“On the price structure of non-congested airports”

Abstract:

This paper analyses the current price structure of non-congested airports and its economic effects. Aircraft weight and passenger based airline charges are a widely practiced and through ICAO advocated pricing policy, albeit exceptions exist. This paper argues that there are other pricing strategies that airports can and should use. The paper will show that there is a private interest to implement two-part tariffs and that adopting these pricing principles will increase economic welfare. Likewise, airport regulators might force airports to use the charging principle to improve the price regulation.

Keywords: Airport economics, airport regulation, price structure

1. Introduction

There are different tariffs and tariff structures in many industries, including transportation and regulated industries. Airlines, for example, have frequent flier programs which is essentially a form of bulk discount where a passenger receives a lower average price if she or he uses a particular airline or an airline alliance more often. In electricity or telecommunications markets two-part tariffs are quite common. A two-part tariff consists of a fixed fee plus a variable usage fee. Usually consumers have a choice between a strictly linear tariff and two-part tariff. The tariff structure is set up in such a way that the strictly linear tariff becomes unattractive if a certain amount of usage is exceeded. This is because the variable fee of the two-part tariff is smaller than the strictly linear tariff. Hence, consumers with a high usage will choose the two-part tariff and consumers with a low usage choose the strictly linear tariff. This is also a form of second degree price discrimination. It can be shown that two-part tariffs with the option of a strictly linear tariff are pareto-superior to a simple per unit price.

In some cases price discrimination is a necessary condition to break-even. In regulated, natural monopolies, where marginal cost pricing would lead to deficit, price discrimination is the only option if monopolistic prices are not allowed. This is because the marginal costs are below the average costs for all units of the relevant output. For multi-product natural monopolies the revenue constraint can be overcome through Ramsey pricing, whereby prices are set according to the price elasticities in the different markets. This is done such that consumer surplus is maximized subject to the constraint that the firm just breaks even. The result is that the firm will charge high prices in markets with a price inelastic demand and low prices in markets with price elastic demand. This is comparable to the simple mark-up rule known from microeconomics where the profit maximizing price is set above marginal costs times. Here , and is the own price elasticity of demand. That means that the mark-up is high if demand is inelastic.

An important point to keep in mind is that the examples given above refer to final consumer markets. In the case of infrastructure however, pricing is usually a cost to the service provider of the respective good in question. In the case of airports for example the airlines deliver their output to the final consumer, i.e. the passenger. The airport is an (essential) input provider for the airlines. This is also called a vertical structure, because airport and airlines are within a supply chain. The pricing of inputs is a “different kettle of fish” compared to the pricing of final consumer products. Yet, in infrastructure pricing similar price differentiation techniques can be found. For example the German railways, Deutsche Bahn, had a pricing structure for its railroad network whereby train operators could pay a fixed fee and then pay a reduced variable fee. Operators that did not pay a fixed fee had to pay a higher variable fee. Hence, it was not worthwhile for smaller train operating companies to pay the fixed fee. It should be noted however that welfare implications that have been reached for final products might not necessarily apply likewise to intermediate products (see Ordover and Panzar, 1982). Two-part tariffs for example might introduce distortions to the supply chain that would not occur with a simple linear tariff.

Another known problem in vertical structures is the so called double marginalization. This is a typical problem that arises in situations where there is an upstream monopoly supplier of an input and a downstream monopoly producer who sells its output to the final consumer. The two successive monopolists will each mark-up their prices so as to maximize their individual profits. That means that each firm sets its monopoly price and hence the term double marginalization. The problem with this is that for the final consumers output is lower and prices are higher compared to a situation in which

there would be only one (vertically integrated) firm supplying both the input and simultaneously the final output. Ideally the input should be priced at marginal costs. This can be achieved through vertical integration. In a vertically integrated firm double marginalization might not arise. If however the input is supplied by a department that acts profit maximizing, the problem could occur as well. That department should set a transfer price that is equal to the marginal costs of producing that input. Even with two (vertically separate) successive monopolies there are other ways to avoid double marginalization. For example through retail price maintenance or two-part tariff (see Rey and Vergé, 2005). A two-part tariff would be structured such that the variable fee reflects the marginal costs of producing the input and the fixed fee acts as profit sharing device. Although the case of two successive monopolies is the benchmark case, double marginalization prevails in oligopolistic markets, albeit to a lesser degree, and ceases only if one or both stages of production are perfectly competitive markets.

