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Market versus state in building the aviation value chain

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Market versus state in building the aviation value chain

by Günter Knieps

Discussion Paper

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Abstract:

The aim of this paper is to analyze the liberalization of the aviation value chain and the remaining role of government policy. In particular, the role of sector-specific regulation of monopolistic bottleneck components of the air traffic value chain is analyzed. For competition on air transport markets and groundhandling services to operate efficiently, non-discriminatory access to complementary monopolistic airport infrastructures must be guaranteed. In particular, the evolution of market driven slot allocation and the role of airport regulation is analyzed. Finally, the issue of airport subsidies is taken into consideration.

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1. Introduction

Institutional reform regarding the division of labor between the market and the state within the aviation value chain is an ongoing process worldwide. In the meantime the liberalization of the markets for airline services has not only been established in EU member countries, but has also gained momentum worldwide. Nevertheless, this process towards competitive airline markets has been a time-consuming and path-dependent undertaking and, from the perspective of worldwide air transport, is not finished yet. After the complete opening of airline markets (including the abolishment of all remaining institutional barriers, such as the prohibition of cabotage) technical safety regulations and environmental regulations for aircraft and the application of consumer protection rules still remain necessary. Moreover, coordinated strategies like airport alliances or code-sharing are characteristics of competitive airline markets and are subject to the evaluation of competition policy.

As the goal of liberalizing the markets for airline services comes closer to being achieved, the focus of government regulation shifts to the problems of infrastructure management and access to network infrastructure, and in particular to the future role of sector-specific regulation of the remaining network-specific market power. Non-discriminatory access to air traffic control activities as well as to monopolistic airport infrastructures for all active and potential providers of airline services is required to guarantee competition on the markets for airline services. The possible role of competitive bidding for air traffic control activities is considered under the precondition of technical regulations, such as the definition and enforcement of boundaries of air traffic control areas. Moreover, competition on the markets for groundhandling services requires non-discriminatory access to complementary infrastructure facilities (“centralized infrastructure”). Price cap regulation on the monopolistic markets for airport slots as well as accounting separation from competitive groundhandling activities and non-aviation airport facilities are also required, whereas market driven slot allocation should not be hampered by regulatory interventions.

The paper is organized as follows: Section 2 starts with the characterization of the worldwide opening process of airline markets. By means of application of the disaggregated regulatory approach the competitive subparts of the aviation value chain can be localized and separated from the subparts characterized as monopolistic bottlenecks. In section 3 the institutional division of labor between sector-specific market power regulation and general competition policy is considered. In particular, the evolution of market driven slot allocation and the role of airport regulation are analyzed. Finally, the issue of airport subsidies is taken into consideration.

2. Liberalization of the aviation value chain and the remaining network-specific market power

In the following the aviation value chain is analyzed from the perspective of the layering scheme of network economics. In order to conduct a thorough analysis of competition potentials and remaining regulatory necessities, it is important to differentiate between transportation services provided by airlines and groundhandling service providers (level 1), air traffic control systems (level 2), and airport infrastructure (level 3).

2.1 The gradual process of market opening for airline services

The process of market opening in the European Community has been implemented gradually between 1987 and the “third air transport package” in 1992.¹ Since 1992 free market entry for European air carriers to intra-European air routes and free price setting has been the leading paradigm. Unlimited cabotage traffic rights granting to Community air carriers the unlimited right to operate

¹ This „third air transport package“ entails Council Regulations (EEC) No. 2407/92 on licensing of air carriers OJ L 240, 24.8.1992, p.1, (EEC) No 2408/92 of 23 July 1992, 24 on access for Community air carriers to intra-Community air routes, OJ L 240, 24.08.1992, p. 8, 24.8.92 and (EEC) No 2409/92 of 23 July 1992 on fares and rates for air services, OJ L 240, 24.8.1992, p. 15.

within the domestic borders of another EC country was guaranteed from April 1997 onwards.²

In 2008 a Regulation was passed integrating the regulations of the “third air transport package”.³ An airline company that has obtained an operating license from a Member State (in accordance with technical and financial conditions) is considered as a Community air carrier and has the right to provide airline services throughout the European Union not only between all the Member States but also within each Member State, such that in the European Union member states all countries grant cabotage rights to each other.⁴

In the meantime, international aviation relations with third (non-EU) countries with the goal of opening access to cross-border markets (“open skies” agreements) became widespread. “From 1992 to October 2012, more than 400 open skies agreements had been concluded involving 145 States, representing 76 per cent of the ICAO membership, ... Nevertheless, granting of cabotage rights is still the exception, registered only within the European Union (EU) and by a few other States in other regions of the world” (ICAO 2013a, p. 1).

