

Malina, Robert; Albers, Sascha; Kroll, Nathalie

**Working Paper**

## Airport incentive programs: A European perspective

Working Paper, No. 107

**Provided in Cooperation with:**

University of Cologne, Department of Business Policy and Logistics

*Suggested Citation:* Malina, Robert; Albers, Sascha; Kroll, Nathalie (2011) : Airport incentive programs: A European perspective, Working Paper, No. 107, University of Cologne, Department of Business Policy and Logistics, Cologne

This Version is available at:

<https://hdl.handle.net/10419/59791>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*

# Working Paper Series

DEPARTMENT OF BUSINESS POLICY AND LOGISTICS

*Edited by Prof. Dr. Dr. h.c. Werner Delfmann*

Working Paper 107

## Airport incentive programs – A European perspective

### Authors

Robert Malina

Sascha Albers

Nathalie Kroll



Malina, Robert; Albers, Sascha; Kroll, Nathalie: Airport incentive programs – A European perspective  
Working Paper 107 of the Dept. of General Management, Business Policy and Logistics, University of Cologne, Cologne, 2011

Malina, Robert; Albers, Sascha; Kroll, Nathalie: Airport incentive programs – A European perspective  
Arbeitsbericht 107 des Seminars für Allgemeine Betriebswirtschaftslehre, Betriebswirtschaftliche Planung und Logistik der Universität zu Köln, Köln, 2011.

#### **Authors/Autoren**

*Dr. Robert Malina*  
University of Münster  
Institute of Transport Economics  
Am Stadtgraben 9, 48143 Muenster, Germany  
Tel. +49 251 83-22901, Fax -28395  
E-mail: robert.malina@wiwi.uni-muenster.de

*Dr. Sascha Albers*  
University of Cologne  
Dept. of Business Policy & Logistics  
Albertus Magnus Platz, 50923 Köln, Germany  
Tel. +49 221 470-6193, Fax -5007  
E-mail: albers@wiso.uni-koeln.de

*Dipl.-Volkswirtin Nathalie Kroll*  
Osterkamp 6  
26209 Kirchhatten, Germany

All rights reserved.  
© the authors, Cologne, 2011

#### **Bezugsadresse**

Universität zu Köln  
Seminar für Allgemeine Betriebswirtschaftslehre,  
Unternehmensführung und Logistik  
Albertus-Magnus-Platz  
D-50923 Köln  
Tel.: +49 (0)221 470 4316  
Fax.: +49 (0)221 470 5007  
E-Mail: spl@wiso.uni-koeln.de

# **AIRPORT INCENTIVE PROGRAMS**

## **- A EUROPEAN PERSPECTIVE**

**Abstract:** In this paper we investigate current pricing practices at the 200 biggest airports in the European Union. Our analysis shows that airport incentive programs are, in general, a common tool of airport pricing as they are used at one third of all airports. We also find evidence on the presence of bilateral agreements between airport operators or regional authorities on one side and airlines on the other side which serve as a substitute for published incentive programs. Geographically, usage of the different tools varies substantially between different EU countries. A detailed assessment of the incentive schemes offered at German airports within our broader European sample reveals that the average level of landing and take-off, parking and positioning and passenger charges is generally reduced by more than 10%, at smaller airports even by up to 44%. Given the usually low profit margin of airlines and that airport charges account for up to 10% of total operating costs, these incentives can have an important influence on the economic viability of a route. Moreover, in an airline's multi-criteria-based assessment of potential market entries or route expansions, such incentive schemes might compensate selected weaknesses of an airport's strategic posture.

**Keywords:** Air Transport, Airports, Pricing, Management, Regulation

## INTRODUCTION

Traditionally, airports perceived themselves as passive providers of infrastructure and did not actively try to stimulate demand for their services. During the last decades, however, airports have discovered the need for encouraging airlines and passengers to make use of their facilities. Airport marketing has, therefore, become an important part of airport management (Graham, 2008). The reasons for the ever increasing market focus of airports are multifaceted. As many airports have been (partially) privatized, the management of these airports is driven by their private shareholders to generate profits in order to increase stock prices and being able to pay dividends. But fully public airports are also showing higher interest in generating demand. Faced with raising public deficits and severe budget constraints, public bodies are becoming more reluctant to offset losses incurred by their airports, which, in turn, are obliged to show higher cost and revenue awareness. Public airport owners, moreover, are also no longer oblivious to the importance of route, passenger and cargo growth for enhancing the development of regional economies. In addition, irrespective of ownership structure, ongoing liberalization of the downstream markets has increased pressure from airlines striving for lower charges and better quality, threatening to switch to other airports and therefore leveraging competition among them.

Airport incentive schemes are one instrument to better align airports' strategic development aims and airline scheduling and network planning decisions. They have been introduced by airports throughout the world as a means for generating additional demand for airport facilities and services. With these programs, airports offer discounts on certain fees, bonus payments or joint marketing initiatives for a limited period of time to airlines, which in turn introduce new routes or generate passenger or cargo growth. Alternatively, airports might also bilaterally agree on certain growth commitments and incentive payments, or local and regional governments could engage into such agreements with airlines. Incentives, generally, are an important factor of airline's choice of airports, especially for low-cost airlines (Warnock-Smith and Potter, 2005).

From a regulatory perspective, incentives offered to airlines via public funds have been a concern of European competition policy for years, as they might constitute state aid and distort competition and trade in the European Union. All agreements which involve public entities might, therefore, become subject to EU investigations. To date (summer 2011), the commission has investigated alleged state aid by granting incentives to airlines in 19 cases with six cases still pending approval.

There is some literature on the general legislative background and the application of the rules on incentives and state aid (for example Lepièce, 2011 and 2007) as well as on case-studies (for example Barbot, 2006 and Kerber and Groeteke, 2004). However, scholars have yet been hesitant to study the actual incentive programs implemented within the European Union in detail. Especially, the forms these incentive schemes take in practice, their prevalence as well as their monetary importance, i.e. their scale, are not yet well understood.

This paper intends to bridge this gap: We analyze prevalence, type and scope of different dedicated incentive programs in the European Union, clarify the economic rationale and legal background for introducing them and, based on data obtained from German airports, give insight into the monetary scale of the incentives offered. In doing so, this paper sheds light onto a hitherto widely neglected phenomenon of airport business practices and establishes an empirical basis for subsequent analyses on why and to which effect airports use specific types of pricing schemes.

