SCIENTIFIC PAPERS
OF THE UNIVERSITY OF PARDUBICE
Series B
The Jan Perner Transport Faculty
19 (2014)

AIRPORT CHARGES – PRICING PATTERNS AT SELECTED EUROPEAN AIRPORTS

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1.Introduction

The costs airlines have to bear to access different airports for performing operations varies greatly and there are plenty of factors influencing this differentiation. In general, airports target their customers (airlines) by their business model, so there are airports who primarily serve network legacy carriers (NLCs) as well as ones that cater to low-cost carriers (LCCs). Depending on that airports adopt different pricing strategies regarding airport charges levied on air carriers. These charges vary not only by amount but also by structure. Although there is some regulatory framework for setting these charges airport managing companies along with respective civil aviation authorities have sufficient leeway to set airport charges at fairly arbitrary levels. At least such a conclusion can be drawn from a quick look at airports' price lists.

Airport charges are an important tool for airport management companies. On one hand, revenue collected can be used to fuel investment that is crucial for infrastructure development [1]. On the other, the level of airport charges, especially relative to other (competing) airports, determines the demand for a given airport's services and can influence the volume of traffic.

The aim of this research paper is to examine airport charges at selected airports that vary in respect of the market they target. Therefore a set of airports will be established comprising airports that cater primarily to NLCs, LCCs, as well as serving

both ty2pes of carriers. The group will also be differentiated by airport size to represent the whole range of airports from the small ones (with a minimum of 2 m passengers served annually) to large European hubs.

The research of airport charges levels is important as they influence air ticket prices that translate directly into economic accessibility (affordability) of air travel which in turn determines the level of economic, social, cultural and other dimensions of inclusion or exclusion [2].

We will start with a quick overview of the rules and principles governing the setting of airport charges in the European Union. After that we will present a methodology for comparing airports with regard to amount charged from airlines for using airport infrastructure. An extensive comparison of the airports analyzed will be followed by concluding remarks.

Because of limitations of this research and limited resources only a dozen airports will be included in the analysis. The analysis will be limited to selected European (EU) airports. This paper should be considered preliminary to a wider investigation of airport charges and their dependence on various factors, such as airport size, airlines (LCCs, NLCs or hybrid) served, traffic characteristics, etc. The results should also indicate areas that need further investigation.

2.Setting airport charges – rules and regulations overview

In this research paper airport charges collected for the use of airport infrastructure and services provided by the airport operator will be examined. Taxes and state-imposed charges will not be included in the analysis. Although they influence the overall competitiveness of an airport they cannot be considered airport charges and therefore are not the subject of this research. There is a wide scope of factors determining competitiveness of airports and airport charges are one of them. Another group of costs that are born by airlines for using air transport infrastructure are navigation charges. Especially charges collected for terminal navigation are often included in comparative analyses of airports, here however they will not be taken into consideration.

Airport charges usually include:

- Take-off/landing charges
- Environmental charges (for noise and greenhouse gas emissions)
- Parking charges
- Passenger charge
- Security charge
- Other charges, including charges for the use of specific infrastructure or services

The above list of charges can be considered complete as practically all charges collected by airports fall within one of these categories.

ICAO guidelines

According to ICAO guidelines take-off/landing charges should depend on MTOW (maximum take-off weight). At congested airports allowance is made for the use of a flat rate per aircraft or a combination of a flat rate and a MTOW-related component. Stage length should note influence landing charges. A single charge should include as many costs of airport-provided facilities as possible [3]. Generally landing/take-off charge is collected for:

- The maintenance of landing area
- Parking at the apron (for a limited, pre-set period of time after which a parking charge is collected)
- Safety features (fire brigade and medical assistance in attendance)
- Lights for approach, landing, taxiing and take-off
- Communications facilities for approach, landing, taxiing and take-off

Moreover, ICAO approves the imposition of noise-related charges at airports that experience noise problems. This is to compensate for the costs of mitigation and prevention of these problems. Similarly emission charges should only be established at airports experiencing local air quality problems and should not exceed the costs of alleviation and prevention of the damage caused by aircraft.