A controversial issue between the EU and its member states was the question whether after the completion of the EU internal airline market the authority to bargain with third countries would remain with the individual member states and to what extent the EC would have the authority to negotiate “open skies” agreements with non-EC countries resulting in binding contracts for the whole EU area. The starting point were the infringement proceedings in 1998 of the Commission against seven Member States regarding bilateral “open skies” agreements with the United States. “Nationality clauses” in bilateral agreements which reserved rights for a country’s own airlines were considered to be illegal, due to the EU “open skies” regulations which forbid discrimination between

² EEC No. 2408/92, Article 3.

³ Regulation (EC) No 1008/2008 of the European Parliament and of the Council of 24 September 2008 on common rules for the operation of air services in the Community (Recast), OJ L 293, 31.10.2008, p. 3.

⁴ Regulation (EC) No 1008/2008, Article 4 and Article 15.

home airlines and airlines from other EU countries and thereby also forbid to discriminate between any EU carriers (community air carriers) flying from their home country to a third country. In particular, the Court of Justice of the European communities concluded in 2002 that the freedom of establishment⁵ guaranteed by the Treaty was in conflict with asymmetric treatment of home airlines and airlines from other EU countries and moreover that bilateral agreements including a “nationality clause” would affect the common rules the EU had included in its internal legislative rulings.⁶ In 2004 a Regulation was passed requiring that all existing bilateral agreements between Member States and third countries that contain provisions contrary to Community law should be adapted to become fully compatible with Community law. Standard clauses developed jointly between the Member States and the Commission enable easier implementation.⁷

During the last decade the Commission has gained an increasing role in the process of bargaining of “open skies” agreements with third countries. In June 2003 the Council authorized the Commission to negotiate a global “open skies” agreement with the United States which has been applied since 2007.⁸ The Commission was also given other negotiating mandates regarding “open skies” agreements with the objective of forming global agreements with other regions of the world. Moreover, efforts are being made aiming at the creation of a Common Aviation Area with neighboring countries (Commission of the European Communities, 2005; European Commission, 2012).

⁵ EU air carriers are permitted to create an establishment in any EU Member State without national ownership and control restrictions and can be owned by any EU interest (European Commission, 2012, p. 11).

⁶ In eight separate cases initiated on 18 December 1998 the Commission brought actions before the Court of Justice against the United Kingdom, Denmark, Sweden, Finland, Belgium, Luxembourg, Austria and Germany (Cases C-466/98, C-467/98, C-468/98, C-469/98, C-471/98, C-475/98, C-475/98, C-476/98). Joined opinion of Mr Advocate General Tizzano was delivered on 31 January 2002, European Court reports 2002, p. I-09427. Judgment of the Court of all cases of 5 November 2002.

⁷ Regulation (EC) No 847/2004 of the European Parliament and of the Council of 29 April 2004, OJ L 157, 30.4.2004, p. 7.

⁸ Agreement and Decision 2007/339, OJ L 134, 25.5.2007, p. 1.

2.2 The theory of monopolistic bottlenecks

In the following the theory of monopolistic bottlenecks is applied in order to localize those elements of a liberalized aviation value chain where neither active nor potential competition can fulfill the function of disciplining the active supplier and the complementary competitive elements. The theory of monopolistic bottlenecks is central to the disaggregated regulatory approach in terms of localizing network-specific market power in connection with the effort of determining the minimum basis for regulation (Knieps, 1997, p. 327; Knieps 2011, p. 18). The aim is to come up with a coherent economic framework consistent with network economics which can be applied to all network sectors and which provides justification for ex ante regulatory measures regardless of historical or institutional quirks. For the competitive parts of the aviation value chain application of the general competition law is sufficient. The conditions governing a monopolistic bottleneck are met when:

- (1) A facility is essential for reaching customers, i.e. if there is no active substitute available. This is the case when a natural monopoly exists in the relevant range of demand and a single provider is able to provide the facility more cheaply than several providers.
- (2) At the same time the facility cannot reasonably be duplicated as a way of disciplining the active provider, in other words when there is no potential substitute. This is the case when the costs of the facility are irreversible.

