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INCENTIVES IN AIRPORT PRICING: BENCHMARKING OF TWELVE CAPITAL EUROPEAN AIRPORTS

Anna Tomová[1], **Alžbeta Martišová**[2]

[1] *Žilinská univerzita v Žiline, Faculty of operation and economics of transport and communications, Univerzitná 1, 010 26 Žilina, the Slovak Republic*
Email: anna.tomova@fpedas.uniza.sk

[2] *Dubová 17, 637 00 Brno, Czech Republic*
Email:alzbeta.martisova@gmail.com

Abstract. The paper compares incentive schemes on airport charges in twelve capital airports in Central and Eastern European countries performing benchmarking excercises based on hypothetical operational assumptions. We quantify difference in the level of potential financial impacts generated by use of incentives on passenger and/or landing charges. Consequently, we benchmark competitiveness of Bratislava and Vienna incentive schemes as these airport compete each other due to overlapping catchment areas providing thus a measurement in the field of competitiveness of incentive schemes In conclusions we sketch perspective tracks of future research which are seen in factors influencing design of the schemes, new airport charges benchamrking based on consideration of the incentives and their competitivenes in different arrangement of airport competition and relations to future airport strategies.

Keywords: airport charges, pricing, incentives, business, benchmarking, competitiveness.

JEL classification: M21, M31.

1. Introduction

Airport business is in a state of flux. Airports belonging to so-called up-stream (infrastructure) aviation markets have been reacting on many exogenous impulses. Liberalisation of markets with air services in many countries, continuing liberalisation of international air transport due to the policy of open sky agreements, economic downturns and shortages in public budgets contributed to the emergence of new airport business models through which airports adapted to new circumstances. Today, airports in many world regions are managed as fully or partially commercialized companies, some of them fully or partially privatized or managed by private operators (Cruz – Marques 2011). Thus, airports started to implement styles, procedures and tools known in private businesses in many industries. The trend was supported by growing competition and new forms of competition among airports (Forsyth *et al*. 2010).

The changes in how airports make their business were recorded also in airport pricing within which airport aeronautical charges play still important roleIn this paper we investigate how capital airports in choosen European countries use incentive schemes on airport aeronautical charges.

2. Airport aeronautical charges

Airport pricing problems consists in any case of pricing of aeronautical services and pricing of commercial services. As airport operation differs mutually due to many factors (capacity of airports, airport presence on handling markets, organisation of commercial services, meteorological conditions, airport design, etc.) basic aeronautical charges are represented by landing charges, passenger charges, noise charges, emission charges, parking charges and security charges as reccomended by the International Civil Aviation Organisaiton (2012) recommendations. Of course, the list of aeronautical charges may be used by different airports differently so some airports due to the complexity of their operation or specific factors implemented a broader scope of aeronautical charges some of them use only landing charges, passenger charges and parking charges (Graham 2008). In spite of a specific scope of airport chages imposed by aiports, airport aeronautical charges are still very important in generating airport revenues although the role of commercial revenues is continuosuly increasing (Graham 2009). Undoubtly, airport aeronautical charges are also used as managerial tools to achieve modification of airport operation (peaks

and other airport aeronautical capacity problems) etc.

Traditionally, airport aeronautical pricing followed the International Civil Aviation Organisation´s charges policy based on charging principles, mainly cost-relatedness and non-discrimination being published as airport offical charges schemes. The situation gradually changed as airports started to use rabats and discounts offering thus incentives on airport aeronautical charges. Concurrently, airports have been introducing a new practise of confidential contracts with airlines in which charges levels and discounts and rebates were agreed individually on bilateral basis out of the publicly announced official charges schemes (Starkie 2012).

3. The state of the art in current research and research questions

Although being a matter of fact in airport business several years, airport charges were traditionally researched and benchmarked without consideration of rebates and discounts.

Fichert and Klophaus (2011) entered the topic of airport incentive schemes on aeronautical charges describing in their paper incentive schemes at nine German airports. They provided a classification of incentive schemes and considered them from a theoretical point of view laying the foundation and challenges for further research.

Malina *et al*. (2011) confirmed the prevalence if incentives at 200 airports in the European Union in 2010.