The remainder of the paper is structured as follows. The following section briefly describes the legal background for airport incentive schemes in the European Union and discusses the economic rationale of implementing them. The third section classifies the schemes based on a comprehensive analysis of the 200 biggest airports in the European Union and gives insight into the prevalence of different provisions. Section four discusses empirical evidence from one sample country (Germany) on the scale of incentives offered. Section five concludes.

### **Legal Background and economic rationale of airport incentives programs**

Like in the US (Federal Aviation Administration, 2010), airport incentives schemes in the European Union are, generally subject to government regulation. In 2005, the European Commission issued “guidelines on the financing of airport and start-up aid to airlines departing from regional airports” (European Commission, 2005), which are currently being considered for revision by the EC (European Commission, 2011). The guidelines were a reaction to the legal and political dispute over the bilateral agreement between low-cost operator Ryanair and Charleroi airport on the reduction of charges and financial support to Ryanair in exchange for Ryanair’s agreement to base aircraft at the airport (Barbot, 2006). They are not part of EU legislation, but aim at offering clarification as to which kind of provisions within airport incentive programs are covered by EU legislation on competition – mainly Art. 107 TFEU (ex. Art. 87 TEC) – and which provisions are not. The guidelines apply to incentives offered by

airports as well as by public authorities such as local or regional governments and no distinction is made between the two as long as public money is spent.

The guidelines state that public airports with *less* than 5 m. passengers per year are generally allowed to offer transparent and non-discriminating incentives to airlines for additional traffic. However, the financial support to airlines must be strictly linked to and must not exceed the extra start-up costs airlines incur for these services. Support should be limited to three years, generally, and should decrease during its duration. The guidelines also give approval to airport discount schemes for public airports with *more* than 5 m. passengers per year if the airport is able to substantiate that the scheme will increase long-term profitability. Privately owned airports, while generally covered by the guidelines, are free to design and introduce whatever incentives they like, as long as these are not financed by public funds from, for example, regional authorities.

From an economics perspective, airport incentive programs can be regarded as price discrimination. Price discrimination may be defined as a pricing structure, in which two or more similar products which have the same marginal cost to produce are sold at different prices (Stigler, 1987). Marginal costs of core aeronautical services such as runway, taxiway apron and terminal provision and supervision obviously are not dependent on whether an additional aircraft movement occurs on a new route or on an already served route, so there is no justification for distinguishing between the two from a cost perspective. If incentives lead to additional aircraft or passenger throughput which would not have occurred without the scheme, a certain reduction of charges might reflect economies of density in airport provision or operations, which appear to be present for smaller airports (Pels, 2000; Salazar de la Cruz, 1999). However, actual incentives offered for incremental traffic are larger than they could be explained by cost differences (see section four).

Within airport incentive schemes, charges for aeronautical services are differentiated according to the nature of traffic: Airlines introducing new routes, adding capacity, increasing load factors or increasing passenger volumes are charged with lower fees than other airlines or are offered promotional payments, which also reduce airline costs for offering services from the airport.

It can generally be assumed, that airport management tries to charge different prices for similar services in order to increase profits. In the traditional literature on price discrimination for infrastructure services it has been widely perceived that profits increase only as long as the price charged to every customer at least covers marginal costs (see for example Varian, 1985). Newer work on airports, however, shows that it might even be profit-enhancing to

charge some customers below marginal costs. Drawing upon Rochet and Tirole (2003), Gillen (2011), for example, regards airports as two-sided platforms that generate revenues from both airlines and passengers. Losses incurred in the airline-airport market – the so called aviation market – due to prices lower than marginal costs, could possibly be offset by additional profits in the airport-passenger (or non-aviation) market. Lower aviation charges lead to lower airline costs and if passed through to the consumers, lower airfares and higher passenger throughput, which, in turn, increases non-aviation profits (Starkie, 2001).

As shown above, incentives offered to airlines in the European Union generally are subject to government regulation which limits their duration. Under this framework, the incentive schemes are only able to increase airport profitability in the long-run, if carriers continue to offer the same, or at least a similar amount of services after the discounts or bonus payments have ended as when they were benefiting from the program. Such an “adhesive effect” might, indeed, exist, because the incentive program gives carriers the opportunity to develop new markets or increase market penetration by increasing frequency or aircraft size at a lower financial risk. Once the services have been established in the market, the carrier might be able to continue them even if the incentives end. Moreover, if the incentive-induced introduction of services from a particular airport has led to relationship-specific investments by an airline, this airline might incur switching costs (Farrell and Klemperer, 2007) if it wants to terminate the services once the incentives stop. Relationship specific investment could be present due to investment into maintenance facilities, terminals, route networks (if slots are scarce) or marketing efforts of the airline for routes from this particular airport (Fuhr and Beckers, 2009). Comprehensive empirical evidence, however, on whether and under which conditions adhesive effects do really occur, is hitherto still lacking.

Even if airport incentive schemes do not increase airport’s profitability, their introduction can, nonetheless, be reasonable from a perspective of regional policy-makers. Connectivity by air plays an important role for the development and growth of regions (Lohmann et al., 2009). High quality connectivity reduces transport costs and, therefore, gives access to new markets, leads to additional factor flows into the region and increases the competitiveness of companies located in that region, which, eventually, leads to more growth and employment within the region (Van den Berg et al., 1996). Policy makers can try to encourage airlines to increase connectivity by offering them incentives in the form of airport discount schemes through a publicly controlled airport.

It is sometimes argued that these additional regional effects would not constitute “on-top effects” which would increase overall national growth and employment, but would just



shift output and employment from one region to another (see for example Heymann, 2005 and Deutsche Lufthansa, 2010). Following this argument, airport discount schemes would be ineffective and if public money is used in order to finance them, a waste of public funds. The question as to the true nature of the growth effects can only be answered empirically. Although much work has already been done on measuring the positive effects of air transport for regional economies in general (see for example Brueckner, 2003; Green, 2007 and Percoco, 2010), quite surprisingly, there is only scarce evidence for on-top-effects or shift-effects available at present. In a conference paper, Forsyth (2006) uses a computational equilibrium model in order to simulate the effect of airport subsidies for Australia, which lead to lower airport charges, on regional and national welfare. He finds that a region offering subsidies can possibly increase its welfare while all other Australian regions lose, even if they are not directly affected by the subsidies. However, no clear picture emerges from his analyses as to whether the nation as a whole gains or loses welfare.