ICAO promotes the rule of cost-relatedness of charges and allows the use of pre-funding of investment projects only in very specific circumstances. In such cases consultation between airports and airlines and the mutual agreement on pre-funded projects is highly advised.

European Commission guidelines

In the European Union there had not been any specific regulation regarding airport charges. Despite initiatives to introduce single regulatory framework within the EU in order to establish common rules concerning airport charges, no regulation had been passed until recently. Until that time other more general regulation (e.g. competition law) was in use regarding airport charges. Finally Directive 2009/12/EC of the European Parliament and of the Council on airport charges entered into force on 15 March 2009 and was expected to be implemented by member states by 15 March 2011. As a compromise between airport managing companies or operators and air carriers the Directive is fairly general. However it sets some rule that should be obeyed regarding airport charges. The most important one is the non-discrimination rule, however modulation is allowed provided it is relevant, objective and transparent (article 3 of the Directive) [4].

Moreover under the Directive consultation on airport charges, services provided and new infrastructure projects should be held on a regular basis between airports and airport users. Any changes in airport charges rates or calculation rules to be introduced by the airport operator should be submitted to airport users no later than four months before they enter into force (article 6 (2) of the Directive).

Another important provision of the Directive is the requirement of transparency of all rules and action regarding airport charges (article 7 of the Directive). Sample information to be provided includes:

- The methodology used to set airport charges
- The revenue collected from different charges with regard to the costs incurred by providing services covered by these charges
- The overall cost structure to provide specific facilities and services with regard to airport chares collected for them
- Estimated influence of the proposed investment projects on airport capacity, and other

Now, after the Directive has been implemented, all airport must comply with its provisions. Airport charge systems applied at the airports presented below meet these requirements.

3.Comparing airport charges – scope and methodology

In order to identify factor influencing airport charges as well as pricing patterns a set of airports was selected so that there is some differentiation between them:

- Brussels National (BRU) – the main airport of Belgium and hub of SN Brussels airlines;
- Charleroi (CRL) – a low-cost airport in Belgium serving Brussels mainly; Ryanair's operating base;
- Rome Fiumicino (FCO) – the main airport for Rome, Alitalia's hub;
- Rome Ciampino (CIA) – Fiumicino's counterpart for LCCs; Ryanair's operating base;
- Helsinki Vantaa (HEL) – the main airport of Finland, hub for Finnair;
- London Heathrow (LHR) – the largest airport in Europe in terms of passenger numbers, British Airways' hub and primary operating base for Virgin Atlantic;
- Stansted (STN) – low-cost airport of London agglomeration; main operating base for Ryanair as well as for other LCCs in Europe;
- Prague (PRG) – the largest airport in Czech Republic, Czech Airlines' hub;
- Riga (RIX) – the main airport of Latvia, hub of hybrid airline Air Baltic;
- Warsaw Chopin (WAW) – the largest airport in Poland, hub of LOT Polish Airlines.

The airports selected differ widely in terms of the volume of traffic, airlines' business models, localization and so on. However, they do have common features too and upon this basis conclusions regarding regularities will be drawn. Following is the table presenting traffic volumes at the airports selected (table 1). Only EU airports were included in the analysis to ensure comparability within single regulatory framework and similar economic conditions.

Tab. 1. Passenger traffic volumes at selected European airports in 2012.

Airport	IATA code	Traffic (thousand pax) [2012]
Brussels National	BRU	18 971
Charleroi	CRL	6 516
Rome Fiumicino	FCO	37 063
Rome Ciampino	CIA	4 499
Helsinki Vantaa	HEL	14 858
London Heathrow	LHR	69 985
London Stansted	STN	17 473
Prague	PRG	10 808
Riga	RIX	4 768
Warsaw Chopin	WAW	9 567

Source: Respective airports' websites.