With regards to airport pricing, charges are usually differentiated according to the weight of the aircraft. Additionally, airlines usually pay a passenger fee that is differentiated according to domestic, international or transfer passengers. The International Civil Aviation Organization (ICAO), the international body responsible for setting standards and principles and techniques in international air transport, sets guidelines with respect to airport pricing. Although each country is free to regulate the level and structure of airport charges on its own and although several airports around the world are subject to formal price regulation, the ICOA guidelines represent industry practices that are being followed even by airports that would be free to adopt any price structure they might want to. That means that at most airports around the world the ICAO guidelines of: weight oriented, transparent, non-discriminatory and cost-related airport charges apply. Furthermore, airport charges should not be adjusted according to stage length according to the ICAO rules, although Morrison (1982) has found this to be superior to simple weight based charges. The rationale behind this is that weight based landing charges do not necessarily reflect the wear and tear landing aircraft impose on the runway, but are essentially a form of value pricing and therefore a form of price discrimination. It is argued that larger aircraft are used for long-haul flights which have therefore a higher willingness to pay and should thus pay a higher landing fee. Morrison (1982) understood that this is not necessarily sufficient for proper price discrimination, because the same type of aircraft could be used for very different routes and therefore different stage lengths. He suggested that landing fees should also be based on the stage length of the landing aircraft. Yet, as this paper will argue, this might not suffice either.

A notable exception with respect to airport pricing is Sydney airport (see Schuster, 2009), as this airport strikes individual, secret contracts with the airlines operating from that airport. These contracts include agreements about the terms of use and specially negotiated prices which may include, for example, a two-part tariff structure. Likewise, Starkie (2011) reports that airport all over the world are increasingly using contracts to maintain their business relationship with airlines. This is also comparable to the situation at US airports where airport use and lease agreements are being stipulated between airlines and airport operators (Graham, 2008). However, the basis for airport charges at US airports still are weight based landing fees that according to the rules by FAA, the US air transport regulatory body, have to be cost related. In Australia, by contrast, a light handed regulatory approach is being pursued by the government (cf. Forsyth et al, 2004). This allows Sydney airport to follow its unconventional pricing strategy. The findings of Gallamore and Panzar (2004) indicate for the railway sector that secret and individually negotiated contracts by a vertically

integrated provider of the bottleneck facility might actually be superior to mandatory open access with regulated access charges.

The aim of this paper is to analyze the existing structure of landing charges at non-congested airports as well as its regulation and economic effects. The paper argues that the current aircraft weight and passenger related airport charges can be interpreted as uniform charges or at best as imperfect second degree price discrimination. It is argued that two-part pricing could enhance the overall social welfare. The intuition is that, once an airport has the ability to reap downstream profits through a fixed and a variable fee, it can exert vertical control and increase the downstream competition. This results in an increase in downstream profits that the airport extracts. On the downstream level, prices de- and output increases, which creates an in increase in overall social welfare. While these results only apply to unregulated profit maximizing airports, the basic principle could also be used for regulated airports.

The paper is structured as follows. The next section will explain the effects of the current price structure regime that is followed by many airports worldwide. The next section will introduce options to reform the price structure and explain the effects the new regulations might have with the help of a small theoretical model. The final chapter summarizes and concludes.