### **Classification and prevalence of airport incentive schemes in the European Union**

No comprehensive analysis exists to date on the prevalence and content of airport incentive schemes. Focusing on Europe, we gathered information on the charges and possibly incentives system directly from airport sources such as airport websites, annual reports or from national aeronautical information publications. We assessed the 200 biggest airports in the European Union based on total passenger numbers in 2009 excluding airports of French overseas counties. Traffic figures for all airports were obtained from the online database of the statistical office of the European Union, Eurostat. The biggest airport in the sample is London Heathrow (66.2 mio. passengers in 2009), the smallest Clermont-Ferrand airport (0.4 mio. passengers). The sample, therefore, does not only take into account all primary and secondary airports in the EU but also more than 120 tertiary airports with less than 3 Mio. passengers annually (see Annex 1 for a list of airports screened). For all but eight airports information on pricing and incentive schemes could be obtained.

One third of the airports analyzed (66 of 200) have introduced airport incentive schemes as defined in the previous section. However, this does not imply that the remaining airports do not offer any incentives to airlines for generating growth. Dedicated airport incentive programs are only one facet of inducing airline growth. Alternatively, airports could, for example, also enter in bilateral agreements with an airline in which the airline commits to a certain level of operations for which the airport grants discounts or promotional payments. Moreover, growth at some airports might also be initiated by bilateral agreements between

regional authorities and airlines, in which the authorities guarantee fixed payments in return for airline growth commitments.<sup>1</sup>

We also investigated the prevalence of these bilateral agreements and found evidence for airport-airline agreements at 33 (17 % of all airports) and for authorities-airline agreements at 26 airports (13 %). At many Spanish airports, for example, agreements have been made between air carriers and regional governments in which the airline is offered certain payments in return for increasing traffic at the local airport. A recent report estimates these payments to be quite substantial, amounting to 31 Mio. EUR for mainland Spanish airports in the year 2010 (Marimon, 2010). The number of bilateral agreements discovered, can, however, only serve as a lower bound of the actual prevalence of these agreements, as the presence of an agreement is often not disclosed officially. We, therefore, had to rely on secondary sources such as newspaper articles or investigations of the European Commission on state aid, so that we might have missed agreements which have not been discussed in public or have not been subject to EU attention. As a consequence, the provisions of these agreements cannot be studied in detail.

Table 1 shows that the general prevalence of incentives offered does not vary substantially between airports of different sizes but stays within the 55% to 74% range. However, the incentives are established by different means. While large airports with more than 10 Mio. passengers almost exclusively employ published airport incentive programs, medium sized and small sized airports rely as strongly on bilateral agreements as on official incentive programs. This discrepancy might be explained with different importance of transaction costs for different airport categories. All airports are faced with a choice between one-time implementation costs for published incentive programs and every-time bargaining costs. For small airports, the costs of setting up a dedicated incentive program might be relatively high in comparison to bargaining with a couple of airlines which are interested into serving this airport. For larger airports which are attractive for a high number of airlines (because, for example, their catchment area is strong or code-sharing possibilities with other airlines are good) bargaining costs with airlines on certain provisions could become prohibitively high so that the introduction an incentive scheme which applies to all airlines might decrease transaction costs.

---

<sup>1</sup> In practice, governments also negotiate with airlines in order to choose a provider for routes on which a public service obligation (PSO) has been imposed. PSO routes cannot be provided profitably, but are believed to be important for the economic development of remote regions and, therefore, are subsidized (Williams and Pagliari, 2010). PSO agreements are not taken into account in this paper as they aim at providing basic air connectivity and not at incentivizing airline growth.

Airport size	airports	Incentives offered overall		official incentive program		bilateral agreements			
		abs.	in %	abs.	in %	airport-airline abs.	airport-airline in %	government-airline abs.	government-airline in %
> 10 Mio	27	18	66.7%	16	59.3%	0	0.0%	2	7.4%
3 Mio ≤ Airport ≤ 10 Mio.	55	41	74.6%	18	32.7%	12	21.8%	11	20.0%
< 3 Mio.	118	66	55.9%	32	27.1%	21	17.8%	13	11.0%
Sum	200	125	62.50%	66	33.3%	33	16.5%	26	13.0%

Note: Some airports employ more than one incentive, therefore numbers do not always add up.

**Table 1: Distribution of airport incentive programs and bilateral agreements according to airport size**

While airport incentive programs and bilateral agreements are a common tool of incentivizing airport growth, the absolute und relative importance of these tools for airport managers and regional authorities differ substantially throughout the European Union. *Table 2* breaks down the collected data to the national level.

Country	airports	incentives offered overall		official incentive program		bilateral agreement			
		absolute	relative	absolute	relative	airport-airline absolute	airport-airline relative	government-airline absolute	government-airline relative
AT	6	5	83%	3	50%	0	0%	2	33%
BE	2	2	100%	1	50%	1	50%	0	0%
BG	3	0	0%	0	0%	0	0%	0	0%
CY	2	2	100%	2	100%	0	0%	0	0%
CZ	2	1	50%	1	50%	0	0%	0	0%
DE	23	11	48%	9	39%	1	4%	1	4%
DK	4	2	50%	2	50%	0	0%	0	0%
EE	1	1	100%	0	0%	1	100%	0	0%
ES	27	22	78%	0	0%	5	19%	17	63%
FI	3	3	100%	3	100%	0	0%	0	0%
FR	26	24	92%	17	65%	6	23%	1	4%
GB	26	15	58%	6	23%	6	23%	3	12%
GR	11	1	9%	1	9%	0	0%	0	0%
HU	1	1	100%	1	100%	0	0%	0	0%
IE	4	4	100%	3	75%	1	25%	0	0%
IT	27	12	44%	3	11%	8	30%	1	4%
MT	1	1	100%	1	100%	0	0%	0	0%
NL	3	1	33%	1	33%	0	0%	0	0%
LT	2	1	50%	0	0%	1	50%	0	0%
LU	1	0	0%	0	0%	0	0%	0	0%
LV	1	1	100%	0	0%	1	100%	0	0%
PL	6	3	50%	3	50%	0	0%	0	0%
PT	5	5	100%	5	100%	0	0%	0	0%
RO	3	0	0%	0	0%	0	0%	0	0%
SE	8	6	75%	4	50%	1	13%	1	13%
SI	1	0	0%	0	0%	0	0%	0	0%
SK	1	1	100%	0	0%	1	100%	0	0%
Sum	200	125	62.5%	66	33.0%	33	16.5%	26	13%

Note: Some airports employ more than one incentive, therefore numbers do not always add up.

**Table 2: Distribution of airport incentive programs and bilateral agreements in EU countries**

Airport incentive programs are the dominant incentive vehicle in many EU countries such as France, Germany, Poland, Finland, Portugal and a lot of smaller countries. In Italy, airports usually do not establish official incentive schemes but engage into bilateral agreements, which can be found commonly in France and Great Britain, as well. Some Spanish airports have also made bilateral agreements. However, they primarily rely on regional governments closing deals with airlines.