Consequently, network-specific market power is only to be expected in those subparts of a value chain of a network industry that are characterized by a natural monopoly and irreversible costs. Although irreversible costs are no longer relevant for decision-making by established enterprises, as far as potential competitors are concerned irreversible costs are a crucial factor, insofar as they must decide whether to invest such irreversible costs or not. Established firms therefore have lower decision-relevant costs than their potential rivals. This means that there is room for strategic maneuvering, with the result that inefficient production or economic profits no longer necessarily enable newcomers to enter the market. The market power of the firm that owns such a monopolistic bottleneck

is therefore stable, even if all market players are fully informed, all users are prepared to switch to another provider, and small price adjustments have an effect on demand.

In the absence of irreversible costs, however, and as a result of the disciplinary effect of potential competition, incumbent carriers do not possess stable market power, regardless of the size of the relevant network operator's market share. Inefficient providers will be replaced by a new entrant due to the pressure of potential competition. In this case there is no need for regulation to limit the active operator's control over the market.

2.3 Competition potentials on the markets for airline services (level 1)

Liberalized airline markets (including required inputs from the aviation value chain like the manufacturing of aircraft, maintenance, repair and overhaul activities of aircraft or fuel supply) do not possess the characteristics of a monopolistic bottleneck and consequently no network-specific market power. There are many facets of competition on the markets for airline services after all legal entry barriers are abolished. Active and potential competition exists on the airline markets. The very fact that airline services may be provided in the form of a network characterized as a natural monopoly (due to their associated bundling effects) does not imply that there is network-specific market power as long as airlines have non-discriminatory access to complementary infrastructure. High profits recorded by one airline company would have the immediate effect of attracting entrants. There is no danger of preventing competitors from entering the market as long as the decision-relevant costs for transport services are similar for established undertakings and for potential rivals. Since irreversible costs associated with providing airline services on an airline network, for example, play no significant role, the use of aircraft is not confined to certain lines; they are just as mobile geographically as trains or lorries. Whereas the theory of contestable markets examines the role of potential competition with identical cost functions for both active providers and potential rivals (Baumol, 1982; Panzar, Willig, 1977), effective competition on the markets for airline services does not

only mean potential competition. Often a newcomer enters the market with no intention of duplicating the established undertaking. What is also important is active competition achieved by means of technological and product differentiation, and the introduction of new products and processes. As a direct consequence of this, it is misleading to assume that newcomers have as their reference point the belief that ideally there can only be one transport network on the markets for transport services.

Indeed, one of the important features of the ability of competition to operate on the free markets for airline services is that corporate strategies such as product and price differentiation, the build-up of goodwill and the development of an efficient distribution network, etc., can also be used for strategic purposes. Information problems (search costs, asymmetric information, etc.) can also play a role. This should not lead to the conclusion, however, that competition does not work on airline markets. As on any other markets which are basically constrained by active and/or potential competition, the burden of proof as to the existence of market power and as to whether such power is abused rests with the competition authorities. In contrast to general ex ante regulation, application of general competition law should be carried out only on a case-by-case and ex post basis.

Competition on international airline markets has created incentives for building strategic alliances in order to exhaust economies of scale and scope and to reflect consumer demands for global airline service networks. Three major airline alliances, Star Alliance, SkyTeam and Oneworld are now providing more than 60 per cent of the global market share (measured in available seat-kilometers for total scheduled passengers). Thus competition is not only between individual airlines but increasingly between airline alliances (ICAO 2013b, p. 1). Since strategic alliance and code sharing are important efficiency improving competitive strategies in liberalized airline markets the evolution of global airline alliances and joint ventures should not be prohibited by active competition policy measures. There is an ongoing debate on the international coordination of anti-trust immunity policies for airline alliances (ICAO, 2013 e).

2.4 Competition potentials for air traffic control systems (level 2)

Air traffic control systems not only have the task to guarantee traffic safety, but are also responsible for an efficient allocation of airspace capacity. Although airport owners, airlines and air traffic control agencies can only jointly guarantee well-functioning air traffic, they are organizationally and institutionally separated. The allocation of airspace is in the competence of the individual countries. Eurocontrol has no final authority, its board, the permanent commission, is composed of the transport ministers of the member countries. National boundaries and the objective of retaining the sovereignty of the individual countries have led to arbitrary inefficient horizontal divisions in the past and subsequent cost of delays. In the meantime, an intense reform process initiated by the European Commission in order to establish a single European upper airspace by merging the current national regions has been initiated.⁹ The move towards an EU infrastructure policy with the aim of developing trans-European networks – and the intended extension of the single European sky to countries which are not members of the European Union¹⁰ – automatically requires that interoperability shall be promoted between the individual state networks. There is a great need for coordination, particularly with regard to traffic control and monitoring systems.

