

German Airport Performance

The economic market power of Amsterdam Airport Schiphol

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**Study of the economic market power
on the relevant market(s)
for aviation and aviation-related services
on the Amsterdam Airport Schiphol**

Final version

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GERMAN AIRPORT PERFORMANCE

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0. Executive summary

1. At the beginning of September 2009, we were asked by the NMa to prepare a study on

**“The economic market power on the relevant market(s)
for aviation(-related) services at the Amsterdam airport Schiphol”.**

The task was to provide an overview of services provided at Schiphol airport (N.V. Luchthaven Schiphol - NVLS) and to review the economic market power of NVLS on the relevant markets. This report summarizes the findings of our work.

Definition and classification of airport services

2. The term 'service' is used in this study to describe the different activities of an airport operator, an airline, or a ground handling company. When we define markets with respect to competition law, a market might consist of one or several services. A particular service might be relevant for one market or for several markets.
3. Activities, which are needed to enable passenger and freight to transfer from surface modes of transport to air modes of transport and to allow airlines to take-off and land, are called 'aeronautical services'. All other activities are called 'non-aeronautical' or 'non-aviation activities' (e.g., retail, parking). This study only deals with aeronautical activities of the airport.
4. Aeronautical activities of an airport are further distinguished between 'aviation services', which are currently regulated according to Article 2 of the Dutch Aviation Act, and 'aviation-related activities', which are currently not regulated by the Dutch Aviation Act, but are necessary for the production of airline services.
5. The revenues generated for aviation services by Schiphol's business area "Aviation" account for 55% of the airport's total turnover (2008 data). Furthermore, Schiphol's business area "Schiphol Real Estate" collects some revenues for aviation-related services, i.e., for rental of space to airlines, to ground handling companies, and to the government (for security tasks and customs).
6. Infrastructure and services offered at an airport to the airlines (i.e. "wholesale market") can be structured:

- according to their dispensability (indispensable service at a given airport, 'opting-out' service, and service which might also be purchased at some other airport),
 - according to market structure (infrastructure or service with a single supplier, service with multiple suppliers dependent on bottleneck infrastructure, and service with multiple suppliers independent of bottleneck infrastructure), and
 - according to the role of the airport operator (the airport operator as the only supplier, the airport operator competing with other suppliers, and the airport operator not offering a particular service)
7. The activities at an airport in the field of aviation services and aviation-related services might also be differentiated between air traffic operations services and ground handling services. Both groups consist of several activities. Furthermore, the airport operator might rent facilities to airlines, ground handling companies, and the government, which are needed to offer airlines services, ground-handling services and to perform governmental tasks related to air transport.

Role of the airport operator

8. The airport operator is the only supplier for air traffic operation services at Schiphol. Among those services, landing and take-off services as well as most passenger basic terminal infrastructure and services (incl. security) are indispensable, whereas long term aircraft parking can be considered as an 'opting out' service.
9. At Schiphol, the airport operator doesn't offer ground handling services. Most of these services are indispensable at the airport. They are offered by several suppliers, who are for some services dependent on access to bottleneck infrastructure, like baggage handling and refueling infrastructure. The possibility of airlines to 'opt out' really only exists for planned maintenance and occasionally on short haul flights for catering and refueling services, which might also be purchased at other airports.
10. With respect to rentals at the airport, all three groups of tenants (i.e., airlines, ground handling companies, and the government) require some facilities for operational reasons within the airport. This includes operational rooms for airlines, facilities for employees and storage space, operational rooms for ground handling companies, and areas for customs and security services. Although some of these facilities might be rented outside the airport, in most cases this will increase operational costs significantly.

Stakeholders at Schiphol airport

11. For the purpose of this study, the term 'stakeholder' is defined in a narrow sense, including only entities and persons who use airport infrastructure or purchase airport services. Stakeholders might be grouped as follows: airlines, passengers and cargo shippers, service providers, and the government.

12. With respect to aviation services and aviation-related services there are several direct and indirect monetary flows between the stakeholders and the airport:
 - Airlines pay charges for air traffic operations services, pay rents to the airport, and pay fees to ground handling companies. They collect revenues from passengers and cargo shippers.
 - Ground handling companies pay rents to the airport. Refueling companies additionally pay a concession fee. All ground handling service providers collect fees from the airlines.
 - The government pays rents to the airport.
13. The different business models of airlines imply different preferences with respect to infrastructure and services supplied at an airport. For example, a network carrier with a high share of transfer passengers puts special weight on quality aspects related to Schiphol's function as a hub (i.e. short minimum connecting time, sufficient capacity for the hub operations during the different "waves"). On the other hand, low cost carriers would be willing to accept a reduced service quality if this leads to lower charges.
14. More than 92.4% of all aircraft movements at Schiphol are scheduled services. The largest 30 airlines at Schiphol operate 88.7% of all movements. KLM is the largest airline at Schiphol airport, operating more than 49% of all aircraft movements and more than 53% of all scheduled movements. Together with Air France, who merged with KLM in 2004, and their subsidiaries transavia.com, VLM, and Martinair, the KLM group accounts for more than 60% of all aircraft movements at Schiphol airport. The second largest airline was easyJet with a share of less than 4% of all movements.

The definition of the relevant markets

15. The conceptual framework for the definition of the relevant market is the analysis of substitution effects at the demand-side and the supply-side. From a demand-side perspective, the market definition focuses on the question whether certain goods are substitutable from a consumer's point of view. Supply-side substitution may be taken into account if third-party suppliers are able to switch production in the short term without significant additional investments and economic risk in case of a price increase.
16. The market definition takes into consideration that the demand for airport infrastructure services is derived from the demand for transportation services. The markets for the provision of airport infrastructure are upstream markets; the markets for transportation services of passengers and cargo are downstream. This study is about the upstream markets, because Schiphol airport is only active in these markets.
17. Still, for the definition of the upstream markets, the functioning of downstream transportation markets needs to be taken into account. This approach is in line with European competition practice and European case law.
18. The methodological approach can be summarized as follows: If a company charges different prices for its services, this is considered as a first indication that these services might belong to separate markets. If these services are

usually consumed in bundles, the definition of a common market for the bundled service appears appropriate. Otherwise the focus lies on demand-side substitution. If substitution is strong, this indicates towards the definition of a common market. In contrast, weak demand-side substitution gives indication that the definition of separate markets is appropriate. Differences in the downstream markets (i.e. elasticities of demand, catchment areas) might also translate into the ability of the airport to charge customers differently, which also gives indication towards the definition of separate markets.

19. The core of the activities of Schiphol airport in terms of revenue is the provision of infrastructure to airlines. Moreover, the airport also provides access to the infrastructure for third parties which offer ground handling services at the airport. Schiphol airport is not active in the provision of ground handling services itself, and it does not generate revenue from the provision of access to the airport (with the exception of concession fees for refueling). Both types of activities differ substantially in terms of revenue creation, the customers and the way these markets work. The market definition takes this into account.
20. The ability of the airport to address different types of customers in a different way through its pricing scheme serves as a first indicator that Schiphol airport is active in a number of separate markets. It is the task of the economic approach in market definition to give evidence if the markets should indeed be defined separately, or if it is appropriate to define a common market for the provision of all infrastructure services which Schiphol airport provides.
21. There are several reasons for defining four separate markets related to the provision of infrastructure to airlines. First, the airport charges different prices for the services (passenger on origin & destination flights (O&D), passenger transfer on transfer flights, cargo, local & instruction flights), and the airlines cannot easily switch between offering these types of services. As an example, cargo transportation works differently as compared to passenger transportation, which results in substantial switching costs for airlines wishing to change the type of service they offer. Second, the related downstream markets differ, which enables the airport to address these types of customers differently. For instance, the introduction of the 'Air Passenger Tax' on July 1, 2008 shows that substitution between O&D and transfer passengers is not substantial in case of a price increase for O&D passenger services. Also, many interview partners indicated that demand elasticities in the different downstream transportation markets differ. Third, the analysis of the catchment areas indicates that these markets differ with respect to their geographic market boundaries. Finally, supply-side substitution is not strong enough to render missing demand-side substitution obsolete. There exists no alternative airport capable of taking over almost all traffic at short duration in case of a price increase.
22. According to the economic reasoning and in line with European case law, the definition of the relevant markets of Schiphol Airport for the provision of infrastructure to airlines with respect to services are as follows:

- Market for the provision of infrastructure to airlines serving O&D passengers.
- Market for the provision of infrastructure to airlines serving transfer passengers.
- Market for the provision of infrastructure to airlines offering cargo transportation.
- Market for the provision of infrastructure for local & instruction flights.

Geographically, these markets are defined through their respective catchment areas. The exact definition is left open, as a too rigid geographic market definition might mislead the assessment of market power. We therefore give only indications about the size of Schiphol airport's geographic markets, with the catchment area of local & instruction flights being the smallest area relatively close to the airport, O&D covering a larger area of or around the Netherlands, and transfer (some part of Western Europe) and cargo (whole of Europe) being even larger.

23. The markets for the access to the infrastructure for the provision of ground handling services by third parties are defined as follows:
- Market for the access to the infrastructure of Schiphol airport for companies which offer passenger handling services.
 - Market for the access to the infrastructure of Schiphol airport for companies which offer freight and mail handling services.
 - Market for the access to the infrastructure of Schiphol airport for companies which offer aircraft handling services.
 - Market for the access to the infrastructure of Schiphol airport for companies which offer catering services.
 - Market for the access to the infrastructure of Schiphol airport for companies which offer refueling services.
24. A separate market for each of the separate ground handling services would result in too narrow market definitions, because the services are usually offered in bundles. We therefore suggest the commonly used clustering into the five groups stated above, which follows from the practical combination of these services. Catering and Refueling are separate markets, because these services require different facilities. Some of the other ground handling services are complementary, resulting in the three other clusters which are not substitutable (freight and mail handling, passenger handling and aircraft handling).
25. The exact geographic market definition of these markets is to some extent left open. In geographic terms, these markets are not necessarily restricted to the airport's area, as the provision of some of these services may also be linked to the use of offices and rental space close to the airport. This is more likely for some services (i.e. catering) compared to others (i.e. refueling). As a consequence, all five geographic markets are defined relatively broadly and may also include nearby locations beyond the airport's space.

Assessment of market power in markets for the provision of infrastructure

26. The assessment of market power of Schiphol airport requires an analysis of the competitive situation at the airport. The starting point for this analysis is the functioning of the downstream transportation markets. For the assessment of the market power we analyze the market position of the airport in line with the guidance of the EU Commission on this subject. We take both demand side and supply side competition into account, and evaluate the ability of the airport to increase its charges to above competitive level to assess market power. In order to identify market power, the European Commission requires that “the undertaking’s decisions be largely insensitive of the actions and reactions of competitors, customers and, ultimately, consumers”. We therefore tried to identify the degree of “insensitiveness” to consumer’s reactions by asking whether a hypothetical price increase would lead to a substantial reduction in demand, due to substitution towards other airports, thereby rendering such a price hike not profitable.
27. In our assessment of the market position of the airport with respect to the four markets for the provision of infrastructure for landing and take-off, we have found different intensity of competition in each of these markets.
28. With respect to the market for the provision of infrastructure for airlines serving O&D passengers, we analyze the effects of overlapping catchment areas and intermodal competition.
29. Schiphol enjoys a strong position on the market for provision of infrastructure for take-offs and landings for O&D passengers. Many of the airlines are very unlikely to leave Schiphol for other airports. AMS is the largest airport in its catchment area, and airlines serving Schiphol airport offer flights to many more destinations as compared to all nearby airports. Even though over the last eight years three airports in Schiphol’s catchment areas emerged as competitors to AMS, its dominant position in its area has not been effectively challenged.
30. The impending launch of HSL-South high-speed rail line will increase substitutability between Schiphol and Brussels, Duesseldorf, and Cologne. O&D traffic on the Paris-Amsterdam and the London-Amsterdam market is also likely to be affected; however, market players differ in their assessment of the magnitude of this effect. The net effect will likely imply a lower degree of market power of the airport.
31. Our demand-side analysis suggests that some customers are indeed willing to switch between the airports, responding to various factors, such as airfare, schedule convenience, airport’s proximity, etc. This potential pressure on the airlines serving Schiphol also affects the market position of Schiphol airport. Nevertheless, for most customers in the O&D market, possibilities for substituting Schiphol with some other airport are limited. Therefore, in this market Schiphol remains a dominant supplier. Some rough estimates of a hypothetical price increase - based on typical price elasticities of demand in the sector, and the current level of airport charges - show that a price increase on the wholesale market might be profitable for the airport. This gives an indication on the existence of economic market power (EMP).

32. Unlike with the O&D market, Schiphol is not a clearly dominant player on the broadly defined market for serving transfer passengers. The extent of competition for the transfer passengers among the main EU hub airports has increased very modestly over the last decade. While the market for transfer passengers is segmented between the main hubs, apparent price sensitivity of transfer passengers is likely to limit the extent of potential exercise of market power by Schiphol. We observe more competition in the market for the provision of infrastructure for airlines serving transfer passengers, due to the presence of substitute transfer hubs, with the degree of competition differing between broadly defined market segments (e.g., Europe to North America versus Europe to Middle East).
33. Based on a hypothetical price increase, we again find evidence of market power. Only for those markets where fares for transfer flights are rather low and the price elasticity of demand is rather high, would an increase in airport charges not be profitable for the airport, arguing against evidence of EMP. There is also some supply-side competition with respect to the transfer market, especially as a consequence of the Air France-KLM merger.
34. Nevertheless, we find significant differences between the individual markets and we also find markets with EMP. This finding is due to the fact that airport charges are only a small part of the airlines' total costs. Furthermore, large airlines, which are the most important customers of Schiphol airport, have only very limited options. They have significant sunk investment at Schiphol airport, and their network system relies on access to AMS. This, together with possible slot constraints at other airports and restrictions due to international traffic agreements, will make it difficult to move larger parts of their operation to alternative airports. This is a further indication that Schiphol airport has market power in the market for the provision of infrastructure for the airlines serving transfer passengers.
35. The impending expiration of double hub guarantees in spring of 2011, in light of the apparent development of CDG as the primary hub in the Air France – KLM joint network, along with the purchase of Northwest Airlines by Delta Air Lines, presents a threat to Schiphol's position in the global aviation industry in the middle to long-term.
36. The most intense competition was observed in the market for the provision of infrastructure for airlines serving cargo customers. Because of the larger geographic market and the fact that most cargo is transported on trucks to the airports, high substitutability between airports can be observed. But despite the intense downstream competition, a hypothetical price increase still shows economic market power. Nevertheless, this EMP is weaker than that for the provision of infrastructure for flights for O&D and transfer passengers, due to a larger catchment area for cargo. Also, Schiphol's largest cargo customer has sunk investment at AMS, implying substantial switching costs. About 40% of the cargo at Schipol is belly freight. The share of belly freight is especially high for KLM; therefore, this airline has only very limited possibilities for moving that part of its business to another airport. Martinair, KLM's subsidiary cargo only airline, also has substantial switching costs. As a consequence we find that the airport has market power in the market for the provision of infrastructure for airlines serving the cargo customers.

37. The market for the provision of infrastructure for local and instruction flights is a much smaller geographic market, even smaller than that for O&D passengers. Since most neighboring airports also belong to Schiphol Group,¹ the competitive pressure from substitute airports is rather limited, implying Schiphol has market power.
38. Consequently, Schiphol has economic market power for the provision of infrastructure in all four markets that we analyze, although the strength of the market power differs. On O&D markets, EMP is most apparent, while on cargo it is the smallest.

Access to infrastructure for ground handling service companies

39. In the markets for the access to Schiphol airport for companies which offer ground handling and other aviation-related services, the airport plays a crucial role. It provides access to the central infrastructure (like access to the airport ramp and the terminal, the central baggage system, to energy and utilities, and to rental space). The question to be answered is whether this provides a possible leverage for Schiphol airport to exercise market power.
40. Our analysis shows that in the five markets for the access to Schiphol airport, the airport has indeed the possibility to exercise market power. Almost all markets for the access to Schiphol airport for companies which offer ground handling service (GHS) are bound to the airport. The only exceptions are planned aircraft maintenance and some catering services (and in some very special cases fuel and oil handling). For these activities there might in some cases be either a possibility of opting out or a possibility of purchasing the respective service at some other airport. All other ground handling services are indispensable at a given airport. Control over access provides therefore a possible leverage which Schiphol could use. As a consequence, the airport has a dominant position on the market for the access to Schiphol airport.
41. However, we observed that, except for fueling, access to infrastructure is provided without an access charge and the associated barriers to entry are kept to a minimum. As a consequence, most services are provided by multiple suppliers (including self handling) in the framework of a competitive market structure (except for fuel and oil handling, which is dependent on a bottleneck infrastructure and the supply of rental space, which is provided by a single supplier).
42. Almost all services providers, as well as airlines and security services, need office, storage or operational space at or close to the airport, in order to provide their services. To what extent there might be also market power with respect to rental space depends on the competition for rental space beyond but close to the airport area. For many offices and storage facilities, there are alternatives to the airport.
43. Those service providers who for operational reasons need to have office and/or storage space in the terminal area are dependent on the space the airport's real estate arm provides. Therefore, the airport might be considered to have a

¹ Of the potential competing airports, the airports of Rotterdam, Lelystad and Eindhoven belong to Schiphol Group.

dominant position with respect to the rental of operational space needed for aviation services and aviation-related services in the terminal.

44. Our analysis shows that the real estate market at Schiphol airport is quite diverse. For many offices and facilities, there are alternatives, making this a competitive market. For specific activities, users need to have access to specific locations, for instance terminals. Rents in terminals are high, but users need to pay this because there are no substitutes and there is little opportunity to extend available space at these specific locations. High prices may therefore be market clearing prices, displaying scarcity. Our interviews suggest that there is excessive demand for (office) space in terminals in the sense that even at higher prices tenants are not willing to move.
45. Concluding, the provision of rental space necessary for airline operations, ground handling operations, and government tasks should be considered an aviation-related service. This is due to the fact that each party has to have access to some rented space within the airport in order to produce its service. The airport is the dominant supplier of rental space on its premises, and the tenants only have limited options for moving their operations to areas outside the airport. The question whether the airport abuses its market position has to be left open, as such an assessment cannot be inferred from the available data.

International comparison of market definitions and assessment of market power

Australia

46. In Australia, there is hardly any effective competition between airports, and no effective competition from other transport modes is present. The Productivity Commission differentiates between markets for aircraft movement facilities, passenger processing facilities and non-aeronautical services in order to identify sources of substitution. According to the Commission, economies of scale and scope combined with sunk cost are effective barriers to entry. The price elasticity for an airport's service is generally highly inelastic, indicating EMP.

Great Britain

47. In Great Britain, the airport regulation decisions are based on the assessments of market power by the Civil Aviation authority (CAA) and the Competition Commission (CC). The focus is on aeronautical services. Both the CAA and the CC define the relevant market by the same method. The product market is defined as aeronautical service of an airport and is separated from commercial services. The two agencies disagree on whether to apply the hypothetical monopolist test (SSNIP) to define markets. CAA bases its decisions on SSNIP together with reasoning on substitutability, while the CC abstains from such a test.
48. In the cases of Manchester and Stansted airports, the CAA argues that competition from nearby gateways in all market segments would significantly constrain the airports' market power. The CC compares the market power of each BAA airport under a regime of separate ownership with the market power of BAA under joint ownership. The effects of capacity constraints and price cap regulation had to be taken into account. It was determined, in particular, that Gatwick, Heathrow and Stansted faced hardly any competition from non BAA airports and therefore had EMP.

Germany

49. Four of Germany's roughly 20 international airports (Düsseldorf, Frankfurt, Hamburg and Hanover) are partially privatized. Regulators have not conducted any studies evaluating the market power of these airports. Scholarly research suggested that nearly half of the German airports (including Düsseldorf) face substantial competition, while there are gateways with substantial market power (e.g., Berlin, Frankfurt, Hamburg, Munich and Stuttgart).
50. The German regulatory system appears to be an example of regulatory capture with the resulting low incentives for economic efficiency and relative high transaction costs. Germany does not have an independent regulator and the country's system for airport regulation appears to be rather ineffective.

France

51. The French airport system was managed as a public utility and was reformed in 2006 by partially privatized Aéroports de Paris (ADP). In the process of privatizing and reforming regulation, the market power of ADP was assessed, but on a broad and a rather loose base. Therefore there is little information on the questions what the relevant market for which airport service is, and how great the market power might be. Overall the ADP airports have persistent market power. The regulation of ADP has been reformed by switching to an incentive regulation without establishing an independent regulator.

United States

52. The crucial feature of the US airport industry is that airports are viewed as part of the general transport infrastructure rather than as firms. Most US airports are public enterprises. An evaluation of the airports' market power is not an issue. The Federal government is able to enforce cost-based charges by mandating them on airports receiving Airport Improvement Program grants. Access to gates and terminal facilities can serve as an entry barrier for airlines, as it is often arranged via long-term contracts.

Conclusion

53. We define two groups of markets for the aviation and aviation-related services which NVLS, the airport operator of Schiphol airport, offers.
54. The first group consists of markets for the provision of infrastructure to airlines. This group comprises four separate markets (the provision of infrastructure for airlines serving O&D, transfer, and cargo markets, and local instruction flights). Geographically, these markets are defined by their respective catchment areas. Our analysis shows that Schiphol airport has market power in each of these markets, but the degree of market power varies. It is strongest in the market for the provision of infrastructure for airlines serving O&D markets, and weakest in the cargo market. Overall, downstream competition intensified over the last years, but it is not yet sufficient to discipline Schiphol airport at the upstream markets. For instance, opportunities for airlines to switch the airport are rather limited. This is also confirmed by an analysis of a hypothetical price increase using reasonable price elasticities, where we tried to identify the degree of "insensitiveness" to consumer's reactions.
55. The second group of markets consists of markets for the access to the infrastructure for companies offering ground handling and other services. This

group consists of five separate markets (access to the airport to offer passenger handling, freight & mail handling, aircraft handling, catering, and refueling services). Geographically, these markets are defined by the airport's space and nearby locations. Schiphol airport controls access to the infrastructure and has significant market power, although it currently charges no access fees to the airport (with the exception of concession fees for refueling). However, the rental of operationally required space is a crucial instrument which can be used to exercise market power.

56. From an international perspective, the presence of market power for Schiphol airport is in line with findings of regulators in other countries. As differences in the country airport industry situation, national government policies and the methodology employed to analyze market power exists, a comparison of the resulting market definitions gives only limited insights.

1. Introduction

57. The question raised by the NMa to study the market power of Schiphol airport, is a fundamental one, because airports have traditionally been seen as local or natural monopolies. Hence, the issue of how much market power is present along the different parts of the value chain of an airport was never really seriously addressed.
58. For most airports there are no close substitutes, as attractive locations are limited (Forsyth, 1997). It seems almost impossible to build a competing airport next to a hub like Frankfurt or Paris. According to Forsyth (2010) “such airports have a de facto monopoly reflecting planning and environmental restrictions and they have market power in the provision of aviation services which should be regulated”.
59. The issue of how to control the market power of airports through regulation was therefore considered to be much more important than the question of how to assess the market power of both an airport as a whole, and within the different submarkets in particular. However, over the last 25 years the ownership structure of airports has changed in many parts of the world. Today airports are no longer a homogenous group of public utilities, but a heterogeneous group with wide-ranging ownership structures, and with regulatory systems ranging from cost regulation to price cap and even to complete deregulation and with different degrees of competition. According to Niemeier (2009), “these changes mirror the changes of the downstream market”. The downstream market, i.e. the *airline* industry, underwent these changes earlier and is in many parts of the world a competitive industry. Intense competition forces airlines to apply innovative business strategies with sophisticated pricing and cost cutting approaches, including efforts to acquire the inputs from airports at a lower price (Winston and de Rus, 2008). To look for a more deregulated environment, in which similar practices could be applied to the airport sector, was therefore a logical consequence.
60. These changes in the structure of the airport sector and the pressure from users has also brought about further policy initiatives, combined with academic studies. For example, when the scope for competition between airports was being investigated in 1999, the breakup of BAA airports was already seen as a real option. However, having taken evidence from the Civil Aviation Authority (CAA), a joint team of the Departments of Transport, Trade and Industry and the Treasury, concluded that a breakup would not offer benefits to consumers which outweighed the damage (Toms, 2002). Ten years later, a further investigation by the CAA and the Competition Commission (CC) led to the breakup of the BAA airports, as described in Chapter 7 of this study.
61. This debate illustrated a number of topics which are also relevant for this study:
 - a) There are many aspects of competition between and within airports, but the notion of effective competition between airports at different locations, and with different networks is not yet proven.

- b) Head to head competition across the product range is not common, though it does exist.
 - c) More likely is some form of competition for different services and market segments of the value chain of an airport, where the technical determinants of the market structure allow more than one supplier. It is therefore important to work out where barriers to entry can be reduced and workable competition can be established. The workability of competitive submarkets within the airport business has been shown for the market for ground handling services, an issue we deal with in Chapter 6.
 - d) Thus the assessment of market power and competition issues with respect to airports are not matters of black and white – rather, they are of varying shades of grey. This means that empirical and policy issues related to this question are both subtle and complex (Forsyth, 2010).
62. Documenting some forms of competition is quite straightforward, but it is much more difficult to measure the intensity of competition. Is competition sufficiently strong to eliminate market power or does it significantly constrain its use?
63. The emergence of some kind of airport competition has led to a number of initial studies which assess the effects of airport competition on market power. These studies deal, for example with specific types of traffic, like passengers using low cost carriers (LCC) (see Lei et al., 2004) or cargo traffic (see Tretheway and Andriulaitis, 2010). This highlights the need to estimate travelers' (and shippers) willingness to travel to remote airports, and how they trade off access times for other attributes of airports. To this end, the theory and evaluation of consumer choice is of particular relevance (see Gaudry and empirical studies by Hess and Polak, 2010; Strohbach, 2010; Malina, 2010).
64. The evidence suggests that sometimes travelers do have an effective choice of airport, but they may have a strong preference for low access times and general convenience. This would imply that competition between airports might not be strong. On the other hand, passengers who use LCC probably might not have such a strong preference for low access times, and they would be willing to travel further to save money. Hence, airports catering for this market segment will compete more strongly.
65. There has also been some work on competition between major hub airports; an issue, which we deal with in Chapter 5. Passengers and shippers can choose between different airlines to fly through different hubs to their long haul destination. Airports compete through the airlines to win this traffic. The intensity of **hub competition** has with a few exceptions (Schiphol versus Aéroports de Paris (ADP), Heathrow versus Gatwick) not been studied intensively (Burghouwt and Veldhuis, 2006). If hubs were close substitutes, hub airports could easily win new hub carriers. While in the US some airlines have over time developed new and closed old hubs, Europe has relatively stable hub and spoke networks (Burghouwt and de Wit, 2005).
66. These studies show that hub competition is limited by relatively high switching cost for airlines because a hub operation is a specialised investment with a certain level of sunk costs. Air service agreements restrict in some cases traffic rights, making switching unattractive or even impossible. Capacity constraints are also important, as many hubs in Europe are slot coordinated. Where slot

trading is not possible, airlines are locked in (Wolf, 1999). Nevertheless, the alliance of Schiphol and ADP is an indication that airlines might shift traffic and that airport managers may try to reduce this competition (De Wit, 2009; Forsyth et al., 2009)

67. **Hub and secondary hub competition** is also a form of competition that is emerging. The intensity of competition for example of Heathrow versus Manchester, or Frankfurt versus Munich versus Düsseldorf depends in particular on traffic rights, aircraft technology and hub congestion. So far no secondary airport in Europe has become a major hub, which might have happened if competition were more intense.
68. **Primary and secondary airport competition:** There are few regions where a relatively large airport competes against a mid sized secondary airport. For example Luton won most recently traffic from Stansted (Starkie, 2009). Vienna and Bratislava are competitors, as indicated by the attempt of Vienna to buy Bratislava which was blocked by the Slovak competition authorities (Forsyth et al., 2009). Overall, currently this type of competition is not very strong as airport products differ and access costs might be high (Forsyth et al. 2009).
69. **Potential supply side competition.** In competitive markets with strong growth and persistent excess demand, entry would occur and competition would be intense. In Europe only few market entries were observed but not in areas with strong demand with the exception of the Manchester (Müller-Rostin et al., 2009).
70. We may also look at forms of **indirect competition**, like competition between destinations, leading to indirect competition between airports at different destinations (see Kincaid and Tretheway, 2010), along with competition for services (see Morrell).
71. Finally, it is worth looking at **countervailing power**, because market power only needs to be regulated if users are unable to exercise countervailing power (see Button, 2010; Pels and Verhoef, 2010, on extent and nature of airline competition). This can also be instituted more formally, as can be seen by discussions in the UK. In 2001, the Government's Better Regulation Task Force recommended that the Government consider the lifting of price controls on BAA's airports to encourage direct negotiation with airlines and eliminate regulatory gaming. However, the Government did not act on this recommendation (Toms, 2008).
72. From the policy perspective, the most critical issue is how strongly airports are competing for their core business - handling flight and passenger movements. If competition is strong, regulation is unnecessary and probably counter-productive. If competition is weak or non-existent, the airports will have market power. Regulation, explicit or light handed, will be needed if it is desired to keep prices down.
73. Evidence suggests that competition is sufficiently strong amongst the smaller UK airports to keep prices down and render regulation unnecessary (see Starkie). Competition, if enabled by the political framework, might also be strong enough in other countries, such as Germany (see Strohbach, 2010; Malina, 2005) or France, to dispense with regulation. In some countries, such as

Greece, while there are several airports spread across a region, they tend to serve local markets and do not compete (see Papatheodorou, 2010).

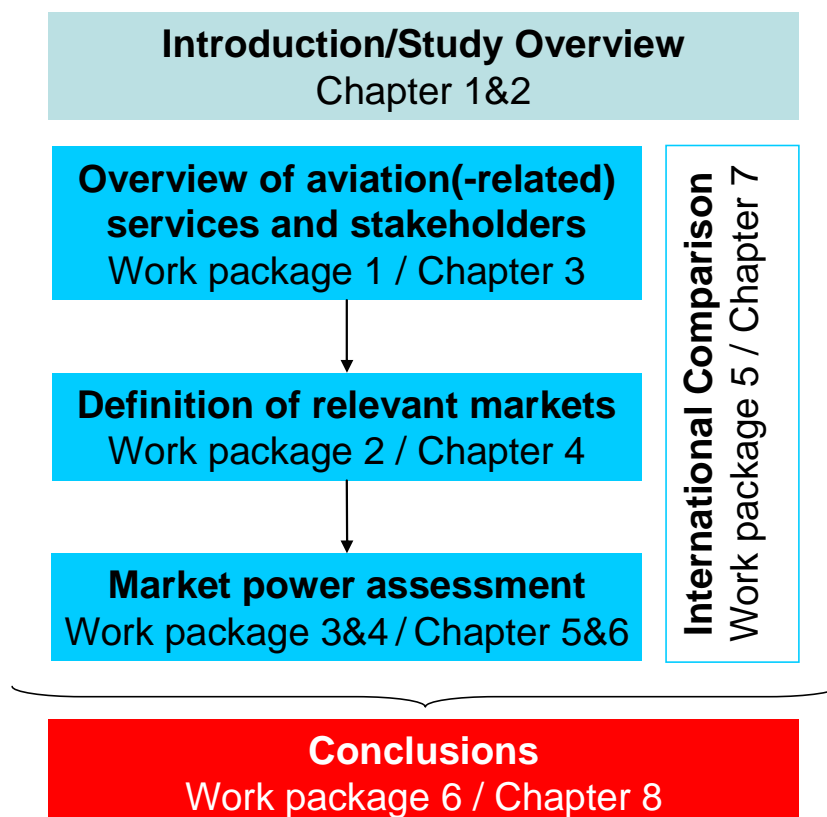
74. However, according to Forsyth (2010), there does not seem to be much evidence of strong competition between the airports of medium to large cities. In the cases of very large cities, such as Paris and London, with several airports, the potential for competition has been eliminated by common ownership (see Forsyth and Niemeier, 2010). “Competition between the airports of different cities is not likely to be sufficiently strong as to eliminate the need for regulation, since most cities with major airports in Europe are sufficiently far apart for them to be weak substitutes for most of their traffic” (Forsyth, 2010).
75. It was against this background of the current policy debate, which has only been sketched in the paragraphs above, that we set out to review the economic market power of NVLS on the relevant market(s). We have greatly benefited from the expertise and research network that has been established within the research project GAP (German Airport Performance). The GAP project, which has been funded by the German Ministry of Research and Technology, relies on the cooperation of three universities and a number of external academic and industry collaborators, which we could draw on for advice on some of the questions that rose during the study.
76. In this context we could also rely on the support of the research students involved in this project, especially Marius Barbu, Isil Altinkaya and Kübra Gürtaş.
77. We have benefited enormously from access to industry experts around Schiphol, who have willingly given their time and expertise to explain to us the intricacy of the Dutch aviation market.
78. Finally we would like to thank the team within the NMa, which supported our research effort and guided us along a productive path.
79. Without the support of all these individuals, the study would not have been possible in the present form. We hope that it helps to enlighten the debate about how to reform the regulatory system for airports in the Netherlands.

2. Study overview

80. The aim of this study is to assess, whether NVLS, the operator of Schiphol airport, possesses a dominant position on the market(s) for aviation and aviation-related services. This assessment will be used in the review process of the Dutch Aviation Act, which determines the current sector-specific regulation of Schiphol airport.
81. The traditional role of airports is to provide infrastructure for airlines, passengers and cargo forwarders. The infrastructure provision is usually financed by airport charges, which are in almost all countries subject to some kind of sector-specific regulation. In the last decades, so called commercial services have become more and more important. Modern airports offer large shopping and restaurant areas, hotels, entertainment as well as conference facilities, just to name a few. These commercial services (also called non-aviation services or non-aeronautical services) are not within the scope of this study. It concentrates on the provision of infrastructure and services, necessary for producing air transport services, i.e., the aeronautical activities of an airport.
82. Schiphol airport is one of the large hub airports in Europe. It offers services for passenger as well as for cargo transportation. In the passenger market, Schiphol, like all other large hubs in Europe, has a high share of long haul (mostly intercontinental) traffic, leading to a large number of transfer passengers.
83. As Schiphol airport offers a multitude of services, the compilation and classification of these services is a precondition for any further market analysis. This is done in chapter 3, together with the illustration of some fundamental concepts and definitions. As different airport services have different groups of users, the stakeholders at Schiphol airport are also described and analyzed in chapter 3.
84. The next step in the analysis of market power is the delineation of markets. This is done in chapter 4, using an approach which is common in European competition policy case law. The analysis in this chapter is based on demand- and supply-side substitution.
85. With respect to aviation services and aviation-related services, two types of markets are delineated in chapter 4. The first group of markets is the provision of infrastructure for airlines, consisting of four different markets. The second group is the provision of access to infrastructure for the provision of ground handling services by third parties. This group consists of five markets.
86. The grouping of markets developed in chapter 4 is further used as a basis for the analysis of the market structure and market power assessment. In chapter 5, the market position of Schiphol airport in the different markets for the provision of infrastructure to airlines is analyzed. Chapter 6 deals with the market position of Schiphol airport with respect to the access to infrastructure

- for ground handling companies and other third parties (including the government).
87. Almost all aviation services and aviation-related services are factors of production (inputs) for airlines or for companies which are producing inputs for airlines (e.g., ground handling service providers). Therefore, the markets on which Schiphol airport offers its services can be considered wholesale (or upstream) markets. On the other hand, the markets on which airlines offer their services to passengers and/or freight forwarders can be considered retail (or downstream) markets. Since the structure of the retail market determines in many ways the market position of the airport in the wholesale market, the competitive position of Schiphol airport with respect to other airports is taken into account in chapter 5. This analysis is done for origin and destination passengers, for transfer passengers and for cargo, thereby basing this analysis of the retail market on the results from the delineation of markets for the provision of infrastructure for airlines (wholesale market) in chapter 4.
 88. Finally, an international comparison is drawn. Chapter 7 describes the ways airport market power assessment and airport regulation is carried out in five other countries. In each case, differences as well as similarities to the situation of Schiphol airport are pointed out.
 89. Figure 2.1 gives an overview of the work packages of the study and the chapters of this report.

Figure 2.1: Overview of study work packages and report chapter structure.



90. Since this study analyses different markets and parts of markets, several methodological approaches have been applied. The basis of the study is a comprehensive analysis of the existing literature on airport competition. Our own empirical work has been mainly used for analyzing the competitive position of Schiphol airport with respect to other airports. Furthermore, we have interviewed staff members from Schiphol airport as well as from several stakeholders. During this period, different companies have made their data available to us. At several stages of the research project, preliminary results have been presented and discussed with the NMa and the members of the advisory board. Nevertheless, all valuations, opinions, and conclusions in this report are those of the GAP project team.

3. Services and stakeholders

(Work package 1)

91. This chapter has several purposes that also determine its structure. First, some basic definitions are presented which will be used throughout the entire study. Second, the different services which are performed at an airport are explained, and categorized with respect to the conditions at Schiphol airport. Thereby, a special attention is given to the revenues which are generated by Schiphol airport for aviation services and aviation-related services. These parts of the chapter also serve as a basis for the delineation of markets and the assessment of market power in the remainder of the study. Finally, the different stakeholders are identified and their respective interests are analyzed.