Apart from Athens airport, no evidence on the presence of incentive programs or bilateral agreements could be found at Greek airports. The same is true for airports from some smaller countries such as Lithuania and Slovenia. However, as mentioned before, the lack of evidence does not necessarily imply that no incentives are offered at all but just that they are neither publicly disclosed nor discussed.

We have been able to get access to the details of all but three of the incentives schemes. After analyzing the content of these 63 programs we believe it is instructive to differentiate between (a) the *air service type*, (b) the *market specificity* of the program, (c) the *type of growth* to be promoted and (d) the *incentive mechanism* offered.

Concerning the *air service type*, schemes can cover passenger, cargo or both service segments. Airport incentive programs in the EU are usually directed at passenger, not cargo growth. This might indicate that most airports either do not have a strategic interest in dedicated air cargo services or that they know that their location or infrastructure is not suited for these services. All 63 airports have put in place a scheme that aims at the passenger market. Additionally, some airports such as Amsterdam, Athens and Prague also offer incentives for growth in air cargo. Overall 8 airports (13 % of all incentive program airports) have implemented rules on cargo growth.

Regarding *market specificity*, schemes might either aim at incentivizing general growth or growth in particular markets such as intercontinental markets or country-specific markets which are currently underserved from the airport. About 35 % of the airports (22 airports) have put in place special provisions for specific market segments. For example, Dublin airport offers dedicated incentives for long-haul routes while Vienna airport grants rebates for services to eastern European markets. Some airports such as Warsaw and Dublin have also put in place special provisions for generating growth of transfer traffic. The majority of airports (70 %, 44 airports), however, have established provisions for general growth.<sup>2</sup>

---

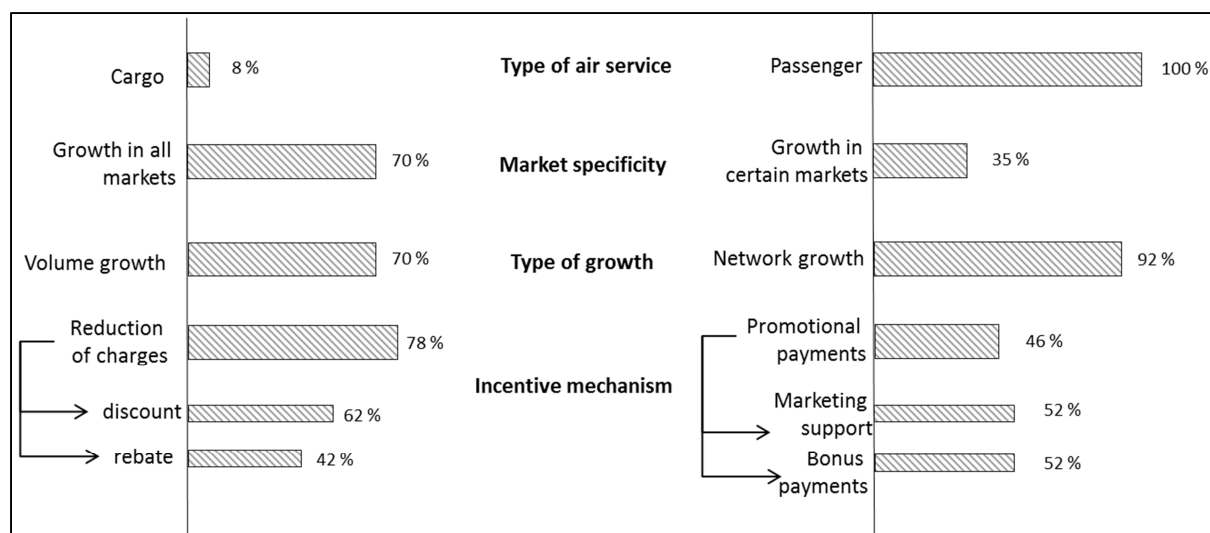
<sup>2</sup> The percentages do not sum up to 100, as some airports offer both dedicated incentives for certain markets as well as general incentives without restrictions on markets.

Irrespective of their aim, incentive programs contain different provisions according to the *type of growth* to be promoted. While schemes for volume growth offer incentives if passenger throughput of an airline increases or flight frequency or seat capacity is raised, schemes for network growth apply if services on new routes are started. Provisions for stimulating network growth can be found in all but five airports for which we were able to obtain detailed information on the program content (58 airports, 92 %). More than two thirds of the airports (44 airports, 70 %) have put in place provisions that reward volume growth.

The distinctions made above were all concerned with the scope of the scheme. It is, however, also feasible to differentiate between different *incentive mechanisms* used within the schemes. Two main types exist. The first is a reduction on airport charges, which might either come in the form of an ex-ante discount or in the form of an ex-post rebate on payments already made. Overall 49 airports (78%) reduce airport charges. 62 % of those airports rebate part of the charges ex-post after a flight period has ended. At 42 % of the airports charges are reduced ex-ante based on airline schedule or commitment to the airport and, if necessary, revised ex-post.<sup>3</sup> Examples for the former category are Innsbruck, Madeira and Hamburg airport, examples for the latter Copenhagen, Nice and Warsaw. The second type of incentives are promotional payments to airlines that realize route or passenger growth. Promotional payments are offered by 29 out of the 63 airports (46 %). They are either granted without earmarking – as in the case of Amsterdam, Duesseldorf and 13 other airports (52 % of all airports offering promotional payments) or specifically aimed at financing a part of airline's marketing efforts. Such marketing support is offered at 15 airports (52%), for example Budapest and Lyon. Again, it should be noted that some airport programs contain both a reduction of charges and promotional payments. *Table 3* provides an overview on the prevalence of the different provisions.

---

<sup>3</sup> Again the individual percentages do not sum up to 100 as some airports offer both rebates and discounts depending on the scope of incentive concerned.



Note: Some airports employ more than one incentive, therefore numbers do not always add up.

**Table 3: Prevalence of provisions in airport incentive programs in the European Union**

### Empirical evidence on prevalence and scale from Germany

We now carry out a more detailed assessment of airport incentive schemes and, especially, give insight into the monetary scale of the incentives offered. Our sample country for this analysis is Germany, which is the biggest air transport market in continental Europe and whose airports frequently make use of airport incentive programs. We look at the pricing structures of 23 German airports that are part of our broader European sample.

While all German sample airports differentiate their structure of charges according to different customers or market segments, ten airports introduced genuine incentive schemes as defined in this paper. As all 10 airports are at least partially publicly owned, the incentive provisions are subject to European rules on state aid.