Jones *et al*. (2013) developed taxonomy of incentive schemes based on an analysis of data for 46 European airports. They performed as the first also benchmarking exercise covering four selected airports to illustrate financial impact of incentives.

Allroggen *et al.* (2013) assessed through econometric analysis factors that may impact on the presence of incentives for route and traffic development at 194 European airports sketching the need for deeper insight into the dynamics of airport pricing strategies.

Out of the European Union, the topic was researched and presence of incentives in airport charging in North America was confirmed by Airport Council Internationa (2009). In a broader scope of revenue guarantees, waived (not only reduced) airport charges, marketing support or direct subsidies to attract new service at small airports it was researched also by Wittman (2014).

Our analysis is aimed at answering three research questions:

- What would be financial impacts of incentive schemes both for airlines and airports as two main players in terms of incentives at twelve capital European airports assuming hypothetical scenario of airline´s operation?
- If airports compete do they compete also in their incentive schemes? Bratislava-Vienna airports were chosen for investigation as they represent a case of competing airports with overlapping catchment areas (Tomová, 2011).
- What are perspective tracks of research in the field?

4. Methodology of incentive schemes assessment

We worked in our analysis with twelve capital airports of the European Union member countries which entered the European Union in 2004 and 2007 and we confronted their incentive schemes on airport aeronautical charges published for winter season 2013 – Prague, Larnaca, Tallin, Riga, Vilnius, Budapest', Malta, Warszawa, Bratislava, Ljubljana, Sofia and Bucharest.

The Jones et al. indeed investigated all these airports in their analysis in terms of their design and structure however they benchmarked only four airports with regard to financial impacts of the schemes, Malta being the only one from our benchmarked sample. Thus, the scope of our benchamrking activity is broader.

In our research we emanated from the taxonomy of incentive schemes developed by Fichert and Klophaus (2011) using the part related to separate incentives and focusing on landing and passenger airport charges. In line with their taxonomy, incentive schemes may be analyzed according to type of services (passenger or cargo), mechanism of incentives (ex ante discounts or ex-post refundation), according to markets specification (incentives related to any, i. e. general market or specific markets), aims of incentives (network expansion or traffic expansion, etc.) Thus we benchmarked financial impacts of such incentive schemes for passenger traffic (if any) using hypothetical assumptions. Our analysis does not include incentives which may inbuilt in charges themselves or confidential incentives within bilateral agreements.

To benchmark the impacts of incentive programs stimulating existing traffic we worked with an airline which operates four destinations each with frequency of five flights per week by aircraft Airbus A320 with maximum take off weight 74 tons and capacity of 146 seats at the airport. Benchmarking exercise predicts that an airline will increase frequencies to six and incentives may be applied. Two load factors (LF) are considered, 72% and 67% respectively, to take into account

average load factor may be decreased due to the increase in frequencies.

To benchmark the impacts of incentive schemes aimed at network expansion we assumed that a hypothetical airline had decided start operation of new short-haul route within Europe with frewuency three flights per week in air both seasons (summer and winter) keeping an average load factor 72%. Other assumptions were as in the previous benchmarked case.

To benchmark competitiveness of incentive schemes of Bratislava and Vienna airports we used the same assumptions as in the realized benchmarking cases aimed at network expansion (72% load factor, Aibus A320 aircraft with 74 tons maximum take-off weight, 146 seats in aircraft) in two alternatives. The former relates to a new short haul route with frequency three flights per week during one year within three years of operation, the latter considers a new long haul route per week during one year within five years of operation. In our analysis we included only passenger and landing charges although there is a significant difference between Bratislava and Vienna airports in terms of number of charges imposed on airport users.

Also being hypothetical, our assumptions tried to describe an optional typical operation of European airline, on the other hand we must admit that just choice of hypothetical operational situation is rather arbitrary and may be differently moderated. Therefore we deem that any similar benchmarking study of broader scope will need to work with alternatives of assumptions.

5. Benchmarking findings

Four of the capital airports analyzed Ljubljana, Sofia, Bucharest and Riga had not implemented any incentive schemes on their aeronautical charges. The data for Tallin airport were not at disposal.