Despite the above differences there are some common characteristics shared by sub-groups. First, there is a group of airports that cater mainly to legacy carriers: BRU, FCO, HEL, LHR, PRG, WAW. This can be subdivided further by size into large hubs like LHR and FCO, medium sized hubs like BRU and HEL and small hubs: PRG and WAW. There are airports that serve LCCs only: CRL, CIA, STN (RIX couldn't be placed in this group although Riga-based Air Baltic is consider a low-cost carrier by some, however this airline pursues a business model of a hybrid airline that combines characteristics of both LCC and NLC business models). Of course, one airport can belong to more than one group.

Generally, airport charges can be categorized into two main groups: airside and landside charges. These categories can be further subdivided and this subdivision can differ a lot depending on charge patterns applied by particular airports. However most airports follow the pattern where airside charges comprise landing charge, environmental charges, boarding bridge charge, parking charge and other airside charges, while landside charges comprise passenger charge, security charge and other landside charges. This approach has been adopted in this research paper. Some clarification of the above categories should be provided before we proceed to describe the airports one by one.

Some charge categories require explanation as their names may be ambiguous or they may be understood or interpreted differently.

Landing charge includes all charges applying directly to aircraft movements, i.e. landings and take-offs. This charge may be collected on landings only or on both landings and take-offs.

Environmental charges generally apply to noise emissions, but at some airports they may be collected on NOx emissions too.

"Other airside charges" comprise charges on services available at apron, especially ramp handling. These charges are often included in other charges, usually landing charge or passenger bridge charge.

"Other landside charges" comprise all charges collected on a passenger basis and connected directly with the passenger. Specifically these include the use of check-in counters and kiosks, baggage handling fees, CUTE (Common Use Terminal Equipment), and other passenger handling fees. These fees were included in the calculations where applicable for consistency as at some airports they are not enumerated separately and charged jointly with passenger charge.

Most airport in the European Union collect **PRM charge** that is used for financing assistance to passengers with reduced mobility. In this paper it is considered jointly with passenger charges.

The aim of this research paper is to compare airports in terms of airport charges they collect. Because some airport may, for example, keep passenger charges low and inflate landing charges, or the other way round, a comprehensive approach is required. Therefore the comparison will be based on specific aircraft types:

- Bombardier Dash Q400 (DH8D),
- Embraer 170-200 (E175),
- Boeing 737-800 (B738),
- Boeing 787-8 Dreamliner (B788).

Such selection consists of different aircraft in terms of operational specifications. There is a regional turboprop aircraft (DH8D), small regional jet (E175), short- to medium-range airliner (B738) and wide-body long-range airliner (B788).

The following assumptions were made:

Assumption 1. All airport charges collected for the above aircraft types are analyzed globally according to schedules presented in section "Charges applied by airports".

Assumption 2. If some charges have not been published it is assumed they are not collected or are included in other categories of charges.

Assumption 3. DH8D, E175 and B738 aircraft perform intra-European or Schengen/EEA flights, while B788 performs flights outside Europe/Schengen/EEA.

Assumption 4. All aircraft are served by boarding bridges, only DH8D are parked on remote stands. This aircraft is very rarely connected to jetways in regular operations.

Assumption 5. For each flight two check-in counters are used for two hours each.

Assumption 6. Each passenger checks one piece of luggage in.

Assumption 7. In case no round-up rules for MTOW (one of the factors used in most calculation algorithms of landing charges) are specified in the pricelist the exact MTOW is considered in the calculations.

Assumption 8. All automatically applied discounts, like transfer/transit passenger discount or domestic passenger discount, are taken into account. Other discounts that depend on the volume of traffic or are designed to promote new routes or traffic increase are excluded.

Assumption 9. All charges are expressed in EUR. In case of airports that quote charges in different currencies ECB exchange rate as of August 1 was applied to convert them to EUR.