Germany’s two main hubs and biggest airports Frankfurt Main and Munich airport have not introduced incentive schemes. However, incentive schemes are not limited to minor German airports as the third to fifth biggest sites (Duesseldorf, Tegel and Hamburg) have put in place provisions in order to facilitate growth. Dortmund airport started its incentive program in 2004, offering substantial discounts on airport charges and paying cash marketing support to airlines starting new routes. The program was limited in duration to summer 2009, however, and no follow-up scheme was introduced, so that since then, only nine German airports still use incentive schemes.

Classification		DUS	FKB	HAI	HAM	HHN	LBC	SCN	SXF	TXL	
Air service type	Passenger	x	x	x	x	x	x	x	x	x	
	Cargo	-	-	-	-	-	-	-	-	-	
Market specificity	General growth	x	x	x	x	x	x	x	x	x	
	Certain markets growth	x	-	-	x	-	-	-	x	x	
Type of growth	Volume growth	x	-	-	-	-	x	-	x	x	
	Network growth	x	x	x	x	x	-	x	x	x	
Incentive mechanism	Charges reduction	Discount	-	x	-	-	-	x	x	-	-
		Rebate	-	-	x	x	-	-	-	x	x
	Promotional payments	Marketing support	-	-	-	-	x	-	-	x	x
		Bonus payments	x	-	x	x	-	-	-	-	-

**Table 4: Prevalence of airport incentive programs in Germany and provisions**

We employ our scheme developed above and first broadly classify the programs (see table 4). Concerning the air service types, all programs are restricted to the passenger market; there are no provisions in any scheme especially tailored to air cargo. All airports aim at incentivizing general growth, with Duesseldorf, Schoenefeld, Tegel and Hamburg having put in place additional incentives for intercontinental markets. Luebeck and Saarbruecken also aim at attracting new carriers to the airport as they offer incentives to newcomer airlines starting flights on already served routes, as well. Concerning the type of growth incentivized all airports but Luebeck reward the introduction of new routes while three airports also reward growth of passenger volumes. Luebeck airport only rewards passenger growth. Seven airports use a reduction of airport charges as incentive mechanism, four offering rebates and three discounts. Six airports use promotional payments of which three each offer marketing support and bonus payments.

Using the official schedules of charges and published information on incentive programs we are able to assess the scale of discounts offered at German airports. The reduction is calculated as the decrease in percentage between the standard and the discounted level of charges. As incentives granted gradually decrease over time in most programs, the average yearly reduction throughout the incentive period is calculated. Marketing support and bonus payments are also taken into account. Like discounts and rebates on charges, they reduce the financial burden of an airline and are, therefore, disclosed as the yearly average relative decrease of standard airport charges, as well. For airports offering several incentive schemes, the relative reduction is calculated separately for each program as all programs which could be used for calculations are mutually exclusive. In order to reduce complexity, only landing /

take-off charges (excluding noise and NOx surcharges), passenger charges and parking / positioning charges are included. Duration of the incentives offered and potential degression are taken into account. See Annex 2 for details on the calculations. At Berlin Schoenefeld and Tegel, the relative scale of cash marketing support for new long-haul routes could not be assessed as the provisions of the program are not publicly accessible. The results of the calculations are presented in table 5.

The table shows that incentive programs at all airports substantially reduce the level of charges. The highest relative decline (44 %) can be realized at Hanover airport for the introduction of a new route. With the exception of Tegel, the relative reduction offered for new routes is higher than 10 % at all airports.

Airport	Program	Duration in years	Degression	Ø standard charge (per pax in €) p.a.	Ø charge after incentives (in €) p.a.	Reduction
SXF	new routes	2.5	x	14.9	13.0	12.9%
	pax growth	5	x		l: 14.2 m: 12.2 h: 10.3	l: 4.8% m: 18.5% h: 31.0%
	Long-Haul marketing support new routes	2	-		n.c.	n.c.
TXL	new routes	2.5	x	17.3	16.4	5.0%
	pax growth	5	x		l: 17.3 m: 15.6 h: 15.3	l: 0.0% m: 8.8% h: 11.6%
	long-haul marketing support new routes	2	-		n.c.	n.c.
DUS	long-haul route growth	5	-	17.8	13.8	22.5%
	pax per mov. growth	n.l.	-	l: 17.1 m: 17.0 h: 16.7	l: 17.0 m: 16.7 h: 16.4	l: 0.4% m: 1.1% h: 2.0%
HHN	marketing support new routes	one-off payments	x	3.7-6.6	2.9 -6.2	6.7% - 21.9%
HAM	short-haul route growth	2	x	10.3	8.6	16.5%
	long-haul route growth	3	x	22.7	20.1	11.7%
	volume growth	3	-	l: 10.23 m: 10.1 h: 10.3	l: 10.2 m: 9.9 h: 9.3	0.7% 1.9% 9.7%
HAJ	new routes	2.5	x	15.0	8.4	44.0%
FKB	new routes	3	x	9.9	7.6	23.4%
SCN	new carrier	3	x	10.3	6.9	33.3%
LBC	new carrier	2	x	8.7-10.9	7.7-8.2	11.7%-24.7%

n.l.: not limited. n.a.: no information available, n.c.: not calculated,  
l: low growth scenario, m: moderate growth scenario, h: high growth scenario

**Table 5: Scale of German airport incentive programs**

While most provisions of the German schemes such as on general route or volume growth are rather ubiquitous from the broader European perspective, others can only be fully understood by analyzing the strategic focus of the particular airport concerned and its traffic and customer structure.



Duesseldorf airport is the third biggest German airport and serves one of the strongest catchment areas in the European Union. Duesseldorf has been highly congested for years and its capacity will remain fixed at its current level due to legal constraints. Duesseldorf, therefore, aims at enhancing the average value of aircraft movements to the airport. This either occurs if the average number of passenger per movement increases (as load factor and / or aircraft size increases) or if movements are shifted to routes which have a higher impact on airport profits than others. It can, for example, generally be assumed, that scheduled intercontinental traffic is of high value to airports, as both aeronautical and non-aeronautical revenues are higher on these routes (Gillen and Hinsch, 2001). Consequently, the incentive scheme implemented by Duesseldorf airport offers promotional payments for enhancement of capacity use, which in the case of new intercontinental routes are substantial, reducing the amount of airport charges payable by 22.5 %. The actual impact of the provisions on passenger growth per movement is negligible (0.4% to 2.0 % reduction).