Air traffic control systems do not constitute monopolistic bottlenecks (Knieps, 2006, p. 8). They are natural monopolies, whose geographical limits have to be clearly defined (control jurisdiction). This still does not mean that they possess network-specific market power, however, since the computer software and know-how needed to develop such systems are not tied to any particular place. Whereas with respect to transport services the pressure of competition can also

⁹ Regulation (EC) No.1070/2009 of the European Parliament and of the Council of 21 October 2009 amending Regulations (EC) No 549/2004, (EC) No 550/2004, (EC) No 551/2004 and (EC) No 552/2004 in order to improve the performance and sustainability of the European aviation system, 14.11.2009, OJ L 300/34; Commission Regulation (EU) No 677/2011 of 7 July 2011 laying down detailed rules for the implementation of air traffic management (ATM) network functions and amending Regulation (EU) No 691/2010, 15.7.2011, OJ L 185/1.

¹⁰ Regulation (EC) No. 1070/2009, Article 7.

be achieved by selective, sequential (time-wise) hit-and-run entry (which does not necessarily result in total substitution of the established undertaking), in the case of traffic control systems auctioning competition is needed, where the subject of the auction is the predefined geographical traffic control area for a set period of time, and where the contract is awarded to the bidder who is able to offer the service at the lowest prices while at the same time covering the costs involved.

Clearly, active competition between different providers of traffic control systems cannot work. An individual airplane can only be monitored by one institution at a time if accidents are to be avoided. Such systems are therefore natural monopolies with geographical limits that have to be clearly defined under public authority. Responsibility for traffic monitoring must remain in the hands of a single authority for a set period of time. This raises the question of the “natural” limit to a regional monitoring area and the coordination needed between different areas. Since traffic control systems are natural monopolies, which need public authority to define the scope and borderlines of the control areas, selective free entry into the control business is not feasible and would conflict with traffic safety. Nevertheless, competitive bidding to find the most efficient traffic control agency for a well-defined control area can be expected to work. If bidding took place to serve larger cross-border areas, a process of competition among institutions would occur. As a consequence, the agency with the most innovative software and control system might also be successful in providing traffic control services in other countries.

2.5 Monopolistic bottlenecks on the markets for airport capacities (level 3)

Airports are multiproduct enterprises. Take-off and landing slots are required such that airlines can guarantee a specific flight schedule. Moreover, additional airport infrastructure (e.g. baggage sorting, fuel-distribution systems) is necessary for the supply of complementary groundhandling services (e.g. passenger handling, baggage handling, ramp handling, and aircraft maintenance). In con-

trast, non-aviation infrastructures (parking areas, restaurants, shopping areas) are provided for non-aviation services.

For the case that two or more airports exist in the relevant range of demand (e.g. London) competitive airports do not create regulatory problems of network-specific market power. As long as only one airport exists to provide airport capacities in the relevant range of demand, airports possess the characteristics of a monopolistic bottleneck as providers of aviation infrastructure required for take-off and landing slots and groundhandling services. This is already the case if only for a subset of airlines access to slots during a specific time interval is essential for providing scheduled flights. In order to guarantee a safe and efficient flight service, non-discriminatory access to groundhandling infrastructure is essential. Although non-aviation infrastructures can enjoy location rents, they nevertheless do not fulfill the characteristics of network-specific market power, because non-aviation facilities are not essential for providing airline services.

2.6 Competition potentials on the markets for groundhandling services (level 1)

Groundhandling services do not fulfill the characteristics of a monopolistic bottleneck production structure. After liberalization potential competition is possible due to the absence of irreversible costs, but also active competition between different providers for each category of groundhandling services seems possible. The markets for groundhandling services on European airports (above a minimum size) were (partially) opened for competition in 1996 by Council Directive 96/67/EC. Entry by third parties into four categories of groundhandling services consisting of baggage handling, ramp handling, fuel and oil handling and freight handling may be limited by member states in such a way that at least two providers for each category of groundhandling service should be allowed to provide an effective choice for the airport users. In the meantime a draft regulation

requires that at least three ground handling companies should be allowed to enter.¹¹

The opening of the groundhandling service markets requires several regulations. Precondition for competition is nondiscriminatory access to the complementary airport infrastructure facilities consisting of “centralized infrastructures”, such as baggage sorting, fuel-distribution systems etc. Suppliers of groundhandling services and self-handling airport users are granted the right of non-discriminatory access to the required airport infrastructure.¹² Possible suppliers on liberalized groundhandling services markets are airports, airlines and independent handlers. In order to avoid cross-subsidization between groundhandling services and other activities accounting separation must be implemented.¹³ Regarding (non-EU) third countries reciprocity requirements are allowed¹⁴ in such a way that the liberalization and subsequent regulations valid within the EU are only obligatorily applied to groundhandling providers of third countries, if no discrimination between EU and third countries providers takes place.