3.1 Identification of services at Schiphol airport

Identification of aviation services, aviation-related services and non-aviation-services

3.1.1 Differentiation between markets and services

92. For the purpose of this study, a distinction between markets and services is made. First, the term "market" is used in accordance with the Commission notice on the definition of the relevant market for the purposes of Community competition law.² It is a prerequisite for the application of competition policy, especially the assessment of market power (see chapter 4). With respect to the air transport industry, a crucial distinction has to be made between downstream markets, i.e. markets where airlines offer their services to final customers (especially passengers or cargo shippers), and wholesale markets, i.e. markets where the airport is offering services to airlines and/or third parties. In some cases, several elements of the vertical production chain have to be taken into account, e.g., the airport is providing services to a ground handling company which offers its services to an airline.
93. Second, the term "service" is used to describe a certain activity of the airport operator, an airline, and/or a third party. With respect to ground handling, the distinction of different services will be based on the EC's ground handling directive.³
94. Therefore, a market as delineated in accordance with EC competition law might consist of one service or of several services. On the other hand, a certain

² Official Journal C 372, 9.12.1997, p. 5–13.

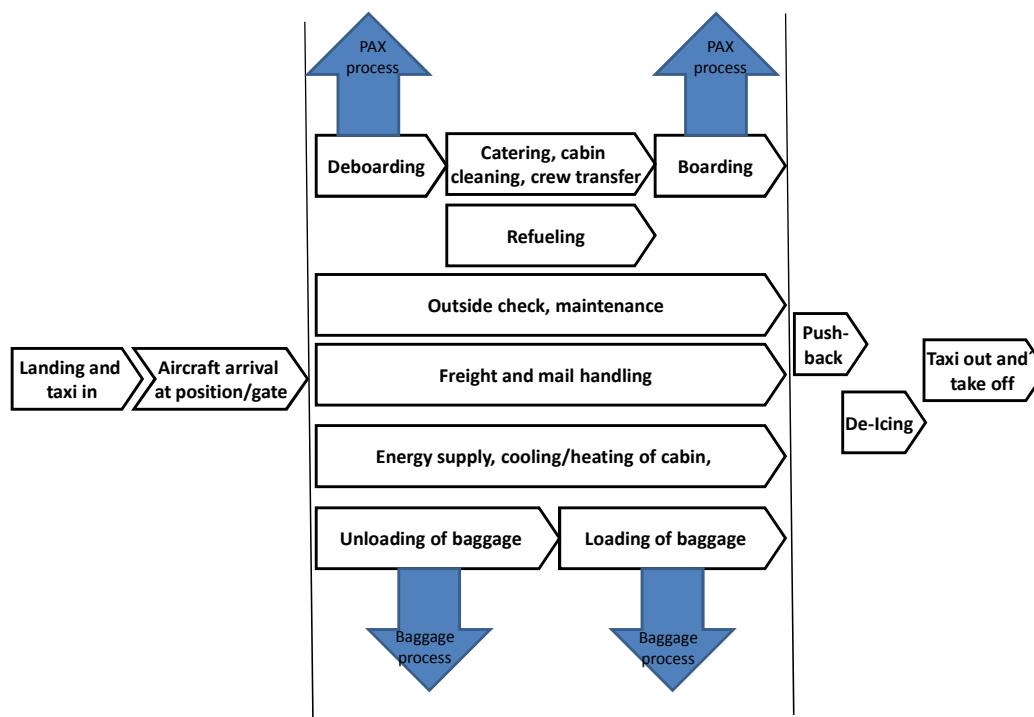
³ EU Directive 96/67/EC, Annex 1.

service might be relevant for several markets. A compilation of the different markets and services will be provided at the end of chapter 4.

3.1.2 Definition of aviation services, aviation-related services and non-aviation-services

95. The terms “aviation services”, “aviation-related services” and “non-aviation-services” have to be defined. In the literature, a distinction is made between aeronautical activities and non-aeronautical activities of an airport.⁴ Since the function of an airport can be described as the provision of “the entire infrastructure needed to enable passengers and freight to transfer from surface modes of transport to air modes of transport and to allow airlines to take-off and land”,⁵ all services of an airport which are directly related to this function might be called aeronautical activities.
96. In general, an airport is a complex system where several processes are interlinked. An analytical distinction can be made between passenger processes, baggage processes, freight and mail processes, and aircraft handling processes. The following figures provide a simplified overview of aircraft handling, passenger, and baggage processes and identify some linkages between these processes.⁶

Figure 3.1: Aircraft handling process (key elements) with linkages to passenger and baggage process



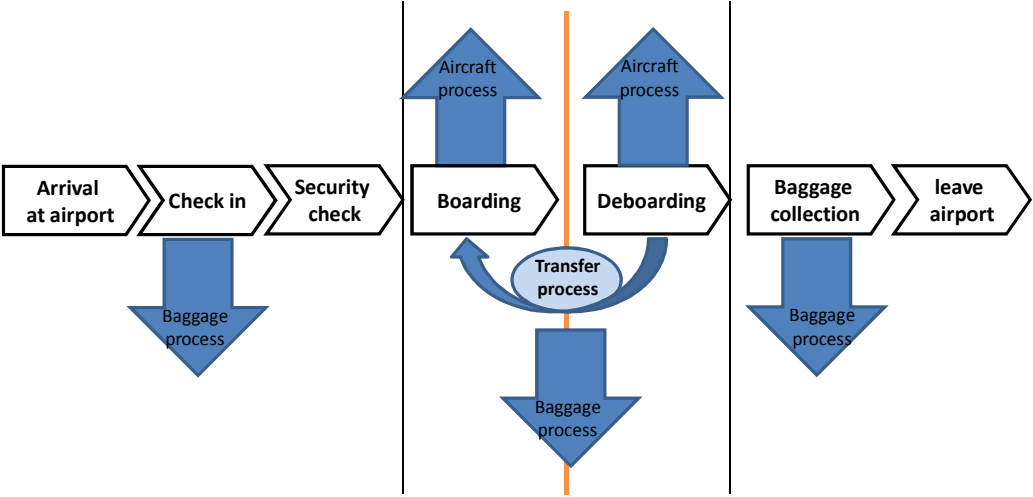
Source: GAP.

⁴ See Doganis, R. (1992), *The airport business*, London, p. 54.

⁵ Graham, A. (2008), *Managing airports: An international perspective*, 3rd edition, Oxford, p. 2.

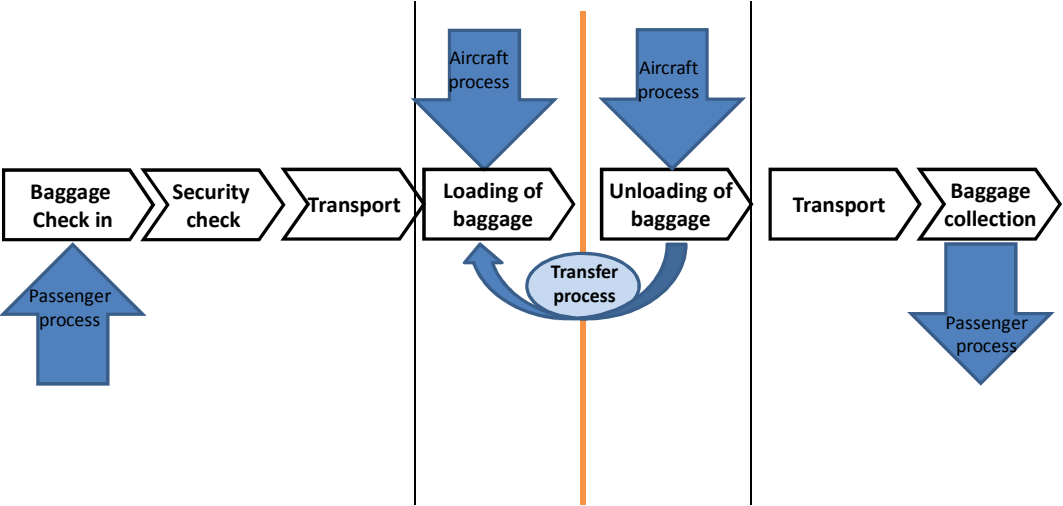
⁶ For a more detailed description of the different processes see von Dietman, N. (2008), *Airport Performance Measurement*, Berlin.

Figure 3.2: Passenger process (key elements) with linkages to aircraft and baggage process



Source: GAP.

Figure 3.3: Baggage handling process (key elements) with linkages to aircraft and passenger process



Source: GAP.

97. For the purpose of this study, a further distinction between “aviation services” and “aviation-related services” is made, based on the regulatory framework in the Netherlands.
- Aviation services are those aeronautical services which are regulated according to article 2 of the Dutch Aviation Act. In this Act, the terms “aviation activities” and “activities directly related to aviation activities” are used. Aviation activities are characterized by their indispensability for users and by the absence of substitutes.
 - Aviation-related services are unregulated aeronautical services, i.e., they are necessary for the production of airline services, but mostly not regulated by the Dutch Aviation Act.
 - Finally, non-aviation-services are all services which are neither aviation services nor aviation-related services (negative definition).
98. In order to analyze markets for aviation services and aviation-related services, the different activities of the value chain have to be identified. An important dividing line can be found between the airside and the landside interface, which separates the activities on the runway, the apron and the parking area on the one hand, and the terminal site on the other hand.
99. Access to runways, the apron, and parking facilities are provided as regulated services to airlines. Schiphol also provides terminal facilities, such as access to the luggage sorting facility and access to the check-in desks and gates, which are also financed by the aviation charges.
100. Airlines concentrating on cargo services receive a less integrated product, since they don't need access to check-in desks, gates or luggage sorting facilities. Cargo airlines obtain only runway, apron, parking and ramp services from the airport, and do their own ground handling or use the services of independent ground handling companies. They can purchase some of the services they need either in bundles or from specialized suppliers, especially concerning aircraft fueling, or aircraft maintenance.

3.1.3 Sources of revenues at Schiphol airport

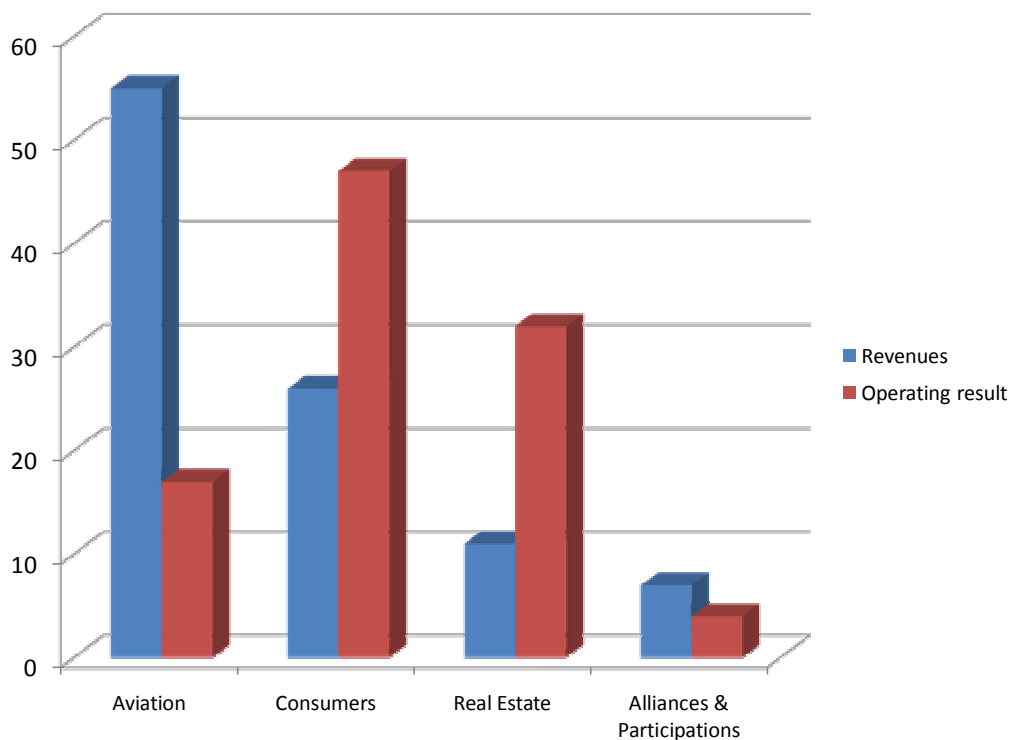
101. An airport operator provides infrastructure and services to airlines, passengers and third parties, especially ground handling companies and the government (e.g., provision of terminal space for customs authority). Except for some non-aviation services which are out of scope for this study (e.g., passenger car parking), the airport mainly has contractual relations with airlines and third parties.
102. Airport services might be classified according to the different sources of revenues of the airport operator. In the case of Schiphol airport, like most other airports, these revenues consist of
- aviation charges,
 - concession fees,

- rents, and
 - other revenues.
103. Aviation charges are paid by airlines for the use of the airport infrastructure, based on the charging manual of Schiphol airport. Concession fees are paid by third parties for the right to offer services at Schiphol airport, e.g., refueling companies, ground transport service providers such as taxis, or shops. Rents are paid by tenants for the use of offices, entire buildings, storage facilities, etc. Furthermore, an airport operator might receive revenues from other activities, e.g., consultancy, equity holdings etc; these revenues are not relevant within the scope of this study.
104. Schiphol airport collects revenues from several sources. With respect to the purpose of this study, the following classification is appropriate:
- *Landing and take-off charges*
Landing and take-off charges are paid by the airlines. They are differentiated according to aircraft weight, noise emissions, point in time (day/night), flight type (point-to-point, local/instruction, and cargo flight), and type of handling (connected or disconnected handling).
 - *Passenger and security charges*
Passenger and security charges are paid by the airlines. They are differentiated according to O&D and transfer passengers.
 - *Aircraft parking charges*
Aircraft parking charges are paid by the airlines. They are differentiated according to aircraft weight and hours of parking.
 - *Concessions from refueling companies*
The airport gets a percentage of the sales generated by the concession holder. The concessions are non-exclusive. With respect to aviation services and aviation-related services, only concessions for fuel suppliers are relevant.⁷
 - *Rents and leases from airlines, ground handling companies and the government*
These revenues are collected by Schiphol Real Estate. Furthermore, the airport gets revenues from utilities (e.g., water, energy). Rents and leases are negotiated individually.
 - *Other revenues*
This position includes all other revenues, especially concessions from the non-aviation sector, rents from other tenants than airlines, ground handling companies and the government, and revenues from other activities like consulting. These revenues are not relevant for this study.

⁷ Other concessions are gathered from non-aviation services (e.g., shops, restaurants, and taxi services).

105. Schiphol airport group is organized into four business areas: Aviation, Consumers, Real Estate, and Alliances & Participations.⁸ The main sources of revenues for the business area Aviation are the different airport charges and the refueling concessions. In 2008, Aviation's revenues were 640 million Euro, which is more than 55% of the total revenues of Schiphol group. The following figure gives an overview of the relative dimensions of these income streams. Although the business area Aviation has the highest share of revenues, its contribution to the overall operating result is rather small. The most important sources of operating result are the business areas Consumers and Real Estate. Thereby, the business area Consumers exclusively gets their revenues from the non-aviation business. The business area Real Estate also gets some revenues from airlines, ground handling companies and the government.

Figure 3.4: Main revenues of Schiphol Airport and operating result (in percent – 2008)



Data source: Annual report Schiphol airport. Calculations: GAP.

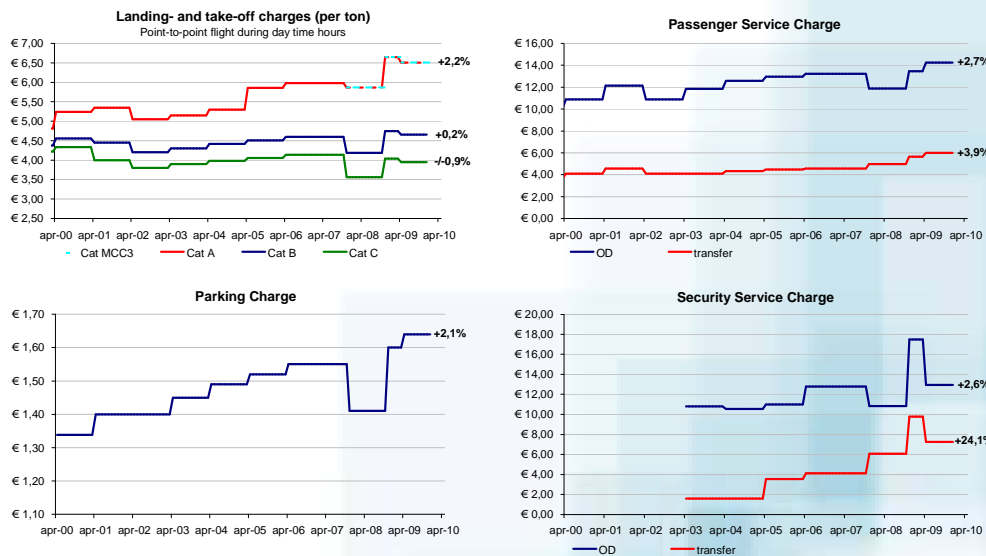
106. In order to assess the revenue development of the business area Aviation, one option is to look at growth rates of charges and concessions. The following figures show the development of the different airport charges and the development of the concession rate for fuel. The average annual growth rates of airport charges in the past ten years significantly differ. Whereas the landing and take-off charge for Category C aircraft (relatively low-noise-aircraft) has even been reduced on average (by 0.9%), the security service charge for transfer passengers on average grew by 24.1%, nevertheless starting from a

⁸ The information in this paragraph is based on the Annual report of Schiphol airport group.

rather low level. The growth rate of the concession rate for fuel was on average 2.5% per year (last eight years).

Figure 3.5: Development of airport charges at Schiphol Airport (2000 – 2009): average annual growth rates range from -/ 0.9% to + 24.1%

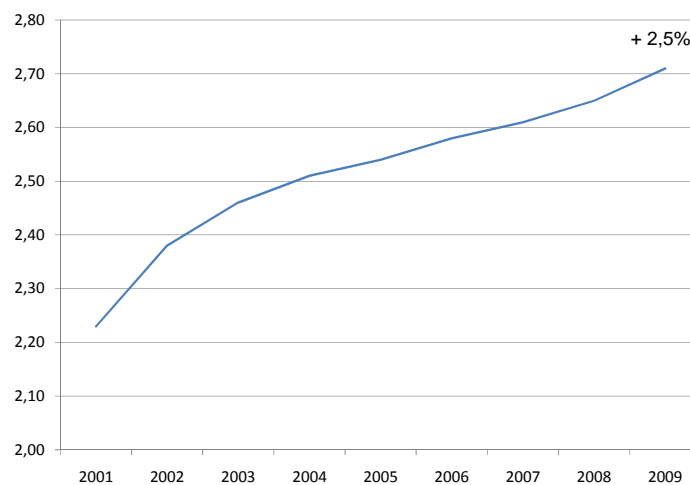
Benchmark Development airport charges AMS 2000 – 2009



The percentages mentioned reflect the average change per year for the total period as shown in the lines of the individual charts

Source: Schiphol airport.

Figure 3.6: Development of the concession rate for fuel at Schiphol Airport in €/m³ as of April 1st (2001 – 2009): average annual growth rate of 2.5%

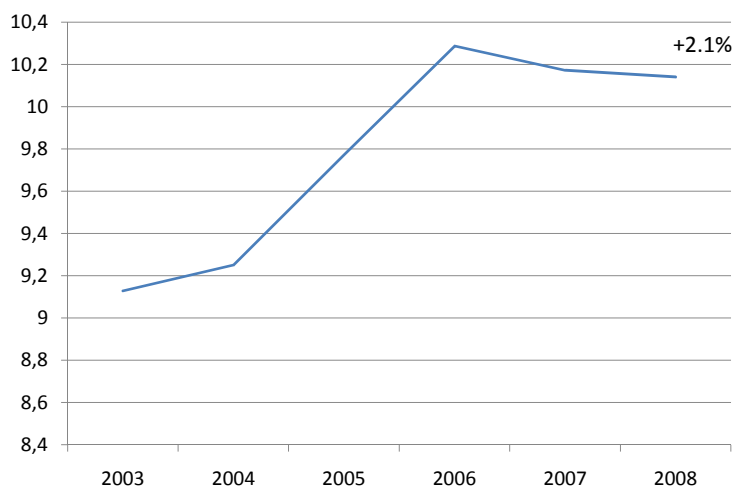


Data source: Schiphol airport; calculations: GAP.

107. The past development of airport charges at Schiphol airport shows some large increases and decreases over time, especially in the years 2008 and 2009. According to information provided by Schiphol airport, this is due to some peculiarities of the regulated charges setting process, which on the one hand side only allows changes at some specified dates and on the other hand side prescribes that costs have to be recovered within the respective calendar year.
108. As airlines have to pay different kinds of charges, structural changes (e.g., an increase in average aircraft weight or load factor) influence their costs for airport usage. Therefore, the average revenues of the business area Aviation will be calculated. As airports differ in their mix of passenger and cargo traffic, the measure Work Load Unit (WLU) is typically used in order to describe the output of an airport offering passenger as well as cargo services. One WLU equals one passenger or 0.1 tons of cargo. The following figure shows the development of the revenues of Schiphol's business area Aviation per WLU. The average annual growth rate in the period 2003-2008 was 2.1%, nevertheless with strong increases in 2005 and 2006.

Figure 3.7: Development of revenues per WLU (Business area Aviation only) 2003-2008: average annual growth rate of 2.1%

Business Area Aviation: Revenues per WLU (in EUR)



Source: Own calculations, based on information from the annual reports of Schiphol airport.

3.1.4 Basic classification of airport services

109. In order to offer their services (i.e. passenger and/or cargo transport), airlines use several elements of the airport infrastructure and different services which are provided at an airport, either by the airport operator itself or by third parties.
110. With respect to the purchasing options of an airline, three different possibilities exist:
- *Indispensable (essential) services*

If an airline offers its services at airport A, it has to use some infrastructure and services at this particular airport (e.g., use of the runway system, baggage handling facilities).

- *“Opting-out” services*

If an airline offers its services at airport A, some additional services might be purchased at this airport or the airline might decide not to use these services at all (opting out). For example, some airlines offer their passengers a special lounge at the terminal, whereas others don't.

Another possibility of “opting out” exists in some cases, if the airline can decide whether to offer a certain service directly at the airport site or at some place outside the airport, presumably at a lower price and at a lower-level quality.

- *Services with (limited) competition among airports*

An airline might purchase a service at airport A or at some other airport. Examples include planned maintenance and, to a limited extent, fueling.

111. With respect to the market structure of the different activities in the value chain at a given airport, three possibilities exist:

- *Infrastructure or services with a single supplier*

The infrastructure or service provider is the only supplier of this infrastructure or service (e.g., provision of the runway system or passenger terminals).

- *Bottleneck infrastructure for multiple service providers*

The service is offered by multiple suppliers, but these service providers are dependent on some bottleneck infrastructure.

The term bottleneck infrastructure was derived from the unbundling debate in the telecommunication and postal sector, where integrated services were traditionally offered by monopoly network operators. “If returns to scale are substantial in one stage – perhaps big enough to make that stage a natural monopoly – while returns to scale are much smaller in other stages, then a bottleneck problem is likely to exist.⁹ For the airport sector the concept of bottleneck infrastructure has been applied with respect to access to “centralized infrastructure”. In article 8 of the EC ground handling directive,¹⁰ centralized infrastructure is defined as infrastructure whose “complexity, cost or environmental impact does not allow of division or duplication”. Examples mentioned in the directive are baggage sorting, de-icing, water purification and fuel-distribution systems. According to the directive, it might even be made compulsory for suppliers of ground handling services and self-handling airport users to use these infrastructures in order to avoid costly infrastructure duplication.

⁹ See Bergman, Mats A. (2004) from the Swedish Competition Authority in “Competition in services or infrastructure-based competition?” Report commissioned by the Swedish National Post and Telecom Agency, Stockholm, p 16.

¹⁰ Council Directive 96/67/EC of 15 October 1996 on access to the ground handling market at Community airports, *Official Journal L 272*, 25/10/1996.

In a certain sense, bottleneck infrastructure could also include facilities which might be divided or duplicated but are only supplied by the airport operator. The most important example is the rental of operational space / facilities which is indispensable for performing the respective service at the airport and where the airport operator is the only provider of such facilities. However, this is not a bottleneck issue but one of market structure, as division or duplication would not raise total costs, but solve the problem of market power. In the remainder of this study, we define bottleneck infrastructure according to the EC ground handling directive.

- *Service markets with multiple suppliers*

The service is offered by several firms, who do not have to have access to some bottleneck infrastructure

112. Table 3.1 combines the two classifications explained above.

Table 3.1: Classification of airport services

	Service is indispensable at an airport (bound to the airport)	Service is bound to the airport but dispensable (opting out)	Service might also be purchased at other airports
Infrastructure or service with a single supplier			
Service with multiple suppliers, dependent on bottleneck infrastructure			
Service with multiple suppliers, independent of bottleneck infrastructure			

Source: GAP.

113. With respect to the different activities in the value chain, again there are three possibilities for an airport operator:

- The airport operator is the only supplier at the airport (e.g., provision of the runway system).
- The airport operator is one of several suppliers (e.g., ground handling at most German airports).
- The airport operator doesn't offer the respective service (e.g., ground handling at Amsterdam Schiphol).

114. The activities at an airport in the field of aviation services and aviation-related services might also be differentiated between air traffic operations services (ATO) and ground handling services (GHS).¹¹ Both groups consist of several activities as shown in Table 3.2. The grouping of the GHS is based on the EU directive on ground handling services. A short description of the different services can be found in Appendix A.

¹¹ Frontier Economics 2000, p. 29.

115. Furthermore, the airport operator might rent facilities to airlines, ground handling companies, and the government which are needed by airlines and ground handling companies to offer their services and by the government to perform tasks related to air transport (tenancy – TE).

Table 3.2: Air traffic operations services, ground handling services and rental services

Air traffic operations	Ground handling services	Tenancy
ATO 1: Landing and take-off services	GHS 1: Ramp handling	TE 1: Rental to airlines
ATO 2: Aircraft parking	GHS 2: Aircraft services	TE 2: Rental to ground handling companies
ATO 3: Passenger basic terminal infrastructure and services (including security)	GHS 3: Passenger handling	TE 3: Rental to the government
	GHS 4: Baggage handling	
	GHS 5: Freight and mail handling	
	GHS 6: Aircraft maintenance	
	GHS 7: Surface transport	
	GHS 8: Ground administration and supervision	
	GHS 9: Flight operations and crew administration	
	GHS 10: Fuel and oil handling	
	GHS 11: Catering services	

Source: GAP.

116. Landing and take-off services (ATO 1) are indispensable at the airport and the airport operator is the only supplier at a given airport.

117. Aircraft parking (ATO 2) is considered an “opting out” service as an airline might adapt its schedule in order to avoid parking at a given airport. If an airline decides to park its aircraft at a given airport, the airport operator is the only supplier of aircraft parking space.

118. Most passenger basic terminal infrastructure and services (ATO 3) are indispensable at the airport with the airport operator being the only supplier. Depending on the airline business model, some airlines (especially low cost carriers) might refrain from using selected services (at Schiphol airport this is referred to as disconnected handling). Therefore, for some airlines, some infrastructure facilities and services belong to the second column of the first row.

119. Almost all ground handling services (GHS) belong to the first column, second and/or third row, which means that they are indispensable at a given airport and provided by multiple suppliers (including self handling). The only exceptions are aircraft maintenance, fuel and oil handling, and catering services, where in some cases there might either be a possibility of opting out or a possibility of purchasing the respective service at some other airport.

With respect to aircraft maintenance (GHS 6), routine services performed before each flight as well as unplanned services in case of failures have to be performed at the respective airport. Nevertheless, so called medium and heavy maintenance is planned in advance and therefore not bound to a specific airport.

With respect to fuel and oil handling (GHS 10) an airline might choose to purchase fuel at some other airport. Nevertheless, this is only possible for short haul flights. For long-haul and most medium-haul flights, refueling is indispensable at a given airport. Moreover, if an airline chooses not to refuel at a given airport, the aircraft has to carry additional weight, which increases fuel consumption.¹²

With respect to catering services (GHS 11), some airlines (especially low cost carriers) might decide not to offer in-flight catering. Moreover, an airline might purchase food and beverage at some other airport. Nevertheless, storage space for food and beverages at the aircraft might be limited.

120. Most ground handling services consist of several activities. Some of these activities are dependent on bottleneck infrastructure.

With respect to bottleneck infrastructure as defined above, refueling suppliers (GHS 10) must have access to the airport's network for fuel supply and baggage handling suppliers (GHS 4) must have access to baggage sorting facilities.

121. With respect to rentals at the airport, all three groups of tenants (i.e., airlines, ground handling companies, and the government) require some facilities for operational reasons within the airport. This includes operational rooms for airlines (TE1), facilities for employees and storage space for ground handling companies (TE2) and areas for customs and security services (TE3).

Although some of these facilities might be rented outside the airport, in most cases this will increase costs for the airlines, the ground handling companies, and the government significantly. Some airlines operate crew centers outside the airport, which reduces costs for space rental but leads to additional costs, e.g., costs for transportation and generally additional time requirements. According to information we received from airlines, two large airlines which are operating crew centers outside the airport are intending to relocate them back to the airport. Options for ground handling companies will be discussed in the following paragraph.

However, it should be noted that, according to our interviews, some buildings within the perimeter, but outside the security area are owned by an airline.

122. In general, if a ground handling service requires some specific vehicles or equipment, the service provider typically needs some storage space at the airport. This is especially relevant for GHS 1 - Ramp handling (e.g., push back tugs), GHS 2 – Aircraft services (e.g., de-icing vehicles, ground power units), GHS 7 – Surface transport (e.g., passenger or crew busses). Although it might be theoretically possible to store the vehicle and/or the equipment outside the airport perimeter, security regulations make such an option not viable from an

¹² See also chapter 4, paragraph 88-89.

economic point of view. According to the information we received in our interviews, Schiphol airport does not levy a specific fee for parking vehicles or special ground handling equipment at designated areas of the airport.

Aircraft maintenance (GHS 6) requires hangars and storage space for spare parts and tools.

123. Moreover, for the provision of all ground handling services it might be necessary or at least economically viable to have some space available at the airport, especially for storing equipment or rooms for employees. Most ground handling companies are dependent on the provision of some rental space. One obvious example is aircraft maintenance. In case of a failure, it is very important to quickly repair the aircraft in order to minimize delays. If spare parts were stored outside the airport and employees were stationed outside the airport, the entire process of repairing the aircraft would be much more time consuming and costly, especially due to security regulations. Nevertheless, there are some examples where certain activities are performed outside the airport, especially parts of the freight and mail handling process (GHS 5), flight operation and crew administration activities (GHS 9), and catering services (GHS 11).

124. The following table provides an overview of the classification of the different services (services in brackets indicate limited number of users or selected services).

Table 3.3: Classification of airport services

	Service is indispensable at an airport (bound to the airport)	Service is bound to the airport but dispensable (opting out)	Service might also be purchased at other airports
Infrastructure or service with a single supplier	ATO 1, ATO 3 TE1, TE2, TE3	ATO 2, (ATO 3) (TE1), (TE2), (TE3)	
Service with multiple suppliers, dependent on bottleneck infrastructure	GHS 4, GHS 10		(GHS 10)
Service with multiple suppliers, independent of bottleneck infrastructure	GHS 1-3, GHS 5-9, GHS 11	(GHS 11)	(GHS 6), (GHS 11)

Source: GAP.

3.1.5 Classification of aviation services and aviation-related services

125. Referring to the analysis above, the following classification of aviation services and aviation-related services at Schiphol airport (based on the Dutch Aviation Act) is appropriate

I. Aviation services

- Provision of infrastructure for landing and take-off (i.e., runways, taxiways, aprons)
- Provision of infrastructure for aircraft parking

- Provision of infrastructure for arriving and departing passengers as well as passengers in transfer and transit (i.e., passenger terminal, baggage handling facilities)
- Provision of infrastructure and selected services with respect to passenger security and the security of their baggage.

II. Aviation-related services

- Granting of concessions for aircraft fuel supply
- Granting of concessions for aircraft catering (not levied by Schiphol airport)
- Utility services at the airport
- Access to infrastructure and rental of areas and facilities at the airport, necessary for airline operations, provision of ground handling services, and security or customs tasks.

3.2 Background on stakeholders and their interests

Compilation of stakeholders and analysis of stakeholders' interests

3.2.1 Definition of stakeholders

126. The definition of an airport's stakeholders might be either broad or narrow. A broad definition includes all persons and entities which might be affected by the airport's operation, either in a positive or in a negative way. This includes for example companies which are situated in the airport region and thus benefit from the region's accessibility, as well as people living in the vicinity of an airport and being exposed to aircraft noise.

127. For the purpose of this study, and especially for the compilation of stakeholders and an analysis of stakeholders' interests, a narrower definition is sufficient, concentrating on entities and persons who use airport infrastructure or purchase airport services. Only for those stakeholders, the question of whether an airport has economic market power directly matters.¹³

3.2.2 Stakeholders at Schiphol airport - overview

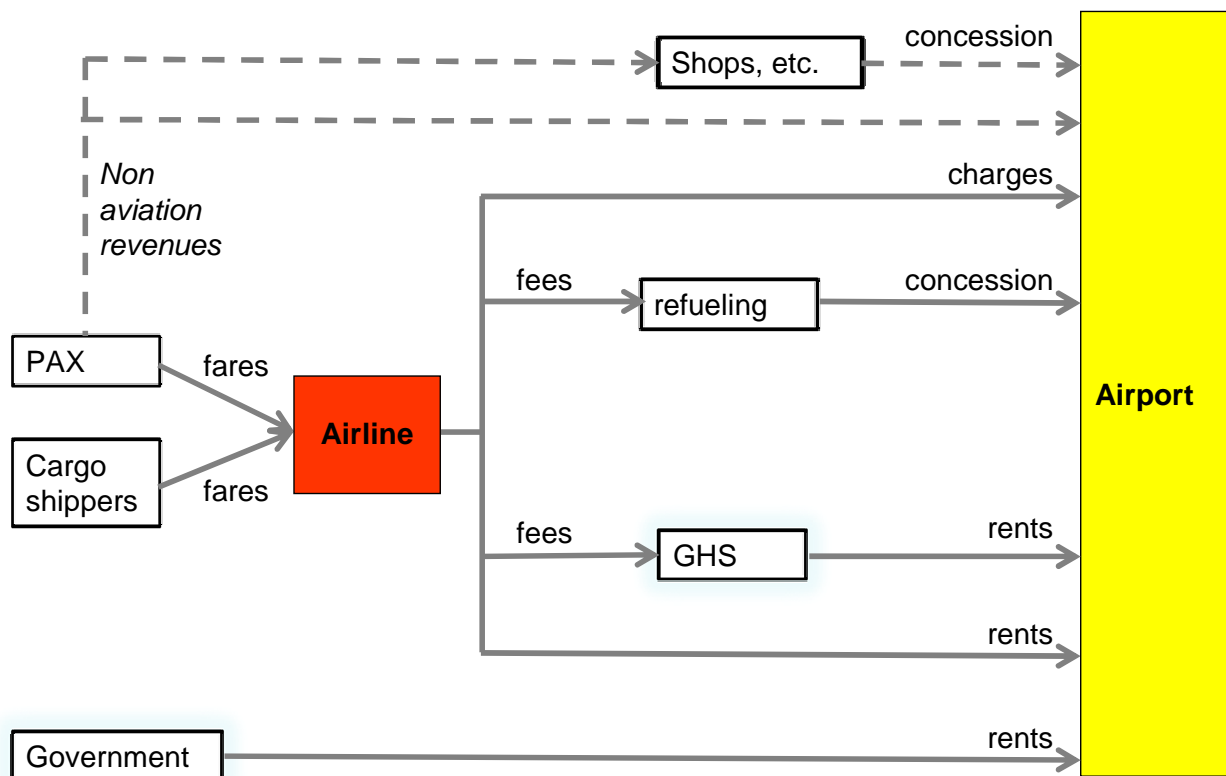
128. The different groups of stakeholders at Schiphol airport might be grouped as follows, based on the different revenues the airport collects (see above paragraph on revenue sources of Schiphol airport):

¹³ There is no indication that an airport might have a dominant position in one of his purchasing markets, e.g., with respect to local craft or in the local labor market. Therefore only the airport's selling markets are analyzed.

- Airlines
- Passengers and cargo shippers
- Service providers (Ground handling companies and related services) (excluding refueling)
- Refueling companies
- Government bodies

129. The following figure gives an overview of the different monetary flows between the airport's stakeholders and the airport. Additional flows exist between stakeholders, e.g., between airlines and the government (especially taxes) and between airlines and the ATC operator (charges). Nevertheless, as this report deals with the market position of the airport operator, only monetary flows which directly or indirectly affect the airport operator are included in the figure.

Figure 3.8: Monetary flows between the airport's stakeholders and the airport



Source: GAP Note: PAX stand for passengers, GHS stands for ground handlers.

3.2.3 Analysis of stakeholders at Schiphol airport

3.2.3.1 Airlines

130. Several options exist for the description of an airline's business model. Before the different business models are presented, it has to be pointed out that some airlines follow only one business model (e.g., Ryanair only offers low cost

passenger services), whereas other airlines are active in several segments of the aviation market (e.g., KLM offers passenger as well as cargo services).