Other airports with strong catchment areas which might be suited for additional intercontinental traffic such as Hamburg and Berlin also aim at inducing growth in this market segment. Contrary to Duesseldorf, however, Hamburg airport and Berlin Schoenefeld airport are not used to their capacity limits so that they are also interested in increasing volume or movement growth. Therefore, they have put in place provisions for general growth, as well.

Saarbruecken is a small regional airport with around 500,000 passengers p.a. and is only served by a few airlines, predominantly flying to holiday destinations and some major business centers. It is one of a few airports Europe-wide offering dedicated incentives to new carriers even on routes which are already flown by other carriers. From our understanding there are two main reasons why an airport might implement such provisions. First, it might aim at increasing competition on a route level, offering passengers more choice and, therefore, indirectly increasing attractiveness of the airport. Second, it might aim at attracting a new carrier that expects to be offered discounts for all routes, irrespective of whether they are already served from the airport. While the former aim might indeed be rational for airports who already offer a wide choice of destinations served, the latter aim can reasonably be expected to be dominant for smaller airports, as their traffic and profit are highly dependent on locational choices of individual airlines. In Saarbrücken, the introduction of the “new carrier clause” into the schedule of charges in 2007 can easily be traced back to the concurrent negotiations between the airport and Air Berlin on the conditions under which Air Berlin would be willing to start operations from the airport. Subsequently, Air Berlin commenced flights from Saarbruecken, including routes which were already served from another airline before. The

amendments made to the schedule of charges, therefore, follow from bilateral negotiations and serve, in essence, as a surrogate for a formalized bilateral agreement.

Frankfurt-Hahn is predominantly used by low fare airline Ryanair, which – in summer 2011 - serves 50 of the 54 scheduled routes offered from Hahn. Looking at the structure of charges and the structure of the incentive scheme it becomes evident that both are specifically tailored to fit the needs of the dominant carrier. At Frankfurt-Hahn, both standard charges and reduced charges for new routes are dependent on the amount of traffic an airline already offers. Average charges per passenger vary from 6.6 € for airlines serving few passengers to 3.7 € for airlines with more than 2,000,000 passengers p.a, which only applies to Ryanair. Marketing support per new route varies from 70,000 € to 130,000 € according to passenger numbers and number of routes already served. Given this incentive structure, Ryanair is granted substantially higher incentives than other carriers which have less traffic and routes from Hahn. The marketing support amounts to a relative annual reduction on charges between 6.7% and 21.9% (on a three year basis), with Ryanair being at the upper bound of discounts. While this relative discount is moderate compared to the discounts at other German airports, it should be noted, however, that the base level of charges at Hahn is substantially lower than at other airports. In consequence, even the standard charge without taking account of marketing support is lower than the charge after incentives at most other airports considered. Moreover, concerning the discount for the dominant carrier at Hahn, it becomes evident that on all new routes offered Ryanair, effectively, is only charged with 44 % of the standard charges for small carriers at the airport (2.9 EUR vs. 6.6 EUR).

It would go beyond the scope of this paper to conduct a comprehensive analysis on whether the provisions of incentive schemes at German airports fully comply with European rules on state aid. In particular, although we have been able to assess the scale of incentives granted at German airports we are not able to determine whether the amount of incentives offered do not exceed extra start-up costs airlines incur for these services, as no information is publicly available on these costs for a particular route or service. However, concerning rules on transparency, non-discrimination, duration and degressiveness of the incentives, our analysis shows that German airports mostly adhere to these rules. Some exceptions apply: As mentioned before, Saarbruecken airport offers discounts for newcomer carriers, even if they fly to destinations already served from the airport by other carriers. The same provision on new carriers can be found at Luebeck airport. It is highly questionable whether this complies with European law on state aid as it discriminates between incumbent and newcomer carriers. Some incentives at Duesseldorf and the two Berlin airports are granted for five years, whereas

the guidelines state that they should, generally, be limited to three years. However, all three airports serve more than 5 m. passengers annually so that they are allowed to offer incentives for longer periods of time as long as these incentives increase profitability. To date, these provisions have neither been given approval by the European Commission nor have they been objected to.<sup>4</sup>

## CONCLUSION

Incentive programs are one tool of airport pricing for generating additional demand. In this paper, we set out to investigate current pricing practices as part of airports' marketing efforts which have substantially evolved in the wake of the recent liberalization tendencies in the air transport industry. Especially, we were interested if and to which extent airports engage in price discrimination practices, which parameters they decide to employ and what kinds of growth goals airports seem to gear their pricing schemes at in order to influence airline network planning and scheduling decisions to their benefit.

Our analysis of the 200 biggest airports in the European Union showed that airport incentive programs are a common tool of airport pricing used at one third of all airports. While it is widely used in many countries of the EU such as France, Germany, Poland, Finland and Portugal, other countries, for example Spain, Italy and Greece make much less use of this tool. However, this does not imply that airlines generating growth at airports in these countries are not financially rewarded for this growth. We found evidence for several airports on bilateral agreements between airport operators or regional authorities on one side and airlines on the other side which include promotional payment or a reduction of charges in exchange for route or passenger growth.

A detailed assessment of the schemes offered at the German airports within our broader European sample revealed a substantial scale of incentives. Most programs offer yearly average reductions of more than 10 % throughout the duration of the incentive on standard landing and take-off, parking and positioning, and passenger charges. Hanover airport grants rebates of the highest relative scale, averaging at 44 % p.a. Many provisions of the German schemes such as on general route or volume growth are ubiquitous from the broader European perspective. It became clear, however, that some specific provisions can only be explained by analyzing the strategic focus of the airport and its traffic and customer structure. While bigger airports such as Dusseldorf and Hamburg have put in place schemes that strategically aim at

---

<sup>4</sup> Since 2007 the European Commission is investigating whether agreements made by Berlin Schoenefeld airport with several airlines constitute state aid. No decision has been published in this matter, to date. However, the agreements were made before the incentive program came into force and the program itself is not part of the investigation. See European Commission (2007).

fostering long term growth in those markets which the airport believe are the most profitable under the airport's infrastructural and market constraints, other, smaller airports have implemented provisions which are specifically tailored to the needs of a particular airline and therefore, serve as a surrogate for a bilateral agreement.