2. The effect of the current price structure regulation

As said above, most airports around the world have weight based landing fees. Moreover, the airlines usually collect a per passenger fee from their customers which is being passed onto the airport, sometimes with a small discount for collecting the fee. This is the usual industry practice that is being put forward by the ICAO (see ICAO, 2004). These guidelines determine that airport charges should:

- be weight based[1],
- transparent,
- non-discriminatory,
- cost related, and
- not be differentiated according to stage length. (ICAO, 2004, p. 9f)

Rebates are allowed if they abide by the above rules, most importantly the rule of non-discrimination. That allows for discount schemes for example in the form route discounts, where discounts are given to airlines that open up new routes at a particular airport. Rebates are allowed if they are open to all airlines. As said above, even though these guidelines are not binding and need to be implemented in each signatory country into national law, the guidelines are being followed by many airports around the world and have become an industry standard.

What are the effects of such a pricing structure on uncongested airports? Imagine an airport at mid-sized city. Furthermore, imagine that there are very thick, highly frequented routes between highly populated and economically powerful agglomeration centers. These are routes where airlines operating them, have a high willingness to pay, since the passengers flying on that route have a high willingness to pay. Call these routes A-routes. Next to that there are connections to very small cities,

[1] A fixed fee per landing or a fixed charge with a weight-related element is allowed at congested airports or during peak periods.

more insignificant tourist destinations or short-haul routes. These are called C-routes and they have a small willingness to pay. All routes in between are called B-routes. These might be routes to cities of the same size as the origin destination, i.e. medium-sized cities. To start off the discussion, imagine the airport has five C-routes and three B-routes.

To analyze airport pricing in such an environment it must be understood how a profit maximizing airport behaves. Thus, the premise under which this paper operates is that airports are behaving so as to maximize profits. Although the airport is able to set landing charges according to take-off weight a B-route as well as C-route could be flown with one and the same aircraft. On the same note, a B-route and an A-route could have the same stage length. Hence, another premise is that the weight-based landing fees as well as stage length based landing fees are not able to fully capture the willingness to pay of a particular route market. An example for this could be the following: Take Hamburg (HAM) airport as the starting point. The flight to Frankfurt airport (FRA) is probably the most important feeder flight for Lufthansa from HAM and has a high willingness to pay accordingly. Thus it would be an A-route. The flight to Cologne airport (CGN) is probably flown with the same aircraft, e.g. a 737 by Air Berlin and would be a B-route. These routes also have an almost identical stage length, but the willingness to pay is likely to differ between CGN and FRA. That is not to say however that weight based landing charges are completely unable to capture the willingness to pay of airlines. Especially with respect to A- versus C-routes it is likely that different types of aircraft are being utilized. Whenever long- and short-haul routes are under consideration weight based pricing is likely to be able to capture the relative willingness to pay in those markets. The stage length could theoretically serve as an additional indicator either. Yet weight based and/ or stage length based landing fees are likely to be imperfect. As it turns out there could be a simpler and more direct way to capture the willingness to pay of different route markets, which will be discussed in the next section.

Thus, the assumptions are that the airport behaves profit maximizing and must set a schedule of weight based landing fees that are imperfectly able to capture the willingness to pay of the different route markets and therefore represent a form of average price. The fictions airport was said to have five C-routes and three B-routes. Since the airport sets its landing fees such that they represent a form of average price, it means that the landing fee for the B-routes is a little bit too low and too high for the C-routes compared to a situation in which each route would be priced according to the willingness to pay. Hence, there is an imbalance with respect to airport charges. Under perfect price discrimination or individually negotiated contracts the landing fee for B-routes is likely to be higher and for C-routes to be lower than under an average price regime. This is the first distortion that is arises because of the ICAO charging principles. It would not matter much if the B- and the C-routes were operated by the same airline, since that airline could cross-finance the discrepancy internally. Compared to a situation where the two routes are operated by two different airlines the mismatch does matter, because the B-route would be comparatively cheaper to operate than the C-route.