Assumption 9. If the rates for any services are differentiated according to peak and off-peak times, peak-time rates are taken into account in the calculations.

In order to compare airport charges all the algorithms for calculating airport charges were coded in MS Excel spreadsheet. Figure 1 shows the screenshot of the interface in which cumulative airport charges are displayed.

This tool makes it possible to compare airports based on global (overall) charges they collect from airlines. It allows to modify the value of passenger load factor (the percentage of seat capacity actually filled) as well as the share of transfer passengers. This feature is useful then analyzing airports depending on specific characteristics – whether they prefer point-to-point or hub-and-spoke carriers or whether they offer better value for airlines with high or low seat capacity utilization.

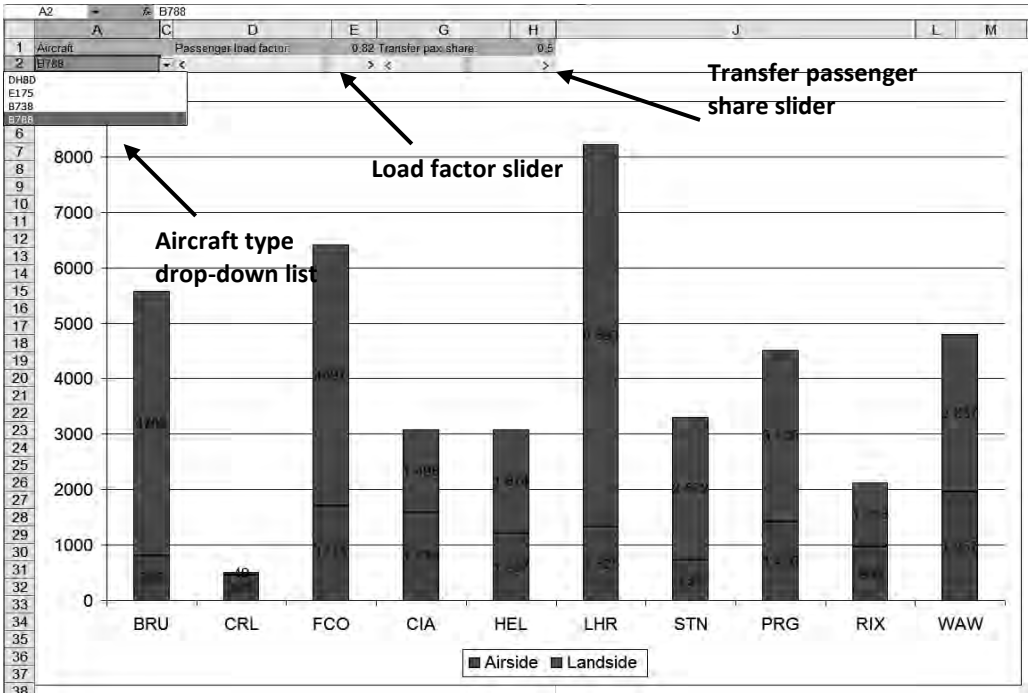

Fig. 1 *The interface of airport charges comparison tool*

Due to the limitations placed on the length of the paper only charts with charges for one aircraft type (Embraer 175) will be presented, although conclusions were made upon analysis of all four aircraft types mentioned above.

4.Comparative analysis of airport charges

The comparison of airport charges collected at ten selected airports showed vast differentiation of costs levied on airlines depending on an airport. However some patterns have been identified for different groups of airports.

In terms of airside charges (comprising landing, environmental, parking, boarding bridge and other airside charges) on average the most expensive airports were big hubs like London Heathrow and Rome Fiumicino (see figure 2). Also Warsaw Chopin airport collected high airside charges, which is not supportive for Warsaw-based LOT Polish Airlines and proves there is little cooperation between the airport and its main customer. On the other end of spectrum were small- to medium-sized hub airports like Riga and Helsinki Vantaa that strictly cooperate with their main customers – AirBaltic and Finnair (respectively). In terms of airside charges low-cost airports (like London Stansted, Brussels Charleroi or Rome Ciampino) are not the cheapest ones but still charge low rates reasonable enough to attract LCCs.