131. A first distinction applies between airlines offering passenger and/or cargo services. Within the passenger market, a further distinction can be made between scheduled services and non-scheduled services, the latter being mostly charter services. Finally, airlines offering scheduled passenger services might follow a specific business model, especially full service network carrier (FSNC), regional carrier or low cost carrier (LCC).
132. In the year 2008, 446,693 aircraft movements were recorded at Schiphol airport, among them 18,361 movements for the purpose of general aviation.¹⁴ The share of scheduled services was 92.4%. Within the scheduled segment, 3 % of the movements were full freighter flights. Within the non-scheduled segment, the share of full freighter flights was more than 18%.
133. According to its Annual report (2008), Schiphol airport is served by 99 airlines offering scheduled services. Among those 99 airlines, 26 offered full freighter flights, of which 16 offered only full freighter flights.¹⁵
134. 88.7% of all movements (excluding general aviation) were operated by the largest 30 airlines at Schiphol airport (largest airlines according to number of movements). The following table shows the concentration ratios with respect to scheduled and non-scheduled movements. The concentration ratio (CR_n) is defined as the sum of the market shares of the n largest companies in the market. In both segments (scheduled as well as non-scheduled movements), the five largest airlines account for more than two thirds of total traffic.

Table 3.4: Concentration ratios at Schiphol airport with respect to aircraft movements

	Scheduled movements (CR based on airlines offering scheduled services)	Non-scheduled movements (CR based on airlines offering non-scheduled services)	All movements (CR based on all airlines)
CR1	53.4	43.8	49.4
CR3	61.6	69.2	60.3
CR5	67.1	n.a.	65.5
CR10	76.6	n.a.	74.5
CR20	83.2	n.a.	83.5

Source: Own calculations, based on information from Schiphol traffic review 2008.

135. KLM is the largest airline at Schiphol airport, operating more than 49% of all aircraft movements and even more than 53% of all scheduled movements. Together with Air France, who has merged with KLM in 2004, and their subsidiaries transavia.com, VLM, and Martinair, the KLM group accounts for

¹⁴ The following information is based on Schiphol Traffic Review 2008.

¹⁵ Airbridge Cargo, Asiana, Atlantic Air, Cargolux, DHL Int., Emirates, Great Wall Airlines, Jade Cargo, Jett8, Kalitta, LAN Cargo, Nippon Cargo, Polar Air Cargo, Qatar Airways, Soth African, and West Air. Some of these airlines have (temporarily) stopped their all cargo operations to Amsterdam in 2008. The ten airlines who offered full freighter operations as well as passenger services were China Airlines, China Southern, El Al, Japan Airlines, KLM, Korean Air, Martinair, Malaysia Airlines, Singapore Airlines and VLM Airlines.

more than 60% of all aircraft movements at Schiphol airport. The second largest airline was easyJet with a share of less than 4% of all movements.

136. The following table shows the market shares of the largest airlines at Schiphol airport in terms of movements.

Table 3.5: Largest airlines at Schiphol airport

Rank	Scheduled Services				Non-scheduled services		
	Airline	Business model	No. of movements	Share (cumulated)	Airline	No. of movements	Share (cumulated)
1	KLM	PAX (FSNC) + Freight	211,197	53.4	Transavia	14,230	43.8
2	Transavia	PAX (LCC + charter)	17,532	4.4 (57.8)	Arke Fly	4,179	12.9 (56.7)
3	easyJet	PAX (LCC)	14,934	3.8 (61.6)	Martinair	4,083	12.6 (69.3)
4	Lufthansa	PAX (FSNC)	11,281	2.8 (64.4)			
5	Air France	PAX (FSNC)	10,856	2.7 (67.1)			

Source: Own calculations, based on information from Schiphol traffic review 2008.

137. Since more than 90% of all aircraft movements at Schiphol airport are scheduled services, the market share of charter carriers is rather small and only three airlines offered more than 4,000 non-scheduled flights in 2008. The market share of LCC, with respect to aircraft movements, was above 12%. This is significantly higher than the respective share at Frankfurt, slightly smaller than the LCC-share at Munich, and significantly smaller than the LCC-share at Düsseldorf.¹⁶

138. Therewith, most movements at Schiphol airport are operated by Full Service Network Carriers. Nevertheless, KLM and Martinair are the only carriers with a significant share of transfer passengers. All other FSNC only connect their hub-airport, and in some cases also secondary airports, with Amsterdam.¹⁷

139. The following revenues are paid directly by the airlines to the airport:

- Landing and take-off charge
- Passenger and security charge
- Aircraft parking charge
- Rents for office space and facilities (including costs for utilities) – only some airlines

140. Other parts of airlines' costs are related to services or infrastructure directly or indirectly provided by the airport:

- Fees for ground handling

¹⁶ For the share of LCC at German airports see DLR/ADV, Low Cost Monitor.

¹⁷ For example, Lufthansa, the largest foreign FSNC, offers flights from Amsterdam to Frankfurt, Hamburg, and Munich.

- Purchase of fuel (including fuel concession)

141. In general, airlines' interest with respect to the infrastructure and services provided by the airport might be described as providing a bundle of required services at minimum cost. Nevertheless, as airlines apply different business models they may have different priorities. For example, KLM as a network carrier competing for transfer passengers puts special weight on quality aspects related to Schiphol's function as a hub (i.e. short Minimum connecting time as a result of fast transfer facilities, including a sophisticated luggage sorting system, sufficient capacity for the hub operations during the different "waves"). On the other hand, low cost carriers like easyJet are mostly interested in low charges for the (few) services they require. LCC would also be willing to accept a reduced service quality if this leads to reduced charges. For example, easyJet uses Pier H with disconnected handling (i.e., no use of passenger bridges), leading to a reduction in landing fees of 20 %.¹⁸
142. It is almost inevitable that some controversies on the allocation of costs for different parts of the airport services arise, especially if they are sold as combined services. As each airline is only willing to pay for those services it needs for applying its particular business model, some unbundling will be required. If the airport wants to attract airlines, its charging and business practices must support a variety of business models and therefore must provide easy and nondiscriminatory, partially unbundled access to aviation and aviation-related services. The ability of the airport to offer bundled services to users that are unable to leave the airport could point to market power.

3.2.3.2 Passengers and cargo shippers

143. In 2008, Schiphol airport was used by more than 48 million passengers,¹⁹ two thirds of them travelling within Europe and one third travelling on intercontinental flights. Depending on their purpose of journey, passengers might be interested in a high connectivity of an airport (many destinations, high frequencies), low fares, accessibility of the airport and convenient processes at the airport.
144. Whereas the airport can decide on the quality of its service within the terminal building directly, the airlines are primarily responsible for the number of destinations, the frequency of services, and the fares.²⁰ Nevertheless, the airport might influence these factors, especially by setting charges and other costs. Therefore, passengers as well as cargo shippers should generally be interested in low charges and other costs for the airlines, as cost increases/decreases will be passed on to them.²¹

¹⁸ See NMA decision on easyJet, Para. 204. See Schiphol Airport Charges and Conditions.

¹⁹ Note that aviation statistics include some form of 'double counting'. On a return flight, each passenger using an airport is counted once as a departing passenger and once as an arriving passenger. Furthermore, transfer passengers are counted twice as departing passengers and twice as arriving passengers.

²⁰ Some political restrictions may apply, e.g., with respect to bilateral air service agreements.

²¹ An airline's ability to pass on costs depends on the market structure on the retail market.

Nevertheless, independent of retail market structure, customers on the retail market will benefit from cost decreases on the wholesale market.

145. For completeness, it should be mentioned that a passenger might spend some money in restaurants, shops, or for car parking. Since these are non-aviation revenues, they are beyond the scope of this study. Nevertheless, these revenues play an important role in the strategic decision making process of an airport, and in turn the airport might decide not to increase charges and other aviation-related costs in order to increase the number of passengers (i.e. the number of potential customers for shops and restaurants).

3.2.3.3 Service providers (ground handling companies and related services) (excluding refueling)

146. According to information provided by Schiphol airport, four ground handling agents, six catering companies, four independent line maintenance companies, eight general sales agents, and three companies providing airline handling supervision are active at the airport (as of January 2009).
147. Those companies neither pay a charge for using the airport infrastructure, nor do they have to pay a fee for access to Schiphol airport. Nevertheless, they might rent some office space or other facilities they need for performing their services.
148. Since most service providers pay rents for the use of buildings or facilities at the airport, they expect a reasonable relation between rents and quality of the facilities. There is an interest in high quality infrastructure and services provided by the airport operator because poor quality is likely to increase ground handler's costs. With respect to the different charges collected from the airlines, there is an indirect interest; if lower charges lead to more traffic at Schiphol airport, ground handling companies might benefit due to increasing demand with respect to their services.

3.2.3.4 Refueling companies

149. There are three companies providing refueling services. They have to pay a concession fee for using the underground distribution pipeline network that is used to distribute the fuel to the aircraft. The concession, which is part of the Aviation till, has been raised each year since 2001 (see discussion above). Furthermore, refueling companies might also pay some rents for offices or buildings. In general, high quality infrastructure, a low concession rate, and moderate rents might be expected by those companies.

3.2.3.5 Government bodies

150. The Dutch government is an important stakeholder, not only as the owner of the majority shares of Schiphol airport (69.77%) but also with respect to the function of Schiphol as a 'main port' for the Dutch economy. Nevertheless, this report concentrates on stakeholders in a narrow sense, (see definition above) thus these aspects are not within the scope of the study.
151. With respect to the narrow definition of a stakeholder, it has to be taken into account that some government bodies (customs, Royal military police) also rent office space or other facilities from the airport operator. They might also expect

high quality infrastructure at moderate rates. The decisive difference between government bodies and service providers is that they don't charge customers for their services but have to finance their expenses by collecting taxes.

3.3 Conclusions

152. Most services offered at Schiphol airport are bound to the airport, i.e., if an airline offers flights to/from Schiphol airport, it has to make use of these services. The only exceptions are planned maintenance and – to a limited extent – refueling for short-haul flights. Moreover, for some services which are offered separately, the possibility of “opting out” exists, depending on the business model of the respective airline.
153. Schiphol airport receives most of its revenues from regulated charges for aviation services. These charges are paid by the airlines and passed on to their customers (passengers and cargo shippers). Furthermore, airlines as well as ground handling companies pay rents for facilities owned by Schiphol airport. Whereas charges for aviation services (as well as the concession paid by fuel handling companies) are regulated according to the Dutch Aviation Act, the rental of facilities necessary for the provision of airline services, ground handling services and the performance of administrative tasks (customs, security) might be considered as aviation-related services, i.e., they are necessary for the provision of aviation services but not regulated according to the Dutch Aviation Act.
154. Airlines offering flights from/to Schiphol airport apply different business models leading to varying demands for airport services. A first distinction can be made between airlines offering passenger services and airlines offering cargo services. Airlines offering cargo services might be further divided into airlines offering full freighter flights and airlines offering cargo transport as a combined product with passenger transport. Airlines offering passenger services might be grouped according to their business model (network airlines, charter airlines and low cost carrier). Thereby, on the one hand side the by far largest airline at Schiphol KLM serves O&D markets as well as a significant number of transfer markets. All other airlines, with Martinair being the only exception, primarily offer direct flights. The difference between transfer markets and O&D markets will be further discussed in chapter 4.

4. Definition of the relevant markets with respect to the services Schiphol airport provides

(Work package 2)

155. This chapter defines the relevant markets for the services which Schiphol airport provides. The definition of the relevant markets with respect to services and geography is in line with European case law. It is the basis for the assessment of market power in Chapters 5 and 6. The definition of the relevant markets is divided into two parts. After an introduction, Chapter 4.2 defines the relevant markets for the provision of infrastructure to airlines which is the basis for the assessment of market power in the markets for the provision of infrastructure for take-offs and landings in Chapter 5. Chapter 4.3 defines the markets for the access to the infrastructure for the provision of ground handling services by third parties which is the basis for the assessment of market power for the access to Schiphol airport for companies which offer ground handling services in Chapter 6. Chapter 4.4 gives a summary of the market definitions and indicates the link between the services identified in Chapter 3.1 and the definition of the relevant markets.

4.1 Introduction

156. The conceptual framework for the definition of the relevant market focuses on demand-side substitution and supply-side substitution.²²

157. From a demand side perspective, the market definition has to focus on the question if certain goods are substitutable from a consumer's point of view. The relevant framework for this discussion is the SSNIP-Test. Could a hypothetical monopolist, which consisted of all suppliers for a specific product, benefit from a "small but significant non-transitory increase in prices"?²³ If there is substitution on the demand side, the price increase is unprofitable, which indicates that the market should be defined larger. If the price increase is found to be profitable, this provides evidence that the market should not be defined larger, because there is no substitution towards other goods. We do not apply a fully estimated SSNIP-test here, as it is beyond the scope of this study and the process of data gathering would take too much time. However, we use the SSNIP-test as a conceptual framework and give indications whether a hypothetical price was profitable or not.

158. Supply-side substitution may be taken into account if third-party suppliers are able to switch production in the short term without significant additional

²² Commission notice on the definition of the relevant market for the purposes of Community competition law. Official Journal C 372, 9.12.1997, p. 5–13. Compare also appendix C of this report.

²³ SSNIP=Small but Significant Non-transitory Increase in Prices.

investments and economic risk in case of a price increase.²⁴ If it exists, supply-side substitution may put a competitive constraint on pricing. It is most appropriate in cases of differentiated products which are not substitutable from a customer's point of view, but which are produced in almost the same way. In this case, suppliers of one good may easily switch production between different types of products and put a competitive constraint on pricing. The standard example is the definition of the relevant market for different types of paper.²⁵ Different qualities of paper are not substitutable from a customer's point of view, which is an indication of separate markets. But separation of markets is not appropriate in this case, because the producers of paper can easily meet demand for different quality levels; that is suppliers can easily step in the case of a price increase. As a consequence, different qualities of paper belong to a single common market named "paper", even though the different quality levels are not substitutable from the demand-side perspective.

159. The demand for airport infrastructure services is derived from demand for transportation services. An airport supplies access to infrastructure for airlines. The airlines' demand for these services is derived from the customer demand that these airlines serve.
160. This study discusses the definition of the markets upstream, in the context of the services an airport provides to the airlines in form of access to infrastructure. Therefore the market definition for different types of services in the downstream transportation market is an appropriate starting point in the discussion of the relevant markets in the upstream market of infrastructure provision which an airport supplies.
161. The airport offers infrastructure to different types of flights which use Schiphol airport as their origin or destination. The airport offers infrastructure for landing and take-off of aircraft, provides security related infrastructure and services, and gives access to the airports facilities for self-handling airlines and third party ground handling companies. The use of the airport's infrastructure on the upstream markets is closely related to the transportation markets downstream. On the upstream markets there are different types of flights, especially passenger flights, cargo flights, and local & instruction flights. Some flights are mixed, and passenger flights may also carry cargo in the belly holds. On the downstream markets, passenger flights can be further subdivided according to different characteristics of the transportation services, for instance short-haul versus long-haul flights, origin and destination flights (O&D), transfer flights,²⁶ or flights by full service, low cost or charter airlines. Moreover, it is common practice in European case law to define separate markets for transportation services which are directly offered by airlines to customers and transportation services which are offered to customers via tour operators. Thus, regarding the markets for transportation services by airlines, these markets are separate or at least potentially separate.²⁷

²⁴ Commission notice on the definition of the relevant market, para. 20.

²⁵ Commission notice on the definition of the relevant market, para. 22.

²⁶ Transfer flights refer to passenger flights carrying a mix of transfer and O&D passengers as opposed to O&D flight that only carry O&D passengers.

²⁷ Case M.5440 Lufthansa / Austrian Airlines and COMP/37.730 Deutsche Lufthansa / Austrian Airlines; Case M.5403 Lufthansa / BMI; Case M.5141 KLM / Martinair; case M.3770 Lufthansa / Swiss.

162. The ability of airlines to switch to different airports in case of unfavorable price developments is crucial for the definition of the relevant markets.²⁸ It is well known that switching costs for airlines are high. Relocation is difficult due to congestion at possible alternative airports, sunk costs, economies of scale for the operation at an airport,²⁹ network effects, long-term contracts (especially in passenger transportation where frequent scheduling changes are not possible) and the loss of passenger volumes. Nor can an airline easily switch from supplying passenger transportation services to cargo transportation services or vice versa. In our interviews, KLM, the most important customer at Schiphol airport, and Martinair representatives indicated that they cannot leave the airport due to high sunk investment costs. Moreover, KLM plays a special role for political reasons, as it is perceived as the national carrier of the Netherlands. To consider switching costs is in line with European case law. For instance, in the Ferrovial et. al. merger case the Commission notes that relocation is difficult especially for hub and base airports.³⁰ Moreover, airlines have incentives to bundle activities to one airport³¹, and there are substantial economies of scope for hub-and-spokes carriers.³²
163. It is possible to define separate markets if different prices are offered to different types of customers.³³ When this is the case, the rationale will depend on the evidence provided in that particular case. Questions of secondary demand or bundled demand for specific services may play a role.
164. If the service under consideration is only secondary from the airlines' point of view, it may be appropriate to define the market for the primary and secondary product as a common market, even if the airport charges different prices for each single service.³⁴ A secondary market comprises of complementary products that are purchased after or only due to the purchase of another product to which they relate to. Thus, a secondary market depends on the demand for a more important (primary) service.³⁵ The reasoning is that the demand for the secondary product is not given per se, but determined by the demand for the primary types of goods and services. In European competition law several factors play a role in appropriately defining separate or common markets for primary and secondary products. First, the general question is if the demand for the service in the secondary market can be considered as independent from the demand in the primary market. Second, the particular case being investigated is also taken into account that is if it helps to define separate markets for the specific purpose of the investigation. For instance, the definition of separate markets is often inappropriate in merger cases where

²⁸ It is of importance for the economic assessment of market power, too.

²⁹ The minimum scale depends on the airline's type of operation at the airport. For instance, for airlines operating a hub at the airport the scale level is high in order to make operation profitable. The scale level is lower for airlines offering point-to-point services.

³⁰ Case M.4164 Ferrovial et. al., para. 26.

³¹ Case M.3280 Air France / KLM, para. 26.

³² Case M.3770 Lufthansa / Swiss, para. 43.

³³ Commission notice on the definition of the relevant market, para. 43.

³⁴ Commission notice on the definition of the relevant market, para. 56. A discussion on secondary markets (or "aftermarkets") in the context of Art. 82 is also found in "DG Competition Discussion Paper on the Application of Article 82 of the Treaty to Exclusionary Abuses", para. 243.

³⁵ Examples are the markets for spare parts for cars, toners for printer or other consumables for durable goods.

secondary demand plays only a minor role, and it is appropriate in antitrust cases which cover certain types of behavior in secondary markets (for instance in the market for spare parts in the automobile sector). Third, it is important to assess the response of customers based on their purchasing decisions. If the customer has full knowledge of the whole price structure and takes this into account in his purchasing decision, this serves as an indicator that the definition of a common market is appropriate.

165. If the airlines request the services only in bundles, or if there is no possibility to decompose the bundle for physical or economic reasons, all services together form the relevant product. In this case, it is appropriate to consider the whole bundle of services as the relevant product market. Even if different prices for individual services exist, there is a unique joint price which is relevant in the purchasing decision from a customer's point of view. The customer here is the airline which uses the infrastructure of Schiphol airport. If different services of the airport are only requested in bundles, this is a strong indicator that these services belong to a single product market. In this case, the market comprises the whole bundle and it is inappropriate to define separate markets for every single service.
166. The structure of this chapter is as follows. The first part covers the markets for the provision of infrastructure to airlines. This is the core of the activities of Schiphol airport and creates most of its revenue. The second part covers the markets for the access to the infrastructure for the provision of ground handling services by third parties. Schiphol airport is not active in the provision of ground handling services itself, and it does not create revenue (left refueling aside). Both types of activities differ substantially in terms of revenue creation, the customers and the way these markets work.

4.2 The markets for the provision of infrastructure to airlines

4.2.1 Definition of the markets with respect to services

Do all airport services belong to a single bundle which an airport supplies to airlines?

167. There has not been much work yet on the exact definition of the relevant markets in the airport industry. Even though the European Commission made several decisions in airport-related cases, the exact market definition was often not critical for the economic assessment of the case. As a consequence, to a certain extent the definition has still been left open. For instance, in the Birmingham International Airport case, the Commission notes:

“Airport operation and management consists of several broad categories of services within which infrastructure, ground handling and commercial services could be distinguished as separate markets. Finally, the question could be raised whether each of these categories of airport services could be divided into several distinct markets depending on the nature of services supplied. However, for the purpose of the present case, the exact definition of the relevant product market for airport management and operation can be left open, since the concentration will not lead to the creation or

strengthening of a dominant position on any of the alternative markets considered.”³⁶

Many subsequent merger cases refer to this approach.³⁷

168. This indicates that the Commission tends to define the markets for the provision of infrastructure by airports in a relatively broad way. At the same time it recognizes that arguments may exist which possibly provide evidence for a more narrow market definition.³⁸ For instance, the Commission notes in the *Ferrovial et. al.* merger case:

“As regards the provision of airport infrastructure services to airlines the market could be further subdivided according to the categories of customers of airline infrastructure services, i.e. airlines: full service scheduled airlines, low cost airlines and charter airlines. This could be justified by the fact that full service scheduled airlines run a timetable based service with a higher service compared to other types of airlines and lower load factors. In addition, full-service airlines need an airport being able to handle interline traffic,³⁹ whereas neither low cost carriers nor charter airlines have this requirement. Furthermore, charter airlines operating to holiday destinations need airports which provide capacity in peak times but do not need the airport for much of the year. At the same time the distinction between the different types of airlines becomes less evident e.g. full service airlines compete with low cost carriers start to offer discounts.”⁴⁰

The Commission takes into account that different types of customers in the downstream markets may also affect the market definition upstream. Even though the separation of categories in the cited decision is not appropriate for this study (reasons will follow in the rest of this chapter), it shows that the definition of the upstream markets has to take the customer structure downstream into account.

169. This is also in line with the approach of the UK Competition Commission in its report on the BAA airports. After discussing several aspects of market definition,⁴¹ the Competition Commission came to the conclusion that “a bundled market for aeronautical services provided to airlines and their ground-handling agents”⁴² is an appropriate approach.

³⁶ Case M.786 Birmingham International Airport, para. 14.

³⁷ Case M.4164 *Ferrovial*, para. 11; case M.3823 *MAG et. al.*, para. 14; case M.1035 *Hochtief et. al.*, para. 10; case M.1255 *Flughafen Berlin (I)*, para. 10.

³⁸ Case M.1255 *Flughafen Berlin (I)*, para. 10f; case M.3823 *MAG et. al.*, para. 14.

³⁹ Own remark: Interline traffic is the transportation of passengers and cargo on itineraries which use different airlines. This allows passengers to have a single ticket even though they use transportation services by different airlines for their trip. Interlining relies on voluntary agreements between airlines to handle these passengers. The same applies for cargo interlining.

⁴⁰ Case M.4164 *Ferrovial et. al.*, para. 12.

⁴¹ Competition Commission (2009), “BAA airports market investigation”, section 2.

The discussion focuses on intermodal competition, car parking at the airport, and the price of rental space.

⁴² *Ibid.*, para. 2.41. The term “aeronautical services” is defined in para. 2.13: It includes “(a) the provision of airport infrastructure; and (b) the coordination and control of the activities performed on or in airport infrastructure and the provision of associated services including security”. It does not

170. In section 2.20 the Competition Commission discusses several possible subdivisions, inter alia between services provided to passenger and cargo flights. In the case of British airports, the Competition Commission came to the conclusion that this separation is not appropriate. However, it also notes:

”Where different prices are offered to different users, and differences are not cost-related, it may be appropriate to define separate markets... .

For the most part, BAA airports do not charge different published prices to different users...”⁴³

This indicates that the Competition Commission does not consider an approach of market subdivision for the provision of “aeronautical services” (the provision of infrastructure services by the airport) as inappropriate, especially when the airport sets charges which address different types of customers differently. The Competition Commission also states that market definition is not “an end in itself”.⁴⁴ It serves “as a framework within which to analyse the effects of market features; and that it is a useful tool for identifying the competitive constraints present in the market.”⁴⁵ This confirms that market definition is not a general exercise which is done independently of the specific market situation. Rather, market definition always refers to a certain case. It has to take the circumstances of that particular case into account (i.e. the price structure), and comes to conclusions which are relevant for the purpose of the specific investigation.

Pricing at Schiphol airport

171. Schiphol airport provides infrastructure to airport users for take-off and landing of aircrafts. These services include the provision and maintenance of the runways and of the aprons, the provision of passenger security handling, and access to different types of infrastructure, such as aircraft service, aircraft maintenance, loading and unloading, and access to refueling infrastructure at the airport. The customers of Schiphol airport include airlines which provide transportation services to passengers or freight transportation.

172. Schiphol airport is not active in the business of providing ground handling services to airlines. In this respect, the airport differs from other airports like Frankfurt (where Fraport also offers ground handling services to airlines), or Paris Charles de Gaulle. The ground handling business at Schiphol is perceived by interview partners as the most liberalized market in the European Union.⁴⁶

173. The access to the airport for companies which offer ground handling services to airlines is open.⁴⁷ The airport does not charge concession fees for the access to the airport or its infrastructure,⁴⁸ nor does it restrict access to a maximum

conclude “commercial services (including catering, retail, car rental, sale of advertising space, car parking and activities relating to commercial property)”.

⁴³ Ibid., para. 2.21.

⁴⁴ Ibid, para. 2.1.

⁴⁵ Ibid, para. 2.1.

⁴⁶ Representatives of KLM, Martinair, Aviapartner and Menzies expressed that view.

⁴⁷ See also the EU Ground Handling Directive: Council Directive 96/67/EC of 15 October 1996 on access to the groundhandling market at Community airports.

⁴⁸ The exemption is a charge for access to fueling infrastructure.

number of companies. Security requirements do exist, which companies need to fulfill if they intend to offer ground handling services.⁴⁹ These requirements are identical for each company, non-discriminatory and focus on airport security. They do not restrict access to the airport, nor has it been recorded that companies complain about the security requirements as discriminatory.

174. The airport charges a set of landing and take-off fees for an aircraft which uses the airport's infrastructure. The airport charges (compare table 4.1 below) also include different types of passenger fees and fees for aircraft parking. Additional charges with relevance for this study do not exist.⁵⁰ These fees also cover the costs which the airport has to bear for the provision of the infrastructure at the airport, such as the baggage handling system, the passenger counters, or the access to the energy infrastructure.

Table 4.1: Airport Charges at AMS Airport as of 1 April 2009,

Airport Charges Effective as of 1 April 2008 (in euros)

Landing and take-off charges* (charge per 1,000 kg)	Category MCC3			Category A			Category B			Category C		
	day		night	day		night	day		night	day		night
	landing/ take-off	landing	take-off	landing/ take-off	landing	take-off	landing/ take-off	landing	take-off	landing/ take-off	landing	take-off
Point-to-point flight												
Connected handling	6.51	12.40	14.65	6.51	8.27	9.77	4.65	5.91	6.98	3.95	5.02	5.93
Disconnected handling	5.21	9.92	11.72	5.21	6.61	7.81	3.72	4.72	5.58	3.16	4.02	4.74
Local/instruction flight												
Connected handling	3.26	6.20	7.32	3.26	4.13	4.88	2.33	2.95	3.49	1.98	2.51	2.96
Disconnected handling	2.60	4.96	5.86	2.60	3.31	3.91	1.86	2.36	2.79	1.58	2.01	2.37
Cargo flight												
	3.39	6.45	7.62	3.39	4.30	5.08	2.42	3.07	3.63	2.06	2.61	3.08

*) minimum charge is based on an MTOW of 20 tonnes

Passenger Service Charge

Per departing local passenger	14.24
Per departing transfer passenger	5.98

Security Service Charge

Per departing local passenger	12.94
Per departing transfer passenger	7.25

Parking Charge

Per 1,000 kg per period of 24 hours	1.64
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Source: Schiphol Airport

175. There are different types of aircraft related charges for passenger point-to-point flights, local & instruction flights and cargo flights. All of these fees consist of a landing and take-off charge, which is differentiated according to the noise level generated by the aircraft, the take-off and landing time and to the type of handling.⁵¹ During the daytime (6:00 - 23:00 hours) the airport charges for landing and take-off are the same, at nighttime (23:00 - 6:00 hours) the fees for landing and take-off are different. The smaller of these two, the nighttime fee for landing is still above the fee for take-off and landing daytimes. In addition, the airport charges a parking fee if the aircraft stays more than 6:15 hours at the airport, for instance overnight. If parking is below that time-limit, it is free. All

⁴⁹ Information about security requirements can be found at <https://www.schiphol.nl/Working/SafetySecurity.htm>.

⁵⁰ There are rebates for the development of new lines, as well as different governmental charges levied on customers.

⁵¹ This differentiation applies to passenger aircraft handling only, not to cargo aircrafts. The fee is differentiated according to connected and disconnected handling (reduced fee).

these fees are calculated per tonne of weight of the aircraft; hence the overall price is differentiated according to the aircraft's weight.⁵²

Separate markets for the provision of infrastructure to airlines serving passengers and airlines offering cargo transportation

176. For passenger flights (point-to-point flights, local & instruction flights), the aircraft charge is complemented by a Passenger Service Charge and a Security Service Charge, which are charged for departing passengers over the age of two. These charges are paid by the airline and differentiated according to departing local passengers and departing transfer passengers.⁵³
177. There are different markets for the provision of infrastructure to airlines serving passengers and airlines offering cargo transportation. The reasons are as follows:
178. In regards to the market for services in transportation, it is common practice in European competition law to consider passenger transportation and cargo as separate.⁵⁴ First, the cargo business works differently in comparison to the transportation business. For instance, cargo is less time-sensitive than the transportation of passengers, who are often bound to certain days or weeks for traveling, or in the case of business travelers even to specific daytimes. Second, passengers have a preference for direct connections between their point of origin and destination. Even though it is common practice to assume a certain degree of substitution between direct and indirect flights,⁵⁵ the passenger transportation business relies very much on offering connections with minimum travel time. In contrast, the cargo transportation business is less time-sensitive.⁵⁶ Stop-overs are common practice, as well as temporary storage of goods in order to optimize the use of the cargo network. Third, the duration of contracts is different in the cargo business compared to the passenger transportation business, with cargo being more flexible due to short-term contracts.
179. If the airlines could easily switch the provision of transportation services from cargo transportation to passenger transportation and vice versa, this provided evidence that demand-side substitution is sufficient to consider these markets as a common market. But this is not the case. The business model for full

⁵² These fees refer to the maximum take off weight (MTOW) of the aircraft. The MTOW is the maximum permissible total weight with which the aircraft is authorized to take off under the most favorable conditions in accordance with the Certificate of Airworthiness. It is independent of the actual weight during parking.

⁵³ A transfer passenger is a "passenger arriving at and departing from the airport on a different aircraft or on the same aircraft under a different flight number whose main purpose for using the airport is to effect a transfer (origin \neq destination) without leaving the customs area for a period exceeding 24 hours." (Compare Schiphol Airport Charges and Conditions, 1 April 2009, p. 5).

⁵⁴ Case M.3770 Lufthansa / Swiss; case M.5141 KLM / Martinair.

⁵⁵ The Commission considers indirect flights only under exemptions as a substitute for direct flights. For instance, it considers indirect flights in the case M.5141 KLM / Martinair as substitutes for long-haul international flights, if this does not add up more than 150 minutes travel time (para. 144).

⁵⁶ For instance case M.3280 Air France / KLM, para. 36: "The Commission has in previous decisions departed from the point of origin / point of destination (O&D) pair approach to delineate the relevant market in air cargo transport cases. However, the Commission has found in previous cases that a wider market could be defined as, unlike passengers, cargo may be routed with a higher number of stop-overs and hence any indirect route is substitutable to any direct route."

freighter airlines which focus on cargo transportation services is different from airlines which offer passenger transportation services. There are substantial switching costs⁵⁷. Each service needs different types of aircraft, there are different demands to the network, and the sunk costs associated with passenger transportation for marketing and brand-development are substantial. Moreover, the costs structure of cargo airlines is different from passenger airlines. Costs for the crew, for reservation systems and terminals are lower for cargo airlines. Airport charges thus represent a relatively higher proportion of total operating costs, which makes cargo airlines more sensible to airport charges than passenger airlines (Tretheway and Kincaid, 2010). This is confirmed by the fact that different airlines are present in each of these businesses, and airlines can not easily substitute passenger transportation to cargo and vice versa.

180. Passenger airlines do also carry freight. The aim is to optimize the load factor,⁵⁸ which essentially determines the profitability of airline operations. According to estimates by Boeing, roughly half of world cargo is carried by full cargo airlines, the other half is carried in the bellies of passenger aircrafts.⁵⁹ This indicates that transportation of cargo and transportation of passengers are complementary to some extent.
181. The demand for the provision of infrastructure services at an airport is derived from the demand for the transportation services offered by the airlines. Concerning full cargo airlines, Schiphol airport has the ability to address these types of flights separately, because the full cargo business is a different business compared to passenger transportation. The price structure of the airport shows that the company does in fact charge different prices dependent on the type of customers. The take-off and landing charge for cargo-flights is about half of the fee charged for passenger flights for connected handling (the most prevalent type of handling at Schiphol airport).⁶⁰ This provides evidence that the provision of infrastructure to airlines serving passengers and the provision of infrastructure to airlines offering cargo transportation are separate markets from the airport's point of view.
182. Concerning the transportation of cargo by passenger aircrafts, the relevant question is if a hypothetical price increase, say in the cargo business, leads to a substantial substitution towards the transportation of cargo in the belly holds of passenger flights.⁶¹ A hypothetical price increase for cargo aircraft made full freighter operations relatively more unattractive vis-a-vis passenger flights. The relevant question then is if this would lead to a shift of cargo transportation in full freighter aircraft towards transportation in the bellies of passenger flights. If this was the case, the question could be raised if this marginal substitution is

⁵⁷ Combi-freighters with much more room for belly freight provide for a bit more flexibility on intercontinental routes, where such aircraft may be used. KLM operates a number of combined passenger-cargo flights, using primarily its B-747 aircraft.

⁵⁸ The load factor is the capacity utilization of the aircraft during a given period.

⁵⁹ Ibid, p.1.

⁶⁰ The exact ratio is 52% in relation to connected passenger handling, and 65% of the fee in relation to disconnected handling.

⁶¹ The question may also be posed the other way round: Does a hypothetical price increase for passenger aircrafts lead to substitution of passenger transportation by cargo airlines? This is obviously less likely than the other way round. Hence this question will not be further discussed.

substantial enough to render the initial price increase unprofitable from the airport's point of view. If this turned out to be the case, cargo and passenger flights belonged to the same markets.

183. The assessment of this question can only be addressed by a fully estimated SSNIP-test. As a fully estimated SSNIP-test was impossible, given time and data constraints, the analysis is based on relevant indications. First, the charge for full freighter aircraft per tonne of weight is way below the charge for passenger aircrafts per tonne of weight, even taking account that cargo only flights do not need to access the passenger terminal. A hypothetical price increase of 5 or 10 % in charges for full freighter aircraft does not render this price differential obsolete, which still leaves transportation of cargo by full freighter airlines substantially less cost expensive compared to transportation of cargo by passenger aircrafts.⁶² In fact, this indicates that substitution, if it occurred at all, is expected to be small. Second, cargo carried in passenger airlines is used to increase the load factor to make flights more profitable. It is a by-product of passenger transportation, and there is no substitution between passengers and cargo (Tretheway and Andriulaitis, 2010). The amount of cargo which can be carried in a passenger aircraft is limited by the space in the belly hold. Airlines try to fill this space as much as possible to increase the load factor. Substitution effects do not play an important role in this decision. Third, the former arguments are based on the assumption that there is a single agent who has access to both types of aircraft and can indeed choose between transportation by full cargo aircrafts or by passenger aircrafts. If this is not the case, substitution becomes even more unlikely. In order to occur, the price increase for landing and take-off charges needed to increase the price a customer has to pay for the transportation service downstream to such an extent, that she switches her demand for the transportation service from a full freighter airline to a passenger airline. To affect the airport, substitution downstream must then be strong enough to lead to substitution of aircrafts upstream. This in turn must be strong enough to render the hypothetical price increase unprofitable for the airport. These arguments indicate that it is unlikely that the degree of substitution between cargo and passenger transportation is sufficient to define a common market for the provision of infrastructure services to airlines, independent of the fact that the airline serves passengers or offers cargo transportation.
184. There is also evidence that these markets are different from an airport's point of view in the light of Chapter 5. The analysis of the catchment areas for cargo and passenger flights shows that they differ to a substantial extent. Different catchment areas indicate that these markets work in a different way, and that the degree of competition in the downstream markets may differ. As the demand for the airport's infrastructure upstream is derived from these downstream transportation markets, it indicates that the upstream markets can also be addressed differently by the airport.
185. This is also in line with the definition of the geographical markets in cargo and passenger transportation services in different airline related merger cases by

⁶² In terms of landing and take-off fees, a tonne of cargo carried in a full freighter aircraft costs roughly half as much as the same tonne carried in a passenger aircraft.

the European Commission.⁶³ Whereas the Commission defines the geographic market for passenger transportation on a route-by-route basis, the relevant geographic markets for cargo are defined on a continental basis.⁶⁴ Therefore the catchment areas for airports in the cargo business tend to be EU-wide, which is different from the catchment areas for O&D and transfer passenger transportation.