A second distortion that arises is that certain routes could be priced out. Imagine our fictional airport gets six additional B-routes and two A-routes. Since the airport has ample capacity these routes can be easily accommodated. If the airport behaves profit maximizing it will increase the menu of landing chares so as to capture the willingness to pay in all of the markets that are being serviced now. Again, since this is an imperfect price setting the landing fees are likely to create an imbalance between A- B- and C-routes. Eventually however, the landings fees will be set high enough that a number of C-routes are being priced out, meaning that they become economically unviable due to the high airport

prices.[2] If the airport could set prices low enough to make the C-routes viable they would not be priced out. Since some routes might not be served under a weight based pricing regime because the menu of landing charges is too high a welfare loss occurs since some connections cannot be realized. Welfare would be increased if the airport was able to set special charges for such routes. In some countries, such as the UK but also in continental Europe, route discount schemes have been developed by some airports. Those are discount schemes for route development, which means that airlines can a discount on the landing fees if they open a new route.[3] If it is assumed that those new routes are predominantly C-routes, at least temporarily they could become financially viable again.

The third distortion that arises through the current pricing regime is the double marginalization. In situations where there is only one airline serving a particular route there would be such a double marginalization. Yet, as said above, even in imperfectly competitive markets a form of double marginalization is present in the market. The more competitive a market, in this case the route market, gets the less there will be a welfare loss through double marginalization. Only if either the down- or the upstream level of production is a perfectly competitive market (or at least one side sets the price for its output equal to marginal costs) double marginalization will be eliminated completely. Strategies to avoid double marginalization include resale price maintenance and a two-part tariff. Whereas resale price maintenance seems infeasible for the air transport industry, two-part tariffs could eventually be introduced. This will become important in the next section.

The example of Sydney airport, striking individual and secret deals between its users, has potentially the power to overcome all of the above mentioned forms of distortions. While Sydney airport may be the most prominent example, there are actually more and more airports using such contracts. In the pricing that is being laid down in those contracts there would be no distortion between the routes, since airlines serving A-routes would get higher prices than airlines serving C-routes. For the same reason C-routes would not the priced out. Furthermore, double marginalization could be eliminated through the introduction of two-part tariffs, which are sometimes part of such deals. However, there could be negative effects in the downstream route competition between the airlines using such an airport. These are negative effects that arise due to the non-linear pricing of inputs (see Ordover and Panzar, 1982).[4] Take the example of Qantas at Sydney airport. Qantas gets a price (which eventually will include a two-part tariff) that reflects all of the routes Qantas operates from that airport. That includes all A-, B- and C-routes. An airline that wished to compete with Qantas, say on an A-route, and that operates only this particular route gets a price that reflects just this single and expansive route. Thus, Qantas' competitor might have a comparative disadvantage because it has to pay higher landing fees at Sydney airport. Eventually the competitor stays out of the market, which creates negative welfare effects through distortions in the competitive behavior of downstream firms.

[2] That does not imply that these C-routes are economically unviable in general. They are only unviable because of the airport's demand structure that leads to too high airport charges. The matter of PSO routes is not covered in this paper.

[3] The discounts are usually also subject to the condition that the route is being served for a specified amount of time, that a certain load factor is achieved and that the discount fades out after a while.

[4] Similar publications are those by Yoshida (2000) and Inderst & Valletti (2009).

3. Options for policy reform

Based on the previous section it can be concluded that an airport pricing system is required that: a) does not distort between routes, b) does not price out C-routes, c) avoids double marginalization effects and d) avoids Ordover and Panzar (1982) style effects caused by distortions in the downstream competition. While achieving all these goals might be impossible to achieve, the goal should be to adopt the pricing regime that achieves those requirements best.

Research by Morrison (1982), Martín-Cejas (1997) and Hakimov and Scholz (2010) indicate that landing fees in the US, Spain and Germany are lower than (calculated) optimal Ramsey prices. Although that may have several reasons, one of them could be that the airports are not able to price discriminate sufficiently due to the restrictions that a weight based charging system imposes. In airline merger and alliance cases the competition authorities usually investigate the relevant route markets, i.e. the relevant market is always the route. From the discussion in the previous section it is evident that the willingness to pay is based on the type of route that is being operated. If the relevant market for the airlines is the route market, then the same could be true for airports. An alternative pricing system that is being proposed in this paper will concentrate around two-part pricing system.