The implementation process of Directive 96/67/ EC has raised several complex regulatory issues, in particular regarding the provision of non-discriminatory access to central airport infrastructure and the procedure for tendering out the right to provide groundhandling services with a restricted number of providers. The large conflict potentials among the parties involved is already indicated by several formal infringement procedures by the EC against Member States regarding the proper adaptation of the Directive concerning selection of ground handling suppliers, non-discriminatory access to airport infrastructure, etc. (e.g. Niemeier, 2010, p. 20).

¹¹ European Commission, Proposal for a Regulation of the European Parliament and of the Council on groundhandling services at Union airports and repealing Council Directive 96/67/EC, Brussels, 1.12.2011, COM(2011) 824 final.

¹² Council Directive 96/67/EC, Article 8.

¹³ Council Directive 96/67 EC, Article 4.

¹⁴ Council Directive 96/67 EC, Article 20.

3. The evolution of market driven slot allocation and airport regulation

Regulating those parts of airports characterized as monopolistic bottlenecks remains an important task after full market opening of airline services. This requires, above all, symmetric access to the monopolistic bottleneck areas for all active and potential providers of airline services to allow (active and potential) competition to fully develop. For competition on the markets for airline services to be effective the conditions of access to the monopolistic bottleneck components of airport infrastructure must be the same for all (active and potential) service providers. If established undertakings have preferential access to scarce infrastructure capacities, they enjoy unwarranted advantages over others that can result in their gaining control over markets that would otherwise be competitive. In January 1993 the Council of the European Communities adopted a Regulation on common rules for the allocation of slots at Community airports¹⁵ which established a legally binding framework applicable in all Member States.

3.1 Slots as marketable commodities

Due to the growth in air traffic, shortages of airport take-off and landing slots can be observed at a growing number of airports, so that the challenge of airport capacity constraints and the search for appropriate solutions is becoming topical. In view of these capacity shortages, the public authorities are increasingly being asked to overcome the problem by developing more capacity. Many airports have invested in additional airport capacities (e.g. new runways). Nevertheless, the scarcity problem of airport slots continues to increase (ICAO 2013c). Investments on such a scale that slots lose their scarcity would be a waste of valuable resources. This is not the same as saying that airport investments (generally) should stop, but rather – according to a basic principle in transportation economics (Mohring, Harwitz 1962) – that they should continue only for as long as the added benefits of capacity expansion are in keeping with the extra costs in-

¹⁵ Council Regulation (EEC) No. 95/93 of 18 January 1993 on common rules for the allocation of slots at Community airports, 22 January 1993, OJ L 14.

volved. This means that even in the context of economically optimal investment at busy airports capacity will still be in short supply at peak times. The allocation of scarce slots is therefore not only a transitional problem: the process of transforming a public commodity into a private one is unstoppable and irrevocable.

As soon as airport capacity is no longer available in excess – i.e. as public commodities – it becomes necessary to specify and define which slots have become in short supply and when. In the usual world of trading in commodities (e.g. grain), there is the microeconomic problem of defining the different categories of a given commodity (e.g. types of grain), but the precise time of the transaction is generally not crucial. The situation regarding airport capacities is completely different. There are several complementary resources that must be coordinated with each other, time-wise, to the highest possible degree of accuracy. The very definition of a take-off or landing slot opens up a vast range of alternatives that can be crucial for potential transactions. If a take-off slot, for example, means only the right of a given airline to take off within a relatively long period of time, that right is worth much less than a guarantee that the airline can take off at a specific point in time without being subject to any delays. Some airlines on the other hand may prefer flexible operating times. Trading in slots therefore presupposes that take-off and landing rights have first of all been defined in a way that reflects both the needs of the airlines (and their passengers) and the operational and logistical possibilities of the airport operators.

The definition of slots contained in Article 2 of Regulation 95/93 also leaves considerable room for maneuvering (“the scheduled time of arrival or departure available or allocated to an aircraft movement on a specific date at an airport coordinated under the terms of this Regulation”). Here, too, it is *ex ante* coordination with no guarantee of punctuality, no rules on priority, and no means of enforcing the right to take off or land as a right of ownership.