186. This argumentation is also in line with the practice of the European Commission regarding the definition of the relevant markets for the provision of services in airports. Although there has not yet been a case which crucially relied on an exact market definition, in some cases the Commission indicated the approach it takes towards the definition of the relevant markets in the airport business. First it defines a general market in services linked to the access of airport infrastructures for which a fee is paid.⁶⁵ In different merger cases, the Commission decided to leave the market definition open, because it was not necessary to exactly define relevant markets for the competitive assessment of the case. However, the Commission indicates that it considers a narrow definition of the markets as appropriate, depending on the services an airport supplies.⁶⁶ Moreover, in the merger case Ferrovial⁶⁷ the Commission states that the market for provision of airport infrastructure services to airlines could be further subdivided into different types of air services. Even though in this case the Commission refers to the separation according to full-scheduled, low cost and charter airlines⁶⁸ (and notes that the distinction between these types of airlines becomes more and more less evident), this approach shows that the definition of the upstream markets concerning the provision of airport infrastructure is related to the type of services which the airlines provide downstream to customers in transportation markets. This is also in line with the Commission's approach in several antitrust cases.⁶⁹

⁶³ Case M.3280 Air France / KLM; case M.3770 Lufthansa / Swiss; case M.5141 KLM / Martinair.

⁶⁴ This depends on the availability of intra-continental infrastructure. If it is highly developed (as for instance in Europe and North America), the continent-to-continent approach is valid. Otherwise a continent-to-country approach applies.

⁶⁵ Compare case COMP/35.737 PO / AENA, para. 33; case COMP/35.767 Ilmailulaitos / Luftfartsverket, para. 25; case COMP/35.469 Portuguese airports, para 14.

⁶⁶ For instance in case M.786 Birmingham International Airport, para 15, the Commission states that the question could be raised whether several distinct markets depend on the nature of services supplied could be appropriate. „Airport operation and management consist of several broad categories of services within which infrastructure, ground handling and commercial services could be distinguished as separate markets. Finally, the question could be raised whether each of these categories of airport services could be divided into several distinct markets depending on the nature of services supplied.“ The Commission gives reference to this argument also in more recent cases, i.e. in case M.4164 Ferrovial et. al., para. 11, or case M.2262 Flughafen Berlin (II), para. 13.

⁶⁷ Compare case M.4164 Ferrovial et. al., para. 12.

⁶⁸ Full-scheduled airlines run flights in a network on a specified regular basis. Charter airlines operate specific routes at specific points of time. Low cost carriers focus on point to point services and low-cost operation.

⁶⁹ Case COMP/35.737 PO / AENA, para. 33; case COMP/35.767 Ilmailulaitos / Luftfartsverket, para. 25; case COMP/35.469 Portuguese airports, para 14.

Subdivision of the market for the provision of infrastructure to airlines serving passengers according to O&D and transfer passengers

187. There is evidence that the market for the provision of infrastructure to airlines serving passengers can be subdivided into separate markets for the provision of infrastructure to airlines serving transfer passengers and the provision of infrastructure for airlines serving O&D passengers.
188. Schiphol airport charges different fees for aircrafts carrying passengers who use the airport as a hub (“transfer passengers”) and aircrafts carrying passengers who use the airport as an origin or destination (“local passengers”). Even though the landing and take-off fee is aircraft related and independent of the type of passengers which the aircraft carries, the Passenger Services Charge (PSC) and the Security Service Charge (SSC) differ to a substantial degree. This leads to an overall price for landing and take-off, which contains aircraft and passenger related elements. As a consequence, the total price for landing and take-off depends on the passenger mix of an aircraft. It is paid in the upstream market by the airline for the provision of the infrastructure by the airport, although it is charged dependent on the customer mix of an airplane in the downstream transportation market.
189. The existence of passenger mix dependent aircraft prices reflects the ability of the airport to address these types of services differently.⁷⁰ The fact that the airport uses this instrument - it could also charge the same price for both types of customers - indicates that it is attractive to do so.⁷¹
190. Charging different prices can only be profitable if the ability to substitute on the demand side is limited. The load factor and the mix of customers are crucial for the profitability of airline operations. Even if the passenger mix can be adjusted marginally, it is difficult to react to price changes which make a price increase unprofitable. The fact that the business model for low cost carriers (serving O&D passengers) is different from the business model for full service airlines (serving O&D and transfer passengers) supports this view.⁷² Moreover, representatives of Schiphol airport commented in our interviews and confirmed a low degree of substitutability of demand between O&D and transfer passengers. They indicated that KLM, the most important customer of the airport, did not react to a substantial change in the relative price structure between O&D and transfer passengers in 2007. Moreover, as the price is charged on the upstream market, the ability of airlines to pass on a price increase has to be taken into account. This ability differs between transfer and O&D passengers, as the introduction of the air passenger tax and evidence of

⁷⁰ Some portion of the price differences are driven by cost differences, especially with regard to the PSC (compare NMa case number 200120/137.BT1377, para. 118). Concerning the SSC, the NMa comes to the conclusion that security checks constitute equivalent services (ibid., para. 123). This gives evidence that the airport employs the fee to address these types of customers differently.

⁷¹ The fact that other airports (like Madrid or London Heathrow do not charge different prices for O&D and transfer passenger flights does not challenge this argument. If an airport charges unique prices for both types of infrastructure services, this might indicate that the airport does not use this type of instrument.

⁷² Also, that network carriers have different needs to an airport compared to low cost carriers (case M.3280 Air France / KLM, para. 26).

different elasticities of demand indicate.⁷³ Representatives of Martinair also indicated in interviews that it is appropriate to separate the O&D and transfer markets.

191. Two main remarks. Even though the ability to substitute is small, to charge different prices can help to at least marginally address the mix of flights which are offered to passengers from Schiphol airport. It is an instrument which may be designed with the purpose to appear more attractive for transfer or O&D passengers, and thus helps to balance between the airport's hub-functionality and its functionality as an entry gate to the catchment area around Amsterdam. If this it profitable can only be assessed in a fully estimated SSNIP-test. As this was impossible, the analysis is based on relevant indications. Second, the fact that an aircraft typically carries both types of passengers at the same time does not challenge the airport's ability to charge different prices. It is not necessary for an aircraft to carry only one type of customers to be affected by this type of price structure. It suffices to focus on the relative structure of the aircrafts' passenger types, which is relatively inelastic, and which the airport marginally influences by charging different prices.
192. Evidence that O&D flights and transfer flights do not belong to the same transportation market is provided by the introduction of the 'Air Passenger Tax' at Schiphol airport, which serves as evidence that the provision of infrastructure to airlines serving transfer passengers and the provision of infrastructure to airlines serving O&D passengers constitute separate markets. The air passenger tax came into effect July 1, 2008. It is a tax which is levied on local passengers departing from Schiphol airport. It is not levied on transfer passengers.
193. The tax introduction has the property of a natural experiment in this context.⁷⁴ As the induced price increase is well above the usual 5 or 10 % price increase applied in the context of the SSNIP-test, it cannot be taken as a substitute for a fully specified SSNIP-test. Rather, it will be used as an indication if the definition of a separate or common market for the provision of infrastructure to airlines serving transfer and O&D passengers appears appropriate. If transfer and O&D passengers belonged to the same market, the price increase induced by the tax should lead to substantial substitution towards demand in the transfer passenger market. But this cannot be observed. Figure 2 shows that the passenger tax led to a decline in the growth rate of O&D passengers at Schiphol airport, but didn't affect the market for transfer passengers at all. This was also confirmed in our interviews by Schiphol airport representatives, who indicated that the airport lost about 10 % of its O&D passenger travel as a consequence of the introduction of the tax to other airports and saw the cancellation of planned expansions which were moved across the border into Germany.⁷⁵ This provides evidence that transfer and O&D markets are independent of each other, and that the airport addresses separate markets by the provision of infrastructure services to local or transfer flights.

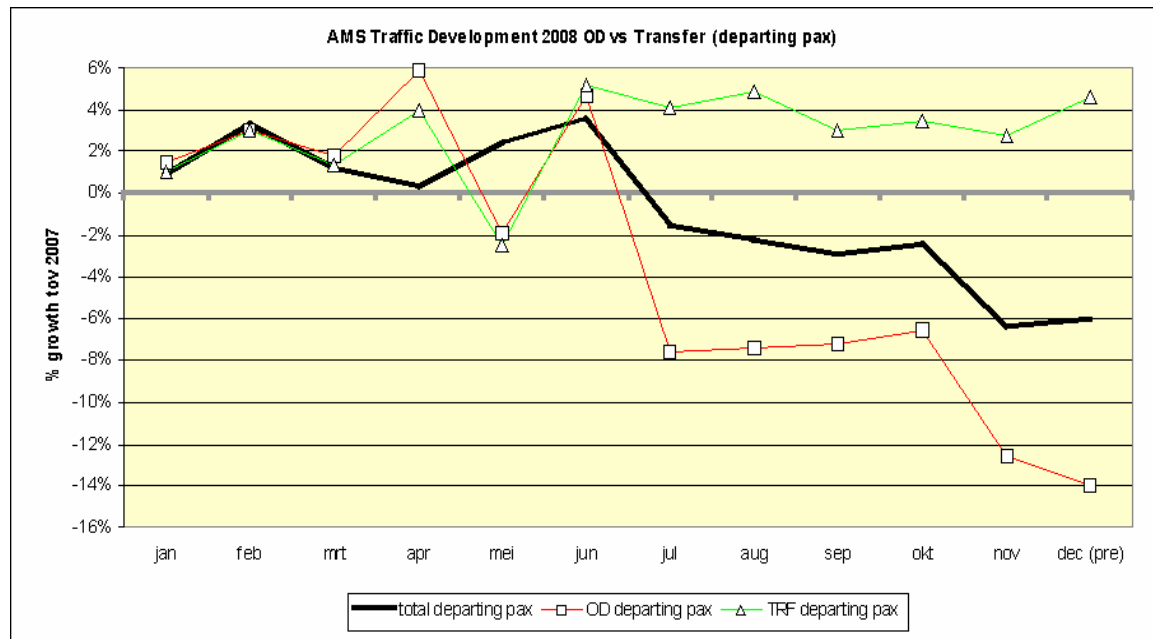
⁷³ This is confirmed in NMa case number 200120/137.BT1377, para. 137.

⁷⁴ Commission notice on the definition of the relevant market, para. 38.

⁷⁵ Representatives of KLM also indicated that some of the low cost carriers moved out Schiphol due to the tax, but tend to relocate their activities to Amsterdam again.

194. To take the introduction of the passenger tax for market definition into account is also in line with the approach of the European Commission in the KLM / Martinair merger case.⁷⁶ Here, the Commission takes the analysis of the tax introduction on O&D travel, which was provided by the parties, as an indicator in the competitive assessment, even though it does not take the parties' arguments as definitive for different reason.

Figure 4.1: Impact of passenger tax



Source: Airport Schiphol

195. Furthermore, there is strong evidence that the elasticity of demand differs between transfer and O&D passengers.⁷⁷ From the airport's point of view, different price elasticities in the downstream markets gives discretion to address these markets differently, as the ability to pass-on price increases differs. The hub market tends to be larger than the O&D market. Passengers using Schiphol airport as a hub to travel to other destinations regard different airports as an alternative, whereas this is applicable only to a limited extent for O&D passengers. The argument is in line with the larger size of catchment areas for transfer markets and leads to higher elasticities of demand in transfer. Standard economic reasoning shows that a firm's ability to charge prices above marginal costs is inversely related to the demand elasticity. Firms take small markups if the price elasticity is high, and vice versa. If substitution between passengers using Schiphol airport for transfer flights or O&D flights is small, different elasticities of demand in the downstream market translate into different elasticities upstream. Hence the airport's ability to address these types of customers separately. The fact, that Schiphol airport charges lower fees for

⁷⁶ Case M.5141 KLM / Martinair, para. 182f. The Commission noted that only one out of several papers submitted by the parties had been published in a renowned journal.

⁷⁷ The Commission discusses the elasticity of demand in O&D markets in the context of the passenger flight tax in case M.5141 KLM / Martinair, para. 183.

transfer passengers compared to O&D passengers is in line with both economic reasoning and evidence of different demand elasticities in these markets.^{78,79}

196. The evidence that the provision of infrastructure services to airlines serving transfer passengers is a different market compared to the provision of infrastructure services to airlines serving O&D passengers is also in line with case law of the European Commission. The Commission defines markets in air transportation services on a route-by-route basis and differentiates according to different types of customers, i.e. time-sensitive and non-time-sensitive customers, short-haul and long-haul flights etc. The economic reasoning is that substitution between these types of flights is small and customers regard these services as non-interchangeable.
197. There is some room concerning the Commission's assessment of the market definition in the airport industry. A number of case decisions by the European Commission indicate its approach. An exact market definition has not yet been crucial for the economic assessment of a case, and thus not been given. In several cases the Commission indicated that "the question could be raised whether each of these categories of airport services could be divided into several distinct markets depending on the nature of services supplied."⁸⁰ The same applies to the Berlin Flughafen I and II cases. The Commission explicitly states that the definition of the market is left open and there are certain indications that the markets could be separated further. The reason to do so becomes obvious in the economic assessment of the Berlin Flughafen I merger case. Although the Commission leaves the exact market definition open, it assesses the competitive effect of the merger separately for transfer flights and separately for short-haul and long-haul O&D flights.⁸¹
198. This is also in line with the more recent Ferrovial et. al. merger case, where the Commission states: "As regards the provision of airport infrastructure services to airlines the market could be further subdivided according to the categories of customers of airline infrastructure services, i.e. airlines: full service scheduled airlines, low cost airlines and charter airlines."⁸² Moreover the Commission notices that the "parties have also submitted that it is appropriate to differentiate between hub airports and non-hub airports".⁸³ Since this is not crucial for the economic assessment of the case, the Commission does not state if it adopts this opinion or not.

⁷⁸ This is also affirmed by representatives of the airline industry in our interviews. KLM, Easyjet and representatives of Schiphol airport jointly agree that transfer passengers are more price-sensitive than O&D passengers (compare also NMa case number 200120/137.BT1377, para. 135).

⁷⁹ This is also an indication for sound economic reasoning of the Dutch Government. A tax should be high if the elasticity of demand is low, and vice versa. This might have driven the government's decision to adopt only a tax in the O&D market (for an analysis of the introduction of the ticket tax, compare also SEO (2009), "Implicaties van de invoering van de ticket-tax".)

⁸⁰ Case M.786 Birmingham International Airport, para. 15. The Commission refers to this decision in a number of subsequent cases, i.e. case M.1255 Flughafen Berlin (I), para. 9f; case M.3823 MAG et. al., para. 14.

⁸¹ Case M.1255 Flughafen Berlin (I), section C.

⁸² Case M.4164 Ferrovial, para. 12:

⁸³ *Ibid.*, para. 16.

The provision of infrastructure for local & instruction flights is a separate market

199. Schiphol Airport charges a separate fee for local & instruction flights. Local flights are flights which depart and land at the airport without a stop in between, while instruction flights are local flights which are carried out under the supervision of an instructor for the purpose of acquiring flying skills. The charge is weight-dependent, with a minimum fee corresponding to 20 MTOW. As with passenger flights, the fees are further differentiated according to flight duration, the type of aircraft and to connected or disconnected handling.
200. This market is separate from the markets for the provision of infrastructure to airlines serving O&D or transfer passenger flights. Local flights depart and land at Schiphol airport, there is no substitutability between local and O&D-flights from the passenger side. This in turn also leads to the definition of separate markets upstream, the airport is able to address different types of flights. Moreover, compared to passenger O&D flights, there is a different degree of substitutability in the downstream markets. In contrast to passenger O&D flights, instruction flights can be shifted more easily to other nearby airports such as Rotterdam, Lelystad or Eindhoven. The degree of substitutability may be lower for local flights. This leaves room for discussion whether this market should be further subdivided. However, this question can be left open for the purpose of this study. The revenue generated by local & instruction flights is rather small, and this business is of minor importance to the airport. This is also confirmed by the fact that the airport charges a weight-dependent minimum fee, which in fact is prohibitive for small aircraft. Interview partners indicated that the airport has incentives to reduce this kind of traffic in order to reduce congestion at the airport, and this business is also of minor relevance for revenue creation.

It is not reasonable to define separate markets for the provision of infrastructure to airlines dependent on the type of aircraft being used.

201. It must be noted that the airport charges different prices depending on the type of aircraft which uses the airport's infrastructure. This could be an indication that these are regarded as separate markets by the airport. Additionally, a change in the relative price structure may not induce substantial enough substitution towards other types of aircraft in the short run. The determination of the overall fleet structure is a long-run decision for which a number of other variables are important in addition to airport charges, and in the short run the airlines do not react substantially to a change in relative prices. This is also valid for the allocation of different types of aircraft within the airline's fleet, as well as the decision on upgrading and overhauling. Moreover it needs to be noted that airlines do not only use the infrastructure at Schiphol airport, but at other airports as well. This also limits the possible substitution of aircraft in reaction to a change in relative prices at Schiphol airport.
202. Even though possible substitution effects between different types of aircrafts may be small, it is misleading to consider these markets as separate for the purpose of this study. First, the different charges for different types of aircraft are related to the aircrafts' noise emissions. The airport does not charge different prices in order to address different markets, but to induce airlines to use noise efficient aircraft. The price structure is in fact an instrument aimed at allocating available capacity within Schiphol airport's noise contours. This kind

of price structure is stipulated by the ICAO's Policies on Airport and Air Navigation Charges,⁸⁴ to which the European directive on airport charges refers.⁸⁵ Second, market definition is not a means in itself, but aimed at assessing market power for the purpose of the specific investigation.⁸⁶ In this case, the definition of separate markets does not help in terms of purpose for the study. Third, the definition of separate markets would not be in line with the practice of European case law. There is no known case to the author which defines markets in that narrow sense.

It is not reasonable to define separate markets for the provision of infrastructure to airlines dependent on daytime and nighttime flights.

203. Schiphol Airport charges different fees depending on the time of landing and take-off of the aircraft. This fee is differentiated according to daytime or nighttime flights. This type of price structure makes it necessary to check if daytime flights and nighttime flights constitute separate markets for the provision of infrastructure services to airlines.
204. It could be argued that due to the importance of being able to offer connecting services, the extent of switching between daytime and nighttime-flights induced by a change in relative prices may be limited. This gives a certain price-discretion to the airport. Moreover, many passenger flights take place during a specific range of daytime hours, which depends on passenger preferences, the destination of the flight, and the relevance of connecting services. Also, the use of the infrastructure during nighttime is more expensive compared to daytimes, hence airlines generally prefer to use daytime slots. These effects tend to limit the airlines' discretion to react to changes in the relative price structure and to substitute demand.
205. There is evidence that a common market for daytime/nighttime flights is an appropriate approach for the purpose of this study. First, airlines are able to substitute to a limited extent between daytime and nighttime slots. This puts competitive constraints on pricing. Second, the same argument applies regarding the different price structures dependent on the aircraft type. For the purpose of this study, the definition of separate markets dependent on time-structure will not be pursued further. Rather a common market for the provision of the infrastructure for all time slots is in line with the focus on the most important aspects in the competitive assessment of Chapter 5. Third, it is not common practice in European competition law to define different markets according to the time-structure (also for the definition of the downstream transportation markets), which in general are defined more narrowly than the upstream markets of services provided by the airport.
206. It could also be reasonable to differentiate the provision of infrastructure according to peak-times and off-peak times. However, in order to differentiate

⁸⁴ ICAO's Policies On Charges For Airports And Air Navigation Services, Seventh Edition – 2004, ICAO.

⁸⁵ Directive 2009/12/EC, para. 9.

⁸⁶ Commission notice on the definition of the relevant market, para. 2f.

between these types of flights, the airport needs to charge different prices for these types of services.⁸⁷ This is not the case with the current pricing scheme.

It is not reasonable to define separate markets for the provision of infrastructure to airlines dependent on the type of handling.

207. It is not reasonable to define separate markets depending on the type of handling. First, airlines are able to substitute between connected handling and disconnected handling.⁸⁸ As there is a substantial degree of substitutability, it is reasonable to consider these activities as belonging to the same common market. Furthermore, interviews indicate that the charge for disconnected handling most notably applies to handling at Pier H, which is mainly used by easyJet.⁸⁹ The charge for disconnected handling is however applicable to any airline which might use disconnected handling, even though the capacity at pier H is extremely limited. To define separate markets for any individual trading partner who is able to negotiate an individual price would lead the market definition meaningless.

Aircraft parking is a secondary demand and does not constitute a separate market

208. Schiphol Airport does not charge a fee for aircraft parking if the parking is less than 6 hours 15 minutes. If an aircraft stays longer than this time, for instance overnight, a daily fee applies.⁹⁰

209. In European competition practice, the question if secondary markets constitute separate markets or belong to a common market with the primary service is mainly discussed in the context of antitrust cases. The relevant question is then if firms try to foreclose secondary markets for third-party suppliers in order to increase profits. Relevant industries are for instance the supply of spare parts as secondary supply to the market for automobiles, or the supply of brand-specific ink or toner cartridges for printers.

210. Schiphol airport does not address airlines to use the airport only as a parking space. Rather, the parking activities of airlines is secondary to the use of the airport's infrastructure for landing and take-off in order to transport passengers or carry freight. Moreover, the existence of the parking fee is published in an open and transparent way, and there is no economic risk for the airlines if they have to bear these costs or not. Instead, each airline will consider the parking fee as a part of the whole bundle of the demand for Schiphol airport's infrastructure. Since this is part of an overall economic decision, aircraft parking does not form a separate market.

The role of supply-side substitution

211. If demand-side substitution is low, supply-side substitution may put a competitive constraint on pricing. If supply-side substitution exists, it may point

⁸⁷ Competition Commission (2009), para. 2.21.

⁸⁸ Disconnected handling by bus was originally applied to platform handling applied to small regional aircraft. Larger aircraft can only be provided with disconnected handling at the H-pier in a manageable way. That capacity is however severely restricted.

⁸⁹ NMa case number 200120/137.BT1377, footnote 131.

⁹⁰ The fee is charged per tonne of weight of the aircraft.

towards a broader definition of the relevant market. The notice on the definition of the relevant market states: "Supply-side substitution may also be taken into account when defining markets in those situations in which its effects are equivalent to those of demand substitution in terms of effectiveness and immediacy."⁹¹ In paragraph. 22 of the notice, the Commission provide a practical example in the case of paper. Even though different types of quality of paper are not substitutable from a customer's point of view, a producer can easily switch production between different types of quality. Paper manufacturers are therefore able to compete for orders of various qualities. This puts a competitive constraint on pricing, which leads to a definition of a common market for paper instead of separate markets for each type of quality.

212. The Commission also indicates the role that supply-side substitution plays in the definition of the relevant market. First, a report published by the European Commission discusses which conditions have to be met so that supply-side substitution plays a crucial role in the definition of the relevant market.⁹² Secondly, case law and the discussion of case law by the Chief Competition Economist give an indication of the role of supply-side substitution.
213. The Commission report on supply-side substitution develops and elaborates on the type of reasoning which is necessary for the discussion if supply-side substitution plays a role in the definition of the relevant markets in a particular case.⁹³ In summary, there must be competitors, which do not produce the same good (otherwise it was assumed to be substitutable from the demand-side perspective), but similar products. The suppliers must have physical, distributional and marketing assets which allow them to step into the market immediately and effectively, without incurring significant additional costs or risks.⁹⁴ Moreover, significant irreversible investments must not be necessary, and consumers must regard the products as valid substitutes for the existing set of products. The Commission's notice on the definition of the relevant market states, that if "supply-side substitution would entail the need to adjust significantly existing tangible and intangible assets, additional investments, strategic decisions or time delays, it will not be considered at the stage of market definition."⁹⁵ This does not mean it does not play a role at all. It only has the effect that it does not play a role at the stage of market definition. In the competitive assessment it might well play a role in terms of potential competition. Moreover, supply-side substitution must be nearly universal, which means that it is not sufficient that some producers might step in to a certain extent, but it is necessary that these producers are able to cover almost the whole market over the complete product range.
214. Supply-side substitution typically arises "when companies market a wide range of qualities or grades of one product".⁹⁶ This is likely to occur when products are

⁹¹ Commission notice on the definition of the relevant market, para. 20.

⁹² Padilla (2001), "The role of supply-side substitution in the definition of the relevant market in merger control. A report for DG Enterprise A/4, European Commission". To be found at: http://ec.europa.eu/enterprise/newsroom/cf/document.cfm?action=display&doc_id=433&userservice_id=1&request.id=0.

⁹³ Annex D of this report gives some references.

⁹⁴ Commission notice on the definition of the relevant market, para. 20.

⁹⁵ *Ibid*, para. 23.

⁹⁶ *Ibid*, para. 21.

similar but not substitutable from a customer's point of view. The report also discusses the practical relevance of supply-side substitution in a number of cases. It indicates that the Commission is relatively reluctant to apply the argument of supply-side substitution in order to define broader markets.⁹⁷

215. Evidence for the applicability of supply-side substitution is also given in a recent merger case (M.5046 Friesland Foods / Campina). The Commission tested if “immediate and costless entry”⁹⁸ rendered a small but permanent increase in price unprofitable in the market of dairy products. For this case, it turned out that the “view that fresh milk, fresh buttermilk, basic yoghurt and custard are supply-side substitutes for the purposes of relevant product market definition could not be supported.”⁹⁹ The reasons are that only 1 out of 17 suppliers produced the whole range of products, and many suppliers also said that they were able to step in only after additional investments in terms of capacity, machinery and space were undertaken. This led to the conclusion, that

“the conditions laid down in the Relevant Market Notice that supply-side substitution is to be immediate and effective are not fulfilled. In particular, it is not the case that most, if not all suppliers would be able to switch production to the relevant products and market them in the short term without incurring significant costs or risks. This idea is even more supported in the case of branded products, where there are costs and lead times (in terms of advertising, product testing and distribution) before products can actually be sold.”¹⁰⁰

In a discussion of this case, the Chief Competition Economist of DG COMP concludes:

“This case illustrates that the necessary conditions in the Commission’s notice on market definition for a market to be expanded on the grounds of supply-side substitutability are stricter in practice than is generally believed. Indeed, supply-side substitution first requires (i) entry at short notice, (ii) at low cost, and (iii) without incurring irreversible investments - circumstances that hardly apply in most cases, particularly when it is recognized that these conditions apply not only to production but also to distribution and marketing. Moreover, market aggregation - a broadening of market boundaries to include a larger group of products or geographical area - only makes sense when supply-side substitution is found to be technologically feasible and economically viable for most, if not all, firms that sell one or more of the products in question (the so-called “near universality” criterion). Whereas one competitor may be able to shift swiftly from producing and distributing (say) “young cheese” to “mature cheese”, only if all (or nearly all) competitors can do the same would it be possible to include both types of cheese in the same market. However, nothing of substance is lost since

⁹⁷ Padilla (2003), Chapter 3.

⁹⁸ Case M.5046 Friesland Foods / Campina, para. 158.

⁹⁹ Ibid, para. 160.

¹⁰⁰ Ibid, para. 166.

the competitive pressure potentially exerted by such rivals will generally be taken into account in the assessment of merger-induced entry.”¹⁰¹

216. Even though the definition of the relevant market is not a general exercise but relates to a specific case and follows a specific purpose, it might be worth considering a hypothetical example. Suppose airport A only serves airlines carrying passengers, and airport B only serves cargo airlines. Suppose airport B increased the cargo charges. The relevant question in terms of supply-side substitution is if airport A could immediately step in and also serve cargo transportation. Most importantly, to address cargo flights requires the airport to be able to set a charge for cargo airlines which is attractive enough to give incentives for a change. Setting a separate price does not require additional investments, and it is easy and without substantial risks. Second, it must be assessed if the airport has enough capacity to be an alternative of supply. This is the case when the airports are comparable to each other in terms of capacity and geographic catchment, and if the airport is not congested. The latter is only given if airport A is uncongested enough to take over most of the traffic of airport B, not only parts of it (NUS-test). Third, the airport must in fact be an alternative for cargo airlines. The capacity to handle cargo must exist,¹⁰² as well as a comparable connection to transportation infrastructure. Fourth, cargo airlines as the relevant customers of airports must be able to easily switch demand.
217. In case all these questions might be best answered with a “yes”, it needs to be noted that even in this hypothetical example the argument relies on some particularities. For instance, it depends on the types of services offered and on the question of “who switches to whom”. Whereas it might be easier for cargo airlines to switch airports, and for passenger airports to offer infrastructure for cargo, it might not be as easy the other way round. Passenger handling needs a different type of infrastructure at an airport (check-in desks, security controls, baggage handling), which renders additional investments necessary to offer these services and makes the switch a non-immediate one. This might again be different if we consider supply-side substitution for the provision of infrastructure services to airlines serving passenger flights and the provision of infrastructure services to airlines serving local and instruction flights. Whereas the infrastructure is closer to each other for these types of services, differences do exist in relevance to baggage handling and possibly also in relation to the type of runway-systems (local flights tend to be done by smaller aircraft, long-haul passenger flights and cargo flights by larger). An airport providing infrastructure for airlines serving passengers might easily also offer services for local and instruction flights (as long as congestion does not play a role), but switching is probably not as easy the other way round. However, these hypothetical questions can be left open. But they give some indication towards the role of supply-side substitution in the airport market. Market definition is not a general exercise in a means in itself, but done within the context of a particular case and to address a specific purpose of investigation.

¹⁰¹ Neven, de la Mano (2009), „Economics at DG Competition, 2008-2009”, Review of Industrial Organization, 35:317-347. Here page 319.

¹⁰² To offer cargo may require significant investments by the airport in terms of specialized storage and warehouse facilities.

218. The question if supply-side substitution is strong enough to define a common market for the provision of infrastructure to airlines for the purpose of this study needs to be addressed in the factual context of Schiphol airport. Consider for instance the fact that Schiphol airport increased its prices for O&D passenger flights to a substantial extent. The relevant question then is if other airports could step in by switching the provision of their services from transfer passenger flights to O&D passengers flights, and vice versa. Generally speaking, it must be the case that a) substitution is possible at short notice, b) at low costs and c) without additional and incurred investment.¹⁰³ Moreover, airlines must take this alternative as viable. If this was the case for all of the markets involved, and airlines were indeed able to respond to it by airport switching, supply-side substitution indicated that the provision of infrastructure services to airlines belonged to a common market. In this case no further separation of markets was appropriate, even though these services are not substitutable from a demand-side perspective.
219. First, only airports are a valid option for the test of a supply-alternative. Second, the airport must not only be within the catchment area of Schiphol airport, but must also be comparable in terms of geographic location (the airport must be considered as an “as good as” alternative), size, capacity and ability to handle passengers and cargo. Moreover, this airport must not be congested.
220. In terms of the provision of service to airlines serving O&D passengers, this requires that the airport is close enough to Schiphol airport,¹⁰⁴ that it is uncongested and able to handle the same amount of passengers (NUS-test).¹⁰⁵ Even though there are some airports which may handle passengers to a certain extent and which might be viewed as an alternative for O&D passengers (Rotterdam, Eindhoven), they are not comparable to Schiphol airport in terms of capacity, especially short term (but also long-term). In the case one of these airports increased capacity, the argument does not apply at the market definition stage, because substitution must be immediate, without substantial economic risk, and without additional investments. Moreover, the relevant airports belong to Schiphol Group, which restricts competitive constraints from these airports. Third, the development of airports in the Netherlands is governed by the Alders agreement. The extent of regulation is high, and there are certain roles assigned to the airports in the development of the Dutch air transportation infrastructure, which again restricts the competitive constraints by these airports.

¹⁰³ Annex D of this report gives some references.

¹⁰⁴ It is not sufficient to be located within the catchment area of Schiphol airport. Consider for instance an airport which is located at the border of Schiphol airport's catchment area (take as an example Dusseldorf airport). The catchment area of this airport overlaps to the west with the catchment area of Schiphol, but to the east covers different areas and potential customers (like the Ruhr-area and farther east the Sauerland). Hence, from an airline's point of view Dusseldorf airport does not offer equivalent services because the catchment areas overlap only partially. For instance, customers to the far south-east of Schiphol airport may not belong to the catchment area of Dusseldorf airport.

¹⁰⁵ It is not sufficient that the airport can take over some customers, but it must be able to take over almost all customers, such that supply-side substitution is enough to define a common market (NUS-test, compare appendix III). The effect that substitution may occur marginally indicates that substitution needs to be taken into account at the stage of the competitive assessment, but marginality is not sufficient to define a common market at the market definition stage.

221. In terms of the provision of services to airlines serving transfer passengers, the catchment area of Schiphol airport is broader compared to the O&D passenger segment. This makes supply-side substitution more likely. However, congestion plays a crucial role. Many of the relevant airports are congested (i.e. Dusseldorf, London Heathrow). It can be discussed if they could take over a certain part of Schiphol airport's transportation services, but for obvious reasons they cannot take over nearly all of its services immediately, without additional investments, and without substantial economic risk. But this is the requirement for the definition of a common market for reasons of supply-side substitution.
222. Finally, if there was an equivalent alternative supplier, an additional requirement is that the alternative must be considered as a valid substitute from a customer's point of view. This means that switching must be possible. As has already been discussed, switching costs are substantial in the airline industry. Even though the extent of switching costs differs between airlines serving local and international flights, airlines offering cargo transportation and airlines serving passengers, switching costs exist to variable extents. There are sunk costs of operation, economies of scale for the operation at an airport, there may be network effects, and airlines are bound in contracts with different lengths of duration. As the time-horizon for supply-side substitution is short-term, switching costs matter.
223. From this it can be concluded that supply-side substitution does not provide evidence that the definition of a common market for the provision of infrastructure to airlines is the appropriate approach.

4.2.2 Geographic market definition

224. The following section will give some basic indications about the geographic market definition. The exact definition will be left open here, and it is subject to the assessment of market power in the following chapters. The reason not to define exact geographic markets, but to give some indications only at that early stage of the inquiry, is that the definition of the geographic markets should not predetermine the assessment of market power too early.¹⁰⁶ This approach is also in line with European case law regarding the definition of markets in the air transportation industry.

Provision of infrastructure to airlines serving passengers flights (O&D and transfer)

225. An airport attracts passengers within a certain geographical area around the airport, which is called the catchment area of the airport. The relevant geographic market in the downstream markets for air transportation services is defined by these catchment areas. Since the demand for the provision of infrastructure for landing and take-off of different types of aircraft is derived from demand downstream, the geographic market definition for the upstream

¹⁰⁶ Competition Commission (2009), para. 2.47.

markets has to take the catchment areas of the downstream markets into account.¹⁰⁷

226. The European Commission's approach towards the definition of the geographic market in the airline industry is a two-step approach, which also applies here. The first step is to take a certain circle area around the airport as a starting point. The distance from the airport and the travel time needed to approach it is of great relevance. With reference to passenger transportation, the circle tends to be wider for long-haul or intercontinental flights and smaller for regional or short-haul flights. As a starting point for the definition of the catchment area, the Commission considers distances of 100 km and 1 hour travel time for short-haul flights and distances of about 300 km for international airports. For a hub-airport, the Commission considers the main European hub-airports as belonging to the same catchment area, which can be reached within a 2 hours flight.¹⁰⁸
227. In the second step it is necessary to determine the exact catchment area, which is part of the competitive assessment in Chapter 5. Former merger cases by the European Commission give some indication about the size of catchment areas of Schiphol airport. In the KLM / Martinair merger case the Commission conducted a passenger survey at Schiphol airport to investigate if Dusseldorf and Brussels airports belong to the catchment area for time-insensitive long-haul flights to Caribbean destinations.¹⁰⁹ The findings of the survey confirm the conjecture. Furthermore, tour operators said that they would switch from Amsterdam to Dusseldorf or Brussels in case Schiphol airport increased its prices.¹¹⁰ Interviews with representatives from Schiphol airport also confirmed this view. They consider Schiphol airport's catchment area of 200 km and 2 hours drive as relevant. All this indicates that that Dusseldorf and Brussels airport belong to the catchment area of Schiphol airport for long-haul flights, which is also in line with the findings of Chapter 5.

Provision of infrastructure to airlines offering cargo transportation

228. The geographic market definition for the provision of infrastructure services for cargo airlines will be left open at this stage of the study for the same reasons given above. There are strong indications that the relevant geographic market is EU-wide. Cargo transportation is not time-sensitive, contracts are of short duration and airlines have a greater flexibility to adjust their networks as a reaction to price changes compared to passenger airlines. This works in favor of the broad geographic area with which Schiphol airport competes. This view was also confirmed in our interviews.¹¹¹

¹⁰⁷ This becomes most clear if several airports serve a city, as for instance in Berlin. In this case, the geographic markets are not limited to each airport's area, because substitution effects between different airports exist.

¹⁰⁸ Case M.1255 Flughafen Berlin (I), para. 11, 15.

¹⁰⁹ Case M.5141 KLM / Martinair, section 8.2.

¹¹⁰ If such a step was indeed possible, the case of a price decrease would depend on several factors, for instance on the level of congestion of the airport. There are indications that Dusseldorf is more congested compared to Amsterdam and Brussels (M.5141 KLM / Martinair, para. 196). However, it cannot be the role of a market definition to completely determine if such a step is possible from a business strategy point of view.

¹¹¹ For instance KLM representatives consider the European Union as the relevant catchment area in cargo.

229. This argumentation is also in line with the practice of the European Commission. In many cases, the geographic market definition is left open, since it was not crucial to precisely define the market for the competitive assessment in a particular case.¹¹² However, in several cases the Commission gives indications as to how it understands the geographic market definition in the cargo business. Generally speaking, the geographic size of the market is broader in cargo transportation compared to passenger transportation. Flights are less time-sensitive, indirect flights are a substitute to direct flights and there is a certain degree of intermodal competition from road and sea-transportation.¹¹³ As seen in the KLM / Martinair merger case,¹¹⁴ the Commission gives its understanding that the market for air cargo transport is EU-wide for an intra-European cargo transport. International cargo flights can be defined on a continental-to-continent basis for intercontinental transport of cargo, at least when it concerns continents with a sufficiently developed infrastructure which allows for onward connections. Otherwise a continent to country definition is appropriate.¹¹⁵ In regards to its assessment of the geographic market for Schiphol airport, it states that many cargo airports can be seen as substitutes, in particular Brussels, Luxembourg or Frankfurt.¹¹⁶

Provision of infrastructure services for local & instruction flights

230. It is reasonable that the catchment area for the provision of infrastructure services for local & instruction flights is smaller compared to O&D passenger services. Local flights are by definition restricted to the catchment area which is very close to Schiphol airport. This indicates that the geographic market should be restricted to the airport itself, and may possibly include very close airports like Rotterdam or Lelystad, maybe even Eindhoven. For instruction flights it is appropriate to define the catchment area the same way, including Rotterdam, Lelystad and Eindhoven.