3.1 The model

Assume a simple vertical model with downstream airlines selling output to the final consumer and an upstream airport, which is a monopolist and sells input to the airlines.

Assume identical firms competing in a Cournot fashion with the following linear demand function:

. [1]

Thus, is each firm's output, is the intercept with the y-axis and the slope of the demand function with and . Furthermore, assume that the upstream monopolist has zero marginal costs. In order to price its essential input to downstream firms, the monopolist has two options: it could set a uniform price per unit sold or it could set a two-part tariff consisting of a variable fee fixed fee that serves so as to extract downstream firms' profits. The order is as follows: First the airport sets its price and then the airlines compete in Cournot fashion.

In the case of a uniform price, the profit function for the downstream firms is:

[2]

Thus each firm has identical, constant marginal costs and . The profit function for the upstream monopolist is:

[3]

where is the input demand by each downstream firm. In the case of a fixed fee the airlines' profit functions are:

[4]

The airport's profit function is:

[5]

The model is solved backwards, which means that airline equilibrium quantities are solved first. The results are then substituted into the airport's profit function to solve for the equilibrium airport price. The airline competition game can be restated as a duopoly game where:

[6]

The profit functions for the case of a uniform airport price are therefore:

[7]

Reaction functions can be described by the following set of equations:

[8]

Solving both equations simultaneously yields the equilibrium airline quantities for the case of a uniform price:

[9]

Analogous procedure for the case of a two-part pricing scheme yields the same result since, the fixed fee is eliminated after differentiation. Like a fixed cost, airlines do not consider the fixed fee when making their output decisions.

These quantities are substituted into the airport's profit functions. These functions are maximized to solve for the profit maximizing uniform price and the profit maximizing fixed fee.

In case the airport chooses a uniform price, profit is maximized for

_ [10]

Thus, irrespective of the number of downstream competitors the airport sets the profit maximizing uniform price solely on the basis of the reservation price and the airlines' marginal cost factor.

For the case of a two-part price, first the airline profits have to be determined. Substituting [9] in [7] yields airlines' profits

_____ _____ [11]

Assuming that the airport can extract all downstream profit the optimal fixed fee can be set equal to

_____ _____ [12]

Substituting [12] and [9] in [5] yields the airport's profit function:

_____ _____ [13]

Profit maximization with respect to yields

____ ____ [14]

Thus, in case the airport chooses a two-part pricing regime, the variable fee is being adapted according to the number of downstream firms. As the number of downstream competitors increases, i.e. the stronger the downstream competition, the fixed fee gets smaller and the variable fee gets greater. Looking at the extremes reveals that the variable fee becomes zero if there is only one

downstream firm, which is analogous to the standard successive monopolies case. In case the number of downstream firms reaches infinity, i.e. approaches perfect competition, and . The two part pricing regime allows the airport to earn the same amount of profits irrespective of the downstream competition. To the two-part pricing regime the airport's profits will be:

[15]

In case of a uniform price however profits will be:

[16]

Thus, profits are always greater if the airport chooses a two-part pricing system.[5] Hence, there is a private incentive on the side of the airport to adopt the two-part pricing scheme instead of the simple uniform tariff.

From a social welfare perspective the two-part pricing regime also yields better results. Consumer surplus can be defined as the triangle formed by , and , which is the market price in equilibrium.

[17]

The equilibrium market prices are:

[18]

for the two-part and uniform pricing regime respectively. Thus, market price is always smaller for the two-part pricing regime and it is independent of . The equilibrium quantities are:

[5] Only if reaches infinity and the airport would be indifferent between the two-part pricing and the uniform pricing regime.

