

Impact of Price Regulation on Airport Charges

Airport Charges and Price Regulation in Germany

As part of the master program Transport and Supply Chain Management (TSCM) at VU University in Amsterdam I did a thesis research concerning the impact of price regulation on airport charges. The research was aimed to provide an answer to the literature discussion whether airports have the incentive to charge excessive tariffs and if they do so whether price regulation is the right method to avoid this incentive. Results and insights gained from the thesis research will be treated in this article. The objective is to point out the effects of price regulation on airport charges. The following research question was formulated to execute the research: "What is the impact of price regulation on airport charges?"

by: Ahmed Fadlaoui

Price Regulation of Airports

Airports are regulated for different reasons, which are mostly related to market failures and monopolistic features resulting in excessive price setting. Generally two methods are imposed for the regulation of airport charges. To begin with, rate of return regulation is applied by means of a limit on the profit level. Profits are set to a level to which the firm can recover its costs and earn some return on investment. The allowed rate of return is based on the costs of capital of the firm multiplied with a rate base including the non-depreciated portion of investments related to regulated operations. Next to the revenue requirement, the price structure is periodically determined in order to avoid excessive costs. Restricting profits by maximizing the return on investment of a firm is supposed to reduce excessive price setting. On the other hand, the price cap regulation method is characterized by a limit on the price level during a certain period. The price limit is set in advance, in accordance with a price index (inflation) and a factor set beforehand. This price is reviewed periodically (mostly yearly or per 5 years) according to the consumer plus index and the inflation and cannot be changed in the meantime.



Price cap regulation and rate of return regulation are the most applied price regulation methods to reduce market failures in the aviation industry. However, both price regulation methods are criticized on different points. For instance rate of return regulation is accused of incentives to overinvest and high costs to contain high profit levels, while price cap regulation is criticized for liquidation risks and reduction of quality levels. The varied effects of both regulation methods will be treated in the section “Empirical analysis” and further.

Airport Charges

Airports face operational and capital costs for supplying aviation services to airlines and passengers. For that reason airports fix user charges to recover costs and earn a return on capital or profit. Airport charges are established according to sets of guidelines and principles. In this process the government plays an important role, since it is the national government who sets procedures which have to be followed by airports and ultimately determines the amount of the airport charges. Economists support transparent allocation of airport charges because of its necessity to clarify the relationship between the level of airport charges and the costs involved. Transparency provides insight in the costs included within airport charges.

Aspects of Airport Charges

Charges levied by airports are based on several costs involved with service providing. This research focused merely on passenger transportation, excluding cargo, training and other air transport purposes. Passenger transportation includes provision of runways, terminal facilities for passengers, security and other technical services to the aircraft. Hence, airport charges are based on services and infrastructures related to the provision of aircraft movement areas and passenger processing areas. Moreover, airport charges do not include airport taxes which are directly felled to the government.

The main components determining airport charges include take-off and landing charges, passenger service charges, parking charges and security charges. In contrast, airport charges may differ between various airports. Discrepancies in airport

Table 1: Coefficient results

Coefficients ^{a,b}			
Model	Unstandardized Coefficients	Standardized Coefficients	Sig.
	B	Beta	
(Constant)	2121,316		0,000
DummyMedium	-138,714	-0,272	0,013
DummyRegional	-246,064	-0,482	0,000
Regulation (reference is RoR)	-418,760	-0,658	0,001
Nr Airlines	-6,632	-1,009	0,010
Nr Passengers (Mill)	37,142	2,075	0,000
Aircraft movements	-0,001	-0,370	0,546

a. Dependent Variable: Charges

b. Reference category variable ‘Airport type’ is Hub.

charges are commonly attributable to differences in airport characteristics. For instance, Hub airports are frequently visited by transfer passengers while other airports generally are used by local passengers travelling on a direct connection. The various effects of airport characteristics will be discussed further in the empirical analysis (section 4).

Empirical Analysis

Essentially, regulators entail price regulation on airports in order to influence change of charges in a certain way. But do airport charges indeed change in practice after being regulated?