231. This part of the study is not concerned with the assessment of market power. However, the geographic market definition assesses the ability of other suppliers to step in case of a price increase, which puts a competitive constraint on the ability to raise prices. Substitution is unlikely in case of joint ownership where all entities belong to the same group or holding (at least partially). The airports of Rotterdam, Lelystad and Eindhoven belong to Schiphol Group. This limits their potential competitive constraint. The Alders Agreement gives evidence that there is indeed a certain degree of joint control. It foresees a shift of about 70.000 flights from Schiphol airport to other Dutch airports. This gives evidence that the competitive pressure from these airports is relatively small, and that they rather tend to complement the development of each other instead of exerting competitive constraints by offering substitutability.¹¹⁷

¹¹² Case M.2262 Flughafen Berlin (II), para. 16; case M.1255 Flughafen Berlin (I), para. 16.

¹¹³ Case M.5141 KLM / Martinair, para 35, 43.

¹¹⁴ Ibid.

¹¹⁵ Case M.5141 KLM / Martinair, para. 36. References are given to case M.3280 Air France / KLM; case M.3770 Lufthansa / Swiss; case M.5181 Delta Airlines / Northwest Airlines.

¹¹⁶ Case M.5141 KLM / Martinair, para. 41f.

¹¹⁷ Schiphol Group Annual Report 2008, p. 5, which indicates that the degree of competition between these airports is limited.

232. The arguments given above for the definition of the other geographic markets also apply. In addition, local & instruction flights generate only a minor portion of revenue share for the airport, and they are of minor importance for the assessment of its competitive position. This also underlines the fact that the airport charges a minimum fee based on MTOW¹¹⁸ of 20 tonnes, which gives incentives to small local & instruction flights to substitute to nearby airports. Consequently, the exact geographic market definition of the market for local & instruction flights will be left open for the purpose of this study at this stage.

4.2.3 Summary of the market definition for the provision of infrastructure to airlines

233. According to the economic reasoning and in line with European case law, the definition of the relevant markets of Schiphol Airport for the provision of infrastructure to airlines with respect to services and geography are as follows (these markets also include the related security services):

- Market for the provision of infrastructure to airlines serving O&D passengers.
- Market for the provision of infrastructure to airlines serving transfer passengers.
- Market for the provision of infrastructure to airlines offering cargo transportation.
- Market for the provision of infrastructure for local & instruction flights.

234. For the purpose of this study, the exact geographic market definition will be left open at this stage of the inquiry.

4.3 The markets for the access to the infrastructure for the provision of ground handling services by third parties

4.3.1 Definition of the markets with respect to services

235. The market for ground handling is basically served by three different types of actors: Integrated airlines like KLM provide ground handling services themselves. Some airlines also offer these services to third party airlines, and specialized ground handling companies like Menzies or Aviapartner only offer ground handling services to airlines, but do not offer air transportation services themselves.

¹¹⁸ The MTOW is the maximum take off weight of the aircraft. It is the maximum permissible total weight with which the aircraft is authorised to take off under the most favourable conditions in accordance with the Certificate of Airworthiness.

236. Schiphol airport provides access to the infrastructure needed to offer ground handling services to airlines. This includes the access to the airport, the access to the central baggage system, to security infrastructure or to energy utilities.
237. Schiphol airport does not provide ground handling services itself. There are no concession fees to third party suppliers of ground handling services or self-handling airlines, which are charged for the access to the airport's central infrastructure. In terms of fees, the only exemption is a concession fee for the usage of the network for fuel supply, which is charged to fueling-companies and which includes a quantity dependent charge. Moreover, Schiphol airport rents space to ground-handling companies at the airport. The market for the rental of space is unregulated, the parties negotiate contracts individually.
238. The markets for the access to the airport's infrastructure for the provision of ground handling services also include the access to rental space at the airport. This is the case because the ability of third parties to offer ground handling services at Schiphol airport makes access to rental space obligatory (i.e. office space, storage facilities). To a certain extent, rental space in facilities close to the airport may serve as an alternative to space directly located at the airport's area. This aspect has also been indicated by some of our interview partners. For instance, representatives of KLM (as self handler) indicated that they have only limited alternatives to move staff out, even though they were able to adopt its structure of rental use to a certain extent. However, increasing the density of use is limited, as well as the ability to move staff due to extra costs in terms of transportation, time and security related issues.
239. Services are usually offered in bundles.¹¹⁹ For instance, there are few companies which offer only passenger related services like ticketing, but do not offer passenger baggage handling at the same time. Therefore, it is not appropriate to define separate markets for any single activity. For the purpose of this study, the suitable approach is to define markets of bundled services offered in packages to airlines.
240. Many third party companies are active in several of the markets defined below. The portfolio of activity differs from company to company, as well as the exact definition of each service a bundle includes. In general, interview partners indicated that the ground handling market is flexible in terms of services supplied, and it very much depends on the specific needs of the particular customer. Moreover, the market changed a lot in the last five years. The subdivision of the markets given at the end of this section consequently serves as a suitable market definition, even though there may be a certain degree of overlap between different activities.
241. This is in line with European case law. In several cases, the Commission discusses the definition of the relevant markets related to ground handling services. First, it regards ground handling services as a separate market compared to other services provided at an airport.¹²⁰ The Commission also

¹¹⁹ This is in line with the European Commission's approach (case M.1124 Maersk Air / LFV Holdings, para. 18). For a description of the different activities and services which are part of a bundle, compare Chapter 3.

¹²⁰ Case M.1035 Hochtief et. al., para. 12; case M.786 Birmingham International Airport, para. 15; case M.1255 Flughafen Berlin (I), para. 9f.; case M.5141 KLM / Martinair, para. 15.

indicates that a further subdivision seems appropriate, even though it was not necessary to clarify this point so far.¹²¹ The Commission gives reference to different types of categorization, for instance the IATA's Standard Ground Handling Agreement,¹²² or the definition of the markets in the EC Ground Handling Directive.¹²³ Moreover, in several antitrust cases the European Commission tended to define narrow markets with respect to ground handling services.¹²⁴ The market definition given below is in line with the approach of the European Commission.¹²⁵

242. A separate market for each of the eleven ground handling services would result in too narrow market definitions, especially since these services are offered in bundles. Therefore we suggest the commonly used clustering into five groups, namely passenger handling services, freight and mail handling services, aircraft handling services, catering services and refueling services, which follows from the practical combination of these services. Catering and Refueling are separate markets, because these services require different facilities. Some of the other ground handling services are complementary, resulting in the three other clusters. Freight and mail handling, passenger handling and aircraft handling are not substitutable.

4.3.2 Geographic market definition

243. The geographical market is limited to the airport, given that the services required at a particular airport cannot be substituted by services provided at other airports. This is in line with the practice of the European Commission and has been confirmed by the Court of Justice. It held in its judgment in the Port of Genoa case, that the organization of port activities for third parties at a single port may constitute a relevant market for the purposes of Article 82.¹²⁶
244. There is a certain extent of substitution with respect to fueling of short-haul flights. For very short flights airlines are able to fuel for a round trip ("tankering"), which may be aimed at circumventing high refueling costs at the destination. However, this is only economically rational for short haul flights and only under certain conditions, because the possible gains from reduced costs for refueling need to be traded-off with a higher weight of the aircraft, which in turn increases fuel consumption and tends to increase costs.

¹²¹ Case M.1124 Maersk etl .al., para. 18.

¹²² IATA Standard Groundhandling Agreement, appendix A.

¹²³ Council Directive 96/67/EC of 15 October 1996 on access to the groundhandling market at Community airports.

¹²⁴ Case COMP/35.737 PO / AENA; case COMP/35.767 IImailulaitos / Luftfartsverket; case COMP/35.469 Portuguese airports.

¹²⁵ The alternative definition is to define a common market for the access to the infrastructure for the provision of ground handling services by third parties, which comprises of all sorts of activities like ground-handling, passenger handling, refueling activities etc. This is inappropriate for the purpose of this study. It is too broad in scope and not in line with the activities of the companies which offer services at Schiphol airport.

¹²⁶ C-179/90 *Merci Convenzionali Porto di Genova SpA v. Siderurgica Gabrielli SpA*, [1991] ECR I-5889, p. 5923. Also case M.1913 *Lufthansa / Menzies*, para. 13; case M.4164 *Ferrovial et. al.* para. 23; case M.2262 *Flughafen Berlin (II)*, para. 17.

245. For the purpose of this study, the geographic market for access to refueling facilities is limited to the airport. The ability to save costs by this type of behavior is only potentially available to a small fraction of airlines on specific routes. Moreover, it is not known that parties complain about high refueling costs. In contrast, our interview partners indicated that Schiphol airport is an attractive spot for refueling, because fuel costs tend to be low due to the airport's proximity to the Rotterdam stock market. This indicates that the ability to circumvent refueling at Schiphol airport does not play a role in practice (i.e. opting-out is unlikely). If tankering is done, there is a good chance that it is done at Schiphol airport.
246. As indicated above, the providers of ground handling services need to get access to rental space which is needed to offer these services. Under certain conditions, rental space beyond but close to the area of the airport may serve as a substitute. For instance, catering companies do not need to produce at the airport, but may use nearby facilities close to the airport. This does also apply for certain types of storage facilities in the mail and freight handling business. Interview partners indicated that these are only imperfect substitutes, because security checks for the access to the airport are time consuming and costly. A too rigid geographic market definition at an early stage of the inquiry bears the problem that it might mislead the assessment of economic market power. As a consequence, all geographic markets are defined relatively broadly and may also include nearby locations which are beyond the airport's space. It is then task of the assessment of economic market power in Chapters 6 and 7 to consider if the markets for offices and rental space close to the airport exert a competitive constraint on Schiphol airport.

4.3.3 Summary of the market definitions for the access to the infrastructure for the provision of ground handling services by third parties

247. The markets for the access to the infrastructure for the provision of ground handling services by third parties are defined as follows. All markets also include access to rental space at the airport:
- Market for the access to the infrastructure of Schiphol airport for companies which offer passenger handling services. This market is geographically defined by the area of the airport and may also include nearby locations beyond of the airport's space.
 - Market for the access to the infrastructure of Schiphol airport for companies which offer freight and mail handling services. This market is geographically defined by the area of the airport and may also include nearby locations beyond of the airport's space.
 - Market for the access to the infrastructure of Schiphol airport for companies which offer aircraft handling services. This market is geographically defined by the area of the airport and may also include nearby locations beyond of the airport's space.

- Market for the access to the infrastructure of Schiphol airport for companies which offer catering services. This market is geographically defined by the area of the airport and may also include nearby locations beyond of the airport's space.
- Market for the access to the infrastructure of Schiphol airport for companies which offer refueling services. This market is geographically defined by the area of the airport and may also include nearby locations beyond of the airport's space.

4.4 Conclusions

248. The strict applications of the EU guidelines for the definition of the relevant markets gives evidence that it is appropriate to define four separate markets related to the provision of infrastructure for landing and take-off, and five separate markets for the granting of access to the infrastructure for the provision of ground-handling services.
249. The methodological approach can be summarized as follows: If a company charges different prices for its services, this is considered as a first indication that these services might belong to separate markets. If this is given but services are usually consumed in bundles, the definition of a common market for all services appears appropriate. Otherwise the focus lies on demand-side substitution. If substitution is strong, this indicates towards the definition of a common market. In contrast, weak demand-side substitution indicates towards the definition of separate markets. Differences in the downstream markets (i.e. elasticities of demand, catchment areas) might also translate into the ability of the airport to charge customers differently, which also gives indication towards the definition of separate markets. Supply-side substitution may render the lack of demand-side substitution obsolete if there is an alternative and independent supplier which is able to step in immediately in case of a price increase by the airport. The alternative supplier needs to offer the same capacity and the customers must be able to switch without losses. Finally, the definition of separate markets is not a purpose in itself. It aims at gaining insights in the context of the purpose of the study. If a further segmentation of markets does not help in the context of the study, the definition of a broader market is therefore appropriate.
250. The link between the services identified in Chapter 3.1 (compare figure 3.2) and the definition of the relevant markets is as follows: The air traffic operations (ATO 1-3) belong to the markets for the provision of infrastructure to airlines. The ground handling services (GHS 1-11) belong to the markets for the access to the infrastructure for the provision of ground handling services. This may also include rental services (TE).
251. The relation between the air traffic operations identified in Chapter 3.1 and the definition of the markets for the provision of infrastructure to airlines is as follows:

Figure 4.2: Markets for the provision of infrastructure for landing and take-off

Market for the provision of infrastructure ...			
...to airlines serving O&D passengers	...to airlines serving transfer passengers	...for local and instruction flights	...to airlines offering cargo transportation
ATO 1: Landing and take-off services			
ATO 2: Aircraft parking			
ATO 3: Passenger basic terminal infrastructure and services			
TE 1: Rental to airlines			

Source: GAP.

252. The definition of the relevant markets of Schiphol Airport for the provision of infrastructure to airlines with respect to services and geography are as follows (these markets also include the related security services):

- Market for the provision of infrastructure to airlines serving O&D passengers.
- Market for the provision of infrastructure to airlines serving transfer passengers.
- Market for the provision of infrastructure to airlines offering cargo transportation.
- Market for the provision of infrastructure for local & instruction flights.

The geographic market definition will be addressed as part of the competition analysis in chapter 5.

253. The relation between the ground handling services and the definition of the relevant markets for the access to the infrastructure for the provision of these services is as follows:

Figure 4.3: Access to the infrastructure for the provision of groundhandling services

Market for the access to Schiphol airport for companies which offer ...				
...passenger handling services	...freight and mail handling services	...aircraft handling services	...refueling services	...catering services
GHS 1: Ramp handling			GHS 10: Fuel and oil handling	GHS 11: Catering
GHS 2: Aircraft services				
GHS 3: Passenger handling	GHS 5: Freight and mail handling	GHS 6: Aircraft maintenance		
GHS 4: Baggage handling				
GHS 7: Surface transport				
GHS 8: Ground administration and supervision				
		GHS 9: Flight operation & crew administration		
TE 2: Rental to ground handling companies				
TE 3: Rental to government				

Source: GAP.

254. The markets for the access to the infrastructure for the provision of ground handling services by third parties are defined as follows. All markets also include access to rental space at the airport:

- Market for the access to the infrastructure of Schiphol airport for companies which offer passenger handling services. This market is geographically defined by the area of the airport and may also include nearby locations beyond of the airport's space.
- Market for the access to the infrastructure of Schiphol airport for companies which offer freight and mail handling services. This market is geographically defined by the area of the airport and may also include nearby locations beyond of the airport's space.
- Market for the access to the infrastructure of Schiphol airport for companies which offer aircraft handling services. This market is geographically defined by the area of the airport and may also include nearby locations beyond of the airport's space.
- Market for the access to the infrastructure of Schiphol airport for companies which offer catering services. This market is geographically defined by the area of the airport and may also include nearby locations beyond of the airport's space.

- Market for the access to the infrastructure of Schiphol airport for companies which offer refueling services. This market is geographically defined by the area of the airport and may also include nearby locations beyond of the airport's space.

5. Assessment of the market position of Schiphol airport for the provision of infrastructure to airlines

(Work package 3 & 4)

5.1 Introduction

255. The aim of this and the next chapter is to assess the market position of Schiphol airport on the nine markets as they have been defined in Chapter 4. We bring together the various strands of analysis for an integrated assessment. This chapter offers the analysis for the four markets for the provision of infrastructure to airlines (Figure 5.1). Chapter 6 considers the five markets for access to the airport for ground handling companies.

Figure 5.1: Markets for the provision of infrastructure for landing and take-off

Market for the provision of infrastructure ...			
...to airlines serving O&D passengers	...to airlines serving transfer passengers	...for local and instruction flights	...to airlines offering cargo transportation
ATO 1: Landing and take-off services			
ATO 2: Aircraft parking			
ATO 3: Passenger basic terminal infrastructure and services			
TE 1: Rental to airlines			

Source: GAP.

256. In chapter 3, the different services performed at an airport have been described. In chapter 4, the nine markets relevant for competition analysis have been delineated. Fig 5.1 shows the relation between the services and markets for the provision of infrastructure to airlines.¹²⁷

257. With respect to the provision of infrastructure, four different markets have been defined in chapter 4:

¹²⁷ It is important to note that the market for the provision of infrastructure to airlines serving passengers (O&D as well as transfer) also includes security services provided by Schiphol airport. Therefore, all arguments referring to these two markets also refer to security services.

- Market for the provision of infrastructure to airlines serving O&D passengers
 - Market for the provision of infrastructure to airlines serving transfer passengers
 - Market for the provision of infrastructure to airlines offering freight transportation
 - Market for the provision of infrastructure for local and instruction flights.
258. As a first step, those markets are analyzed separately. Furthermore, some parts of the infrastructure are indispensable for offering each of the services relevant for the different markets, especially runways, aprons and aircraft parking space, whereas others are dedicated specifically to some markets (e.g., passenger terminal). Therefore, the different markets are interlinked, also with respect to the downstream market.
259. This chapter is organized as follows. Following the section on methodology and some introductory remarks of applying this methodology to the markets concerned, we first evaluate the position of Schiphol airport on the market for the provision of infrastructure services for airlines carrying O&D passengers (providing analysis from both demand and supply side). This is followed by a discussion of the role of high-speed trains as a potential source of intermodal competition. Then, competition of AMS with other hub airports for transfer passengers is discussed. Finally, we proceed with a discussion of the cargo markets, and take a brief look at the market for local & instruction flights.

5.2 Methodological framework

260. To assess the competitive position of the Schiphol airport, we focus on three major questions: (1) Does the airport have market power on the different markets for the provision of infrastructure to airlines? (2) What are the major factors that determine the airport's market power? (3) How does the airport's own strategy influence the extent of market power?

We begin with a short overview of different attempts at evaluating market power, followed by discussion of applicability of these concepts to the assessment of the market position of Schiphol airport. Lerner (1932) provides a simple index to answer the first question in a simple, one-period market, namely "the percentage mark-up of the market price over marginal cost". Since in a competitive market price should equal marginal cost, any difference between price and marginal cost indicates market power. But this approach, which has been widely applied in "structure-conduct-performance" (SCP) studies, does not show how much market power a firm actually has, and also it cannot be applied to multi-period dynamic models. Even if we observe current prices and some measure of short-run marginal cost, we cannot easily determine the degree of market power. This depends on the directly unobservable opportunity cost or option values to the firm.

261. What we can observe - and what is also reflected in many empirical studies - is the relation between the structure of the market (for example as indicated by the

Herfindahl-Hirschman Index (HHI)), and a measure of performance (Cowling and Waterson, 1976). But this performance is not always a reflection of market power, because genuine long-term performance measures are not being used and the market structure is not always exogenous, but influenced by the firm's own strategy.

262. Long-term performance measures are difficult to obtain, because of the amount of time needed to reach a long-run equilibrium in the market. The situation gets even more complicated on regulated markets, where market equilibrium is strictly speaking never observed. At any time, some markets in the industry may be highly profitable, while others are not, so one has to keep the long-run evolution in mind. In addition, performance measures, such as the price cost margin or profits are not always an indication of market power, but may be related to efficiency (Demsetz, 1973).
263. The second question relates to determinants of market power. In addition to understanding the cost and the demand side, we need to worry about barriers to entry (and how they are influenced by government actions). In addition, (and this was the third question we raised) actions by firms, for example to differentiate their products, thereby lowering their price elasticity of demand, tend to raise the firms' market power. We therefore must keep these explanations for market power in mind when examining empirical evidence on demand, the associated price elasticities, or the firms' cost functions.
264. In practice, this means that in addition to understanding the cost and demand side, the behavior of firms has to be modeled. This is usually done in econometric models, employing either reduced form, structural, or nonparametric approaches to determine whether firms have market power (Perloff, Karp, Golan, 2007, p 42). Since we have neither access to the kind of data required for such an analysis, nor enough time to carry it out, we have to rely on simpler indicators, such as market structure or market dominance, keeping their limitations in mind.
265. The European Commission¹²⁸ has recently published a communication in which it provides some guidelines for the assessment of market dominance.

"The Commission considers that an undertaking which is capable of profitably increasing prices above the competitive level for a significant period of time does not face sufficiently effective competitive constraints and can thus generally be regarded as dominant. In this Communication, the expression 'increase prices' includes the power to maintain prices above the competitive level and is used as shorthand for the various ways in which the parameters of competition - such as prices, output, innovation, the variety or quality of goods or services - can be influenced to the advantage of the dominant undertaking and to the detriment of consumers.

The assessment of dominance will take into account the competitive structure of the market, and in particular the following factors:

¹²⁸ See Appendix F: Commission Guidance on Market Power, paragraph. 9.

- constraints imposed by the existing supplies from, and the position on the market of, actual competitors (the market position of the dominant undertaking and its competitors),
- constraints imposed by the credible threat of future expansion by actual competitors or entry by potential competitors (expansion and entry),
- constraints imposed by the bargaining strength of the undertaking's customers (countervailing buyer power)."

266. The difficulty of applying these concepts to the case of airports can be illustrated by the recent assessment of market power for Stansted Airport in the UK. As we will see below in the chapter discussing international experience, the UK regulator, the CAA and the Competition Commission (CC) have different views on the assessment of market power of Stansted airport.

267. But this is only partially due to their attitudes towards the assessment of market dominance and the use of the SSNIP test. Both institutions agree that the assessment of market power should be based on a variety of methods including analysis of catchment area, current and future market power, product definitions, airlines' and passengers' switching costs. Both institutions emphasize that their approach is in line with the European Competition Policy, and the guidelines of the Office of Fair Trading on competition law. For example the CAA quotes the UK Competition Appeals (CAT) that there are a variety of methods, and they are all based on the *key idea* "[...] of a competitive constraint: do other products, alleged to form part of the same market, act as competitive constraint on the conduct of the allegedly dominant firm?" (Competition Appeals Tribunal quoted by CAA, 2006, p 29).

268. We therefore summarize here the main issues of using a SSNIP test for market definition, and the follow up market dominance tests which were discussed in the case of the de-designation of Stansted and Manchester and in the break up BAA¹²⁹.

1. The CAA (2007, p. 20) points out two problems. A) The current level of charges might not be at a competitive price level. The prevailing price level might be above or below the long run equilibrium price. The latter was most probably the case with Stansted airport. B) The lumpy character of investment might lead to distortions. Adding new capacity reduces scarcity rents which would result from growing, but unmet demand (ibid.). Therefore, it is necessary to analyse the historical and actual level of charges. Given these problems the CAA nevertheless used the SSNIP test to define the relevant markets and assess market power.
2. The SSNIP test involves estimations of elasticities with respect to travel time and cost between airports. Frontier Economics' (2007) study prepared for easyJet challenged the results that Stansted was in the same market as Birmingham and East Midlands Airports on the ground that the CAA had overestimated the price elasticity for Stansted airport

¹²⁹ Note that while these may be substantive issues it should not lead to the conclusion that no other estimations are better than and those discussed below. Moreover, these problems might be taken up at a later stage with more time and resources.

passengers, thereby suggesting more market power for the airport. Based on the easyJet data base of about three million passengers, Frontier Economics argued that passenger are more sensitive to the distance they have to travel to an airport than the CAA estimates suggest, which would reduce the catchment area of the airport in question.

3. Frontier Economics therefore argues that Birmingham and East Midlands Airports are not in the same market with Stansted. Ryanair, just as easyJet, also estimated lower price elasticity for Stansted passengers. The CAA responded to all these submissions, but left its analysis unchanged maintaining the de-designation [or deregulation] of Stansted (CAA, 2008).
 4. The CC (2009, p. 36) introduces a further point on the use of the SSNIP test for market definition by arguing that a SSNIP test is not useful to correctly define the narrowest possible geographic market for theoretical reasons. They argue that an unrestricted profit maximizing monopolist would set charges at such a level that a further price increase would be unprofitable, and the market will widen if one uses competitive price levels as a reference. Therefore, the starting point of the market definition analysis must be defined as taking place at a somewhat lower (i.e. competitive) price level compared to the monopoly price (otherwise one gets the so-called Cellophane fallacy).
 5. Furthermore, Heathrow, Gatwick and Stansted are price capped as regulated airports, and can therefore not be profit maximizing monopolies. Thus, for them a 5 to 10 per cent price increase above the currently regulated level would be profitable, passing the SSNIP test. Therefore the CC prefers to define the relevant market not too narrowly and without using a SSNIP test.
269. Comparing the positions of CAA, CC and Frontier Economics - a consultant who supported one of the parties - one might conclude at first sight that their difference is based on a disagreement of the SSNIP test. However, this is not the case, as they all are aware of the problems of the SSNIP tests we just mentioned. Still, the CAA, CC and Frontier Economics give different answers to the question of whether Luton, Birmingham and East Midlands Airports pose a competitive constraint for Stansted. This depends on a quantitative and qualitative analysis of all the above-mentioned factors of substitutability. No doubt an answer also finally involves some judgement.¹³⁰
270. [Therefore in this study we apply the following methodology](#), in line with the EU Commission guidance: we analyse the market position of the airport taking into account both demand side and supply side competition, and we assess the ability of the airport to increase prices above the competitive level for a significant period of time (at least one year).

¹³⁰ It should be noted that they all agree on the main policy issue, namely that a break up of BAA increases competition among London airports.

5.3 Applying the methodology to the markets for the provision of infrastructure to airlines

271. With respect to O&D traffic, an airport oftentimes has features of a local monopolist on the market for provision of infrastructure for take-offs and landings, serving as the only (in a certain area) provider of the infrastructure air carriers require for performing their services. In such cases, and depending on the barriers to entry and expansion, such an airport may have dominance, so one can be concerned that it may be able to abuse its position on the market and profit from raising charges to the airlines.
272. Whether an airport has a dominant market position depends on competition from adjacent airports (via passenger behaviour); this requires defining the geographic market boundaries. Geographically, the relevant market for AMS in the O&D market is outlined by the Schiphol's catchment area. If this area does not overlap significantly with that of other airports capable of providing access to the same kind of infrastructure Schiphol offers, we can say AMS is indeed holding a dominant position in the O&D market. This issue has been discussed at interviews with stakeholders, and addressed in the demand side analysis to be described below.
273. Stakeholders confirmed that geographic boundaries of Schiphol airport's catchment areas are different for the three main segments of the downstream market for airline services (O&D, transfer and cargo). Therefore, the boundaries of catchment areas for origin and destination passengers, transfer passengers, and cargo differ significantly. Hence, airports which can act as potential substitutes to AMS are also different for these three downstream markets. This necessitates separate analysis of each of the above named segments.
274. Even in an area with multiple airports, air carriers may have limited options for switching their services to alternative gateways. This can be due to either substantial cost sunk at the present airport, or specific infrastructure unavailable at alternative airports. Furthermore, competing airports may face capacity constraints. Thus, airlines can differ in their ability to leave the airport trying to exercise its market power. For instance, KLM representatives clearly stated during the interviews that leaving AMS is out of the question for this carrier. Somewhat contrary to what is believed about the conduct of low cost carriers, easyJet also suggested that it is unlikely to consider leaving AMS and developing its services in a different gateway.
275. While an airport may choose to raise its charges, the airlines' ability to pass those increases on to their customers in the form of higher fares will be limited by the competition on the airline market. Even if an airline may choose not to leave the airport, its customers (whether passengers or freight shippers) may choose to do so (if the price increase is passed on). The customers may leave for either nearby airports or alternative modes of transport, which can undermine market power even if an airport is a local monopolist. This in turn will force the airlines to curtail their services, and can lead to lower revenues for the airport, despite the price increase. Understanding such a possibility, the airport may choose not to raise its charges. Thus, competition on the airline market

- may contain the airport's market power, even for the airport's captive users (such as KLM at AMS).
276. This point is very visible from the 'natural experiment' with the passenger ticket tax in 2008. As a result of this tax, Schiphol airport is estimated to have lost (to both nearby airports and other modes of transport) about 1.4 million origin and destination (O&D) passengers in the second half of 2008 (some of this loss could be attributed to the economic downturn). The tax brought in about 220 million Euros out of projected 350 million. At the same time, the case of the passenger ticket tax also clearly illustrates that the demand Schiphol faces on the O&D segment of the market is clearly not flat – that is, the market is obviously not perfectly competitive. While passengers are indeed responsive to the change in price (the law of demand holds); the airport has only lost a relatively small share of its passengers (1.4 million passengers is slightly over 5 percent of Schiphol's O&D traffic) following a very substantial increase in price. So, the comparable charge increase, fully passed on by the airlines, would have been profitable for Schiphol.
277. In light of the above, understanding the market power on the wholesale market for the provision of infrastructure for take-offs and landings (airport–airline relationship) require analyzing the downstream airline competition. This analysis has to differentiate between competition for the origin and destination (O&D) and transfer passengers, in addition to offering a separate analysis for the air cargo industry. The main goal of this airline market analysis is to demonstrate to what extent nearby airports, high speed rail, and competing transfer hubs can potentially limit the market power of Schiphol airport by attracting demand away from AMS and making potential increases in charges unprofitable.
278. We demonstrate that over the course of the last eight years several airports within Schiphol's catchment area have emerged and developed as competitors for origin and destination passenger traffic. Those airports are Eindhoven, Charleroi, and Weeze. At the same time, AMS remains the dominant airport in the area. Demand side analysis shows limited degree of diffusion between AMS and nearby airports' catchment areas.
279. High-speed rail affects airports in two ways. First, there is substitutability towards the rail services on some short-haul routes. Second, high-speed rail can enlarge the airport's catchment area. The most significant recent development in this respect involves development of the Amsterdam-Brussels high-speed rail link, which is projected to markedly decrease rail travel time on Amsterdam-London and Amsterdam-Paris routes. Stakeholders have different views on the potential impact of this innovation, with the loss of passengers ranging from small to significant numbers.
280. Rapid development of airline alliances over the last eight years has led to only a modest increase in competition for transfer passengers between AMS and the main competing hub airports (CDG, FRA, and LHR). On over 40 percent of the markets, guided (within the same airline or alliance) connections offered via AMS are not offered via any of the other three competing gateways.¹³¹ Share of transfer passengers for which AMS does not effectively compete with other

¹³¹ Connections within two-hour window, with one-hour minimum connection time. See details in the appendix J..

hubs is likely to be much smaller than 40 percent, as competitive routes are typically larger markets than the non-competitive ones. One has to also understand that transfer passengers in general are more price sensitive than O&D passengers. This means that actions taken by Schiphol to increase relative cost of providing transfer services may result in a loss of transfer traffic. This issue will be discussed in detail below.

281. According to stakeholders, the cargo market appears to be extremely competitive, with catchment area coinciding geographically with the entire Europe. While some carriers, notably Martinair, will not normally consider moving out of Schiphol, many customers will be able to more easily move to alternative gateways.
282. Imminent expiration of the double-hub guarantees associated with the KLM – Air France merger in March 2004 poses a risk to Schiphol's status as a hub airport in the medium to long term. Presence of airports with developed infrastructure within Schiphol's catchment area is likely to increase market pressure on AMS in the future.

5.4 Competition for origin and destination (O&D) passengers

5.4.1 General background

283. When choosing which airport to operate from (among those providing infrastructure suitable for the sort of services it plans to offer), an airline needs to evaluate factors potential passengers may take into account when making the choice between modes of transportation, nearby airports (if any), and airlines operating at a given airport. Passengers differ in their location relative to airports (yet, in a given metropolitan area one can usually define an airport which will be a preferred point of departure for the largest number of passengers, other things being equal), their value of time, and various socio-economic characteristics.
284. It is common to differentiate between two broad classes of airline business models. The so-called 'full service carriers' operate complex hub-and-spoke networks, relying to a large extent on transfer passengers. They tend to offer several service classes, and operate a fleet of diverse aircraft types. The so-called 'low cost carriers' tend to focus on point-to-point services,¹³² offering a single class of service, and limiting its fleet to a single or few aircraft types. Moreover, low cost carriers mostly offer short- and medium haul flights, whereas full service carriers also offer long-haul (intercontinental) flights. 'Full service carriers' are also more likely to be present at the metropolitan area's main airport; whereas 'low cost carriers' often choose secondary airports, less costly to fly into, usually remotely located from the population density centers, and with less developed terminal infrastructure.¹³³ Ryanair takes this model to

¹³² In the USA, the low-cost carriers adhere to this model to a lesser degree than in Europe. Air Tran and Frontier operate classical hub-and-spoke network, and about half of Southwest Airlines' passengers change flights on the way.

¹³³ In the USA, the low cost carriers have been recently moving into the metro areas' main airports.

extreme, effectively inducing passenger terminal development at a number of airports it has chosen to fly from/into.

285. Because of these differences between the two business models in the airline industry, and in particular considering the low cost airlines' willingness to operate in smaller airports; we can suspect that the low cost carriers (easyJet is the largest representative of this type in AMS) are the more likely to leave Schiphol for alternative airports.
286. Airlines' demand for airport services is derived from the passengers' demand for airline services. A passenger considering a trip from point A to point B may have a choice of modes of transportation, and a passenger who has chosen to travel by air may be able to choose among airlines and airports. Air travel is a dominant mode of transportation for medium-haul and long-haul travel. Among the possible alternative modes of transportation for short-haul trips, high-speed trains can be the most attractive alternative. They offer total travel times comparable to those achievable with air travel,¹³⁴ as well as convenience (through high frequency of service) approaching that associated with the use of personal cars.

5.4.2 Airports within Schiphol's catchment area

287. From the interviews with stakeholders, we have identified nine airports which could be considered as substitutes for AMS by O&D passengers. Two of those (Brussels and Düsseldorf) are used extensively by the 'full service carriers', and offer travel to a wide array of destinations, including scheduled transcontinental services. Other airports (Eindhoven, Enschede, Rotterdam, Groningen and Maastricht in the Netherlands; Charleroi in Belgium; and Weeze in Germany) are used primarily by the 'low cost carriers', with Ryanair playing the primary role.
288. Of all the airports in the area, Schiphol is clearly the largest one. Its total 2008 passenger volume of 47.4 million people (with about 27.1 million O&D passengers) is way ahead of 18 million each served by Brussels and Düsseldorf over the same year. Other airports in the list are dwarfed by AMS, with Eindhoven serving 1.6 million passengers in 2008, Weeze slightly over 1.5 million people over the same year, and Charleroi about 3 million. Schiphol thus serves about the same number of passengers as all potential substitute airports combined. Over the last eight years, a number of the competing airports, including Brussels and Düsseldorf, surpassed Schiphol in terms of the average growth rates, albeit starting at lower level.
289. Rotterdam and Eindhoven airports are managed by Schiphol group. However, from our interviews with stakeholders it became evident that the airports are managed as separate entities rather than an airport system. This indicates that competition between AMS and these airports is indeed a possibility despite the fact that they have the same owner. Nevertheless, we cannot be certain that the Schiphol group will not change this view should sizeable competition from another airport in its group arise in the future.

¹³⁴ Rail terminals are typically located in city centers; rail travel does not require the passenger to undergo security screening, and imposes fewer luggage and other restrictions on the traveler.

5.4.3 Competition between airports – supply side analysis

290. It is clear that KLM will not consider leaving AMS under any circumstances. The airport's second largest carrier, easyJet, with a much, much smaller traffic share may be more open to such a possibility, especially given the presence of substitute airports in the area. Admittedly, moving to an airport such as Rotterdam, Eindhoven or Weeze will not only expose easyJet to full-scale competition with Ryanair, but may mean the airline will have to lower fares to compensate its passengers for the generally inferior airport location. In the interview, easyJet suggested that moving to an alternative airport will not be easy. The factors hindering such a move include substantial investment the carrier made at AMS and high likelihood of losing relatively price insensitive passengers exhibiting strong preference for AMS over other area airports.
291. Stakeholders indicated that easyJet may respond to potential pressure from AMS in an indirect way, by not assigning new aircraft to Schiphol. This is similar to Ryanair's response to the ticket tax via developing new services at Weeze rather than Eindhoven. EasyJet itself indicated that over the last several years it has been able to grow much more robustly at airports offering lower charges and easier access to slots as compared to AMS.
292. Most of the EU's 'full service carriers' are present at AMS, and up to now they were not seen leaving Schiphol to serve the area via other gateways: DUS and BRU are apparently viewed by those carriers as separate destinations in their networks. More intense competition on the airline markets (including competition from the low cost carriers serving airports near AMS) may force those carriers to curtail their services rather than completely exit the airport. We can suggest that potential increases in charges by Schiphol may affect the size of full service carriers' presence rather than the presence itself.
293. In addition to the above stated, airlines' expansion at alternative airports can be limited by the current capacity constraints. As an example, current noise restrictions will probably not allow Ryanair to base more than two or three additional aircraft at EIN, which translates into about 12-15 new destinations that could be served (some of them infrequently) out of that airport. DUS is also a rather congested airport.
294. Some stakeholders' comments indicated that Schiphol competitors might not necessarily be the nearby airports; airlines (especially low cost ones) tend to select from among the potential base airports when making decisions about expansion of their networks (e.g., easyJet purchasing new aircraft and deciding which airport to base it at). The extent of such competition appears very limited; and an airline's decision not to allocate new aircraft at AMS might be stipulated by the structure of and competition on the downstream airline markets, which is largely outside of the airport's control. In either case, detailed analysis of competition in the airline industry is outside of the scope of this study.
295. To investigate whether and to what extent airports in Schiphol's catchment area can be considered substitutable, as well as to trace development of substitutability over time, we have conducted a simple analysis to identify the destinations served out of each of the nine airports mentioned above, which overlap with those served out of AMS. We have used Official Airline Guide (OAG) data for years 2002 through 2009. A destination served out of an airport

was recorded if fourteen or more services to that destination were scheduled during a year. The analysis was performed at both the airport-pair market and city-pair market levels. In the latter case, as an example, all London area airports (Heathrow, Gatwick, City, Stansted, and Luton) were considered indistinguishable. Making this differentiation is very important, as low cost carriers often serve a metropolitan area via secondary airports. Relevant OAG data has been extracted by ECAD (Darmstadt, Germany).