This imprecise formulation of the right to use airport capacities does not provide incentives for airports to issue guarantees of punctuality (for specific flights) and accept the liability rules that would stem from such guarantees without at the

same time benefiting from the scarcity rents. On the other hand, it is obvious that administrative management of capacities in short supply with no financial incentives for all the parties involved can produce a high degree of inefficiency.

3.2 Potentials for trading of airport slots

The goal of Regulation No. 95/93 was that the allocation of slots on congested airports should be based on neutral, transparent and non-discriminatory rules. Article 8 (1a) states the maintenance of ‘grandfather’ rights, according to which the air carrier that has operated a slot in the previous scheduling period has priority over other air carriers with respect to that slot in the next scheduling period. The Regulation also provides that carriers have an obligation to use 80% of the slots allocated to them. Regarding slots allocated out of the slot pool, preference is given to new entrants; 50 % of such slots must be allocated to new entrants (Article 10, paragraph 7). Thus, primary exchanges of airport capacities, e.g. slot auctions are excluded.

Article 8 (4) states that: “Slots may be freely exchanged between air carriers or transferred by an air carrier from one route, or type of service, to another, by mutual agreement or as a result of a total or partial takeover or unilaterally”. However, it remained up to legal interpretations whether secondary trading of airport slots including side payments was consistent with the Council Regulation. The interpretation of the term ‘freely exchanged’ became the central conflicting point in the Guernsey Transport Board Case. This case became a landmark case for the more general question, whether secondary trading of airport slots including side payments was consistent with the Council Regulation of 1993. According to the British High Court the meaning of the term ‘freely exchanged’ set down in article 8 (4) Regulation 95/93 does not exclude financial compensations in slot exchanges, due to the absence of legal prohibitions of side payments.

Since the British High Court Decision a continuing debate on the reform of airport slot allocation has evolved. In 2004 Regulation 95/93 was followed up by

Regulation 793/2004.¹⁶ The process of slot allocation has been improved for example by a strengthening of the use-it-or-lose-it rule, which determines under what conditions unused slots are reallocated to newcomers. According to article 8a/1c of the new Regulation slots may be “exchanged one for one between air carriers”. Thus, the possibility of secondary trading in airport slots, including financial compensations, was again not mentioned explicitly. In 2008 the European Commission finally communicated that article 8a/1c of Regulation 793/2004 did not prohibit secondary slot trading. This new interpretation of the law by the Commission is a reaction to the evolving grey markets for secondary slot trading at congested airports. The reasoning in the Commission’s Communication pointing out the legal gap with respect to financial compensations in secondary slot trading uses the same arguments already provided in the British High Court Decision in the Guernsey Transport Board Case.

At congested airports slots do not possess the characteristics of a homogenous good, but differ in market value depending on time. Depending on the flight characteristics (e.g. scheduled business flights, charter flights) airlines have different willingness to pay for slots in a peak period. Thus, regulatory constraints enforcing a one-for-one exchange of slots prohibit welfare improving buying and selling of slots. In contrast to an exchange, the possibility of selling slots increases the opportunity costs of hoarding slots or using them for a less lucrative flight because of the scarcity rents which can be obtained from selling.

3.3 Optimal user charges based on scarcity rents

For as long as airport slots are allocated by applying “grandfather rights” rather than in auction procedures, the question arises to what extent a reform of airport charges can achieve a more efficient allocation of scarce capacity while at the same time improving the status quo in favor of symmetrical access conditions.

¹⁶ Regulation (EC) No 793/2004 of The European Parliament and of The Council of 21 April 2004 amending Council Regulation (EEC) No 95/93 on common rules for the allocation of slots at Community airports, 30.4.2004, OJ L 138/50.

In the past airport charges have basically depended on the weight of the aircraft, their function being to help finance the airports, not to control the way available capacities are allocated. Aircraft weight and flight distance are no indication of a flight's (marginal) contribution to the shortage neither of capacity available to air traffic control authorities and airports nor of the costs that ensue for all other transport players. The decisive factor in this respect is the demand at a particular time for airport capacities and for route capacities. In the short term, airport capacities are essentially unchangeable. In the event of unforeseen capacity shortages, the typical solution is for airports to ration capacity on a first-come first-served basis.

Air carriers tend to ignore the constraints imposed on other aircraft and their passengers by an additional flight at a particular time (e.g. longer clearance times, longer delays, and longer flight times). To take these constraints into account, one solution would be to levy a (time-based) congestion fee equivalent to the congestion costs incurred by all other flights as a result of the extra flight. If demand for infrastructure capacity still exceeds supply, the solution would be to charge a market price that includes not only the congestion costs but also a scarcity rent. These are therefore capacity shortages where there is direct rivalry for take-off and landing slots.