Given the fact that airlines profitability is usually very low and that airport charges account for 4 % of total operating costs on average and up to 10 % on short-haul routes in Europe (Doganis, 2005), these rebates and discounts can have an important influence on the economic viability of a route. One should keep in mind, however, that airport incentive schemes are only one facet of generating growth at an airport. Even though the exact role of airport charges in airlines' network planning decisions remains unclear (Gardiner et al., 2005), it appears safe to say that airlines, generally, will not broaden operations at an airport sustainably only because of the mere presence of a discount scheme of limited duration. Improving infrastructure quality and quantity and enhancement of airport access by ground-transportation are other means by which an airport might become more attractive to an airline. Moreover, the value of an airport to airlines is quite substantially dependent on exogenous factors such as size and strength of its catchment area or the presence of adjacent airports, which cannot be influenced by airport operators at all. However, in an airline's multi-criteria-based assessment of potential market entries or route expansions, such incentive schemes might compensate selected weaknesses of an airport's strategic posture.

Overall, our paper contributes to the hitherto underdeveloped literature on airport marketing and strategy. We provide a systematic, rich and solid basis of current pricing practices among European airports and their incentive schemes in particular. Our estimation of the magnitude of the incentives offered to airlines provides a first indication as to the monetary effects that airport operators hope to achieve from attracting or expanding air services from their premises. However, further research is needed in order to assess if these envisaged effects are actually achieved. Regulators as well as airports would benefit from a further examination of the effectiveness of such incentive schemes in terms of long term traffic generation, resulting airport development prospects and therefore also regional economic implications. Also, in addition to an estimation of the effectiveness of isolated incentive schemes, a more comprehensive model of airport choice and route development decisions by airlines holds significant promise for all partners in the air transport systems, i.e. airports, airlines but also air traffic control and regulators, since the better understanding of such network development strategies allows an alignment of relevant infrastructure investment and development decisions.

## REFERENCES

- Barbot, C. (2006) Low-cost airlines, secondary airports, and state aid: An economic assessment of the Ryanair–Charleroi Airport agreement, in: Journal of Air Transport Management 12(4), pp. 197-203.
- Brueckner, J. K. (2003) Airline Traffic and Urban Economic Development, in: Urban Studies 40(8), pp. 1455-1469.
- Deutsche Lufthansa (2010) Low-cost carriers: Subsidy hunters –here today, gone tomorrow, Lufthansa Policy brief, September 2008.
- Doganis, R. (2005) The Airline Business (London: Routledge).
- European Commission (2011) Review of the community guidelines on financing of airports and start-up aid to airlines departing from regional airports, Consultation document, Directorate-General for Competition – Unit F.2 (Brussels).
- European Commission (2007) Procedures relating to the implementation of the competition policy, State aid C 27/07 (ex NN 29/07) - Berlin Schoenefeld Airport, Invitation to submit comments pursuant to Article 88(2) of the EC Treaty, in: Official Journal of the European Union, C 257 of 30.10.2007, pp. 16-46.
- European Commission (2005) Community guidelines on financing of airports and start-up aid to airlines departing from regional airports, in: Official Journal of the European Union, C 312 of 09.12.2005, pp. 1-14.
- Fuhr, J. and Beckers, T. (2009) Contract design, financing arrangements and public ownership - an assessment of the US airport governance model, in: Transport Reviews 29(4), pp. 459-78.
- Lohmann, G., Albers, S., Koch, B. and Pavlovich, K. (2009) From hub to tourist destination - an explorative study of singapore and dubai's aviation-based transformation, in: Journal of Air Transport Management 15(5), pp. 205-211.
- Marimon, A. (2010) Ryanair recibe ayudas de 80 millones de euros en España, in: Expansion, online edition, December 21, 2010 <http://www.expansion.com/2010/12/21/empresas/-transporte/1292886660.html> [Accessed: 02/20/2011].
- Farrell, J. and Klemperer, P. (2007) Coordination and lock-in: Competition with switching costs and network effects, in: M. Armstrong and R. Porter (Eds): Handbook on Industrial Organization 3, pp. 1967-2072.
- Federal Aviation Administration (2010) Air Carrier incentive program handbook, a reference for airport sponsors, TC10-0034, (Washington, D.C).
- Forsyth, P. (2006) Estimating the Costs and Benefits of Regional Airport Subsidies: A Computable General Equilibrium Approach, paper presented at German Aviation Research Society Workshop, Amsterdam, June-July 2006, <http://www.garsonline.de/Downloads/-060629/Forsyth%20-%20Paper%20-%20Regional%20Airport%20Subsidies.pdf> [accessed: 03/01/2011].
- Gardiner, J., Humphreys, I. and Ison, S. (2005) Freighter operators' choice of airport: A three-stage process, in: Transport Reviews 25(1), pp. 85-102.
- Gillen, D. (2011) The evolution of airport ownership and governance, in: Journal of Air Transport Management 17(1), pp. 3-13.
- Gillen, D. and Hinsch, H. (2001) Measuring the economic impact of liberalization of international aviation on Hamburg airport, in: Journal of Air Transport Management 7(1), pp. 25-34.

Graham, A. (2008) Managing Airports, An international Perspective, 3<sup>rd</sup> edition (Oxford: Butterworth-Heinemann).

Green, J. K. (2007) Airports and Economic Development, in: Real Estate Economics 34(3), pp. 91-112.

Heymann, E. (2005) Expansion of regional airports: Misallocation of resources, Deutsche Bank Research, International Topics, Current Issues (Frankfurt).

Lepière, A. (2011) Incentives and aids for the development of routes under EU law: Practical guide for airports and airlines, in: Journal of Airport Management 5(2), pp. 160-169.

Lepière, A. (2007) The Community Guidelines on financing of airports and start-up aid to airlines departing from regional airports: Promoting regional airports or creating more legal uncertainty? in: Journaal LuchtRecht 6(1), pp. 5-27.

Kerber, W. and Groeteke, F. (2004) The Case of Ryanair - EU State Aid Policy on the Wrong Runway, in: ORDO 55, pp. 313-332.

Pels, E. (2000) Airport Economics and Policy: Efficiency, Competition, and Interaction with Airlines, PhD Thesis (Amsterdam).

Percoco, M. (2010) Airport Activity and Local Development: Evidence from Italy, in: Urban Studies 47(11), pp. 2427-2443.

Rochet, J.C. and Tirole, J. (2003) Platform Competition in Two-Sided Markets, in: Journal of the European Economic Association 1(4), pp. 990-1029.

Salazar de la Cruz, F. (1999) A DEA approach to the airport production function, in: International Journal of Transport Economics 26(2), pp. 255-270.

Starkie, D. (2001) Reforming UK airport regulation, in: Journal of Transport Economics and Policy 35(1), pp. 119-135.

Stigler, G. (1987) The Theory of Price (New York: Macmillan).

Van Den Berg, L., Van Klink, H. A. and Pol, P. M. J. (1996) Airports as centres of economic growth, in: Transport Reviews 16(1), pp. 55-65.