296. Results of the analysis are presented in the tables in Appendix H. Tables 5.1 and 5.2 give a simple count of overlapping destinations – at both airport-pair market and city-pair market levels. From these numbers, one can easily see that for five of the nine airports included in our analysis the trend has been towards more overlapping destinations with AMS. Charleroi, Eindhoven, and Weeze effectively emerged as new competitors with Schiphol for O&D passengers. These are also airports with substantial presence of Ryanair.
297. Four tables put the numbers reported in Tables 5.1 and 5.2 into perspective. First, we calculate relative exposure of AMS to the nearby airports, by simply dividing the numbers reported in Tables 5.1 and 5.2 by the total number of unique destinations served out of Schiphol (at both airport-pair market and city-pair market levels). Second, we evaluate exposure of each of the nearby airports to AMS; for this, we divide the numbers in Tables 5.1 and 5.2 by the total number of destinations served from the corresponding airport. Two facts clearly stand out from this analysis. First, despite the trend towards more overlap in the absolute number of destinations as reported above, in relative terms Schiphol's exposure to the nearby airports changed only modestly. This is related to the fact that over the same time period airlines serving AMS added more destinations to their schedules. Second, exposure of the nearby airports to AMS is more substantial than exposure of AMS to the nearby airports.
298. Note also the difference in the figures at airport-pair market and city-pair market levels for the airports used by Ryanair – they clearly demonstrate this carrier's use of secondary airports in the metropolitan areas served out of Schiphol. Additionally, exposure of Eindhoven, Charleroi and Weeze to AMS is surprisingly modest – less than same for Brussels and Düsseldorf.
299. One might rightfully argue that the number of overlapping destinations might not adequately measure competition between the airports. Share of affected passengers may also be important. We have not conducted a detailed analysis of this issue. While we can suspect higher overlap in terms of the shares of passengers; it is also true that AMS handles substantially more origin and destination passengers than do nearby smaller airports; and many overlaps of AMS with BRU and DUS represent entirely different markets (for instance, flag carriers view these airports as separate destinations in their networks). Additionally, even though OAG data includes the aircraft capacity, we will only be able to speculate about the volume of O&D traffic on some of the flights, as the airlines operate hub-and-spoke networks.
300. In conclusion, it is clear from this supply side analysis that Schiphol faces only modest competition from the nearby airports. There is substantial overlap of destinations served from AMS with those offered from BRU and DUS (cumulative over 60% of the offered routes); also, three small nearby airports have emerged as new potential competitors. At the same time, Schiphol

airport's dominant position in the area – in terms of both the number of O&D passengers transported and destinations served – remains undisputed. As an illustration, in 2008 airlines serving AMS flew to 231 unique airports, which is 1/3 more as compared to carriers serving BRU (the airport with the second largest number of destinations served, 169). Total number of destinations served out of each of ten airports involved (including Schiphol) can be found in Tables 5.7 and 5.8.

5.4.4 Competition between airports – demand side analysis

301. We have indicated above that despite the number of airports located in Schiphol's catchment area, and despite apparent competition between those airports as manifested by substantial overlap in terms of destinations served out of AMS and other nearby gateways, the likelihood of airlines moving their services from Schiphol to alternative locations is rather limited. To evaluate diffusion of catchment areas of Schiphol and nearby airports, we have commissioned analysis from MKmetric GmbH (Karlsruhe, Germany). Research methodology used by MKmetric is described in Appendix G. Figure 5.1 presents results of MKmetric's analysis of diffusion of catchment areas for 2008. One can see from that figure that the 'pure' AMS catchment area is rather limited, and that at least some of the customers living fairly close to the city of Amsterdam do use other airports than AMS for their travel. Unfortunately, analysis of catchment area overlaps in dynamics is outside of the scope of this study.
302. It is also evident (see Figures 5.2 through 5.5) that passengers embarking on a longer-haul trip might choose to travel from other airports than Schiphol (not necessarily from the nine listed above, though – a traveler to South America or Asia can choose to take a train to Paris, Frankfurt, or London). Each of the Figures 5.2 through 5.5 depicts shares of passengers from a certain area, choosing Schiphol for their trips to a certain region in the world. We can see that the AMS catchment area for North American traffic is the most extensive one. This is understandable, given well developed services to that part of the world out of Schiphol.
303. The presented demand side evidence effectively suggests the following. First, we confirm (limited) diffusion of catchment areas suggested by the presence of nearby airports and overlaps in destinations served. Customers are indeed willing to switch between airports, responding to various factors, such as price, schedule convenience, airport proximity, etc., thereby creating potential pressure on the airlines serving Schiphol to adjust their business strategies and potentially curtail their services. And second, on some (especially longer haul) markets airports competing for O&D traffic with AMS may be located outside of what is conventionally considered Schiphol's catchment area. This appears to be the case, for instance, for traffic to North Africa – nowhere on the Figure 5.3 does AMS market share of departing passengers exceed 75 percent; and it is possible that some of those passengers leave from a Paris area airport, given the traditional strong position of Paris on EU – North Africa market.¹³⁵

¹³⁵ North Africa also has a number of popular tourist destinations, which can be served out of smaller airports located near AMS.

Nevertheless, it should be kept in mind that for almost the entire Netherlands, the market share of Schiphol airport is far above 50 %, reaching almost 100 % in some (densely populated) areas.

5.4.5 The role of high-speed trains

304. High-speed rail (HSR) offers passengers an attractive alternative to air travel, especially on shorter-haul (800 km or less) routes, provided passengers are offered comparable degree of mobility via sufficiently high frequency of service. While being able to achieve only a fraction of the speed of commercial passenger aircraft,¹³⁶ train services can make up for this difference via departures from centrally located train stations and absence of security checks¹³⁷.
305. On a number of routes, development of high-speed rail has led to reduction or elimination of air services. The most vivid examples in the EU are Paris-Brussels, Paris-Lyon, and Madrid-Seville markets, where share of high-speed rail presently exceeds 75 percent. At the same time, high-speed rail enlarges the airport's catchment area and bring more O&D passengers to the airport. Even if the net effect of HSR is to increase the total number of passengers at an airport, it is not evident that such a development will increase airport's revenue. The reason for this is that some of the passengers will be diverted from flights to trains (also reducing the number of flights and/or size of aircraft), and the airport will no longer be able to collect the related charges. In the data, this will manifest itself in reduction in transfer passenger traffic and increase in the O&D traffic.
306. Impact of HSR on Schiphol has so far been limited. It is true that development of rail network has shut down domestic services, but those were a negligible share of the total traffic. Of important (in terms of the volume of air travel) short-haul city-pair markets, Amsterdam-Paris route is perhaps most exposed to the competition from rail (Thalys), with about 45 percent of rail market share. Yet, at about 4 hours' journey time and only six weekday departures,¹³⁸ the Thalys service can be viewed as a somewhat inferior alternative by a number of travellers.¹³⁹
307. This situation will change soon, with the launch of HSL-South, which will link Schiphol and the city of Amsterdam to the higher-speed portion of Thalys network. HSL-South will also link Schiphol to Eurostar HSR services from Brussels to London. Both Amsterdam-Paris and Amsterdam-London routes will be affected; travel time to Paris will be decreased to about 3 hours (by 25 percent); and travel time to London will fall from six to four hours, also making

¹³⁶ High speed trains can achieve speeds of 250-320 km per hour; versus over 800 km per hour for commercial passenger airplanes.

¹³⁷ Domestic air services have played a limited role in a small country such as The Netherlands. A developed rail network and the restrictive policy of the Dutch Ministry of Environmental Affairs towards domestic flights are important reasons, along with the scarcity of slots at Schiphol during the connection waves.

¹³⁸ KLM and Air France jointly offer sixteen weekday B-737 flights on this route.

¹³⁹ To put this into perspective, travel time on Madrid-Seville route, which is only 65 kilometers shorter than Paris-Amsterdam, is slightly over two hours.

- travel by train on this route more competitive to air travel. But the impact of the HSL-South with respect to the current air traffic might be negligible. Brussel is hardly served by air from Schiphol (a few F50 flights). Paris flights are heavily loaded with transfer passengers. These travellers will not choose the HSR due to travel cost, travel time and travel comfort (baggage transfer) unless the airline and HSR are willing to create an integrated product¹⁴⁰. If the HSR is able to apply a revenue management system that enables the passengers to buy discounted advance purchase tickets, this may produce a bigger effect in the modal choice, especially for price sensitive leisure passengers (not for business and transfer passengers).
308. Stakeholders and the available literature offer different opinion on the likely effect of HSL-South on Schiphol airport. Mostly it is expected that the substitution to HSR will decrease the share of air travelers on both the Amsterdam-Paris route and on the Amsterdam-London market.
309. EasyJet did not give a specific evaluation; however, it stated that it was difficult for the airlines to compete with HSR on routes where travel time by rail is four hours or less; meaning the airline is likely to expect a significant effect on both Amsterdam-Paris and Amsterdam-London markets. KLM has been much less pessimistic in its assessment. The airline does not expect a serious reduction in air travel on Amsterdam-London route. A recent thesis by Terpstra¹⁴¹ suggested that Schiphol's market share following the introduction of HSL-South will actually increase (among the nearby airports), and that the airport will benefit rather than lose from the new HSR service. At the same time, the thesis did not evaluate the effect of HSL-South on the Amsterdam-London market.
310. In summary, while currently the role of HSR competition is limited, the situation is about to change. HSL-South will increase substitutability between AMS and BRU (and potentially DUS and CGN, given that Thalys high-speed service extends to Cologne). This means O&D passengers will potentially have more choices of airports; and on some important markets (Amsterdam-London and Amsterdam-Paris) HSL-South will bring in an additional viable travel alternative for some passengers (especially business travelers). While there are indications AMS can actually benefit from this increased substitutability (it still remains the airport from which passengers can travel to the most unique destinations, and enlargement of the airport's catchment area will increase the number of passengers who will be able to take advantage of this), the net effect of HSL-South is uncertain. No matter in which way, providing more choices to consumers means decreasing market power of the sellers, so Schiphol's declaration that HSL-South will do more harm than good to the airport is quite reasonable.

¹⁴⁰ AF-KLM actually tried to develop such an integrated product, but where unable to get a suitable agreement from the rail operators.

¹⁴¹ Ilse Terpstra, "Airport Choice and the High-Speed Train: The Impact of the HSL-South on the Market Share of Amsterdam Airport Schiphol", Master Thesis, VU University Amsterdam, September 2009

5.4.6 Assessment of market power in the markets for the provision of infrastructure for airlines serving O&D passengers

311. The findings, especially from the demand side analysis, suggest limited competition from adjacent airports or other modes in the O&D market. Nevertheless, some customers are indeed willing to switch between airports, responding to various factors, such as airfare, schedule convenience, airport's proximity, etc. This potential pressure on airlines serving Schiphol to offer competitive services also affects the market position of the airport.
312. In the O&D market, despite the larger growth rates at neighboring airports, the market share of Schiphol airport is comfortably within the range usually associated with the market dominance. With respect to future developments, the emergence of new competitors in the O&D markets appears to be very unlikely, given the regulatory framework and the significant sunk costs of constructing an airport. Existing airports with partially overlapping catchment areas face different capacity constraints, due to terminal capacity, runway capacity or noise regulation.
313. Consequently we have to analyze whether the given competitive pressure on the downstream market limits the market power of the airport on the upstream market, i.e., the market for the provision of infrastructure to airlines. In order to identify market power, the European Commission requires that "the undertaking's decisions are largely insensitive to the actions and reactions of competitors, customers and, ultimately, consumers". We will try to identify the degree of "insensitiveness" to consumer's reactions by evaluating whether a hypothetical price increase leads to a substantial reduction in demand due to substitution towards other airports, thereby rendering such a price hike not profitable. A look at the revenues generated by Schiphol airport will help us to put these findings about the O&D markets into perspective¹⁴².
314. In 2008 the share of O&D passengers at Schiphol airport was 57.1 %. Passenger related charges are only levied on departing passengers, and are significantly higher for O&D passengers than for transfer passengers. Similarly, the security service charge is only levied for departing passengers, and is significantly higher for O&D passengers than for transfer passengers. In fact, approximately 75% of the revenues from the passenger related fees and approximately 70% of the revenues from the security service charge are paid by the airlines for the transport of O&D passengers. The total revenue from these two sources for Schiphol airport is about 330 million Euro, i.e. on average almost 25 Euro per departing O&D passenger.
315. The average revenue per passenger for an LCC like easyJet is approximately 60 Euro (= 120 Euro per return flight). Consider a hypothetical price increase, where Schiphol airport raises its passenger related charge and its security service charge by 10 % (= 2.50 Euro). If this increase were completely passed on to the passengers of an LCC, the fare for a return flight would on average increase by approximately 2%. If we assume a price elasticity of demand for LCC passengers of -2, which is on the upper end of all studies on price

¹⁴² We must also remember that Schiphol airport does have a revenue cap as a consequence of regulation. However it is free to adjust price levels between the different market segments as long as the overall revenue does not exceed the total revenue allowed for the airport

elasticity of demand on short haul markets,¹⁴³ demand would decline by 4%. In other words, the price increase would be highly profitable for the airport, leading to a revenue increase of almost 6%.¹⁴⁴ Nevertheless, currently the airport is not free in setting its charges, due to regulatory constraints. Also note that the passenger and security related charges are only part of the total charges of the airport to the airlines.

316. Full Service Network airlines on average have higher fares than LCC, and their share of business travelers is higher, implying a more inelastic demand. Therefore, if passenger related charges and security service charges were increased by 10%, the passing on of these charges would lead to a price increase of less than 2%, leading to a significantly smaller reduction in demand than in the case of an LCC. Therefore, increasing charges for O&D passengers in this market segment would be even more profitable for the airport operator. This is especially relevant for long haul flights, where price elasticity of demand is rather low, and the fares are rather high. As airport charges represent a rather small share of the total ticket price; an increase in charges appears to be profitable for the airport.
317. The likelihood of airlines passing the charge increases on to the customers depends on the intensity of competition on the airline markets, as well as on the opportunities for both airlines and their passengers to move to an alternative airport in the area.
318. In the long run, it might be argued that as a result of the higher charges the airlines might reduce frequency and/or capacity on flights to Schiphol airport, or might even withdraw their services completely. Whether these events are likely to occur depends on several aspects. First of all, it has already been pointed out that many airlines will not consider leaving Schiphol airport in any case. This is true not only for carriers with sunk costs (especially KLM) and their alliance partners, but also for the large network carriers whose business model requires feed and onward connections to offer a comprehensive network, and to have access to airports in areas with a large economic potential. Therefore, carriers like Lufthansa or British Airways will not consider moving operations from Schiphol to Weeze or Düsseldorf, even if Schiphol increases its charges significantly. Second, one might argue that a reduction in demand might lead to a reduction in the number of weekly or daily flights. In other words, if the passing on of the charge increases leads to a decline in demand of e.g. 5 percent, an airline might decide to reduce the number of flights by 5 percent in order to keep the seat load factor constant. In this case, the airport would not only lose revenues from passenger charges, but it would also lose revenues from movement charges. Nevertheless, in many cases this option does not seem to be a realistic one. Many long haul destinations are served with single daily flights, making a reduction in the number of flights hardly possible. On short haul city pairs, frequency is an important quality feature, especially for the time sensitive (and less price sensitive) business travelers. Furthermore, if an airline operates a hub and spoke network, eliminating one frequency also means reducing the connectivity of the hub. Although it cannot be ruled out

¹⁴³ See Gillen, D. / Morrison, W.G. / Stewart, C. (2002).

¹⁴⁴ At the same time, the lower load factor might induce the LCC to pursue a more aggressive pricing policy which would also result in a significant revenue loss, at least until the frequencies on the route are reduced or more passengers can be acquired through extra marketing efforts.

completely that the airlines may reduce their frequency as a result of charge increases by the airport, the effect is likely to be rather limited, as our interviews with stakeholders suggest. Finally, it might be possible for an airline to reduce capacity by using smaller aircraft. In this case, the airport would lose at least part of its weight-based movement charge. Nevertheless, this option depends on the existing fleet mix an airline has access to, and other aircraft characteristics (e.g., fuel efficiency). To conclude, a reduction in the number of movements or the number of seats offered might be possible in the medium term, if the airport increases its charges, and all other factors stay constant. Nevertheless, this option is only viable on a limited number of markets, (e.g. for charter operations and LCC) and it does not change our result that charge increases might be a profit increasing strategy for a deregulated airport.

319. We also indicated above that low cost carriers (of which easyJet is the main representative at Schiphol) might be more likely to consider moving to nearby airports. We see the following factors that might limit such a move in the near future. First, some carriers have sunk substantial cost at AMS – this issue was voiced by easyJet. Second, nearby airports are either capacity constrained or do not provide the needed infrastructure. And third, moving to smaller nearby airports will expose the low cost airlines to direct competition with Ryanair – whereas staying at AMS they could capitalize on passengers exhibiting preference for the airport's location.
320. We therefore conclude that AMS remains the dominant airport in the area as far as provision of infrastructure for airlines serving O&D passengers is concerned. It has a slightly decreasing but still high share in the market for O&D passengers, barriers to entry are large, and its existing competitors face capacity constraints. If the airport raised its charges, airlines are unlikely to leave for other airports on any significant scale.

5.5 Competition for transfer passengers

5.5.1 General

321. In the USA, hub-and-spoke (H&S) networks have been an important innovation of the post-deregulation era in commercial passenger aviation. In Europe, H&S is a legacy of “traditional national regulation”, as domestic flights were “reserved” for the (mostly state owned) national flag carrier, who used one airport as a “gateway” for international traffic. Deregulation in the EU has increased the number of the spokes and/or frequency of service to spokes covered before deregulation. Presently, fiercer competition leads to consolidation among the former national carriers; and we often see some “dehubbing” taking place, with national hubs like Brussels and Copenhagen losing their traditional importance.
322. Airlines operating H&S networks are able to optimize their operations by routing passengers via one or several points in their network. This way, it becomes possible for the carriers to service more cities with fewer flights. In addition to network optimization, airlines using the hub-and-spoke system are able to both

- offer higher frequency of service and achieve higher load factors, taking advantage of economies of traffic density to lower their cost. For the US, there is also substantial empirical evidence suggesting the hub operator is able to charge higher fares to O&D passengers at the hub airport area. The potential downsides of operating hub-and-spoke networks involve overcrowding of the hub airport, and potentially devastating network effects of adverse weather.
323. Schiphol is the only hub in KLM's network. Alternatively, one can view AMS as one of the two hubs in the Air France-KLM network. The merger between the two airlines, concluded in March 2004, included dual hub guarantees, which are set to expire in spring of 2011.
324. Many airport-pair markets worldwide lack non-stop air services. Passengers traveling on those routes will be required to change planes and sometimes carriers along the way. These transfer passengers have a choice among airports hosting airlines that offer such transfer services. Such airlines (KLM in case of Schiphol) are effectively captive users of the airport infrastructure. These carriers are unable to leave the airport; at the same time, the airport stands to lose a lot in case its largest carrier curtails its services. At AMS, the share of transfer passengers has fluctuated between 40-45 percent over the last decade.¹⁴⁵ Without its hub operations, Schiphol would lose its status as one of Europe's largest and most important airports.
325. The above point can be well illustrated through example of Brussels airport, which has not recovered after the fall of Sabena. In 1999, BRU handled 20 million passengers; the volume in 2008 was 18 million. In 2002, the first full year after the bankruptcy of Sabena, Brussels airport handled only 14.4 million passengers (a 28 percent drop from 1999). By contrast, passenger volume at AMS in 1999 was 36.4 million; it grew to 40.5 million in 2002, and reached 47.4 million in 2008.
326. Interlining (an arrangement whereby a passenger changes air carrier along the way) is increasingly done within the global airline alliances. Currently, three such groupings exist: Skyteam, Star Alliance, and Oneworld alliance. Prior to the Air France-KLM merger, KLM was in an alliance with Northwest Airlines (tentatively called Wings). In September 2004 both carriers joined Skyteam; yet, Northwest Airlines' services to AMS were largely unaffected by this move. The recent merger between Delta Air Lines and Northwest Airlines may mean fewer transatlantic services to AMS, as Delta could put more focus on its partnership with Air France.
327. Transfer passengers, according to KLM, are much more price sensitive than O&D passengers. Both KLM and Schiphol indicated that their main competitors for transfer traffic are Frankfurt (FRA), Paris Charles de Gaulle (CDG), and London Heathrow (LHR) airports. It is interesting to note that Aeroports de Paris (ADP) representatives did not name AMS as one of their competitors for transfer passengers. Schiphol Group and ADP have 8 percent stake in each other, so one would wonder whether this strategic relationship may inhibit competition between the two hubs.

¹⁴⁵ KLM stated in an interview that their transfer traffic is close to 70 percent of all passengers.

328. Hub competition in terms of the relevant geographic market clearly goes geographically beyond the European continent. Schiphol indicated that they have found substantial competition for transfer passenger with hubs in other continents. This is confirmed by our empirical analysis below, but that concentrates on city pair markets, for which hub competition with AMS exists.

5.5.2 Competition between hub airports – supply side analysis

329. To evaluate the extent of competition between the four European gateways (AMS, CDG, FRA, and LHR) for transfer passengers, we requested ECAD to perform the following analysis. OAG data for third Monday of July (to focus on the peak travel time) were analyzed every year from 2002 till 2009. At each airport, all reasonable guided connections were obtained within a two-hour and three-hour window after the minimum connecting time of one hour. A *guided connection* is defined as connection from and to a flight of a carrier belonging to the same global airline alliance.¹⁴⁶ We defined connections to be reasonable or realistic if total distance did not exceed the distance of a hypothetical non-stop service by more than 40 percent. This filters out itineraries similar to New York to Boston via London. A two-hour time window after a minimum connecting time of one hour means, for instance, that for a flight arriving at 8:00 a.m. we will look for reasonable guided connections between 9:01 a.m. and 11:59 a.m.

330. Results of the analysis are presented in Table 5.9 and Figures 5.6 through 5.8. The following general conclusions stand out.

- a. Across the four hub airports, the total number of connections did not grow as fast as the corresponding number of airport-pair markets covered by those connections. This means airlines and alliances have been focusing on developing new markets rather than connectivity on the existing routes.
- b. As a transfer hub, AMS has maintained a rather strong position, with KLM and Skyteam members offering passengers more connecting options (in terms of the number of both connections and airport-pair markets) as compared to British Airways and Oneworld alliance members via LHR.
- c. Following the Air France – KLM merger we observe faster growth of the hub connectivity at CDG versus AMS in terms of the number of markets served. There is however parity between the two hubs in terms of dynamics of the number of guided connections offered during a given day. This means that, in relative terms, AMS focused more on adding connections on the existing routes, while CDG's focus has been on developing new routes.
- d. After 2005, despite continuing growth in membership across all three alliances, Schiphol's exposure to competition for transfer passengers grew only modestly.
- e. Schiphol has very limited exposure to transfer passenger competition in terms of the number of markets with any of the three individual airports covered in the analysis.

¹⁴⁶ Note that prior to 2005 KLM was not a part of Skyteam.

- f. On over forty percent of all airport-pair markets serviced via guided connections, AMS does not meet an immediate competitive threat from either of its main competitors on the market for transfer passengers.
331. The last of the above results can be interpreted in two ways. On one hand, one may suggest that the competition for transfer passengers between the main gateways is not as strong as commonly believed. After all, Schiphol does not appear to face competitive pressure on over forty percent of the markets involved. On the other hand, considering that transfer passengers in general are very price sensitive, an action by Schiphol airport (i.e., increase in charges) which makes KLM services less attractive to transfer passengers might lead to a substantial loss of transfer traffic for the airport. This will be further discussed below.
332. The identity of non-overlapping routes also plays an important role. If non-overlapping routes involve on average smaller airports, then exposure of AMS to competition for transfer passengers in terms of the share of travelers rather than markets would be much more extensive. For purposes of illustration, consider data from 2008. In this data, there are 122 origin airports with at least one transfer market, on which connections only via AMS are available. The average number of such connections per airport is 23.5; however, across airport variability is substantial.
333. The airport least connected via alternative hubs is Norwich, UK; with connections to 85 markets available only via AMS. Other airports in the top ten of this list include Leeds (81 markets via AMS and neither of its competitors); Humberside, UK (76 markets); Durham Tees Valley, UK (72 markets); Cologne-Bonn, Germany¹⁴⁷ (69); Cardiff (68); Luxembourg (63); Sandefjord, Norway (58); and Manila (57). On the other side of the distribution, we have such airports as Hong Kong, San Francisco, Dubai, Los Angeles, Chicago O'Hare, Bangkok, New Delhi, Mexico City, Singapore, etc., each featuring fewer than ten endpoints not available via Schiphol's main competitors. Most of the bigger European airports feature guided connections to between 10 and 25 endpoints available only via AMS (among the hubs included in our analysis).
334. The above said suggests that in terms of the share of travelers, Schiphol's exposure to competition for transfer passengers exceeds the approximately sixty percent figure implied by the number of non-overlapping routes. Coming up with a more precise estimate would require data on passengers' actual traffic patterns, which we do not have. Using the available information, however, we can suggest that competition for transfer passengers may be rather strong; especially taking into account the price sensitivity those travelers tend to exhibit.
335. The point of the extent of competition between hubs for transfer passengers is also well illustrated by data from LHR. It is well known that Heathrow is the busiest passenger airport in Europe. It is also a major hub airport for British Airways and Oneworld alliance. However, our data shows that in terms of the

¹⁴⁷ It is necessary to note that Cologne-Bonn area is well connected to FRA via High Speed Rail. This HSR connection led to near elimination of CGN-FRA air services, and some of the Intercity Express trains have Lufthansa flight codes, which do not appear in OAG data. Thus, a transfer passenger originating in Cologne-Bonn area does effectively have more connecting options via FRA than what is found in the data. We are regrettably unable to evaluate the extent of this connectivity.

number of markets served by potential feasible convenient connections LHR lags behind all the other hubs. One explanation can be found in Figure 5.9, which demonstrates that unlike at AMS, CDG, or FRA, passenger charges at LHR do not differentiate between O&D and transfer traffic. This puts LHR into a less advantageous position for channeling transfer passengers as compared to other airports. This is what we see in the data. At the same time, given current congestion levels at LHR, there might be little room to develop transfer traffic, so airlines and the airport might focus on O&D traffic instead.

336. In conclusion, if one simply counts the number of non-overlapping airport-pair markets, exposure of AMS to competition for transfer traffic appears limited. However, both relatively larger sizes of the markets on which there is competition for transfer passengers, as well as the price sensitivity of those passengers imply higher potential impact of hypothetical price increases on part of Schiphol airport than exposure figures we presented may suggest.
337. We are aware of other estimates of the extent of competition of AMS with other hubs for the transfer passengers. Those estimates confirm a high degree of competition on this market segment, and suggest Schiphol is in direct competition with other hubs for the majority of its transfer traffic. Exact number, however, is not as important – one can get different quantitative estimates using different methodologies. An important and an apparently undeniable fact is that AMS does have market power on some one-stop routes.

5.5.3 Competition between hubs – demand side facts

338. In the above supply side analysis we considered only the number of markets, leaving the travel volumes aside. Indeed, LHR might not offer transfer services on too many markets, yet if most passengers traveling from North America to continental Europe transfer via this gateway, the actual market position of LHR will be more solid than the supply side data suggests (also note that about 30 percent of all capacity on the transatlantic market is offered to/from the UK). This is indeed what Figures 5.10 and 5.11, as well as Table 5.10 show.
339. Table 5.10 lists estimated volumes of transfer passengers on several important routes. The analysis was performed by MKmetric; description of the relevant research methodology is in the Appendix E, and definition of markets is presented on Figure 5.12.

Table 5.1: Estimated travel volumes on a set of markets (thousands of passengers, 2008)

Transfer passengers 2008 from region to region (thousand)				
via	DE <-> NYC	DE <-> CHI	IT <-> NYC	UK <-> ME
AMS	40	17	5	143
CDG	22	3	14	45
FRA	60	64	44	52
LHR	55	45	39	269

Source: MKmetric. Analysis performed at city-pair market level

DE = Germany / NYC = New York / CHI = Chicago / IT = Italy / ME = Middle East

340. The facts reported in Figures 5.10-5.11 and Table 5.10, while not representing the entire picture, indicate several things. First, it does appear that the current market structure implies certain segmentation. For example, of the markets we considered, AMS market share (among passengers making a stop en route) is the highest on UK to Middle East market; whereas FRA dominates on Germany to Chicago routes. From Figure 3.11 it is evident that CDG is dominant on Europe to South America market, among the four hubs included into our analysis. This is consistent with the supply side analysis above. Second, some of the broadly defined market segments (e.g., Europe to North America) appear more competitive than others (e.g., Europe to Middle East).

5.5.4 Role of competition for transfer passengers in defining AMS position on the market for provision of infrastructure

341. Transfer passengers comprise 40-45 percent of Schiphol's passenger traffic, and even higher share for KLM–Schiphol's captive user. Moreover, presence of transfer passengers is what makes AMS the kind of airport it is – one of the important European hubs.

342. While it is true that AMS is the only airport capable of providing the infrastructure necessary for KLM to successfully operate its hub-and-spoke network, two factors are likely to limit Schiphol's market power on this segment. First, transfer passengers in general are very price sensitive; this may limit KLM's ability to pass airport charge increases to transfer passengers. Second and more generally, KLM needs AMS as much as AMS needs KLM.

343. Our data analysis shows that of all the routes on which KLM offers “realistic” connections via AMS, on over 40 percent of the markets no competing hub (CDG, FRA, LHR) offers comparable connecting services on the same markets. In general, despite the rapid development of airline alliances, competition between them for transfer passengers appears to have increased only modestly. Demand side analysis also demonstrates a degree of segmentation among competitors for transfer passengers.

344. Since the Air France-KLM merger, CDG has been developed to serve more markets for transfer passengers; while focus of development of AMS hub has been on adding connections on the existing routes.

345. In the end, it appears that there is a set of transfer markets, on which charge increases can be passed on to the passengers by the airport's hub operator. Yet, these markets likely represent a relatively small share of transfer passengers. The fact that AMS competes on a substantial number of markets with other hubs (along with price sensitivity of transfer passengers) might limit market power of Schiphol airport.

346. Consequently we have to analyze whether this competitive pressure limits the market power of the airport on the upstream market, i.e., the market for the provision of infrastructure to airlines. In order to identify market power, the European Commission requires that “the undertaking's decisions are largely insensitive of the actions and reactions of competitors, customers and, ultimately, consumers”. We will try to identify the degree of “insensitiveness” to

consumer's reactions by asking whether a hypothetical price increase leads to a substantial reduction in demand due to substitution towards other airports, and is therefore not profitable. A look at the revenues generated by Schiphol airport will help us to put these findings about the transfer markets into perspective.

347. The competitive pressure on airlines serving Schiphol will force them to adjust their business strategies and potentially reduce their services in response to higher airport charges, so the effect would also be felt by Schiphol airport. Again the question arises, whether this competitive pressure is sufficient to curtail the market power of the airport.
348. Once again, we will evaluate whether a hypothetical price increase can lead to a substantial substitution towards other airports and is therefore not profitable. Based on the numbers reported above, 25% of the revenues from passenger related fees and 30% of the revenues from the security service charge are associated with transfer services. If we assume identical itineraries on a transfer return flight, each transfer passenger is departing two times from Schiphol airport. Therefore, on each journey (= return flight) the average amount of passenger related charges and security service charges paid by an airline for serving a transfer passenger is in total approximately 25 Euro. So, the two charges for a transfer passenger journey roughly equal the single charge for an O&D passenger journey.
349. Again, if we assume a 10% increase of Schiphol's passenger related charges and security charges, a passing on of these cost increases would lead to a fare increase of less than 2.50 Euro. Even if we assume a very cheap transfer ticket of 200 Euro for a return flight, the price increase would only be 1.25%. Even if we assume again a rather elastic demand, e.g., -2, the decline in demand would only be 2.5%, making the increase in charges profitable for the airport.
350. Contrary to the simplified calculation above, most transfer journeys are more expensive than 200 Euro. Therefore the 10% increase in charges will lead to a smaller than 1.25% price increase. Furthermore, the price elasticity of demand is limited also on transfer journeys, for example due to quality aspects (convenient transfer process) or airline loyalty (e.g., due to frequent flyer programs) making our initial calculation a conservative one. Especially for business and first class passengers, prices are less important than quality.
351. At the same time, we need to acknowledge that many transfer passengers have a choice of traveling via alternative hubs. This can imply high elasticity of demand for traveling via AMS, due to the presence of such substitutes. Even if market demand for air travel is inelastic, airlines using AMS as a hub might face very elastic demand for their services. In the extreme case of perfect competition between the transfer hubs, any increase in airfare via Schiphol will lead to complete loss of transfer passengers, and will therefore not be profitable for the airport. Nevertheless, as transfer connections via different hubs are far from being homogeneous (especially due to different total travel times and different arrival and departure times), this extreme assumption is not realistic.
352. Let us assume the market is imperfectly competitive, and return to the above example with a 1.25% increase in airfare following a 10% increase in passenger charges. Then, elasticity of -8 or lower will ensure the charge increase is not profitable for the airport if we limit our analysis to cheap tickets. While we do not

have reliable airline level estimates of elasticity of demand for transfer passengers, we cannot rule out that for some transfer passengers this demand is very elastic.

353. Still, there is another argument to consider. In addition to the passenger related fees and the security service charge, airlines have to pay aircraft related fees (for landing and take-off) and aircraft parking fees. If total revenues from these two sources are divided by the number of movements, the average charge at Schiphol airport is approximately 430 Euro per movement.
354. For an airline offering scheduled service, in the short run the aircraft related charges can be considered as fixed costs. Nevertheless, the aircraft related charges increase average costs and have to be covered by the fares paid by passengers and freight forwarders. As the number of passengers per movement at Schiphol airport is on average approximately 115, the average cost per passenger (departing and arriving) caused by aircraft related airport fees is approximately 3.75 Euro.
355. Again, if we assume a 10% increase in aircraft related charges and a complete passing on by the airlines, the increase in airline fees would in any case be significantly smaller than 1%, making an increase profitable for the airport. This calculation does not even take into account that belly freight is carried in a large number of passenger aircraft, providing an additional opportunity for passing on increased airport charges.
356. Consequently, if all airport charges would be raised by ten percent, even in the most price elastic market segments for passenger services, the increase would be profitable for the airport.
357. Even though transfer passengers appear to be much more price sensitive than O&D passengers; a 10% charge increase passed to customers paying EUR 200 for their roundtrip would require a price elasticity of -8 to yield revenue reduction for the airport.¹⁴⁸ For more expensive tickets, which are bought by the vast majority of passengers, price elasticity would have to be even higher in order to make an increase in airport charges unprofitable for the airport.
358. Again, the conclusion from this exercise seems to be that AMS has market power. However, as we have argued above, the elasticity of demand for traveling via AMS may be higher than we have assumed in these calculations, due to the presence of substitute transfer hubs. In the extreme – and therefore not realistic - case of perfect competition between transfer hubs, any increase in airfare via Schiphol will lead to complete loss of transfer passengers, and will therefore be not profitable for the airport.
359. This argument is the line with our finding above that the degree of competition differs between broadly defined market segments (e.g., Europe to North America versus Europe to Middle East). As a consequence, the calculations would be different if we apply them to different market segments. But we are only assessing one market, namely the provision of infrastructure for airlines serving transfer passengers, as airport charges do not differ according to transfer markets served.

¹⁴⁸ Usually, elasticities as high as -8 are not encountered in the literature.

360. Furthermore, we need to think about the effect of supply side competition in the transfer market. An indication of this supply-side competition can be seen by the longer-term threat to Schiphol's position as a major transfer hub which comes from the expiration of the double hub guarantees in spring 2011.
361. It is therefore likely that the different degrees of competition in the downstream market may have some marginal effect on the upstream market, which obviously influences the pricing decision of the airport.