The congestion charges or scarcity rents would need to be graduated according to the degree of capacity utilization during a day and depending on the season, insofar as capacity utilization for the same flight may vary. This would enable peak-time take-off and landing rights to be allocated more efficiently. Congestion charges operate like peak load prices, but are not to be confused with them since a (non time-based) congestion charge would still have to be levied, even if there was no change in capacity utilization over the period and no fluctuation in the level of the congestion costs. Another advantage of congestion charges with respect to the short-term ad hoc rationing of slots is that when congestion charges are high during peak periods there is no incentive to hoard slots. Given that, unless it can be proved that 80 % of the allocated slot sequences have been used, slots in Europe are returned to the slot pool, the introduction of capacity-based congestion charges also reduces the negative effects of "grandfather rights".

3.4 Auctioning of take-off and landing slots

As in the past, rather than being reallocated according to changing needs, take-off and landing slots in Europe remain in the hands of the airline to which they were initially allocated, even if that airline does not use them or another airline would put them to better use. Flight schedule coordination (*ex ante*) is carried out by the airport coordinators appointed by each individual country. The exchange and transfer of slots is allowed in the context of mutual agreements between air carriers. Voluntary airline associations worldwide also negotiate flight schedule adjustments to take account of airport capacity limitations and avoid unnecessary delays. Even if take-off times booked by airlines are in increasingly short supply, so far they have always been allocated free of charge. Economically, there is no justification for this, unless there is sufficient capacity for all airlines to be able to take off and land at any time. Otherwise, the airlines already well-established at a given airport have an asymmetrical competitive advantage over other airlines.

A more rigorous reform would be the abolishment of the ‘grandfathering rights’ of established airlines in favor of *ex ante* auctioning of take-off and landing slots. This shift of the property rights of airport capacities from airlines to airports would provide important incentives for airport owners. In contrast to administrative allocation procedures, economically efficient allocation mechanisms may evolve, applying congestion pricing and quality of service differentiation of airport capacities. Moreover, the revenues from the slot allocations could be used by airport owners as a contribution towards covering the decision-relevant costs of airport capacities including the capital costs of infrastructures.

Given that on expiry of the auction period slots tend to return to the airport operator, the opportunities for air carriers to receive scarcity rents from the sale of slots is limited to trading in slots during an auction period. Insofar as airport operators are now party to the scarcity rents received from slots, scarce airport capacities are allocated to the bidders who show the greatest willingness to pay. Income from the auctions can also be ploughed back into airport development

projects, given that very high scarcity rents send out a signal to the economy that airport capacity is insufficient and that further airport development is required.

3.5 Regulation of airport charges

A common framework regulation on airport charges applied to airports located in the Community that are above a minimum size has been introduced by Directive 2009/12/EC.¹⁷ According to Article 3 member states shall ensure that airport charges do not discriminate between airport users. According to the transparency requirements (Article 7) airport management is obliged to regularly provide information to airport users on the methodology used for setting airport charges, the revenues from the different charges and the total cost of the services to be covered. These regulations do not prescribe a specific allocation mechanism, as long as the objective is to cover the decision-relevant costs of the airport. According to recital (2), Member States are free to determine if and to what extent revenues from an airport's commercial activities (retailing, property) may be taken into account in establishing airport charges. Directive 2009/12/EC in principle does not prohibit airport management to apply efficient airport charges taking into consideration congestion and capacity scarcity in order to cover the decision-relevant costs.

If in the long run revenues exceed decision-relevant costs due to the airport operator's market power, the issue of price-cap regulation becomes relevant. Disciplining network-specific market power by ex ante regulation is typically considered to be a necessary task for regulatory agencies. In the context of airports the issue of dual till versus single till regulation has been controversially discussed. The basic difference between single till and dual till price cap regulation is that single till extends the regulatory basis to components of the aviation value chain which are not characterized as monopolistic bottlenecks, because they consist of non-aviation revenues (retailing, property). While the single till ap-

¹⁷ Directive 2009/12/EC of the European Parliament and of the Council of 11 March 2009 on airport charges, 14.3.2009, OJ L 70/11.

proach has been widely applied in Europe, from the economist's point of view the dual till approach has been favored. After all, regulation in network industries should focus on the areas of network-specific market power and not intervene in competitive parts of the value chain (Kunz, 1999; Niemeier, 2009, p. 17; Starkie, 2008, pp. 52, 123). Decision-oriented cost accounting as a basis for cost-based airport charges (pursued by Directive 2009/12/EC) requires the application of the dual till principle and subsequently separate accounting between aviation and non-aviation activities. If non-aviation activities are included in the cost basis, the principle of cost-based airport charges is violated. If revenues from non-aviation activities are used to cover (incremental) costs of aviation activities, this causes internal subsidization of the aviation services and the requirement of cost-based airport charges is not fulfilled.