The rest of seven airports used incentive schemes, only four of them apllyied them on both passenger and cargo transport. The schemes were aimed at general market at the airports, however three airports Malta airport, Warszawa airport and Bratislava airport supported by their incentive schemes also specific markets which were denoted by the airports as strategic or insufficiently served. We included in our benchamarking the airports which could be compared due to the existence of the type of incentive schemes present at the airports.

Financial impacts of incentives aimed at traffic growth were benchmarked considering two years of operation without or with incentive schemes and calculating respective difference in %.

Table 1. Benchmarking of financial impacts due to incentives of traffic growth (*Source*: Own computation)

Airport	- without + with incentives	passenger charges LF 72% (difference in %)	passenger charges LF 67% (difference in %)	landing charges (difference in %)
PRG (in CZK)	-	74037600	69101760	17928768
	+ 1st year	74037600	69101760	15687672 (12.5)
	+ 2nd year	74037600	69101760	16687672 (8.3)
Larnaca (in EUR)	-	2796394	2609968	506089
	+ 1st year	2687194 (3.9)	2544447 (2.5)	506089
	+ 2nd year	2796394	2609967	506089
Vilnius (in LTL)	-	2882880	2690688	2308800
	+ 1st year	905486 (68.6)	2690688	2308800
	+ 2nd year	905486 (68.6)	2690688	2308800
Budapest (in EUR)	-	2944469	2748171	851485
	+ 1st year	2944469	2748171	709571 (16.7)
	+ 2nd year	2944469	2748171	851485
Warszawa (in PLN)	-	7862400	7338240	3906240
	+ 1st year	6770400 (13.9)	6814080 (7.1)	3645824 -6.7)
	+ 2nd year	7862400	7338240	3906240

As it is contained in Table 1 the airports provided discounts aimed at traffic growth either on passenger charges or landing charges or both as in Warszawa. Majority of airports implemented two years incentive programs besides Prague with only one year validity of incentive program and Vilnius which enabled to agree on bilateral basis a prolonged time of incentives, however the duration of such agreement had to be at least five year. Based on our hypothetical assumptions the highest difference in % from the reference value of basic passenger charges would be achieved by airport Vilnius in the first year of operation with load factor 72%, namely 68.6% for both years. The highest difference in % from reference value of landing charge would be achieved in Budapest 16.7%, however only for the first year of operation.

Similarly, as for the traffic growth we benchmarked the financial impacts of incentives for network expansion. Duration of such programs differs mutually in compared airports therefore we worked with an assumtion of five years of operation and load factor 72%. Such incentive schemes were offered at five airports Prague, Larnaka, Budapest, Malta, Warszawa and Bratislava. Under our assumption of a new intra-European short-haul route, airports predominantly provided discounts only from one of the charges, besides of Budapest airport which motivated such operation through discounts on both landing and passenger charges. Achieved results of our benchmarking are contained in Table 2.

Table 2. Financial impact of incentives aimed at network expansion (*Source:* Own computation)

Airport	Charges	for one year of operation without incentives	Difference of charges with incentives in %
Prague (CZK)	Landing	2241096	49
	Passenger	9254700	0
Larnaca	Landing	63261.12	0
	Passenger	349549.20	36
Budapest	Landing	106435.68	52
	Passenger	368058.6	5
Malta	Landing	41393.04	0
	Passenger	259459.20	15
Warszawa	Landing	488280	57
	Passenger	982800	0
Bratislava	Landing	151352.76	44
	Passenger	266421.48	0

The most favourable offer expressed as difference in % against the reference value of charges without incentives was provided by airport Budapest discounting both passenger and landing charges and also airport Warszawa with the highest savings result for landing charges. However, airports may serve different origin destination markets with their distinctive characteristics and airlines sensitivity to airport charges (and subsequently to incentives) may be different. Negotiation status of airlines towards airports is another factor calling for consideration, therefore benchmarking of incetives is more easily interpreted in the case of competing airports which serve substitute origin destination markets.

