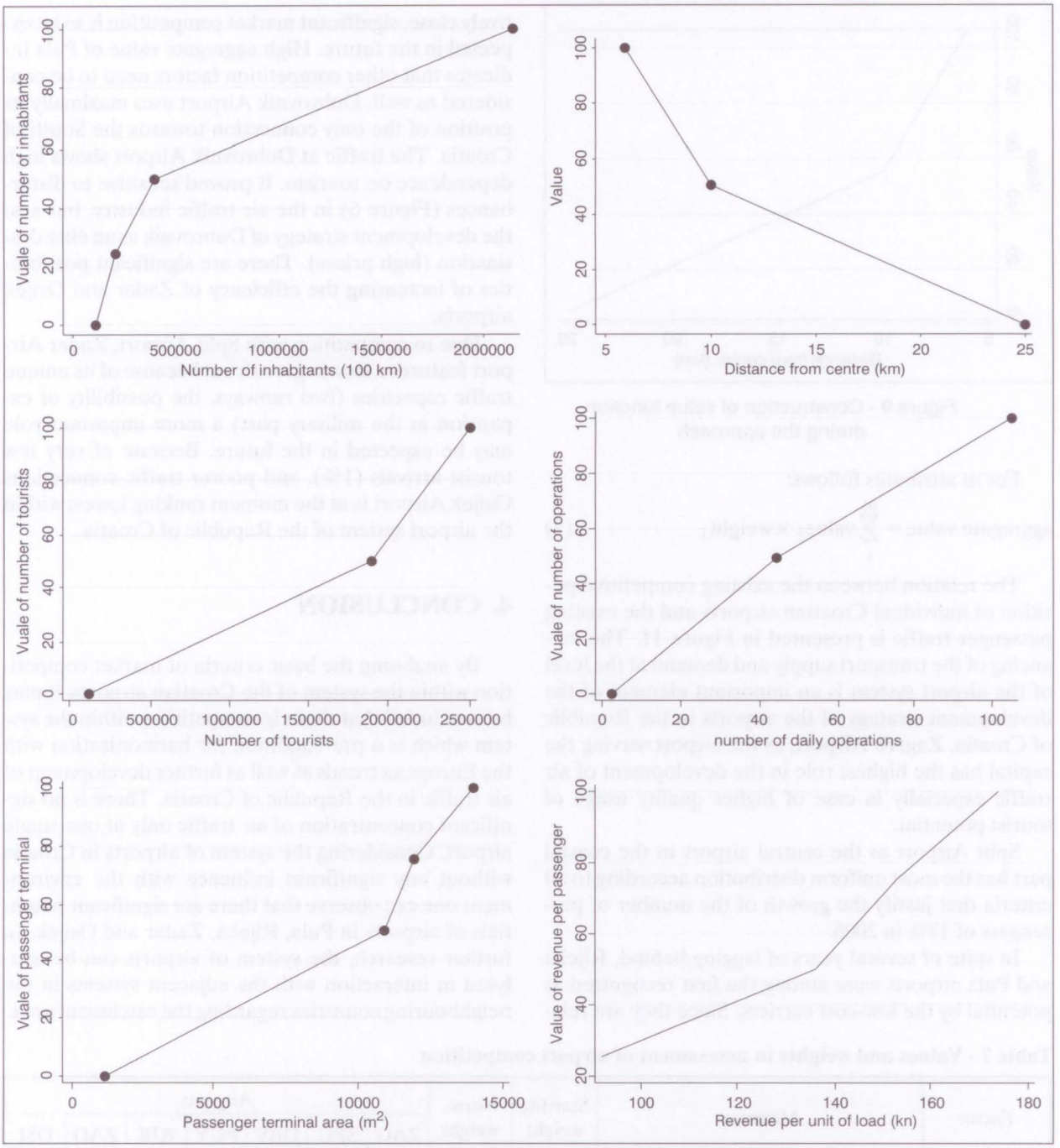

Figure 10 - Functions of values for all competition factors

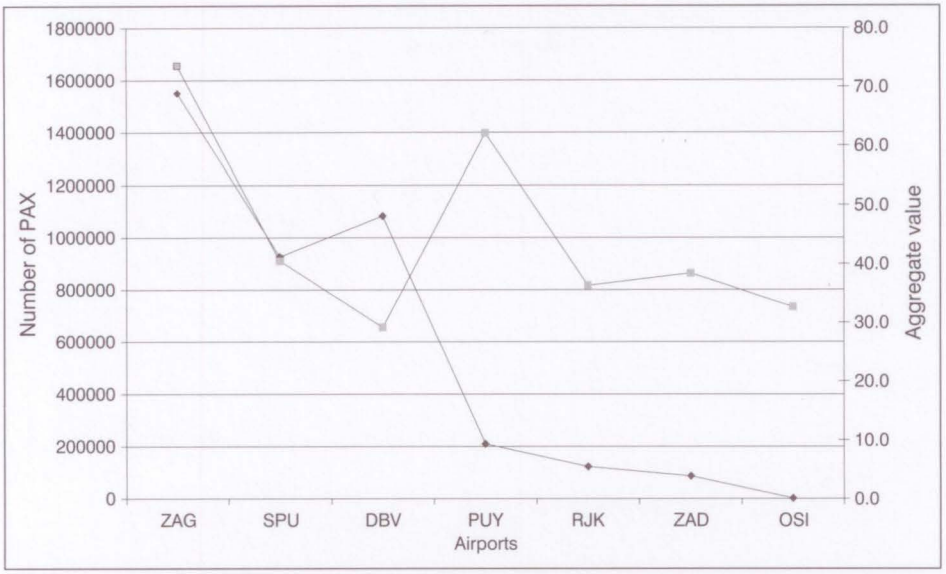

Figure 11 - Traffic of passengers and competitive position of the airports for 2005

Source: Data from Table 7

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SAŽETAK

KONKURENCIJA UNUTAR SUSTAVA ZRAČNIH LUKA REPUBLIKE HRVATSKE

Republika Hrvatska je izuzetno dobro pokrivena zračnim lukama, osobito u priobalju. Gravitacijske zone se međusobno prekrivaju kako unutar sustava zračnih luka Republike Hrvatske tako i bližih zračnih luka u susjednim državama. Liberalizacijom tržišta dolazi do konkurencije više zračnih prijevoznika pa tako i do konkurencije između zračnih luka. U radu je analizirano stanje u zračnom prometu, koncentracija na tržištu zračnog prometa u Republici Hrvatskoj te analiza konkurentnosti upotrebom višekriterijske metode SMART.

KLJUČNE RIJEČI

sustav zračnih luka, gravitacijske zone, turizam, konkurencija, liberalizacija tržišta

LITERATURE

[1] Airport Council International Europe, *European airports: a competitive industry*, Policy Paper submitted by the ACI Europe Policy Committee, 1999

[2] *Airport Economics Manual, Doc 9562*, International Civil Aviation Organization, Montreal, 2006

[3] **Barett, S. D.**: *Airport competition in the deregulated European aviation market*, Journal of Air Transport Management, Vol. 6, pp. 13-27, 2000