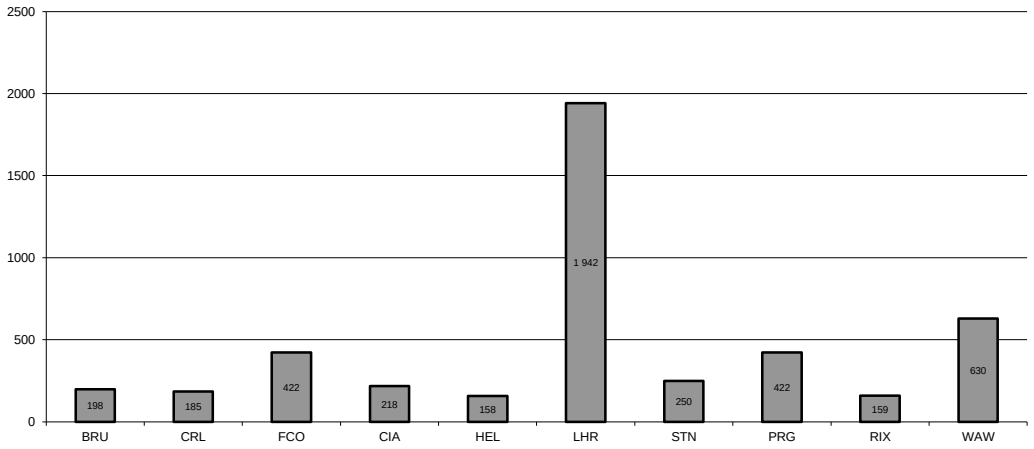

Fig. 2 *Airside charges in EUR (landing, environmental, parking, boarding bridge, other landside charges) for Embraer 175 aircraft*
Source: based on airports' pricelists.

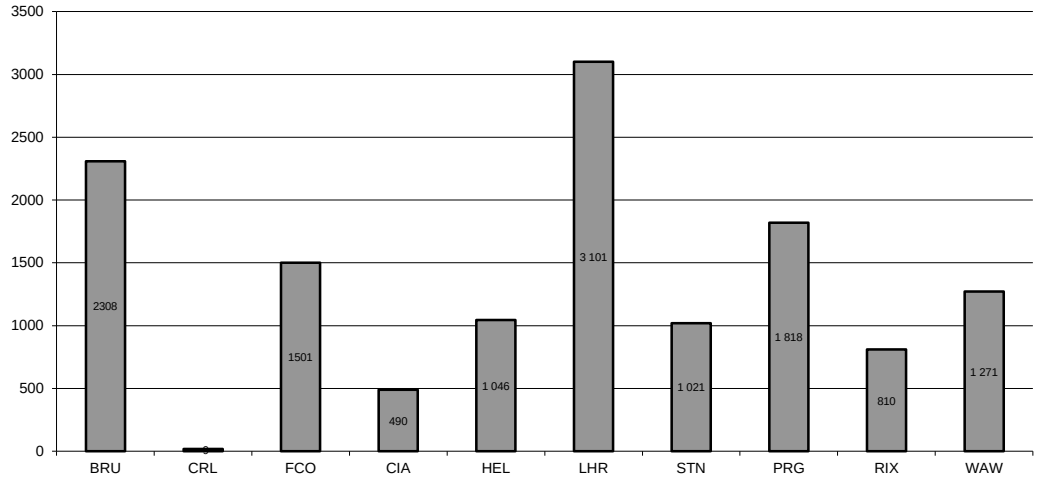

Fig. 3 *Landside charges in EUR (passenger charge, security charge and other airside charges) for Embraer 175 aircraft with 100% load factor and no transfer traffic*
Source: based on airports' pricelists.