6. Bratislava-Vienna: competitivenes of incentive schemes in airport pricing

Bratislava and Vienna airports are unique airports within the European Union due to shared catchment areas creating a specific multi-airport system in which airports are subject to different regulatory and governmental policy of two member states of the Europen Union. Both are capital airports.

Bratislava and Vienna airports provided incentive schemes at the time of our investigation. Overall design and structure of their incentive schemes is contained in Table 3.

The main difference between the schemes was in incentives aimed at traffic volumes which were not offered by Bratislava airport. Using the data availability and comparability of the schemes we subsequnetly benchmarked only incentives aimed at new routes development.

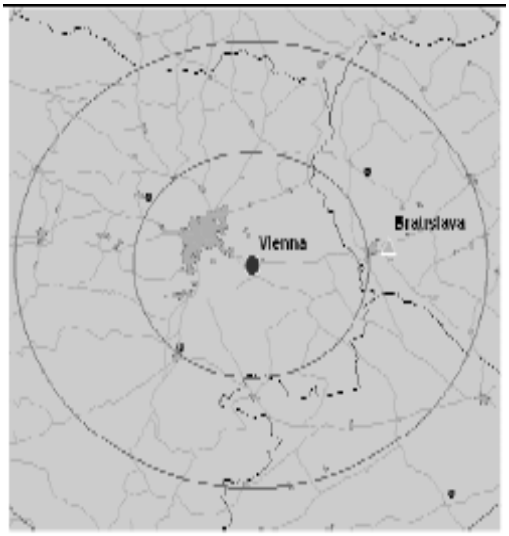

Fig. 1. Vienna and Bratislava overlapping catchment areas. Source: (Bonnefoy, 2007)

Table 3. Design of incentive schemes of Bratislava and Vienna (as of March 2013) (Source: Own compilation)

			Bratislava	Vienna
Services promoted	passenger		✓	✓
	cargo		✓	✓
Served markets	general		✓	✓
	specific		✓	✓
Traffic expansion	traffic volumes	pass./cargo	-	✓
		frequency	-	✓
		capacity	-	-
	network	new routes	✓	✓

Table 5. Bratislava and Vienna incentive schemes: Comparison of main parameters (*Source:* Own compilation)

		Bratislava		Vienna	
Flight specification		Long-haul	Short-haul	Inter-cont.	Intra-Europe
Duration in years		5	3	4	3
Discounts	Landing charges	50-95%	50-95%	40-100%	40-80%
	Passenger charges	30-40 % (3years only)	-	-	-.
Minimum number frequencies	-	-	-	-	-

The financial impacts of incentives for network expansion – short haul variant at Bratislava and Vienna airports are gathered in Table 6. Both airports discounted landing charge and relative impact of Bratislava airport incentive was higher, however in absolute terms airline´s savings are almost twofold. Real competitiveness of Bratislava airport incentives may be impugned by comparison of average charges level per year (passenger and landing). Higher relative incentives of Bratislava airports refer to a higher starting level of basic landing charges, therefore one can at least doubt about real competitiveness of Bratislava airport towards

Vienna competitor through incentive schemes although we compared only passenger and landing charges and Vienna charges are more complex. According to our findings, Bratislava airport incentives only imitated overall level of Vienna charges with stimuli without sufficient motivation for airlines to use Bratislava as a substitute. Bratislava incentives were more designed for the first year effect as with regard to airlines requirement for traffic risk sharing inbuilt in airport pricing, incentives on charges including. The first year discount effect could be reasoned in the case of Bratislava airport by absence of more developed scheduled operation which is very different from Vienna airport situation where network expansion aim refers to a well established position of Vienna in scheduled air transportation.