3.6 The role of public subsidies

The focus of the debate on the role of public subsidies along the aviation value chain is on subsidies for airport infrastructures. Traditionally, the provision of infrastructure investments in streets, canals, airports, and railway tracks has been considered a typical task of the state. As long as the usage of the infrastructure is so low that there is non-rivalry of usage, market-based usage charges do not make sense and the state plays a significant role in guaranteeing its finance. There are still network infrastructures remaining where access charges do not allow cost covering. For these cases it seems important that public subsidies to guarantee cost covering requirements of infrastructures with low demand should only be granted as a result of a transparent political process.

If two or more airports do exist in the relevant range of demand, due to competitive alternatives the problem of avoiding discriminatory access disappears; incentives do exist for efficient allocation of network capacities; excessive profits cannot be expected; and the subsidy problem disappears.¹⁸ Nevertheless, the

¹⁸ The increasing role of airport competition including the market entry of new airports has been pointed out in ICAO (2013 d).

question arises to what extent significant subsidy problems occur in financing airport infrastructures characterized as monopolistic bottlenecks. Only if the revenues from aviation activities together with the revenues from non-aviation activities do not cover the total cost of an airport (incremental cost of aviation as well as non-aviation and economies of scope between aviation and non-aviation) a public subsidy problem arises. It has often been assumed that in particular smaller airports have a large deficit problem which may require public subsidies. In this context it is interesting to note that analyzing the financial performance of the smaller UK airports Starkie (2008, p. 153) came to the conclusion that even small airports can be commercially viable. The underlying reasoning is that measuring the size of the airport by reference to “passenger numbers” would be inappropriate instead “turnover” would be a more appropriate measure of airport size in order to take into account the diverse activities of small airports. Although the overall profitability of an airport may vary and non-profitable airports cannot be excluded, the lesson is that a critical evaluation of the existence and the size of a deficit based on decision-oriented forward-looking cost accounting (Knieps, 2003) is unavoidable as the welfare economic reference point for initiating public subsidy proceedings. Only then is it possible to differentiate between profitable airports and airports operating at a loss. Since revenues increase under the application of optional non-linear pricing as compared to linear pricing, the entrepreneurial flexibility to apply price differentiation in airport user charges also reduces the need for public subsidies. Profitable airports should be subject to price-cap regulation. Non-profitable airports should be subject to politically desired subsidies to the extent that airport user charges do not cover the decision-relevant total costs. The decision how to finance the deficit is not in the competence of the sector-specific regulator. The question of a subsidy from tax revenues is up for democratic debate. Government subsidies are to be legitimized politically and fixed accordingly. Such a clear-cut separation of competences between regulation and policy then allows both efficient access charges and the transparent, politically desired subsidization of airport infrastructure deficits. In particular, subsidies for public infrastructure should not be used to cross-subsidize markets for airline services, so that competition in the markets for airline services can be fully exploited.

4. Conclusions

In this paper the aviation value chain has been analyzed from the perspective of the layering scheme of network economics. The analysis of competition potentials and remaining regulatory necessities requires a differentiation between transportation services provided by airlines and groundhandling service providers (level 1), air traffic control systems (level 2), and airport infrastructure (level 3). After the complete opening of airline markets technical safety regulations and environmental regulations for aircraft and the application of consumer protection rules still remain necessary. Moreover, coordinated strategies like airport alliances or code-sharing are characteristics of competitive airline markets and should not be prohibited by active competition policy measures. The theory of monopolistic bottlenecks has been applied to localize network-specific market power. For competition on air transport markets and groundhandling services to operate efficiently, non-discriminatory access to complementary monopolistic airport infrastructures must be guaranteed by sector-specific regulation. The evolution of market driven slot allocation should not be hampered by regulation. Price cap regulation in network industries should focus on the areas of network-specific market power and not intervene in competitive parts of the value chain. Thus a dual till price cap regulation has been recommended. Only if the revenues from aviation activities together with the revenues from non-aviation activities do not cover the total cost of an airport does a public subsidy problem arise. A clear-cut separation of competences between regulation and policy then allows both efficient access charges and the transparent, politically desired subsidization of airport infrastructure deficits.

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