[19]

The two-part prices yield the same market outcomes

Consumer surplus is therefore given by:

[20]

This implies that, by using the two-part pricing regime, the airport does not only hold its own profits constant, but also keeps the consumer surplus on a constant level, which is always greater than consumer surplus under the uniform price regime.[6]

Looking at producer surplus reveals a similar picture. By definition, producer surplus under the two-part pricing regime is equal to the airport's profit. The producer surplus for the case of a uniform price regime is calculated by substituting [10] and [9] in [7] and adding [16].

[21]

As before, two-part prices yield better results from a welfare perspective. Since, both producer and consumer surplus is greater under the two-part pricing regime, it is unambiguous that social welfare is greater if the airport uses a two-part pricing regime.

[22]

[6] Unless, as before, .

Thus, social welfare is kept at a constant level under the two-part pricing regime, whereas, under the uniform price regime social welfare increases and reaches the same level as the number of downstream airlines increases. The intuition behind this is the following: as the number of airlines goes up, there is a tendency of total industry output to increase as well. This tendency is counteracted by the airport through an increase in the variable fee, which makes airlines to lower their individual output. That in turn keeps the market price from depressing. More downstream competitors means that the output of an individual firm decrease, which means that their profits go down as well, and hence, there less profit for the airport to extract. This is counteracted however through the increase in the variable fee. Under the uniform price there is always the classic double marginalization problem, which only ceases if the downstream level is perfectly competitive. As was shown throughout the analysis the results of the two-part and the uniform pricing regime equaled when the number of downstream firms reaches infinity.

An interesting and intuitive feature of the two-part pricing regime is that for the case of successive monopolies, i.e. , the profit maximizing airport using the two-part pricing regime yields the same social welfare as first-best regulation of the airport. Assume that and , which would correspond to marginal costs pricing, then social welfare becomes:

[23]

For , . For all , . If there is only one downstream firm, it is optimal for the airport to set the variable fee equal to marginal costs, which is analogous to first-best regulation. If there is more than one downstream firm, the airport has a private incentive to set the variable fee above marginal costs. This limits downstream competition, because firms contract their output which lowers consumer surplus and airline profits. First-best regulation, where input prices are always equal to marginal costs would, naturally, yield better results.

3.2 Discussion

The model's limitation is that it assumes a homogenous downstream airline market. This limits the illustration of the airport's ability to discriminate prices using just the variable fee. In the model above, there were identical airlines competing in the same route market. If there were heterogeneous airlines and several route markets the airport might have an incentive to use the variable fee a means of price discrimination, as described above. The question is: will the same results apply if the airport is able to set tailored two-part prices? The answer is simple: The same principle results still apply in more complex settings. The airport has always an incentive to use the two-part pricing regime, which is also beneficial for consumers, because double marginalization effects are lessened and hence, final consumer prices are lower.

The question arises: why do not all airports use a two-part pricing regime? As said above, some airports are already using contracts and two-part prices as a means of vertical control. The first reason, this is not yet a current method is simply that not all airports might be monopolists who can exert unlimited vertical control. In such cases airports are not able to set the monopoly uniform price or to extract the full downstream profits. This might lessen the incentive (profit are higher using a

uniform price) and the ability (airlines might oppose) to set two-part prices. On the other hand, aircraft weight and passenger related charges were established over years and have become an industry wide, common practice that is advocated through the industry body ICAO. Lastly, price regulation might also limit the airport's incentive to use two-part prices. If the price setting behavior of airports is restricted there might not be an incentive to use more elaborated pricing schemes to gain higher profits.

This leads to issue of how a two-part pricing regime could be implemented in practice. Obviously the variable fee would be the usual aircraft weight and/ or passenger related charges. These charges would represent the wear and tear on the runway and the costs associated with passenger handling, such as baggage handling facilities. The fixed fee acts to extract, respectively share profits. This would represent the costs for basic infrastructure facilities and financing costs of large infrastructure. The fixed fee could be a simple charge per landing, which could be differentiated according to destination or origin. It could be an annual or flight plan seasonal fee, which could be differentiated according to the number of landings and passengers of an airline or it could be negotiated bilaterally between the individual airline and the airport. There are many possibilities to construct a two-part pricing regime. An important issue in practice could also be the risk allocation respectively the flexibility of two-part pricing regimes. Committing to a fixed fee requires some predictability of future revenue flows on the airlines' part. The volatile nature of air traffic demand, calls for flexible adjustments in times of demand shocks. However, fixed fees could also turn out to be beneficial for airlines. If the fixed fee is low enough and airline demand is higher than expected the airlines can reap greater profits, whereas the airport has the benefit of predicable income streams irrespective of demand fluctuations.