This section involves results of the empirical study analyzing the way airport characteristics influence airport charges focusing on the influence of price regulation method imposed. Firstly the research method is described and subsequently an overview of the data and data results are presented.

Research Method

A multiple regression analysis is used to execute the empirical research. The multiple regression analysis enables to assess the strength of a relationship between one dependent variable (Y) and two or more independent variables (X)_i (Saunders, 2007 p. 451).

The basic model of a multiple regression looks like:

$$Y = a + b_1 X_1 + b_2 X_2 + b_2 X_2 + \dots + b_n X_n.$$

Where:

Y is the value of the dependent variable that is being predicted. The a is the constant, where the regression line intercepts the y axis, representing the value of Y (dependent variable) when the independent variables are 0. The b’s are the regression coefficients, the slope for the X’s, representing the amount the dependent variable Y changes when the corresponding independent variable (X) changes 1 unit. Lastly the X’s symbolize the independent variables.

Data

In this empirical investigation the issue of interest is determining how charges of a number of German airports vary with the price regulation imposed and a set of characteristics they possess. Therefore, data is used about airport demand characteristics and charges from a dataset of 11 airports in Germany. The research considers airport charges reflecting demand characteristics of airports. Airport characteristics involved are: airport type (Hub, medium and regional), price regulation method, number of passengers at the airports, number of airlines and number of aircraft movements. Throughout the research a focus was on the two most applied price regulation schemes i.e. price cap and rate of return regulation.

Based on the variables included in this research the complete research model can be expressed as:

$$P(\text{airport charge}) = \beta_0 + \beta_1 * \text{airport type} + \beta_2 * \text{regulation method} + \beta_3 * \text{nr of passengers} + \beta_4 * \text{nr of airlines} + \beta_5 * \text{aircraft movements}.$$

Results

In this subsection, the results of the empirical analysis are examined, with a connection to the theoretical findings.

Most variables involved in the research have a significant influence on the charges levied by German airports. According to the Constant shown in Table 1, the level of airport charges would be expected to be €2121,316 if all five independent variables were equal to zero. This indicates the average level of airport charges at Hub airports which are subject to price cap regulation.

Although demand characteristics do influence the level of charges levied by airports, this influence is not as considerable as the price regulation imposed. Regulation is a dummy variable with attributes 'price cap regulation' and 'rate of return regulation', where rate of return is the reference category. The coefficient results indicate that the level of airport charges at a price cap regulated airport is €418,76 lower than the average charge of airports regulated by a rate of return regulation. This effect is statistically significant and can be linked to the theoretical findings about the incentive character of price cap regulation. More specifically variable Regulation approves the view that airports subject to price cap regulation have a stronger incentive to lower prices than airports subject to the rate of return regulation method.

From all variables involved in the research, it is only the Nr of passengers travelling from the airport which has a positive impact on airport charges. Table 1 shows that for each additional passenger, the level of airport charges increases

with € 37,142. This effect is statistically significant and indicates that airports with a high number of passengers are likely to charge higher prices. This is in accordance with general views in literature. Bel and Fageda (2009) for instance, state that airports with the heaviest volume of traffic, particularly when congested, are most likely to fix high prices. So next to regulation method imposed, it is the size and type of the airport which has the largest effect on airport charges. Moreover, according to the research results Hub airports are more likely to fix high prices than medium sized and regional airports. This confirms Bilotkach et al. (2010) who state that hub airports generally set higher airport charges than other airports. This is because Hub airports face less competition from other transport modes due to their high volume of long distance traffic and transit connections.

Besides previous mentioned variables, number of aircraft movements seems to have little influence on charges levied by airports. However, compared to the other variables, the standardized coefficient (Beta) for aircraft movements (-0,370) shows that this variable influences the level of airport charges to some extent. Accordingly, the number of aircraft movements does influence the level of charges levied by German airports, yet given the smallest influence and non-significance effect.