Table 6. Benchmarking of Bratislava and Vienna incentives – a new short-haul route case *(Source*: Own computation)

Airport		Bratislava EUR		Vienna EUR	
1st year of operation without incentives		landing charge	passenger charge	landing charge	passenger charge
		151352.7	266421.5	98108.4	275184
use of incentives	1st Year	7567.6	266421.5	19621.7	275184
	2nd year	37837.8	266421.5	39243.4	275184
	3rd Year	75677.1	266421.5	58865.0	275184
impact of incentives	Relative	73%	-	60%	-
	Absolute	332976	-	176595	-
average charge per year 3 years operation		306782		314427	

As it is seen in Table 7 financial impacts of network expansion with incentives for long haul route were significantly higher in Bratislava. Duration of incentive program was one year longer in Bratislava. Bratislava airport moreover provided discount on passenger charge for the first three years of operation. Although the benchmarking result could in this case indicate that incentives in Bratislava airport charges are more competitive against Vienna, real effect on competitiveness is undermined by the stage of scheduled airlines operation at the airport which is again significantly better in the case of Vienna airport. Developed operation of scheduled airlines at airports enables to offer passengers more options for transfer and flight combination within their long-haul itineraries.

We deem, moreover, that analysis of incentive schemes is obliged to work with negotation status of airlines and airport, both in cases of short-haul and long-haul operation. The published level of incentives on charges may be perceived by airlines as a reference value for bilaterally agreed incentives within confidential airport/airline contracts.

Table 7. Benchmarking of Bratislava and Vienna incentives – a new long-haul route case in Eur (*Source*: Own computation)

Airport		Bratislava (EUR)		Vienna (EUR)	
1st year of operation without incentives		landing charge	passenger charge	landing charge	passenger charge
		151353	266421	98108	275184
use of incentives	1st year	7 568	159853	0	275184
	2nd year	7 568	173174	19622	275184
	3rd Year	7 568	186495	39243	275184
	4th year	37838	266422	58865	275184
	5th year	75677	266421	98108	275184
impact of incentives	relative	82%	21%	56%	-
	absolute	620546	279742	274703	-
average charge per year 5 years operation		237716		318352	

7. Conclusions

Our analysis confirmed a presence and importance of incentive schemes in airport pricing through quantification of their financial impacts using a sample of twelve European capital airports. The topic is urgent for further analysis as airport charges represent a main economic link between airports, airlines and their passengers. Although being very different due to a different design stemming from different endogenous and exogenous factors, airport use – according to our findings – incentives as a standard pricing practise which is expected by us to be enlarged in future. We support this argument by continuous implementation of incentives. Incentives are used by different airports which do not fully comply with theoretical evidences made by econometric analysis performed by Allroggen *et* al. (2013).

Allroggen *et al.* (2013) in their econometric analysis identified determinants of presence of incentives in airport pricing. However, they did not work with different competition status of airports relying only on distances. Accordin to us, the approach is not capable to reveal real nature of airport competition which may be very different and maybe – as it was shown by our analysis – a factor udermining design and incentive effect of the schemes. Working with presence of Ryanair or some other low cost players is further controversial moment. According to us it would be more suitable to work with negotation status of airlines and airports distinguishing among the levels of asymmetry in airines versus airport negotiation due to operationl situation at airports. Similarly, ownership question ought to disinguish more

among different ownership options and work with more ownership clusters as it was revelaed in rich airports performance benchmarking literature. New question could be: Do more efficient airports use incentives more?

Our investigation of impacts of incentive schemes based on hypothetical assumptions revealed several important findings:

- Instead the issues of presence or absence of incentives in airport pricing, research ought to focus more on factors influencing design of such schemes and their development in future. Therefore, we reject an idea about typical or prevailing airport type which uses incentives and support an idea that there may be common factors influencing design of incentive schemes for common types of airports. Which are they?
- Another gap in the research is - according to us – in new possibilities for airport charges benchmarking however with consideration of incentives on airport charges. Within this work more discussions about the most suitable hypothetical assumptions for such benchmarking would be needed. Nature of airport competition would be one of them.
- Within current research of incentives on airport charges more effort ought to be focused on relationship between design of incentives and future airport strategies. We deem that design of incentives on airport charges may serve as a way through which future airport strategies could be revealed, changes in strategies included.
- More studies devoted to competitiveness of incentives would be performed with regard to different types of airports competition as it was discussed for Bratislava and Vienna airports. Particularly, benchmarking of incentives of competing primary and secondary hubs is a chllenge for further resrearch.

In the long term, we expect that incentives on airport charges will be studied with higher intensity also in a theoretical part of the research, mainly within game theory and two-sided markets theory as well.

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