Varian, H. R., (1985) Price Discrimination and Social Welfare, in: The American Economic Review 75(4), pp. 870-875.

Warnock-Smith, D. and Potter, A. (2005) An exploratory study into airport choice factors for European low-cost airlines, in: Journal of Air Transport Management 11(6), pp. 388-392.

Williams, G. and Pagliari, R. (2004) A comparative analysis of the application and use of public service obligations in air transport within the EU, in: Transport Policy 11(1), pp. 55-66.

**ANNEX 1: LIST OF AIRPORTS COVERED**

AAL	BOD	DRS	GRO	LEI	MUC	PMO	SXF
AAR	BOH	DTM	GRX	LEJ	MXP	POZ	SZG
ABZ	BOJ	DUB	GRZ	LGW	NAP	PRG	TFN
ACE	BRE	DUS	GSE	LHR	NCE	PSA	TFS
AGP	BRI	EDI	HAI	LIL	NCL	PSR	TLL
AHO	BRQ	EIN	HAM	LIN	NOC	PUF	TLN
AJA	BRS	EMA	HEL	LIS	NQY	REG	TLS
ALC	BRU	EXT	HER	LJU	NRN	REU	TMP
AMS	BTS	FAO	HHN	LLA	NTE	RIX	TPS
AOI	BUD	FCO	IBZ	LNZ	NUE	RNS	TRN
ARN	BVA	FDH	INN	LPA	NWI	RTM	TRS
ATH	CAG	FKB	INV	LPL	NYO	SCN	TSF
BCN	CCF	FLR	JMK	LTN	OLB	SCQ	TSR
BDS	CDG	FMM	JTR	LUX	OPO	SDR	TXL
BES	CFE	FMO	KGS	LYS	ORK	SKG	UME
BGY	CFU	FNC	KLU	MAD	ORY	SMI	VAR
BHD	CGN	FRA	KRK	MAH	OTP	SNN	VCE
BHD	CHQ	FRL	KTW	MAN	OUL	SOF	VIE
BHX	CIA	FSC	KUN	MJT	OVD	SOU	VLC
BIA	CLJ	FUE	LBA	MJV	PAD	SPC	VON
BIO	CPH	GDN	LBC	MLA	PDL	STN	WAW
BIQ	CRL	GLA	LCA	MLH	PFO	STR	WRO
BLL	CTA	GNB	LCG	MMX	PGF	SUF	XRY
BLQ	CWL	GOA	LCY	MPL	PIK	SVQ	ZAZ
BMA	DAS	GOT	LDE	MRS	PMI	SXB	ZTH

## ANNEX 2: CALCULATION DETAILS

For programs targeting long-haul traffic, we assess the amount of incentives based on the use of an Airbus A330-300 (MTOW 230 t, 330 seats) for 5 weekly flights to a long-haul non-European destination for the full year, for all other programs based on one daily flight for the full year with an Airbus A320-200 (MTOW: 73.5 t, 180 seats) to a non-German destination within the Schengen area. Seat load factor is, if not otherwise stated, assumed to be constant at 0.8 throughout the duration of the incentives. Turn-around time – which is important for determining the parking/positioning charges – are set to 3 hours long-haul and 1 hour short-haul, respectively. All flights are assumed to be day-time flights, so that no night surcharges have to be included. Tegel and Schoenefeld have introduced incentives which are dependent on overall passenger and MTOW growth of an airline at the airport. We, therefore, have to calculate the discounts for different growth scenarios (SXF: low scenario: 10,000 pax and 10,000 MTOW, moderate scenario: 100,000 pax and 100,000 MTOW, high scenario: 250,000 pax and 250,000 MTOW, TXL: low scenario: 20,000 pax and 20,000 MTOW, moderate scenario 200,000 passengers and 200,000 MTOW, high scenario: 400,000 passengers and 400,000 MTOW. The values chosen represent the same relative magnitude of passenger and MTOW growth at both airports within each scenario). At Duesseldorf airport a bonus payment is offered within its scheme for general growth if airlines increase the number of passengers per aircraft movement, so that we assess a range of corresponding reductions in charges for three growth scenarios, as well (Low scenario: 15 extra passengers per movement, moderate scenario: 15 extra passengers per movement, high scenario: 30 extra passengers per movement). DUS also rewards airlines who have higher than average numbers of passengers per movement. However, as the scale of the incentive is extraordinarily low (0.20 EUR per extra passenger), the corresponding charges reduction will be negligible as well and we, therefore, refrain from calculating it. At Hamburg airport, the bonus payment within its so called “route growth incentive program” depends on the route specific passenger growth of an airline. We calculate the impact of these payments in a low scenario and moderate scenario, in which growth is generated by better seat load factors and a high scenario, in which frequency and passenger throughput are doubled (Low scenario: 5 extra passengers per movement on route, moderate scenario: 15 extra passengers per movement on route, high scenario: twice the amount of movements and passengers on route). At Frankfurt-Hahn, both standard charges and reduced charges for new routes are dependent on the amount of traffic an airline already offers and are implicitly bound by a low and high limit. We, therefore calculate the full range of standard and reduced charges for Hahn.



## **Working Papers by the Department of Business Policy and Logistics, edited by Prof. Dr. Dr. h.c. Werner Delfmann**

*Further issues of this series:*

No. 102: Werner Delfmann, Sascha Albers:

Supply Chain Management in the Global Context, Cologne 2000, 95 pages.

No. 103: Natalia Nikolova, Markus Reihlen, Konstantin Stoyanov:

Kooperationen von Managementberatungsunternehmen. Cologne 2001, 50 pages.

No. 104: Caroline Heuermann:

Internationalisierung und Logistikstrategie, Cologne 2001, 101 pages.

No. 105: Benjamin Lüpschen:

Kostendegressionspotenziale in Logistiksystemen, Cologne 2004, 109 pages.

No. 106: Sascha Albers, Caroline Heuermann, Benjamin Koch:

International Market Entry Strategies of EU and Asia-Pacific Low Fare Airlines.

Cologne 2009, 33 pages.

*The working papers are available online ([www.spl.uni-koeln.de](http://www.spl.uni-koeln.de)).*

Department of Business Policy and Logistics

Prof. Dr. Dr. h.c. Werner Delfmann

University of Cologne

Albertus-Magnus-Platz

D-50923 Cologne, Germany

[spl@wiso.uni-koeln.de](mailto:spl@wiso.uni-koeln.de)

[www.spl.uni-koeln.de](http://www.spl.uni-koeln.de)

Phone: +49-221-470-3951

Fax: +49-221-470-5007