

Different Allocation Systems

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Abstract Based on the London's airports example it is obvious that there are differences between 3rd level airports. If the same coordination system would be introduced within various coordinated airports it could lead to various results. The results of analysis of intra-EU route data indicate that larger aircraft have been used at the 3rd level airports and there is no strong evidence of inefficient slot hoarding at these airports, not only before but also after the EC's recognition of secondary slot trading. In contrast, the analysis of slot trading at Heathrow and Gatwick show that slot trading has taken place more likely within alliance and the chances have been very small for carriers to obtain slots from their actual or potential competitors. For the time being, there may be no need for additional regulatory interventions into secondary slot trading as there is little evidence of inefficient slot hoarding. However, the scarce opportunity of slot trading may lead to less intense competition and then to less efficient use of slots in the long run.

Keywords slot allocation, coordination, third level airports, strategy

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1. Introduction

Having defined the slot allocation strategies, an airport typology should be developed in order to identify the various airport environments/settings (i.e., airport clusters) within which the strategies will be evaluated. As a matter of fact, different airport environments/settings may exhibit different congestion patterns, delay figures, and traffic characteristics, while they most probably have different objectives and constraints and should comply with different policy priorities. This, in turn, means that they may require different congestion or demand management approaches for the allocation of slots. As a result, it should be examined whether different or a common slot allocation regime should be established and applied to the airport network.

Based on these there are four main types of coordinated airports:

- super hub airports,
- large international hub,
- large national spoke and small national hub,
- small national spoke.

There will be introduced five coordination schemes/strategies:

- semi-current strategy,
- sequential strategy,
- supervised trading strategy,
- congestion pricing strategy,
- radical strategy.

2. Types of the 3rd Level Airports

- 1st type – super hub airports – represents the largest, busiest and the most congested coordinated airports in EU with a worldwide presence and, last but not least, with a strategic role in the European airport network. Practically, the 1st type airports are the primary hubs of the major European airlines (British Airways, Lufthansa, and Air France KLM). Named airlines operate these airports as the major EU hubs by accommodating traffic between mostly international airport destinations.

- Examples: London Heathrow and London Gatwick, Amsterdam Schiphol, Frankfurt, Paris Orly and Paris Charles de Gaulle

They are the most severely congested airports, an observation that can be also deduced by the notable unsatisfied demand. On the other hand, despite the experienced lack of capacity, available slots are not efficiently used as reflected on the 20% of slot initially allocated but not eventually operated. This might account for slot complementarity reasons, i.e., airlines acquiring slots but not succeeding to match these slots with the corresponding slots at the destination or origin airport. Finally, the 1st type airports are the most 'captive' airport markets on the grounds that the vast majority of slots are subject to grandfather rights.

- 2nd type – large international hub - contains major, metropolitan airports of the European airport network acting mostly as large international hubs (at least for certain national carriers) with focus on intra-European routes and a growth potential to establish one of the major European hubs included in 1st type. Practically, the airports included in 2nd type are primary and secondary large hubs of some of the major European airlines, which operate these airports as servers of traffic both among international destinations, as well as between domestic and international destinations.

- Examples: Madrid Barajas and Barcelona, Roma Fiumicino, Munich, Brussels, Copenhagen, Malpese

Lufthansa, Iberia, and Alitalia are example of based carriers at these airports. Allocated slots practically accommodate the entirety of existing demand expressed by the initially requested slots, which probably accounts for the large airport capacity, as well as the supporting or reliever service that some of these airports provide to 1st type airports. Nevertheless, the same does not hold true for the slot usage, where the highest figure (i.e., 26%) of slot misuse is observed. This could be probably explained by the fact that these airports mainly represent ‘captive’ markets of certain national/flag carriers who pursue to ensure their market share and foothold on their primary or reliever/supporting hubs. In effect, they overbid in their slot requests, while simultaneously maintaining their historic slots some of which are not eventually operated. Finally, the presence of dominant carriers is further explained by the quite low slot mobility (i.e., 71% of slots are grandfathered), a fact that indicates a rather close and ‘captive’ market with substantial entry barriers and well-established incumbent airlines.

- 3rd type – large national spoke and small national hub – contains small and medium-sized airports acting mostly as larger (as compared to the 4th type) spokes of the national airport network or small national hubs channelling traffic from the national spokes to international hubs and vice versa.

- Examples: Malaga, Thessaloniki, Palma de Mallorca, and Porto as ‘large national spokes’ and Vienna, Athens, and Lisbon as ‘small national hubs’

The average traffic figures amount at 93 500 aircraft and 8 500 000 passenger movements. No substantial differences in traffic volumes are observed as compared to 4th type airports. Besides, the slightly higher passenger traffic volume and lower aircraft movements seems to account for the national hubbing role for some of these airports

(larger average aircraft sizes and load factors). The demand is not sufficiently covered with the use of existing capacity, where average hourly declared capacity is 36 runway movements and the initially requested slots slightly exceed 4.5%. On the other hand, a misuse of slots is also observed, since there is substantial number of slots allocated but not operated in 20%. Finally, only 32% of slots are grandfathered, a fact that indicates a rather open market with a promising growth potential. The latter is further supported by the unsatisfied demand especially for those airports ‘small national hubs’ aiming to take a hand in the international airport market shifting to ‘large international hubs’.