5.6 Market for the provision of infrastructure for airlines offering cargo transportation

5.6.1 Cargo transportation

362. The cargo market has two major segments: belly cargo and full-freighter cargo. In the former case, cargo is carried in the aircraft performing a scheduled or charter passenger flight. At this point, belly cargo constitutes about 40 percent of Schiphol's cargo capacity. Belly cargo is oftentimes an add-on to passenger services, and represents the airlines' desire to manage the available capacity to earn revenue. In this respect, belly cargo can be considered a part of the airlines' general revenue management strategy, much like setting airfares to ensure as high load factor in the passenger cabin as possible. If one looks at the service from this point of view, it does not look like the core business for the airlines, but is rather the carriers' use of opportunity to make some revenue. However the airlines are flexible in the use of aircraft even on passenger routes. If they have a lot of cargo volume, they can use so-called combi-freighters (KLM uses its B-747 aircraft for this purpose). In these planes, the cargo section of the aircraft is much larger and on a certain route, cargo can become very important. It is therefore not that easy to differentiate between the two businesses. Often they are really a joint product.
363. It is also worth noting that over the last decade belly cargo market volume at AMS has been relatively stagnant, while full freighter services have nearly doubled in terms of volume of cargo transported.
364. KLM operates a number of such combined passenger-cargo flights, using primarily its B-747 aircraft. However, with phasing out of the aircraft of this type (it will be replaced primarily with B-777 aircraft) underway, we are likely to see a diminishing role of belly cargo for both KLM and AMS in general.
365. It has been suggested by a number of stakeholders that the cargo (freight) market is generally much more competitive than the passenger market. Here, Schiphol faces competition from many airports (CDG, FRA, Luxembourg, Liege, CGN, Leipzig, BRU, and Maastricht). Note the important differences between this list and the one we provided when analyzing competition for O&D passengers. First, Schiphol's competitors on freight market include more remote airports, reflecting the fact that cargo carriers do not necessarily require airports located near large population centers. Second, some of the airports in the list (Paris and Frankfurt) are more important players on the cargo market than

Schiphol.¹⁴⁹ So, AMS is not the dominant airport in the corresponding catchment area, which is rather large, due to the fact that cargo is being transported by trucks Europe-wide. Third, some of Schiphol's competitors face fewer restrictions (e.g., are allowed to handle night flights, have fewer noise restrictions, etc) as compared to AMS.

366. Given that cargo is often a byproduct of passenger transport, it is very closely related to the network strategy of the hub carrier KLM. It therefore also faces sizable sunk costs, which acts as a barrier to exit even if the airport has EMP. This is also likely to be true for its cargo only specialists, the cargo airline Martinair. Just like KLM in the passenger market, Martinair is very unlikely to leave the airport, because of the tight cooperation between the two business models, passengers and cargo. However, the same argument as above applies here as well: the competitive nature of the downstream market may limit Schiphol's power to raise charges to cargo carriers.
367. In light of the current economic downturn, Schiphol airport initiated the freighter retention program, offering rebates to cargo airlines that in 2009 are keeping at least 75 percent of their last year's cargo volume. This unusual volume discount is an indication how tough the cargo market is during the recession, and suggests that cargo carriers might move easier to other airports and their freight forwarders, especially if they specialize in cargo transportation.

5.6.2 Assessment of market power in the markets for the provision of infrastructure for cargo flights

368. Some stakeholders indicated that the cargo catchment area encompasses entire Europe and therefore many airports, so the concentration in that large geographic market would not be very high, suggesting little EMP. This is in line with observation from stakeholders that there is sufficient evidence of strong competition on cargo market. As we mentioned, competition on the downstream market also limits airports' ability to exercise its market power at the wholesale level, even if an airline is unlikely to abandon the airport and move to an alternative location.
369. Thus, despite the presence of a captive carrier, Schiphol's ability to extract monopoly rents from the cargo airlines appears to be limited by competition on the downstream market. Schiphol's market power on the cargo segment is clearly lower than on either of the two passenger segments. Therefore, the question arises whether Schiphol's ability to increase charges above a competitive level is limited by competition on the downstream market.
370. Again we will analyze if a hypothetical price increase can lead to a substantial substitution towards other airports and is therefore not profitable. However, as some cargo is carried in the belly of passenger aircraft whereas some other cargo is carried by full freighter aircraft, it is difficult to perform a calculation based on average costs and charges, as we have done for the other markets.

¹⁴⁹ In 2008, CDG handled about 2.3 million metric tons of cargo; FRA – 2.1 million, AMS – 1.6 million.

371. A full-freighter Boeing 747-400, which is the aircraft most often used at Schiphol airport for full freighter traffic, will be taken as an example. If we assume both movements during nighttime, the total charge for one turnaround would be approximately 6.000 Euro (= on average 3.000 Euro per movement). The maximum payload of this aircraft is about 113,000 kg. Assuming a load factor of 67% results in 76,000 kg of freight carried. On a long distance flight to Asia (9,000 km), this would result in more than 680,000 ton km. Further assuming a yield of 0.20 Euro/tkm, the cargo airline would receive approximately 136,000 Euro revenues per flight.
372. An alternative approach is to look at tons transported and the average revenue per ton of an airline. In the financial year 2008-09 Air France-KLM had average revenues per ton cargo of approximately 1,850 Euro. For a Boeing 747-400 operation, this leads on average to revenues of 140,000 Euro.
373. For both ways of calculation, the share of airport charges at Schiphol airport equals approximately 2%.¹⁵⁰ If Schiphol airport increased its aircraft related charges by 10%, this would lead to a cost increase of 300 Euro per B747-400 cargo movement. If this cost increase would be passed on to the customer, average fares for cargo would increase by no more than 0.25%. Even within the rather competitive cargo market, the resulting loss of demand would not be sufficient to make such an increase in airport charges unprofitable¹⁵¹ and would therefore support the view, that the airport has EMP.
374. At the same time, we view the airlines' ability to switch to an alternative airport as the most important factor limiting Schiphol's market power in the air cargo segment. Cargo airlines do not need to locate near population centers; and operation in other airports might be associated with fewer restrictions. In the most extreme case, Martinair could be the only airline remaining at Schiphol following the rate increase. Even with the otherwise perfectly price insensitive demand (i.e., Martinair not losing any customers – a plausible scenario given the very small increase in the cargo rates to the final customers); a 10 percent increase in the charges followed by the higher than 10 percent drop in the volume of cargo operations due to other cargo airlines exiting the airport will render the charge increase unprofitable. This scenario is clearly more likely in the longer term than immediately after the hypothetical charge increase.
375. Again, the conclusion from this exercise seems to be that AMS at least in the short run has market power.¹⁵² This result is somewhat surprising, given the previous analysis where we argued that Schiphol's ability to extract monopoly rents from the cargo airlines appears to be limited by competition on the downstream market, a finding in line with the competition which was mentioned

¹⁵⁰ Some cargo airlines report the share of charges. Nevertheless, charges include ATC-charges and therefore cannot be compared with the figures calculated above.

¹⁵¹ One methodological note applies to all the above markets: Our calculations are based on common value for demand elasticity cited in the literature. Though, airlines' demand might not exactly be continuous in some cases. For example, a cargo operator may not be able to move only half of its cargo traffic to a different airport, it can simply leave AMS (which some airlines, as we have learned, may be able to do).

¹⁵² However, as we have argued above, the elasticity of demand for cargo shipments via AMS may be higher than we have assumed, due to presence of substitute transfer hubs. As a consequence, the calculations would be different if we used somewhat higher price elasticity and also our impression about the degree of market power in the cargo market would be different.

by cargo carriers and cargo specialists at the airport. Barring airlines exiting Schiphol, the price elasticity of demand is insufficient to make a price increase unprofitable. In addition one must remember some structural aspects of this market, at least for the hub carrier KLM. Such a carrier faces sizable sunk costs given that a large part of cargo traffic is often a byproduct of passenger transport, which acts as a barrier to exit.

5.7 Market for the provision of infrastructure for airlines offering local and instruction flights

376. The catchment area for the provision of infrastructure services for local & instruction flights was found to be smaller than the catchment area for O&D passenger services, i.e. the geographic market should be restricted to the airport itself, and may possibly include very close airports like Rotterdam or Lelystad, maybe even Eindhoven.
377. To assess the market power of Schiphol, we need to analyze the ability of other airports to increase their market share in case of a price increase. However, we argued above that competition is unlikely in case of joint ownership, as is the case for the airports of Rotterdam, Lelystad and Eindhoven. This limits potential competitive constraints of these airport leaving Schiphol airport with a certain amount of market power.
378. We have not carried out in-depth interviews on this market, also because local & instruction flights generate only a small portion of Schiphols revenues,¹⁵³ and are only of minor importance for the assessment of its competitive position.
379. In light of the evidence that we have analyzed, we conclude that Schiphol has market power the provision of infrastructure services for local & instruction flights.

5.8 Additional considerations and conclusions

380. As we have attempted to make an assessment of the market position of the airport with respect to the four markets for the provision of infrastructure for landing and take-off, we have found different degrees of competition in the markets which we have analyzed in detail.
381. Some (if not many) of the airlines currently serving AMS are very unlikely to leave Schiphol for other airports. KLM both has very high switching cost, and does not have an alternative airport in the Netherlands to run its hub-and-spoke network. Other full service carriers have up to now viewed Schiphol as the 'best'

¹⁵³ In 2008, 18.361 general aviation movements have been reported. Total revenue would roughly estimated be well below 0.2% of total revenue of the business area Aviation of 640 million Euro in 2008.

airport for serving the area; Skyteam alliance members benefit from connectivity to KLM's services. Martinair's cost of switching out of Schiphol also appears high. Among the carriers operating at the airport, low cost carriers are the ones most likely to be able to consider leaving the airport for alternative locations nearby. However, easyJet indicated that such an option is not likely to be exercised in the near future.

382. Notwithstanding the above stated; Schiphol's market power over the airlines unlikely to abandon their presence at AMS may be limited by competition on the airline markets.

O&D

383. Of the relevant segments of commercial aviation markets, Schiphol has the highest degree of advantage in competition for the origin and destination passengers. AMS is the largest airport in its catchment area, and airlines serving Schiphol offer flights to many more destinations as compared to any of the nearby airports. Even though over the last eight years three airports in Schiphol's catchment areas emerged as competitors to AMS, Schiphol remains a clearly dominant gateway.

384. The impending launch of HSL-South high-speed rail line will further increase substitutability between AMS and BRU, DUS, and CGN. O&D traffic on Paris-Amsterdam and London-Amsterdam markets is likely to be affected; however, market players differ in their assessment of the magnitude of this effect. Despite the estimates suggesting HSR development may increase Schiphol's market share, the net effect will likely imply a lower degree of market power for the airport.

385. With respect to the market for the provision of infrastructure for airlines serving O&D passengers, we found that some overlapping catchment areas and inter-modal competition put some competitive pressure on AMS; however, Schiphol remains the dominant airport in the area and has market power.

Transfer

386. We observed more intense competition in the market for the provision of infrastructure for airlines serving transfer passengers, due to the presence of substitute transfer hubs. The degree of competition differs between broadly defined market segments (e.g., Europe to North America versus Europe to Middle East). Conclusions on the existence and extent of market power depend very much on the values of price elasticity for a certain sub-market.

387. But we are only talking about one market, that for the provision of infrastructure for transfer flight and we were not able to determine what the overall price elasticity in the wholesale market should be. That makes it difficult to determine how much market power the airports possess in this market.

388. In general, despite substantial enlargement of the global airline alliances over the last five years, the extent of competition for transfer passengers among the main EU hub airports has increased very modestly. Data analysis suggests that the market for transfer passengers appears to be segmented, with certain hubs dominating on certain routes. However, higher price sensitivity of transfer

passengers (along with the fact that markets with limited competition for transfer passengers appear to be thin) may limit the extent of potential exercise of market power by the airport.

389. In addition, there is also some supply side competition being felt in the transfer market, especially as a consequence of the recent AF-KL merger. Impending expiration of double hub guarantees in spring of 2011, in light of the purchase of Northwest Airlines by Delta Air Lines (KLM's old alliance partner ceased to exist), presents a threat to both KLM and AMS in the middle to long-term.
390. The other issue to consider is that large airlines, which are the most important customers of Schiphol airport, have significant sunk investment at Schiphol airport and at their network system and will therefore be unable to move larger parts of their operation from AMS to alternative airports. Such airlines are not likely to leave Schiphol if charges are raised, but will possibly reduce their volume of service offerings. This is certainly an indication that the airport has market power in the market for the provision of infrastructure for airlines already serving transfer passengers. On the other hand, airlines planning to start operations at the airport should be in a very good bargaining position to negotiate a favorable long-term agreement which would neutralize this kind of market power, because they don't yet have any sunk cost.¹⁵⁴
391. Overall, we have shown that given the current market structure, the airport has a dominant position on the market for provision of the infrastructure for the airlines carrying transfer passengers. An analysis on the price sensitivity indicates that if all airport charges would be raised by ten percent, the increase would be profitable for the airport even in the most price-elastic downstream market segments. Therefore we conclude that the airport also has market power on the market for provision of infrastructure for airlines serving transfer passengers.

Cargo

392. Competition was found to be the most intense in the market for the provision of infrastructure for airlines serving the cargo market. Expansive geographic market along with the fact that most cargo is transported on trucks to the airport ensures high substitutability between the airports. Here, despite presence of Martinair – a cargo airline with substantial switching costs – potential exercise of market power by Schiphol is likely to be contained by competition on the downstream market.
393. Still, also for cargo, the high price elasticity of demand is apparently insufficient to make a price increase unprofitable. As a consequence, we find that the airport has limited market power in the market for the provision of infrastructure for airlines serving the cargo market.

Local & instruction flights

394. The market for the provision of infrastructure for local and instruction flights is a much smaller geographic market, even smaller than for O&D passengers. Since

¹⁵⁴ This would of course only work, if there is abundant capacity at the airport, to set up a major station at AMS.

most neighboring airports also belong to the Schiphol group,¹⁵⁵ the competitive pressure from substitute airports is rather limited and we do find market power by the airport.

Other considerations

395. Finally, it should be kept in mind that many airlines, especially the larger ones, serve two or even three of the markets analyzed above with one single flight. This leads to the possibility of distributing additional cost to markets with a less elastic demand. In other words, if the airport increased its charges, it might be a profit maximizing strategy for an airline to increase fares for (less elastic) O&D passengers by a larger percentage than fares for transfer passengers or for belly cargo instead of reducing the number of flights or seats offered.
396. Consequently, Schiphol airport has economic market power for the provision of infrastructure in all four markets that we analyze, although the strength of the market power differs. Even intense competition on the downstream market might not be sufficient to constrain the airport's economic market power. This is due to the fact that airport charges represent only a small portion of airline's cost, and the share of airport charges with respect to the overall costs is the smallest on the more competitive markets for transfer passengers and cargo. Furthermore, large customers have had sunk investment, and are therefore not likely to move their operations. Only if we assumed a very high price elasticity of demand on the downstream market, would the economic market power of the airport on the upstream market be limited. Nevertheless, if price elasticity of demand were that high, we would observe larger fluctuations in aircraft movements at different airports in response to variations in the airport charges. In other words, the fact that across- and within-airport variation in charges among the European hub airports does not cause large changes in the number of aircraft movements might be interpreted as to suggest that demand for the airport infrastructure is less responsive to price changes than demand for airline services.

¹⁵⁵ Of the potential competing airports, the airports of Rotterdam, Lelystad and Eindhoven belong to Schiphol Group.

6. Competition analysis with respect to markets for the access to Schiphol airport for companies offering ground handling services

(Work package 4)

6.1 Introduction

397. This section of the report assesses the market position of Schiphol airport with respect to markets for access to Schiphol infrastructure for companies which offer ground handling and other aviation-related services.
398. The airport provides access to the infrastructure needed to offer such services, especially ground handling. This includes the access to the airport ramp and terminal, the access to the central baggage system, to energy utilities etc. The ability of companies to offer such services also depends on the access to rental space at the airport, or space close to the airport.
399. The results of chapter 4 indicate that the relevant geographic market for such services is limited to the airport, since the services required at a particular airport are tied to the location, they cannot be substituted by services provided at other airports. The only partial exceptions are refueling and scheduled maintenance.
400. The providers of such services also need to get access to rental space necessary to offer these services. Under certain conditions, rental space beyond but close to the airport area may serve as a substitute. As a consequence, the geographic markets are defined relatively broadly and may also include nearby locations which are beyond the airport's boundary.
401. In light of the above, understanding the market position of the airport requires analyzing whether market power may be exercised at different stages of the value chain and how the market structure in these markets is related to the provision of access to the airports infrastructure. This requires also looking at potential barriers to entry that could originate from the way such access provision to Schiphol airport infrastructure is arranged for service providers. We therefore first look at the theoretical framework behind the airport's pricing strategies under different market structure conditions. We analyze how this is influenced by competition between airports, which may reduce market power, or service providers having access to infrastructure outside the airport perimeter. Against this background, we then look in detail at the market structure in the different ground handling markets and analyze, to what extent the airport exercises its market position. The chapter concludes with a look at the market for office and warehouse space and other real estate requirements, which airlines and service providers may have for operational reasons in the area of the airport.

6.2 Theoretical considerations with respect to market structure and pricing strategies

402. Assuming a non-regulated environment and no competition from other airports, a profit-maximizing airport will set its charges for indispensable services at monopoly level.¹⁵⁶ If the airport also offers certain services and there is a fixed proportion between those services (perfect complements, e.g., between aircraft landing and aircraft push back), it doesn't matter for which services a charge is levied as long as the sum of the different charges equals the monopoly charge.
403. If an airport is offering infrastructure services to the airlines directly as well as bottleneck infrastructure services to competing ground handling companies, the airport might exert its monopoly power directly via the infrastructure services provided for airlines, as well as indirectly via the wholesale market where he is offering infrastructure services to competing ground handling companies. Nevertheless, it should be noted that from a theoretical point of view, the airport can extract the monopoly rent only once. In other words, the airport is not able to increase its monopoly profits by serving several markets at monopoly prices, as long as those services are perfect complements. Again, the sum of the different charges will be set at monopoly level.¹⁵⁷
404. Furthermore, if different monopoly or bottleneck services would be offered by different companies (assume for example, that there is one supplier for the runway system and another for the aircraft push back), there might be a problem of (horizontal) double marginalization.¹⁵⁸ In other words, the sum of the different charges would be higher compared to a situation where all these services are provided by one horizontally integrated company, i.e. it would lead to smaller output and to smaller profit for the monopolist. However, when downstream services are provided on a competitive basis this issue does not arise. As a consequence, the airport has an interest in a downstream competitive market structure.
405. A slightly different problem arises, if some services are provided optionally. In this case, the airport might set a monopoly charge for the different direct services and/or bottleneck services, complemented by a charge for the "opting-in-services", in order to skim the additional willingness to pay. This behavior might also be interpreted as sort of product differentiation by the airport in order

¹⁵⁶ Except in the case of a two-sided market, where the airport also worries about the effect of aviation charges on non aviation revenues, see JC Rochet, J Tirole (2006), Two-sided markets: A progress report, RAND Journal of Economics Vol. 37, No. 3, Autumn 2006 pp. 645-667 and D. Gillen (2009) The Evolution of the Airport Business: Governance, Regulation and Two-Sided Platforms (Martin Kuntz Memorial Lecture, Hamburg Aviation Conference, February 2009)

¹⁵⁷ See Bergman, M. A (2004) from the Swedish Competition Authority in "Competition in services or infrastructure-based competition?" Report commissioned by the Swedish National Post and Telecom Agency, Stockholm, p 16.

¹⁵⁸ Double marginalization is normally analyzed within a vertical context, e.g., looking at a monopolistic airport and a monopolistic airline. If those two companies act independent from each other, both apply Cournot-pricing, leading to a price which is above the price that would be asked for by an integrated airport-airline-monopolist

to increase profits. One must therefore analyze what services could be provided for optionally when looking at the individual service markets.

6.3 Limits to the airport's market power through competition between airports and through competition between on-site and off-site locations

406. As mentioned above, an airline or a third-party might chose to use an off-site area for carrying out some of its activities or services instead of using an on-site area, if the rents set by the airport are too high. Nevertheless, moving these activities away from the airport site induces some cost, especially transport cost and costs due to additional time requirements. In this case, the airport's ability to exploit its market power would only be slightly limited. It could raise the rents by an amount just below the extra cost of operating from an off-site location, without losing the customer. Still in many areas the demand of an airline or a third party for facilities or office space at the airport site is presumably rather inelastic, because of the extra cost involved for carrying out the activity off-site.¹⁵⁹
407. If fuel at one airport is more expensive than at other airports, an airline might chose to purchase fuel at the "cheaper" airport (sometimes referred to as 'tankering' or 'economic fueling')¹⁶⁰ again the same considerations would apply.¹⁶¹

6.4 Market structure for ground handling services

6.4.1 Market structure is dependent on access to airport infrastructure

408. To analyze how the market structure in these markets is related to the granting of access to the airport infrastructure, one must look at the effect in the individual markets. In chapter 3, several services have been described and in chapter 4, a number of markets have been delineated. We next need to see the relation between services and the markets for access to Schiphol airport for companies which want to offer these services.
409. We have already grouped the ground handling services in chapter 3 according to the 11 categories of the EC's directive on ground handling. Figure 6.1 shows how the different ground handling services relate to the five markets for the access to Schiphol airport that we have identified in chapter 4.

¹⁵⁹ Interview example: cargo ground handling on-site or off-site, especially time consuming to work off-site due to security check.

¹⁶⁰ See G. Radnoti (2002), *Profit Strategies for Air Transportation*, New York, pp. 219/220.

¹⁶¹ This is discussed in greater detail in Chapter 3.

410. In order to carry out a competition analysis of these markets, we must see to what extent a competitive market structure is feasible under the access provisions formulated by the airport. For ground handling services that can be provided independently of the airport bottleneck infrastructure and where there are no barriers to entry, a competitive market structure is feasible. This kind of market conditions can be identified from Table 6.1 (reproduced from chapter 3). We see only two services depend on bottleneck airport infrastructure (GHS 4 and GHS 10). As a consequence, the likely market structure very much depends on how access to infrastructure is granted.

Figure 6.1: Access to the infrastructure for the provision of ground handling services

Market for the access to Schiphol airport for companies which offer ...				
...passenger handling services	...freight and mail handling services	...aircraft handling services	...refueling services	...catering services
GHS 1: Ramp handling			GHS 10: Fuel and oil handling	GHS 11: Catering
GHS 2: Aircraft services				
GHS 3: Passenger handling	GHS 5: Freight and mail handling	GHS 6: Aircraft maintenance		
GHS 4: Baggage handling				
GHS 7: Surface transport				
GHS 8: Ground administration and supervision				
		GHS 9: Flight operation & crew administration		
TE 2: Rental to ground handling companies				
TE 3: Rental to government				

Source: GAP.

411. An impression about the current market structure can be gained from information provided by Schiphol airport. According to which we observe (as of January 2009) the following ground handling companies and firms for related service provision active at the airport:

- four ground handling agents,
- six catering companies,
- four independent airline maintenance companies,
- eight general sales agents, and
- three companies providing airline handling supervision.

412. There are also three companies providing refueling services. They have to pay a concession, to cover the cost of maintaining the underground distribution pipeline.

413. We now look at the market structure in each of the five markets identified in chapter 4 (services in brackets indicate limited number of users or selected services).

Table 6.1: Aviation-related service markets

	Service is indispensable at an airport (bound to the airport)	Service is bound to the airport but dispensable (opting out)	Service might also be purchased at other airports
Infrastructure or service with a single supplier	ATO 1, ATO 3 TE1, TE2, TE3	ATO 2, (ATO 3) (TE1), (TE2), (TE3)	
Service with multiple suppliers, dependent on bottleneck infrastructure	GHS 4, GHS 10		(GHS 10)
Service with multiple suppliers, independent of bottleneck infrastructure	GHS 1-3, GHS 5-9, GHS 11	(GHS 11)	(GHS 6), (GHS 11)

6.4.2 Passenger handling services

414. The market for passenger handling services as defined above includes baggage handling as well as parts of ground administration and supervision,¹⁶² aircraft handling services¹⁶³ and surface transport.¹⁶⁴ These services are sometimes offered jointly by one of the ground handling companies, but sometimes also by separate specialized companies. Some airlines provide their own passenger handling transport; others do passenger and luggage handling also for third parties.

415. These services are indispensable at the airport (bound to the airport). Schiphol airport does not provide these services, but is providing access to the airport

¹⁶² Representation and liaison services with local authorities; load control, messaging and telecommunications; handling, storage and administration of unit load device; any other supervision service.

¹⁶³ External and internal cleaning of the aircraft, cooling and heating of the cabin, removal of snow, de-icing.

¹⁶⁴ Organization and execution of crew, passenger, baggage, freight or mail transport between terminals.

- infrastructure, like access to the ramp¹⁶⁵ with no special fee and in a nondiscriminatory way. As a consequence, there is no problem of distorted market conditions, as we observe in some of the other European markets.¹⁶⁶
416. Larger airlines usually perform a number of these activities, such as ground administration and supervision, themselves. However carriers which perform only few flights into Amsterdam and do not have their own station management at the airport usually outsource the service to independent ground handlers.
417. Our interviews with airlines and service providers¹⁶⁷ suggest that there is quite a “bit of turnover” in these markets, with new service companies coming in and others leaving. Also some larger airline operators are moving from self handling to outsourcing and vice versa.
418. What explains this seemingly competitive market structure? As long as access to the airport infrastructures is provided without discrimination and the associated barriers to entry are kept to a minimum, we would expect a competitive market structure in the market for these ground handling services. According to the information we obtained during our study, those companies neither pay a charge for using the airport infrastructure, nor do they have to pay a fee for access to Schiphol airport. In other words, we find conditions for a competitive market structure, since the airport, which controls access to the essential infrastructure needed to provide these kinds of services, does not exercise his option to use its market power to obtain monopoly rents through leveling an access charge.
419. One of the reasons for this behavior could be the EU directive on ground handling services, whose aim was to open up this market at the European level.¹⁶⁸ However this market has been open at Schiphol already much earlier, indicating a clear preference by the airport to set the market entry conditions for GHS in such a way, that a competitive market structure for the provision of such services could emerge. The aim seems to be to provide airlines with several options of how to organize this kind of services in an effective way. Nevertheless, we also have to consider the regulatory environment. If Schiphol airport raised an access fee, this could become part of the regulated revenues, leading to the obligation to adapt some other charges (this would require a change in the regulation). Currently only concessions from fuelling and catering services are part of the regulated revenues.
420. Nevertheless, for operational reasons the service providers might have to rent some facilities, in order to perform their service effectively. Here, according to

¹⁶⁵ Ramp handling is defined as marshalling the aircraft, assistance to aircraft parking, communication between aircraft and airside suppliers, loading and unloading of the aircraft, transport of crew and passengers, provision of units for engine starting, moving of the aircraft, loading/unloading of food and beverages.

¹⁶⁶ See the study by the Airport Research Center on the Impact of the Directive 96/67/EC, which evaluated the impacts of the Directive 96/67/EC on access to ground handling markets at Community airports. http://ec.europa.eu/transport/air/airports/ground_handling_market_en.htm, (direct link: http://ec.europa.eu/transport/air/studies/doc/airports/2009_02_ground_handling.pdf)

¹⁶⁷ Interviews with KLM, Transavia, Swisscom, Menzies, Aviapartner, Service Air, and CAN. (The Association of Ground handlers in the Netherlands)

¹⁶⁸ Council Directive 96/67/EC of 15 October 1996 on access to the ground handling market at Community airports, *Official Journal L 272*, 25/10/1996.

airport sources, they have to pay market-based rents. We will analyze below in greater detail, whether the rental rates can be considered market-based or above competitive level.

6.4.3 Freight and mail handling services

421. The market for the access to Schiphol airport for companies which offer freight and mail handling services¹⁶⁹ is geographically defined by the area of the airport and may also include nearby locations beyond the airport's space. Still, these services are indispensable at the airport (bound to the airport), and are therefore part of the services to be analyzed.
422. Like the market for passenger handling services, freight and mail handling is often bundled with ramp handling and aircraft handling services and could be provided by one of the ground handling companies. Due to different vertical relations with the shippers and consolidators, some of these services will often be performed by the airlines themselves. For example, Martinair does its own ramp handling and aircraft loading and unloading, but surface transport and subsequent storage and shipping is done by the large shippers. Martinair also does ramp handling and aircraft loading for KLM.
423. The situation is similar for large mail and package handling companies, like DHL and Federal Express, who also do a fair amount of self handling. On the other hand, some of the very large forwarders, like Kühne & Nagel or Schenker, are active over the entire value chain, since they have a sizeable logistics base at the airport. But for some of the smaller freight and mail carriers, who don't have their own station at the airport, all of these services are usually outsourced.
424. As a consequence, we can observe quite different contractual arrangements along the value chain for freight and mail, depending on the type of cargo, documents, mail or parcels transported, and the kind of parties involved upstream and downstream.
425. Since the access conditions to the airport's infrastructure are similar to those of the passenger handling services, i.e. the service providers have access at no extra charge and in a nondiscriminatory way, there seems to be no problem of distorted market access conditions. Again, we have to consider that the regulatory environment is likely to influence the airport's decisions.
426. Instead, Schiphol obviously intends to provide suitable conditions for effective logistic processes. Presumably, the airport considers a competitive service infrastructure for flight forwarders and the handling agents as an important element of this process, since the quality of the logistics chain is crucial for a fast turnaround and the ability to reschedule and unbundle loads. Schiphol has therefore pursued a very liberal infrastructure access policy.
427. The other crucial issue in its competition with other cargo hubs is to provide access to cargo facilities on site through its real estate arm, with direct access to the air site, so loading and unloading can be done without having to go

¹⁶⁹ Physical handling of freight and mail (incl. documents and customs/security procedures)

through security. In addition Schiphol has provided some building space for forwarders who want to have their own air site warehouses near the apron, like Transalpina.

6.4.4 Aircraft handling services

428. The market for the access to Schiphol airport for companies which offer aircraft handling services is geographically defined in chapter 4 by the area of the airport (and possibly locations nearby). Most of these services are outsourced by the airlines, especially the cleaning of aircraft. A number of companies are offering these services at Schiphol.
429. De-icing, which is part of the aircraft handling service, is only offered by one company, KLM aircraft services, that is especially licensed for both remote and gate deicing. The reason for this monopoly solution is that the service requires large capital investment, but has usually a low utilization for only two months of the year and may therefore be undersupplied in an unregulated environment.
430. The market for aircraft maintenance,¹⁷⁰ which is also considered under the overall market of aircraft handling services, has a wider geographic market, at least concerning heavy, scheduled maintenance.¹⁷¹ It is not bound to the airport, so the airport cannot exploit its market power that is linked to providing access.
431. That part of the market is often vertically integrated, with airlines doing their own maintenance but usually only at airports where they have a larger station. Since Amsterdam airport is a large airport, several airlines are able to do routine and non-routine maintenance when aircraft are stationed overnight, so this service is also bound to the airport.¹⁷² Some of the engine manufacturers also offer engine maintenance at Schiphol, so we can observe a competitive market structure.
432. The market for flight operation and crew administration,¹⁷³ which is also considered under the overall market for aircraft handling services, is also bound to the airport. Many of these functions are usually done by the larger airlines themselves, such as ground administration and supervision. However for carriers that only have a few flights into Amsterdam and who don't have their own station management, the service is usually provided by independent ground handlers.
433. Since the service providers for aircraft handling services have access to airport infrastructure¹⁷⁴ in a nondiscriminatory way, there is no problem of Schiphol distorting the market conditions and we can observe a competitive market structure.

¹⁷⁰ Routine and non-routine services. Provision and storage of spare parts. Provision of suitable parking and/or hangar space.

¹⁷¹ Routine and emergency maintenance are indispensable at the airport (bound to the airport), whereas heavy maintenance (planned maintenance) might also be performed at other airports.

¹⁷² This is also the case for light maintenance and maintenance in case of emergencies.

¹⁷³ Preparation of the flight at the departure airport; in-flight assistance; post-flight activities; crew administration.

¹⁷⁴ The issue of rental charges for such facilities will be discussed below.

6.4.5 Catering services

434. The market for the access to Schiphol airport for companies which offer catering services¹⁷⁵ is geographically defined in chapter 4 by the area of the airport and may also include nearby locations beyond of the airport's boundary. These services are indispensable at the airport (bound to the airport), although in some cases catering can also be supplied for the return flight and would then not be bound to the airport.
435. These services are usually outsourced by the airlines to specialist operators with multi-station presence. Some of them are independent subsidiaries of airline companies, which offer the services also to other carriers, others are independent suppliers.
436. Since the service providers for catering services have access to airport infrastructure at no extra charge and in a nondiscriminatory way, there is no problem of Schiphol distorting the market conditions and we can observe a competitive market structure.

6.4.6 Refueling services

437. The market for access to Schiphol airport for companies which offer refueling services¹⁷⁶ is geographically defined in chapter 4 by the area of the airport (and possibly locations nearby).¹⁷⁷
438. Since much of the infrastructure which is necessary for offering the services is installed as an underground distribution system to pump the fuel to parking aircraft, fuel can only be supplied through that system. It therefore represents a monopoly market structure that is regulated under the Dutch aviation act.
439. Access to that system is linked to a proportional concession payment, which pays for past investment and the necessary upkeep of the system. The concession payment is regulated in the aviation act as part of the aviation till. The concession has been raised each year since 2001 (older data has not been made available to us). The growth rates are shown in chapter 3.
440. There is also market for refueling of ground vehicles which is of course a much smaller market. The service providers purchase their fuel from a KLM subsidiary, which is in effect the only supplier.

¹⁷⁵ Storage of food and beverages; preparation and delivery of food, beverages and equipment.

¹⁷⁶ The IATA definition is fuel and oil handling, i.e., the organization and execution of fueling operations (incl. storage).

¹⁷⁷ We saw in chapter 3 that fuel might in some cases be purchased at other airports, in other cases (long-haul flights) fueling is de facto indispensable at a given airport.

6.5 Access to rental space

441. As we saw in chapter 4, the markets for the access for GH-service providers include access to rental space. Companies that provide ground handling services need to have access to rental space (rooms for employees, warehouses, offices, etc.) to carry out their activities. This also concerns of course airlines, government institutions and others. Therefore, the market for rental space for such specific use might be seen as part of these service markets. The issue of rental space for specific operational use concerns all companies at the airport as well as the government.
442. Rental space at the airport itself is provided by Schiphol Real Estate, a wholly-owned subsidiary of Schiphol Group.¹⁷⁸ Some of the airlines and GHS companies own their own buildings, but on the whole, airlines and service providers have to rely on Schiphol Real Estate as a single supplier if they want to rent space at the airport.
443. To what extent there might be also market power with respect to rentals depends on the competition with rental space beyond but close to the area of the airport which may serve as a substitute and therefore exerts a competitive constraint. For instance, catering companies do not need to produce at the airport, but may use nearby facilities close to the airport. This also applies for certain types of storage facilities in the mail and freight handling business. On the other hand, certain service providers need to have office and/or storage space in the terminal area and for operational reasons are dependent on the space the airport's real estate arm provides.

6.5.1 Rents for on-site space

444. We have had a closer look at the rental market, and discussed this issue with Schiphol, several tenants and some real estate specialists. As background, we received from KLM information concerning annual rent per m² in the terminal area. Furthermore, we discussed the rental contracts with some of the users.
445. We compare this data on rents paid by KLM with data on rents provided by Amsterdam Airport Schiphol, and with data on rents provided by a survey from Zadelhoff (2009). These rents include differences for various locations, and most likely also for various activities.
446. In order to avoid high rents, airlines can move parts of their activities to facilities at Schiphol with lower rents, but only to a certain extent. Certain aviation-related activities need to take place at the 'airside' for operational reasons.¹⁷⁹ Even if renting real estate in these areas is rather expensive, airlines as well as some ground handling companies and institutions responsible for security tasks do not have a reasonable alternative.

¹⁷⁸ Schiphol Real Estate develops, manages, operates and invests in commercial real estate and commercial property at and around (international) airports and modal transport hubs.

¹⁷⁹ Source: Interview with KLM, also with BARIN, ground handlers and freight forwarders.

447. If there is a large demand for scarce facilities, high market clearing prices will be induced. In an interview with KLM it was stated that there is competition between users for scarce facilities, and that there is no space to expand facilities.
448. To conclude, given scarce capacity and the need to locate some aviation-related activities in a terminal (or more general, at the airport), the airport has the opportunity to set high (market clearing) prices. Reducing rental prices might increase demand (e.g., users might use space in a less economic way or might move some activities from off-site areas to on-site areas), but realized demand will be unchanged due to inelastic supply. Therefore the effects on economic welfare will be negligible, as the difference is basically a redistribution of scarcity rents.

6.5.2 Rents for off-site space

449. DTZ Zadelhoff (2009)¹⁸⁰ reports rents for offices in the Netherlands, which are shown in Table 6.2. Note that Schiphol is included in the municipality of Haarlemmermeer. For the city of Amsterdam and the municipality of Haarlemmermeer, these rents are between 90 and 385 euros/m². The exact rent is determined by age, location, facilities etc. of the building. Also, rates are negotiable. See for instance Table 6.3 for rents in Amsterdam.
450. Amsterdam Zuidas is closest to Schiphol, and is a major investment project in Amsterdam with good accessibility. The same applies for Amsterdam Airport Schiphol. The rents paid inside the terminal for office space are above the rents for comparable space outside Schiphol, according to information provided by KLM. For Amsterdam West, table 6.3 reports similar rents. With respect to warehouses, KLM argued that comparable space outside the airport might be rented for significantly lower rents than at the airport.
451. The term ‘comparable’ is nonspecific, and to a certain extent subjective. The rents reported in Tables 6.2 and 6.3 are aggregated. Exact rents are dependent on a number of factors. An important factor is location. If location (and status) is not an issue, a tenant would opt for facilities in Amsterdam West with relatively low rents. If this office space is comparable to the space at Amsterdam Airport Schiphol (pier H/pier M), and activities can be moved, then it doesn’t seem rational for an airline, a ground handling company or the government to stay at the airport as there are cheap alternatives available outside Schiphol. If the users need high quality locations, than this will be reflected in the rent paid outside or at Schiphol. If the activities cannot be moved to locations outside Schiphol, then the arguments discussed in chapter 6.5.1 come into play.