Based on the results of the regression analysis the final equation of the model can be expressed as:

$$P(\text{airport charge}) = \beta_0 + \beta_1 * \text{Medium airport type} + \beta_2 * \text{Regional airport type} + \beta_3 * \text{regulation method} + \beta_4 * \text{nr of passengers} + \beta_5 * \text{nr of airlines}.$$

Conclusion and Discussion

Price regulation is an often used tool by regulators to reduce the level of airport charges and subsequently avoid dead-weight losses and other market failures. Literature is not clear about the usefulness of price regulation to influence airport charges. Therefore based on the research results an answer will be given on the research question: "What is the impact of price regulation on airport charges?"

To conclude with, the research results generally prove that price regulation does influence the level of charges levied by airports. More specifically, the research confirms the incentive character of the price cap regulation method, by demonstrating the significant and negative impact of price cap regulation method on airport charges. Price cap regulated airports charge lower prices than airports regulated by the rate of return regulation scheme. Consequently, price regulation of an airport has a significant impact on airport charges, where the price cap regulation scheme leads to considerably lower charges than the rate of return regulation method. Hence, the price cap regulation method certainly lives up to its incentive based reputation.

Nevertheless, most German airports are subject to the rate of return regulation method. Therefore according to this research it is recommended for policy makers to consider price cap regulation rather than rate of return regulation as the reg-



ulation method to be imposed whenever the objective is to minimize airport charges. This particularly holds for smaller airports and airports with a high number of traffic, since the effect of price cap regulation is stronger at these airports.

Accordingly, the effects examined in this research may be studied on a larger sample based on equivalent features to ascertain the impact on a large extent. Lastly, an area for further research may be to determine the causes for the insignificant effect of the number of aircraft movements.

About the Author

Ahmed Fadlaoui recently graduated as Master Business Administration – Transport and Supply Chain Management at the VU University Amsterdam. To contact Ahmed Fadlaoui, please send your mail to: a.fadlaoui@hotmail.com

References

- Bel, G. and Fageda, X.; Does privatization spur regulation? Evidence from the regulatory reform of European airports, Barcelona Graduate School of Economics (2010).
- Bel, G. and Fageda, X.; Privatization, regulation and airport pricing: an empirical analysis for Europe, Journal of Regulatory Economics Volume 37, Number 2 (2009).
- Bilotkach, V. et al; Regulation, Privatization, and Airport Charges: Panel Data Evidence from European Airports; Social Science Plaza, Irvine, (2010).
- Forsyth, P.; Price regulation of airports: Principles with Australian applications, Transportation Research Part E: Logistics and Transportation Review Volume 33, Issue 4, (1997), Pages 297-309.
- Müller, F., König, C. and Müller J.; Regulation of airport charges in Germany, German Airport Performance Germany (2008).
- Starkie, D.; Airport regulation and competition, Airport transport management, (2002).
- Tretheway, M.; Airport Ownership, Management and Price Regulation, InterVISTAS Consulting Inc., (2001).

Photo References

Page 1: Ground handling at Amsterdam Airport Schiphol. Photo by Du Saar Photography © 2010.

Page 2: Marshaller waiting for an aircraft to approach the apron. Photo by United States Air Force at www.af.mil.

Page 3: Push back. Photo by DNATA.



Get Your Thesis Published in Aerlines Magazine!

Have you, just like Ahmed Fadlaoui, written a great academic thesis on Air Transport? Get your results published in Aerlines Magazine and reach over 10.000 Industry professionals, fellow students and researchers worldwide!

There are just three simple steps to getting published:

1. **Send a** copy of your finished thesis, including an executive summary and a **request** to get published to info@aerlines.nl.
2. **Write** an article on your research findings (for size and format requirements visit our website and search for 'Author Guidelines').
3. **Adjust** your article according to feedback of our editors and editorial review board.

Now you are all set! Your article will get published in Aerlines Magazine and potentially read by over 10.000+ Aviation professionals! Still want to know a little bit more? Contact our chief editor; Bram du Saar at bram.dusaar@aerlines.nl.

No thesis, but a PHD research project? Follow the same steps and get published as well!