When considering landside charges for point-to-point traffic (see figure 3) not surprisingly low-cost airports offer the lowest rates as their prime goal is to serve LCCs that operate the point-to-point business model. The highest rates are charged by big hubs and small- to medium-sized hub airports (Warsaw Chopin and Prague) collect somewhat

lower charges. Riga and Helsinki Vantaa airports are exceptions here as their rates are similar to those charged by low-cost airports (Rome Ciampino and London Stansted).

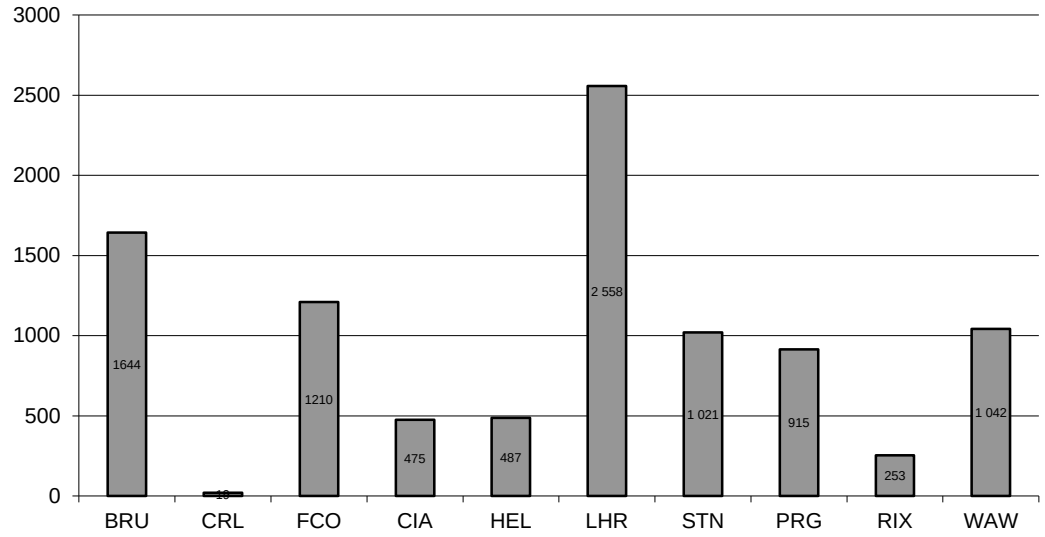

Fig. 4 *Landside charges (passenger charge, security charge and other airside charges) for Embraer 175 aircraft with 100% load factor and 100% transfer traffic.*
Source: based on airports' pricelists.

The comparison of landside charges for transfer traffic (figure 4) shows again a similar pattern like above but with smaller discrepancy between airports catering to network legacy carriers and the ones that are focused on LCCs. This is because all transfer-traffic oriented airports offer discounts on passenger and other landside charges for such traffic, while low-cost airports do not. The comparison of transfer traffic discounts shows that this kind of traffic is given the greatest support at Riga and Helsinki Vantaa airports (see figure 5). This proves there is strict cooperation between these airports and airlines based there to develop hub airports and airlines that are focused on carrying mostly transfer traffic. Prague can also be included in this group as it offers more than 60% discount compared to point-to-point charges. Large hubs offer significantly lower discounts – usually in the range od 20-30 per cent since they have much more diversified customers and do not have to rely on a single hub-and-spoke airline. Warsaw Chopin airports also established such pricing rules, although it is a rather small regional hub that relies largely on the Polish national carrier LOT. This shows cooperation to develop a hub in Warsaw is still to be achieved between Warsaw Chopin airport and LOT Polish airlines. This would allow for much faster and healthier growth of both entities.