Two-part pricing regimes have several advantages over posted uniform prices. They do not distort between routes, since ideally the fees can be adapted according to the route market, for example through a route based multiplier for the variable fee, or, in case the variable fee is unique for all destinations the fixed fee is varied according to destination. Because of that, no C-routes will always be available, since individual negotiations with airlines will enable this. Furthermore, double marginalization is reduced since . Finally, distortions in downstream competition cannot be ruled out completely, but they could not be worse than under the current weight based charging system. Furthermore, the welfare results of distortions could even be positive. Consider a duopoly airline market with one airline having a cost advantage and the airport using only a variable fee. In such a situation the airport would have an incentive to set a higher price for the lower cost airline. If the airport was using a two-part price, it might have an incentive to use the variable to create a successive monopoly, by pricing out one airline and using just the fixed fee to extract profits from the downstream monopolist. This would seemingly distort downstream competition, but it could actually increase social welfare if the reduction in double marginalization outweighs the effect of a reduction in the number of downstream firms.

4. Conclusion

This paper argued that the currently widely practiced[7], and through ICAO advocated, aircraft weight and passenger based pricing system creates several possible distortions. The first was that there might be a distortion between routes in the form that A-routes are comparatively cheap and C-

[7] Although some airports, such as Sydney airport, have negotiated contracts with their users the weight based pricing system is being used by a lot airports around the world.

routes comparatively expansive, compared to a situation where each route would be priced according to its individual willingness to pay. The second distortion is that C-routes might be priced out of the market if the airport, in its attempt to capture the willingness to pay in all the markets that are being operated from that airport, sets its profit maximizing price too high so that the smaller C-routes are being priced out of the airport. The third distortion is the double marginalization that typically occurs in vertical structures, because the firms at each stage will maximize their individual profits. Finally, price discrimination in upstream market has the potential to distort downstream competition. Such effects would be similar to those documented by Ordover and Panzar (1982), Yoshida (2000) and Inderst & Valletti (2009).

The model documented that moving from a simple pricing regime with only variable fees to a two-part pricing regime, where variable and fixed fees can be published or negotiated between airlines and the airport have several advantages: They would not be distortions between routes, not routes would be priced out and double marginalization effects are softened. Distortions of the downstream competition are possible, however its actual effects should be considered carefully, since these distortions could turn out to be welfare enhancing. The fixed and variable fees could be varied according the number of landings and passengers of an airline in a given period, they could be varied according to the airline's destination and they could also be negotiated bilaterally as is the case with some airports already. Thus, this paper makes the case that two-part pricing regimes should be encouraged by regulators and industry bodies such as the ICAO.

Further limitations to the welfare effects of the proposed route based pricing system are that the distortions that have been said to be caused by the weight based pricing system could be quite small. As a matter of fact, there does not exist any empirical evidence about those distortions. Hence, it is unknown whether these distortions really create significant negative welfare effects. Secondly, the weight based charging system could, in simple words, be "good enough" price discrimination or to extract the willingness to pay. This would be the case if, for most destinations, the willingness to pay correlates with the weight of the aircraft, although findings by Morrison (1982), Martín-Cejas (1997) and Hakimov and Scholz (2010) would suggest otherwise. The question though remains whether the weight based charging system creates reductions in welfare sufficient to warrant regulatory intervention in the form of making a change in the airports' pricing system compulsory. However, this might not be necessary at all. All this paper has argued for is that two-part pricing regimes should be made possible and become the norm, instead of the current posted tariff system.

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