[4] **Bošnjak, I., Badanjak, D.**: *Osnove prometnog inženjerstva*, Fakultet prometnih znanosti, Zagreb, 2005

[5] **Goodwin, P., Wright, G.**: *Decision Analysis for Management Judgment*, Third Edition, John Wiley and Sons, Inc., England, pp. 27-70, 2004

[6] **Graham, A.**: *Assessing the Economic Challenges facing Regional Airports in Today's Environment: Turning these Challenges into Opportunities*, University of Westminster, Presentations on Global Airports Development Conference, Rome , 2006

[7] **Graham, A.**: *Managing Airports, an international perspective*, Second Edition, Butterworth-Heinemann, 2003

[8] **Li, G., Song, H.**: *Quantitative techniques for tourism competition analysis*, Corporate Rivalry and Market Power, Competition Issues in the Tourism Industry Edited by Papatheodorou, A., I. B. Tauris & Co. Ltd, London, 2006

[9] **Odoni, A., Neufville, R.**: *Airport Systems*, McGraw-Hill, USA, 2003

[10] **Park, Y.**: *An analysis for the competitive strength of Asian major airports*, journal of Air Transport Management, Vol. 9, pp. 353-360, 2003

[11] *Review of Airport Charges 2005*, Transport Research Laboratory, TRL, United Kingdom, 2005

[12] *Strateški razvoj sustava zračnih luka Republike Hrvatske*, Roland Berger Strategy Consultants, Zagreb, 2005

[13] *Zakon o zračnim lukama*, Official Gazette, 132/98 and 178/04.

[14] *Zakon o zračnim lukama*, Official Gazette, 19/98