- 4th type – small national spoke - contains small, satellite or regional airports acting as the spokes of their national airport network.

- Examples: Dublin, London Stansted, Manchester, Berlin Tempelhof, Berlin Tegel, Turin, Milan Bergamo, Milan Linate, Venice.

The average number of aircraft and passenger movements amounts at 98 500 and 7 200 000 movements. The demand is sufficiently covered through the existing, relatively small capacity (average hourly declared capacity of 30 runway movements). On the other hand, a considerable misuse of slots is observed since there is a substantial portion 15% of slots that were initially allocated but not eventually operated. As well most of the operated slots represent historic usage rights.

3. Coordination Schemes

Coordinated airports were divided into four types/categories before; therefore, the coordination scheme/strategy for every airport type will be introduced here. These strategies are adapted to airports conditions and their needs for coordination and slot allocation. It is not exactly set which coordination strategy is for which coordinated airport type. But airports with low slot mobility could choose from strategies where primary and secondary trading is allowed.

- Semi-current strategy - involves the minimum contrast from the current coordination system on the grounds that it fully maintains the overriding principle of historic slot holdings based on grandfather rights. Basically, this scheme consists of:

- Grandfathering – yes
- Centralized trading with policy criteria – yes
- Primary trading – no
- Secondary trading – no
- Auctions – no
- Congestion fee – no
- Recycling – yes

- Use it or lose it rule – yes
- Policy-designated slots – yes
- All slots – yes, only pool
- Sequential strategy - involves a conservative approach albeit with a more clear orientation to market mechanisms and a slightly more drastic revision of the status quo especially with regards to secondary allocation. In principle, it also retains the grandfather rights in the primary allocation process; however, it attempts an application of market mechanisms in two parallel directions. Besides grandfather rights, the remaining slots will be auctioned at the airport level with monetary trading between airlines being also allowed on a secondary level. In particular:
 - Grandfathering - yes
 - Centralized trading with policy criteria – no
 - Primary trading - no
 - Secondary trading - yes
 - Auctions - yes
 - Congestion fee - no
 - Recycling - yes
 - Use it or lose it rule - yes
 - Policy-designated slots – yes
 - All slots – yes, only pool
- Supervised trading strategy - essentially combines conservative and innovative elements in one strategy. In particular, it retains with slight modifications/adaptations the principle of grandfather rights, but simultaneously allows full primary and secondary monetary trading based on bilateral negotiations either between the airport and airlines (primary trading) or between airlines (secondary trading). The characterization ‘supervised’ trading stems from the principle that although full trading is allowed, primary allocation is self-controlled by the historic slot holdings, which could be also subject to monetary trading. This strategy consists of:
 - Grandfathering - yes
 - Centralized trading with policy criteria – no
 - Primary trading - yes
 - Secondary trading - yes
 - Auctions - no
 - Congestion fee - no
 - Recycling - yes
 - Use it or lose it rule - no
 - Policy-designated slots – yes
 - All slots – yes
- Congestion pricing strategy - represents the most direct pricing method for addressing the real causes of the mismatch between capacity and demand for airport operations. Under the congestion pricing strategy, grandfather rights will be abandoned and a congestion-based scheme with fees varying with

congestion throughout the day will be set by an administrative authority. In particular:

- Grandfathering - removed
- Centralized trading with policy criteria – no
- Primary trading - no
- Secondary trading - no
- Auctions - no
- Congestion fee - yes
- Recycling - no
- Use it or lose it rule - no
- Policy-designated slots – yes
- All slots – yes
- Radical strategy - represents the opposite extreme faced with the ‘Semi-current’ and the ‘Sequential’ strategy on the continuum of the proposed strategies. Grandfather rights will be abandoned with the entire slot pool being allocated by means of market-based instruments (decentralized auctions accompanied by secondary trading). Radical strategy consists of:
 - Grandfathering - removed
 - Centralized trading with policy criteria – no
 - Primary trading - no
 - Secondary trading - yes
 - Auctions - yes
 - Congestion fee - no
 - Recycling - yes
 - Use it or lose it rule - no
 - Policy-designated slots – yes
 - All slots – yes, only pool

There are 1st type airports called super hubs where the grandfathering slots exceed 99% of total slots. At these airports two strategies of the above mentioned could be recommended where this historic rule is removed (congestion pricing or radical strategy). After closer look at coordination statistics of every airport it is possible to adopt one or combination of more strategies.

4. Conclusions

Within airport slot researches there was question about the need for coordination strategies and it showed that the demand for differentiation of coordination schemes is low. The main reason of less demand for strategies is because of today coordination, which is still waiting for amendments. After the innovation of current system it is possible to think about more than one coordination scheme for 3rd level airports.

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