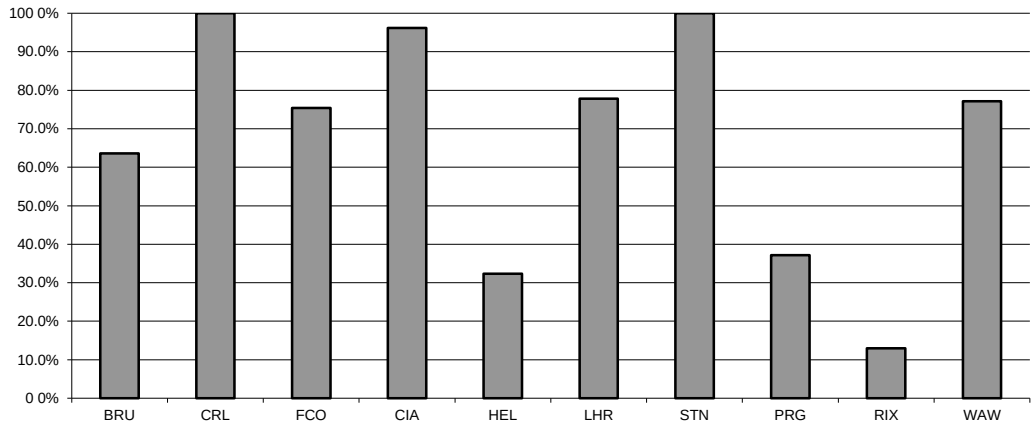

Fig. 5 *Average landside charges in case of 100% load factor and 100% transfer traffic relative to landside charges with 0% transfer traffic (point-to-point traffic only). Source: based on airports' pricelists.*

In terms of cumulative charges (airside and landside charges combined) calculated for conditions similar to the real operational ones – load factor 75% (85% in case of long-haul Boeing 787-8 aircraft) and 50% share of transfer traffic – the most expensive airports are large European hubs, but Warsaw Chopin and Prague airports follow closely (see figure 6). The lowest charges for the described conditions were collected by low-cost airports and small- to medium-sized European hubs that cooperate strictly with airlines to build a hub. Riga and Helsinki Vantaa are equally as competitive as airports catering mainly to low-cost carriers. Generally low-cost oriented airports charge much lower rates than their counterparts used by network legacy carriers. This difference can be as large as one to ten.

Apart from the regularities described above a general observation can be made. Large hub airports collect the highest charges followed by small- to medium-sized regional hubs. The least expensive airports are those that are used by LCCs. However there are exceptions to this rule. Regional hubs that are growth-oriented strictly cooperate with airlines and keep their charges low to promote traffic growth. This places them among low-cost airports charges-wise. On the other hand low-cost airports serving attractive areas like London Stansted usually charge more than smaller hubs.

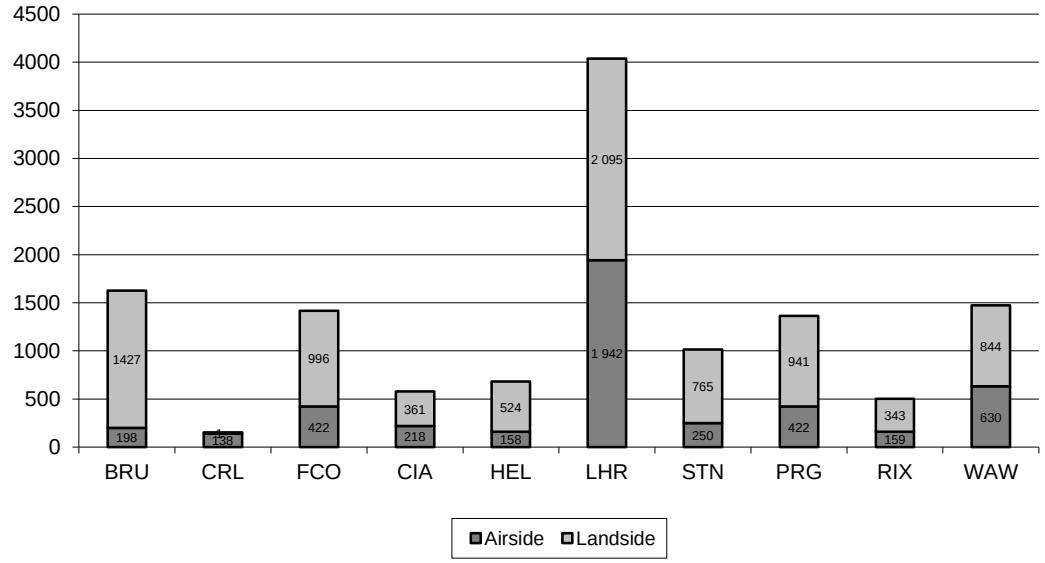

Fig. 6 *Airport charges for Embraer 175 aircraft (load factor 75% and transfer traffic share 50%).*

Source: based on airports' pricelists.

Small airports, especially those located further from cities that cater mainly to low-cost traffic, are aware they have to offer better economic accessibility to airlines through keeping airport charges at low levels in order to attract airlines and foster traffic growth. They lack many advantages that are offered by other airports serving NLCs mainly and low airport charges are the only means of stimulating development.

5. Conclusions

Although airport charges have to follow the same rules and guidelines established by ICAO (globally) and European Commission (in the European Union) they vary tremendously as aviation international organizations are still to achieve standardization in this area [5]. Moreover some airports do not collect some charges, even as common as the passenger charge (Brussels Charleroi). However, all charges that are collected by airports can be easily allocated to several basic categories. This should be attributed to the aforementioned common regulatory framework.

In this paper charges were grouped into two basic categories of airside and landside charges and analyzed accordingly. Apart from this analysis cumulated charges were investigated too. Despite different pricing algorithms applied to airport charges calculation by each and every airport, there are some patterns that can be identified among airports.

Generally, the bigger the airport, the higher are the charges it collects. However, there are exceptions to this rule. Helsinki airport that is larger than both Prague and

Warsaw airports collects lower charges than the latter two. This is due to strict cooperation between Helsinki Vantaa airport and Finnair who work actively to develop a Finnair hub at Helsinki airport.

The lowest charges are collected by low-cost airports, although LCC airports that serve attractive areas charge relatively higher fees (like London Stansted). On the other hand, these airports do not offer discounted fees for transfer traffic. Comparison of landside charges collected from point-to-point and transfer passengers showed that only airports that focus on hub-and-spoke airlines offer such discounts. In case of well-established European hubs they are ca. 30 per cent, while smaller hubs that still need to attract other airlines and promote transfer traffic in order to develop offer significantly higher discounts ranging from 60 to 80+ per cent.

The research showed that airports that established close cooperation with airlines (using these airports as hubs) collect significantly lower fees than other comparable airports that are in less intensive relations with airlines. This applies to both airside and landside charges as well as is reflected in relatively higher discounts in passenger and security charges for transfer passengers.

This research can be considered preliminary as it included ten airports only. However it shows a wider analysis, possibly involving a broad sample of all European airports serving more that for example 3 million passengers, would be of great scientific value to identify regularities in airport charges as well as factors that determine how high these charges are.

Submitted: 24.01.2014

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Summary

Airport charges – pricing patterns at selected european airports

Adam Hoszman, Ivo Drahotský

The paper analyses the differentiation of airport charges as well as is aimed at the identification of regularities and factors influencing these charges. A set of ten airports was analyzed with different operational parameters (load factor, transfer traffic share) applied to different aircraft in order to analyze airport charges with regard to the policy of a a given airport towards point-to-point and transfer traffic. Airside and landside charges were analized separately, but cumulative charges were investigated too. Based on the result of this analysis conslusions were made according to the regulatities that can be observed among airports in terms of airport charges. This research can be considered preliminary and shows the need for further investigation of the problem based on a wider sample of airports.