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(http://www.dtz.nl/fbi/include/evi_imagebank/img.asp?id=2303&number=1&object_type=0&src=image)

Table 6.2: Rents in the Netherlands

Plaats	Huurprijzen kantoorruimten (In euro per m ² /jaar)			
	ultimo 2008		medio 2009	
	van	tot	van	tot
Groot Amsterdam	100	385	100	385
Rotterdam en omgeving	90	185	90	190
Den Haag en omgeving	80	215	80	215
Utrecht en omgeving	90	235	90	230
Haarlemmermeer	90	390	90	380
Eindhoven en omgeving	91	175	91	175
Arnhem en Nijmegen	90	175	90	175
Zwolle, Apeldoorn en Deventer	80	170	80	165
's-Hertogenbosch en Tilburg	80	160	80	160
Gooi en Eemland	110	195	110	195
Twentse Stedenband	80	135	75	140
Breda en omgeving	90	160	90	160
Groningen en Assen	90	150	90	150
Limburg	105	155	105	155
Almere	75	165	75	165
Friesland	100	150	100	140

Source: DTZ Zadelhoff (2009)

Table 6.3: Rents in Amsterdam

Plaats		Huurprijzen kantoorruimten (In euro per m ² /jaar)			
		ultimo 2008		medio 2009	
		van	tot	van	tot
Amsterdam	Amstel Business Park	110	170	110	170
	Buitenveldert	170	300	160	275
	Centrum	170	300	170	300
	De Omval	250	360	250	360
	Riekerpolder	165	235	175	220
	Teleport/Sloterdijk	140	190	130	185
	Westas	100	180	100	175
	IJ-oevers	180	205	180	205
	Zuid/Concertgebouw	200	385	200	385
	Zuidas	250	375	250	375
	Zuidoost	100	205	100	195
Amstelveen		135	205	120	200
Diemen		110	155	105	155

Source: DTZ Zadelhoff (2009)

452. From the (limited) data above, some insights can be gained:
- For the last years, the average growth rate of rents paid by a large customer (KLM) is only slightly above the growth rate of the regulated aviation charges.
 - With respect to the level of charges, rents at different buildings and locations within the airport are rather diverse.
 - Rents for – more or less – comparable space outside the airport are in many cases lower than within the airport.
453. From a theoretical point of view we can distinguish between location rents and monopoly rents (Forsyth, 2003). Suppose a hypothetical situation with several lessors of space within the airport. As rental space within the airport is scarce, rents will likely be the same as in the current situation. Nevertheless, in the long run, each lessor might have an incentive to increase capacity (if possible). This is not necessarily the case in a situation where all rental space is supplied by a single company.
454. Moreover, if rental space is complementary to the aviation activities, the airport (even as a single supplier) has an incentive to provide airlines and ground handling companies with enough space to enable passenger and cargo growth. Again, this also depends on the actual possibilities of increasing capacity, as each increase of office or warehouse space prevents other (aviation or non-aviation) uses.
455. Concluding, the provision of rental space necessary for airline operations, ground handling operations, and government tasks should be considered an aviation-related service. This is due to the fact that each party has to have access to some rented space within the airport in order to provide its service. The airport is the dominant supplier of rental space on its premises, and the tenants only have limited options for moving their operations to areas outside the airport. The question whether the airport abuses his market position has to be left open, as such an assessment cannot be inferred from the available data.

6.6. Conclusions

456. This chapter deals with the markets for the access to Schiphol for companies which offer ground handling and other services for airlines. The airport plays a crucial role in this market, because it provides access to the infrastructure (like access to the airport ramp and the terminal, the central baggage system, to energy and utilities, and to rental space) needed to offer such services at the airport. The question to be answered is whether this provides a possible leverage which Schiphol can use to exercise market power.
457. Our analysis shows that in the five markets for the access to Schiphol airport for companies which offer ground handling services which were defined in Chapter 4, the airport has indeed the possibility to exercise market power. The only exceptions are planned aircraft maintenance and catering services (and for

some very special cases fuel and oil handling), where there might be a possibility of either opting out or purchasing the respective service at some other airport. All other ground handling services (GHS) are indispensable at a given airport, and therefore control over access provides for a possible leverage which Schiphol could use.

458. However, we observed in our case studies and interviews that except for fueling, access to the infrastructure is provided without an access charge and the associated barriers to entry are kept to a minimum. As a consequence, most services are provided by multiple suppliers (including self handling) in the framework of a competitive market structure (except for fuel and oil handling, which is dependent on a bottleneck infrastructure; and the supply of rental space, which is provided by a single supplier).

459. What explains this behavior of the single supplier, who does not exercise his option to exploit its market power to obtain monopoly rents through levying an access charge?

One of the reasons for this behavior could be the EU directive on ground handling services, but this market has long been opened at Schiphol. This indicates a clear preference of the airport to set the market entry conditions for GHS in such a way that a competitive market structure for the provision of such services could emerge and thereby to provide airlines with several options of how to organize these services in an efficient way.

460. One reason for not exercising its market power in the market for access to the relevant handling services may be the competitive pressure from other airports. We find evidence of this in the transfer and in the cargo market. Especially in the latter, Schiphol seems to go out of its way to provide for effective logistics condition in its competition with other cargo hubs. It sees a competitive service infrastructure as an important element of this competitive process. Schiphol has therefore pursued a very liberal infrastructure access policy with the aim of having a competitive service market with low service rates. Though, we have to take into account that we are observing the behavior of a regulated airport operator and the current regulatory environment in the Netherlands might also influence the decision not to raise access charges from ground handling companies.

461. Nevertheless, on the (unregulated) rental market Schiphol might exercise its market power, since airlines, service providers, and the government, have to rent some office space and/or other facilities at the airport. Only under certain conditions, rental space beyond but close to the airport area may serve as a substitute, therefore providing a limit to the airport's market power.

462. Our analysis showed that the real estate market at Amsterdam Airport Schiphol is quite diverse. For many offices and facilities, there are alternatives, making this a competitive market. But for specific activities, users need to be at specific locations, e.g. in terminals. Rents in terminals are high, but users need to pay them because there are no substitutes, and this is reflected in the market price.

463. Our interviews suggest that there is excessive demand for (office) space in terminals, and that there is little opportunity to extend available space at these

specific locations.¹⁸¹ High prices may therefore be market clearing prices, displaying scarcity rents, and market power. Even at higher prices, tenants will not be able to move.

¹⁸¹ The argument that all rents for office space are locational rents rests on the assumption that the airport is not artificially limiting space. It was suggested to us in interviews that the airport cannot easily increase office space in the terminal area as demonstrated, for example, when a small prison had to be constructed in the security area.

On the general issue of locational rents at airports, see Peter Forsyth, *Locational and Monopoly Rents at Airports: Creating Them and Shifting Them*, Paper presented at the Hamburg Aviation Conference, University of Hamburg, February 12-14, 2003

7. International comparison of market definitions for airport services and the assessment of market power

(Work package 5)

7.1 Introduction

464. This chapter reviews the assessment of market power for airports in five different countries. We review approaches to this issue in Australia, UK, Germany (with emphasis on Frankfurt Airport), France (with emphasis on Aéroports de Paris), and the United States.

465. For each country the following three questions are analysed

1. Which aviation and aviation services are offered at different airports?
2. How is the relevant market defined?
3. How is the market power of the airports assessed?

466. Furthermore, a general assessment is provided drawing some implications for the case of Schiphol.

7.2 Australia

467. The Productivity Commission (2002) studied in depth the market power of Australia airports in 2002. The background of the study was the privatization of 17 airports in 1997/8 with the notable exception of Sydney Airport, which was later privatized in 2002. Twelve airports were price capped based on a dual till. Six smaller airports were exempted. The task of the Productivity Commission was to evaluate the price cap system. The Commission recommended either reforming the price cap regulation or changing it to a monitoring system. The latter option was chosen by the Ministry of Transport. Since 13 May 2002 airports have been monitored.

7.2.1 Aviation and aviation services

468. The Commission differentiates between the following facilities and services of airports.

- a) Aircraft movement facilities. These include run- and taxiways as well as aprons.

- b) Passenger processing facilities. These consist of aerobridges, baggage systems, check in, public areas in terminals, flight information displays and landside roads. It should be noted that terminals are very often leased to airlines and ground handling is performed by the airlines themselves. ATC is not provided by airports.
- c) Non-aeronautical services such as car parking, restaurants, administrative office space and other commercial and retail services

7.2.2 Definition of the relevant market

469. The Commission defines a market in such a way as “to identify fully any potential sources of substitution for the firm’s products and services” (Ibid., 95). It requires decisions on the following.

- a) The question what is demanded by whom. This leads to analyzing airlines’ view of services as either essential or optional. This valuation usually varies according to market segments, e.g. main customer group (business, visiting friends and relatives (VFR), leisure), as well as domestic and international traffic.
- b) The geographic dimension. This leads to an analysis of catchment areas which might vary for business segments and other factors.
- c) Whether the relevant market definition should include all transport services, airport services in general, or particular services at a specific airport. The Commission chose the narrow definition of airport services.
- d) The time frame. In the very short run demand cannot react. As an appropriate time for market response, time period of five years was chosen.

The Commission stresses that the abuse of market power can be lessened by countervailing power and demand complementarities and its efficiency loss by price discrimination.

7.2.3 Assessment of market power

470. The Commission discusses firstly the role of barriers to entry, secondly the price elasticity for an airport’s service which leads to estimation of overall market power for particular airports. Thereafter it analyzes the market power in particular air services.

Entry barriers

471. Barriers to entry give incumbent airports an advantage over new entrants. The Commission regards the following barriers as relevant.

- a) Natural monopoly due to economies of scale and scope and sunk costs. From other sources, the Commission sees evidence of economies of scale for airports serving up to 12.5 million passengers. These studies are supposed to be in line with the Commission’s cost data on Australian airports. Economies of scope arise from the lower coordination costs of having one instead of several providers.

- b) Network benefits of larger airports and hubs. These economies stem from the demand side. Airlines usually do not operate from two (uncongested) airports within one region, but concentrate their flights at one location offering better connectivity to passengers. Although the Commission is not able to quantify these network benefits, it judges them to be “a more significant barrier to entry than do airport supply characteristics alone” (PC, 2002, p. 105).
- c) Planning restrictions. These might be due to laws of city and land use planning, noise and environmental regulation.

The Commission stresses that “the essence of an airport’s monopoly is spatial or locational in nature. A direct competitor may not emerge in the same city, but an airport in another city may provide some competition (ibid., p. 106).

Price elasticity of demand

472. The price elasticity for services of a particular airport depends on four factors

- (1) The elasticity of air transport. The Commission relies on secondary sources, namely on the survey by Oum et al. (1992) with a range of -0.8 to -2.0 and a more recent study by Battersby (2001) with a range of 0 to -1.19. The latter study is based on some representative Australian routes for the period 1992-1998. It interprets these studies as evidence that overall the demand is inelastic, but some market segments react elastically.
- (2) Alternative sources of supply, in particular other airports. This is relevant for holiday trips as holiday makers have alternative national and international destinations. It might limit the market power of some airports in main tourist destinations (for example at the Gold Coast). It is also important for international flights and competition between Melbourne and Sydney.
- (3) Proportion of airport charges in airfares and airline costs. The proportion varies between 1.5 and 9 per cent depending on the length of travel and the type of airline model (FSA versus LCC).
- (4) Supply responses of other input services. Given the lack of literature on this issue the Commission only mentions that an increase in airport charges might cause responses from other input service suppliers.

473. If no good alternative sources of supply are available, and the supply of other inputs is inelastic, the demand for airport services is generally very inelastic. For example even for a high price elasticity of -2 for air transport and a high airport charges cost share of 9 per cent, the demand elasticity reaches only a level of 0.18. **Given the locations of most Australian airports and the lack of other transport modes, many airports face a highly inelastic demand.**

Assessment of market power for particular airports

474. The Commission assesses the market power for each airport in qualitative terms based on the main market segment of air transport and the potential for substitution of destination, transport mode and airport. Below table summarizes the main results.

Table 7.1: Market power for particular airports

Airport	Market segment	Destination substitution	Modal substitution	Airport substitution	Market power
Adelaide	Business, VFR	Low	Moderate	Low	Moderate
Alice Springs	Holiday	High	Moderate	High	Low
Sydney	Business, VFR	Low	Moderate	Low	High
Melbourne	Business, VFR	Low	Moderate	Low	High

Source: Based on PC (2002)

475. The main airports like Sydney, Melbourne, Brisbane and Perth have substantial market power, while airports like Adelaide, Canberra and Darwin have moderate market power. Only airports facing inter airport competition like Alice Spring, Coolangatta, Hobart, Launceston and Townsville have low market power.

Market power in particular air services

Table 7.2: Market power in particular airport services

Service	Market power	Assessment
Air craft movement facilities	High	Essential facility
Passenger processing facilities	High	Essential facility.
Lounge	Low	No evidence to constrain supply of space
Vehicle access facilities	High	Incentive to shift demand to car parking
Car parking	Low/mod.	Short term parking limited by other modes
Taxi facilities	Low/mod.	Charges limited by competing modes
Aircraft refueling	Mod./high	High switching cost for refueling
Aircraft light maintenance	Mod.	Access to side for third parties
Aircraft heavy maintenance	Low	Low switching costs
Flight catering facilities	Low	Good off airport locations available
Freight facility & storage sites	Low	Good off airport locations available
Waste disposal facilities	Low	Good off airport locations available
Administrative office space	Low/mod.	Incentive to constrain supply of space
Commercial & retail services	Low	Retail rentals reflect locational rent

Source: Based on PC (2002)

476. Airports with market power might face competition in some of their services. This in turn depends in particular on the availability of substitutes at the airport or off airport. The Commission assesses the market power for each service. The results are summarized in Table 7.2. While it is generally agreed that the sources of airport power lie in the facilities for air craft and passenger movements, the market power in car parking services has been strongly debated (see PC, p. 155 to 162). The assessment of the Commission that airports have only low to moderate market power because other public transport modes are available seems to over estimate the quality and availability of these services. In particular Melbourne airport has been able to reap not only location, but also monopoly rents from car parking (Forsyth, 2004). Nevertheless, as passenger car parking is considered a non-aviation-service, this is not in the scope of our study.

7.2.4 General assessment

477. The Australian assessment of airport market power offers some valuable insights for our study on the assessment of market power of AMS. In particular the methodology is a good example of qualitative and quantitative reasoning. However, there are some important remarks related to differences between Australian and European airports (Forsyth, 2003 and 2008, Niemeier, 2009):

- (1) The definition of the relevant market is only a tool to analyse the competitive constraints a particular airport faces.
- (2) In Australia there is no effective airport competition for the most major airports and only some competition between Melbourne and Sydney for international flights.
- (3) While most of the Australian airports might enjoy falling long run average costs, this is not the case for Amsterdam which according to Pels (2002) operates under decreasing returns to scale. Environmental and land use restrictions indicate that land is scarce at Schiphol airport.
- (4) There is no effective competition from other transport modes in Australia. For example, there is only one train service per day for from Sydney to Melbourne. This route is among the busiest routes of the world with 7 million passengers in 2009.
- (5) The results of monitoring Australian airports are mixed. Monitoring seems to promote cost efficiency, but because of not clearly defined objectives it is similar to a loosely defined cost plus regulation.

478. Airports in Australia are not busy due to overinvestment in the past. Slots are only becoming more recently scarce at Sydney airport at peak times. Therefore it remains to be seen if monitoring can set incentives towards efficient pricing if capacity is scarce.

7.3 United Kingdom

479. The role of market power of UK airports has been continuously analyzed and politically debated over the recent years. In particular, decisions on airport designation are based on detailed assessments of market power. On 10 April 2000 easyJet applied to the Department of Transport to designate Luton airport for price cap regulation. However, following the recommendation of the Civil Aviation Authority (CAA) the Department of Transport rejected easyJet's proposal. CAA argued that Luton had only a small market share in the relevant market consisting of Heathrow, Gatwick, and Stansted. Furthermore, competition was not restricted due to a lack of capacity as claimed by easyJet, because Stansted had unutilized capacity (CAA, 2000).
480. In the following we analyse the decisions to de-designate Manchester and Stansted and to break up the BAA airports in London and Scotland. Both assess the market power but differ in scope and method. An airport is designated if:
- It has substantial market power;
 - Competition law may not be sufficient to prevent an airport from exercising monopolistic behavior; and
 - Regulation leads to additional benefits.

If either of these conditions does not to apply, the Secretary of State can de-designate the airport. The decision whether or not to break up BAA requires the CC to study if common ownership of the BAA airports have an adverse effect on competition. The first two decisions were based on studies of the CAA the later by the Competitive Commission (CC) for the Office of Fair Trading.

7.3.1 Aviation and aviation services

481. The CAA focuses on aeronautical services and does not analyze commercial services, because airports compete mainly against other airports for passenger and freight, and not directly for non aviation revenues. Therefore the focus is on the competition for aeronautical services. The market power of UK airports in providing commercial services is extensively discussed in the debate of single versus dual till regulation. For an overview see the discussion in Starkie (2008 b). Furthermore, the CAA analysed separately the market power of Birmingham airport in car parking in 2002.
482. The CC acknowledges that airports provide a range of services to airlines like parking and passenger handling, and classifies these as "secondary products" (CC, 2009, p.29) which are demanded after an aircraft has landed. As the price of these secondary products affects demand for airlines, the CC includes these services in the definition of the product market (see below).

7.3.2 Definition of the relevant market

483. The CAA and the CC define the relevant market by the same method. This method has been defined by the guidelines “Market Investigation References: Competition Commission Guidelines” of the CC in 2003. According to these guidelines, market definition is regarded not “as an end in itself, but rather as a framework within which to analyze the effects of market features” (CC, 2003, p. 116). CAA and CC define the market for airport services as derived demand for air transport with a product market and a geographic dimension. The price and quality of airport services directly affect the airlines’ and (indirectly through changes in airfares) passengers’ choices.
484. The product market is defined to include aeronautical services of an airport, and is separated from the commercial services. Other transport modes such as rail are also excluded. The differences between LCC and FSA are not big enough to treat the users as being in separate markets. Airports differ in their supply characteristics, but these differences are not large enough to define separate markets. Even the hub Heathrow is in the same market as the other London airports, because only 30 per cent of total passengers are transfer passenger.
485. CAA and CC agree that “there is no analytical advantage in defining rigid geographic markets” (CC, 2008, p 118). The analysis is based on analyzing the substitutability of airports based on methods like catchment area analysis.
486. CAA and CC disagree on whether to apply the hypothetical monopolist test (SSNIP) to define markets. CAA bases its decision on SSNIP together with reasoning on substitutability while the CC abstains from such a test. The CC argues that the competitive level of charges is difficult to calculate and price caps have distorted the market so that an SSNIP test is not necessary and/or too difficult to pursue (CC, 2009, p 36).
487. The geographic market is loosely defined in the three cases as follows:
- a. Stansted operates in a geographic market including London and East Anglia, including the airports of Birmingham, East Midlands and to a lesser degree Bristol and Southampton (CAA, 2007).
 - b. Manchester operates in a market with Liverpool, Leeds Bradford, and Doncaster Sheffield, and in a broader market with East Midlands, Birmingham, and Humberside (CAA, 2007).
 - c. The three BAA London airports are in the market with London City Airport, Luton, Southampton, and Bournemouth. The two BAA Scottish airports are in the same market as Aberdeen, Inverness and Prestwick (CC, 2009).

7.3.3 Assessment of market power

488. CAA assesses market power (present and future) for Manchester and for Stansted in particular by analyzing a) catchment overlaps b) route overlaps c) switching costs d) airport cost structures and incentives e) capacity availability, and f) historical information (CAA, 2007, p 21).
489. In the case of Manchester, the CAA argues that although the airport has a large share of passenger traffic in the North West region of England, it faces

increasing competition from Liverpool, Leeds Bradford and Doncaster Sheffield in all market segments. Over 60 per cent of the domestic services are available at Liverpool and/ or Leeds Bradford. Also 60 per cent of the top 20 services for business traveler are available from these two competing airports. The CAA sees also no evidence that the airport could price discriminate among the regions or between the carrier types (FSA, LCC). Passenger surveys show that passengers have no strong preference, and would switch airports in response to higher airfares. The CAA acknowledges that switching costs might not be as high as the airlines claim, but points out that passenger could switch airports. For example if Manchester raises charges for the long haul route to New York or Toronto, and airlines are forced to raise their fares, passengers could easily choose to fly from Liverpool, which also offers this service. Furthermore, the revenue from commercial activities reduces the incentive to raise charges. Manchester airport has also no incentive to restrict (peak) capacity, as competing airports would be able to provide it. In the future the competitive constraints are most likely to increase, because the number of overlapping routes is likely to increase, and competition is not restrained by capacity constraints (ibid, p.95). According to the CAA a five per cent increase in charges at Manchester Airport would lead to a reduction of more than 4 per cent of traffic. This would not be profitable as the airport also loses commercial revenue.

490. In the case of **Stansted** the CAA argues that the airport draws passenger from a wider area than Manchester and other airports. A two hour drive time for leisure travelers would be an appropriate way of defining the catchment area. This leads to overlapping catchments with Luton and other London airports, and also with Birmingham and East Midlands airports. Furthermore, Stansted draws a significant number of passengers from outside of the market. For only a third of its passengers, Stansted is the closest airport. Passengers also have no preference for Stansted. As most routes are offered as well at other competing airports; Stansted is restrained in its market power. The CAA also sees no evidence that airlines, in particular easyJet and Ryanair, have high switching costs. Even relocating parts of their fleet to other bases would not involve high switching costs. Also, in the future Stansted does not have the ability to restrict artificially capacity, as other airports such as Luton and East Midlands could increase capacity. Furthermore, Stansted is undergoing a planning process to expand capacity up to 25 million passengers. According to the CAA, a five per cent increase in charges at Stansted Airport would lead to a reduction of more than 3.73 per cent of traffic. This would not be profitable as the airport also loses commercial revenue.
491. According to the CAA, Manchester “faces competitive pressure across its business” (ibid. p97) and Stansted airport “has significant direct competitive interactions with airports such as Luton, Birmingham, and East Midlands airports, as well as a number of other airports through a ‘chain of substitution’.”(Ibind 144). Competition will most likely increase in the future, so that both airports should be de-designated. However, the Secretary of State followed this recommendation only in the case of Manchester.
492. The CC had to compare the market power of each BAA airport under a regime of separate ownership with the market power of BAA under joint ownership. Furthermore the effects of capacity constraints and price cap regulation had to

be taken into account. The CC study focuses on demand substitutability of airports from the view of airlines and passengers.

493. In the case of the Scottish airports, there exists a strong overlap of catchment areas between Glasgow and Edinburgh. Passenger surveys show that both airports were good substitutes, and only Prestwick competes with Glasgow to some degree. Therefore, the CC concluded that “common ownership adversely affects competition between Edinburgh and Glasgow, and that under separate ownership there would be potential for competition” (CC, 2009, p 9).
494. In the case of BAA’s London airports Gatwick, Heathrow, and Stansted face “very limited competition from non BAA airports” (ibid., p10). The CC analyzed the substitutability of the three BAA airports by analyzing catchment areas and by interviewing the airlines. These led to the following results:
- a. Heathrow has a distinct role. While for terminating passengers Gatwick is the closest substitute, followed by Stansted and Luton, the main European hubs of Paris Charles de Gaulle, Amsterdam, and Frankfurt are its main competitors.
 - b. The closest substitute for Gatwick is Heathrow, followed by Stansted.
 - c. The closest substitutes for Stansted are Heathrow and Gatwick, followed by Luton.
495. It should be noted that the CC and the CAA differ substantially in their analysis of Stansted. While the CAA argues that Stansted is in intense competition with Luton and non-London airports such as Birmingham and East Midlands airports; the CC “found that there was scope for some competition with Luton and other non-BAA airports to fill off-peak capacity, though the competitive constraints exercised by airports outside London seem weak.”(CC, p. 91)
496. Competition among BAA airports can be limited by capacity constraints. The CC acknowledges this, but argues that BAA has “contributed itself to the current shortage of capacity” (ibid, p 11). A break up would lead to a competition for “innovation and capacity development” (ibid.). Furthermore, there is scope for optimizing price structures, and better utilization of off-peak capacity among the three airports.
497. The CC recommends the divestiture of Gatwick and Stansted, and the divestiture of either Edinburgh or Glasgow.

7.3.4 General assessment

498. The assessment of airport market power in the UK offers some valuable insights for our study on our assessment of market power, and can be used to interpret the situation of Amsterdam.
- The definition of the relevant market is not an end in itself, and is always part of a more comprehensive reasoning relying on quantitative and qualitative analysis. For example, the CC and CAA differ in their approach regarding the usefulness of the SSNIP test. They also differ in their

assessment of the competitive position of Stansted airport, which reflects also a wider market definition of the CAA.

- The situation in the UK is in many respects peculiar. The high density of airports in the Manchester and London region is not typical for most European regions. In both regions the airport industry can be or already is a competitive industry so that regulation might be not necessary at all or only applied to Heathrow (Starkie, 2008b).
- It is important to look at capacity and slot allocation as both might constrain competition. Severe capacity constraints do not play a substantial role in the Manchester region, but are important in the London region and to a lesser degree in the Amsterdam region. While excess demand is much higher in the London region, Amsterdam has only peak problems. While in London slots are traded on a secondary market, this has not been the case for Amsterdam nor for any other European hub. Therefore switching might be easier on the European continent, as the level of excess demand is lower, but might not be possible or more costly if slots are not traded. Furthermore, the intensity of competition might be observed by how airports price scarce slots. Manchester is one of the few airports with peak pricing and this is part of a competitive response to competition from nearby airports. One of the major benefits of a break up of BAA is better pricing of existing scarce capacity as the CC and the CAA argue. In the long run competition will be only as intense as in normal industries if airports can compete on quality and quantity. If for example an airport has invested in a particular quality to attract certain carriers and has undercut its competing airports it must have the capacity to accommodate the traffic. It seems to be an open question if a break up leads to situation where airports compete on quality and quantity as this implies excess capacity in the region (Forsyth and Niemeier, 2010). This might be difficult to achieve in London and perhaps easier in the Amsterdam region. In the Amsterdam region competition between airports is only feasible if airports are a good substitute. While Luton is a good substitute for Stansted. Lelystad is currently not in this position.

7.4 Germany

499. Germany has roughly 20 international and about 30 regional airports, out of which the airports of Düsseldorf, Frankfurt, Hamburg and Hanover are partially privatized (Table 8.3). The country has a relatively high density of airports as compared to most EU countries. While in some local markets like North Rhine Westphalia airports are very close to each other, and competition could at least potentially be effective; in other markets, such as Hamburg or Berlin, established airports have a local monopoly. Given this diversity, and the facts that all airports are regulated, and that regulation has been a critical fact in privatization; it is hard to explain why up to now neither the Department of Transport nor the Competitive Commission has analyzed the market power of airports. From official site, there are no studies evaluating what the relevant market for which airport service is, and how great the market power might be.

500. There are only some scientific studies on market power of airports by Wolf (1997 and 2003), Mandel (1999), Niemeier (2002), Malina (2005a, 2005b and 2010) and Strohbach (2010). These studies focus exclusively on market power in providing aeronautical services. Non-aviation services of an airport are seen as being subject to competition. According to the most comprehensive assessment (Strohbach, 2010) nearly half of the 35 German airports face substantial competition among them Düsseldorf with Cologne/Bonn as a good substitute. The other half has substantial market power among them Berlin, Frankfurt, Hamburg, Munich and Stuttgart.

Table 7.3: Ownership structure of major German airports

Airport	Operating Company	Shareholders	Share
Düsseldorf International (DUS)	Flughafen Düsseldorf GmbH	City of Düsseldorf	50%
		Airport Partners GmbH	50%
Frankfurt/Main (FRA)	Fraport AG	Federal Republic of Germany	18,38%
		Federal State of Hessen	32,13%
		Stadtwerke Frankfurt Holding	20,52%
		Portfolio Investments	28,97%
Hamburg (HAM)	Flughafen Hamburg GmbH	City of Hamburg	51%
		Hamburg Airport Partners GmbH Co KG	49%
Hanover (HAJ)	Flughafen Hannover Langenhagen GmbH	Hannoversche Beteiligung GmbH	35%
		City of Hanover	35%
		Fraport AG and NordLB	30%
Munich (MUC)	Public Airport	Federal State of Bavaria	51%
		Federal Republic of Germany	26%
		City of Munich	23%
Stuttgart (STR)	Public Airport	Federal State of Baden-Wuerttemberg	50%
		City of Stuttgart	50%

Source: Malina (2007)

501. Legally, the German regulatory system is based on § 43 Luftverkehrszulassungsordnung, which states that the “airport operator must seek approval for the charges for starting, landing and parking of aircraft and for the use of passenger facilities from the regulatory authority”.¹⁸² It should be noted that the law does not define exactly how airport charges must be regulated. There has been a common practice adopted by the individual federal states for the last two decades (Niemeier, 2002, Hoffjan and Müller, 2007), but also some differentiation, most notably a change in regulation for Hamburg airport, as well as for the airports of Hanover, Frankfurt and Düsseldorf.

502. The traditional system has the following main features:

¹⁸² Translation by the author

- The federal states actually regulate charges, but the Department of Transport (DoT) can intervene.
 - The regulatory authorities are not independent from the owners.
 - The authorities regulate the charges according to principles of cost relatedness, transport policy and reasonableness.
 - The users of an airport are consulted, but the users have a weak position. For example, the reasons for approval or disapproval of a decision are not made public either to the airlines, or to the general public.
503. According to Niemeier (2009) this low powered cost based regulation leads to an inefficient allocation of resources, namely inefficient choice of inputs (cost-padding), inefficient price structure (absence of peak pricing) and regulatory capture. (Management can influence regulations through the owner).
504. Revenue sharing arrangements were practiced at the German airports Fraport and Düsseldorf. They were based on a Memorandum of Understanding between the airport and airlines on the level of airport charges for the period 2002 to 2006 which were accepted by the regulator. If the parties disagree, the charges would be fixed according to the traditional cost based regulation.¹⁸³
505. According to the revenue sharing agreement the average charge per passenger was to be determined by the future passenger growth rate. Both parties agreed that with a projected growth rate, for example 4 per cent, average charges could be raised by 2 per cent. In the case of a higher growth rate airlines participate with a 33% share in additional revenues. With lower growth rates the airport cannot fully compensate revenue losses through higher charges. Only 33% of the loss can be compensated.
506. Such agreements only look good at a first sight. They have certainly the advantage to break with cost plus regulation because within the contract period the airport may behave as though it is subject to a price cap. However, there are major draw backs. A steep linear sliding scale guarantees the airport nearly the same revenue irrespective of output. This reduces incentives to change the price structure in order to manage efficiently capacity. Furthermore, prices move in the opposite direction of demand shifts which can only be efficient for the unlikely case of decreasing short run marginal costs.
507. Prior to the privatization of Hamburg airport, the regulation was reformed. Both parties agreed to sign a contract for the first 5-year price cap period from January 1 2000 until the end of 2004. Thereafter the contract can end or be extended. Cap regulation consists of the following main principles (Niemeier, 2002):

¹⁸³ Most interestingly this contract has up to date not been renewed for Düsseldorf and for Frankfurt airport. For the latter there are rumors that a new contract might be renewed. The problems related to these contract extensions indicate high transaction costs

- No single till. The single-till principle extends regulation to markets which might work effectively.
- Rebalance of charges and revenue approach. In order to set incentives to reform charges and adopt an efficient structure, a revenue yield approach was chosen.
- Setting of X. The X was defined by sharing the expected growth in labor productivity.
- Quality monitoring. The airport is obliged to implement a quality monitoring system (surveys and service indicators) and consult the results with its users

508. The price cap has been accepted by the airport and its users. Airlines have seen the Hamburg model as a role model for other German airports. However, this has been resisted. Only for Hanover a similar system was adopted, but not renewed in 2008. So far the system has worked well, although far from being perfect (Niemeier, 2002 and 2009).

7.4.1 General assessment

509. The German regulatory system is a good example of regulatory capture with the resulting low incentives for economic efficiency and relatively high transaction costs (Niemeier, 2002 and 2003). It is not a role model for the Netherlands, but it might be interesting to learn from the mistakes in developing an effective regulatory system. The following aspect might be of interest:

- a) Germany does not have an independent regulator with a clear democratic statute.
- b) Germany is regulating too many airports with a rather ineffective system. The direct costs of regulation are unnecessary high, but not on a high scale. The real burden might be the unintended consequences in the form of higher transaction costs (for example, tensions between the airlines and the airports).
- c) The German system cannot rely on monitoring and the threat to re-regulate, because such a threat is not credible.
- d) The airports with market power are facing hardly any effective constraint to abuse their market power by producing with high costs and pricing their products ineffectively. The real challenge is to design effective incentives.

7.5 France

510. The French airport system was managed as a public utility and was reformed in 2006.

- Aéroports de Paris (ADP) was partially privatized in 2006 with a price cap regulation contract between ADP and the state.
 - Major regional airports were transformed into private law companies now owned by regional authorities and the chambers of commerce's with an option for private capital
511. France has 156 airports, which are organized in the "l'Union des Aéroports Français" (2008). The French air traffic is highly concentrated. The twelve largest airports handle 90% of air traffic. The Paris ADP airports have more than 50% share of the French traffic.
512. In the process of privatizing and reforming regulation the market power of ADP was assessed, but on a broad and rather loose base. Therefore, there is little information on the questions of what the relevant market for which airport service is, and how great the market power might be. According to Sauvart (2002) Paris Airports are supposed to have monopoly power only in one quarter of the traffic. This seems at best to be a misleading statement, as it should be interpreted that for one quarter of the traffic no substitute is available. Overall, the ADP airports have persistent market power (Forsyth et al. 2009).
513. For the Paris Airports, the scope for competition differs between market segments that are served by the two airports, but is of a rather low intensity, as long as the Paris Airports are jointly owned.
- Competition with other Hubs: The main competitors of ADP are the hubs of the other big airline alliances: London, Frankfurt, and Amsterdam-Schiphol (second hub for Air France-KLM). Competition between those hubs unquestionably exists, but it is doubtful that this competition is strong.
 - Competition with traditional regional airports: The Paris Airports are the only European airports without competing airports of a comparable size in a range of 300 km. This leads to persistent market power in the origin-destination- traffic segment.
 - Competition with low cost airports: the most important competitor for Paris airports is Beauvais Airport. Beauvais, situated 84 km north of Paris, has taken the role of a third Paris Airport, especially used by Low-Cost-Carriers. Although the passenger numbers have risen dramatically, Beauvais still remains a marginal airport in the area (2000: 0,38; 2005: 1,8; 2007: 2,2 million passengers) ADP- airports (2000: 73,5; 2005: 78,7; 2007 86 million passengers).
 - Competition from other modes of transport: France has a network of high-speed trains, the TGV. TGV is an important competitor only for regional air transport; competition on the Paris-London market comes from Eurostar.
 - Competition from new airports. The option for a third airport in Chaulnes north of Paris is no longer seriously considered.
514. The regulation of ADP has been reformed by switching to an incentive regulation, but without establishing an independent regulator. Therefore, regulatory decisions can be easily influenced by major pressure groups, such as the management and unions of ADP.

515. The incentive regulation consists of a price cap with sliding scale based on a mixed single till combined with quality and investment regulation. According to Forsyth et al. (2009), it has certain merits like setting incentives and ensuring that quality and investment targets are met, but it has so far not given sufficient incentives to set efficient price structures, in particular at Orly.

7.5.1 General assessment

516. The French regulatory system is a good example of the problems of regulatory reform. It is an incomplete reform in many respects and the political economy of such a reform raises interesting problems. The following aspect might be of interest:

- a. The design of institutions guarantying a fair regulatory process is very important.
- b. While setting incentives for cost efficiency are well accepted as an objective of regulation this is not the case for allocative efficiency. Sliding scale mechanisms seem to reflect more the political balance between airlines and airports to share revenues. This seems to be more important than setting incentives for an efficient utilisation of capacity.
- c. The regulation of investment needs further study. ADP is in this respect an interesting example and worthwhile to study together with other approaches.

7.6 United States

517. While US airports are not directly regulated; the extent of their market power and their ability to use it is seriously limited by a number of factors. The most important of these limiting factors is the involvement of the Federal authorities via the Airport Improvement Program (AIP) and a number of laws governing how airport can set up its charges and spend the money collected. Generally speaking, any airport that accepts AIP grants commits to cost-based pricing, based on historic rather than market costs.

518. The crucial feature of the US airport industry is that airports are viewed as part of the general transport infrastructure rather than as firms. This in part explains involvement of the Federal Government in development and operation of airports. Because the airports are viewed as infrastructure, evaluation of the airports' market power is not an issue. Indeed, one does not often see studies of market power of a road between two cities on the market for travel between the endpoints – the central issue in this case is recovering the cost of road construction and maintenance. A similar approach is applied to the US airports.

519. The other important feature of US airports is that they operate as public enterprises, owned by the local authorities (cities or counties), and operated either by the municipalities themselves or by specialized authorities (e.g., Port Authority of New York and New Jersey).

520. Peculiarities of the airport – airline relationships in the USA involve long-term agreements between the parties. As a result, airlines obtain exclusive access to the airport facilities on a longer term basis. Additionally, airlines end up having a say in airport development itself.
521. There have been talks about privatization and congestion-based pricing at the US airports; however, little has been done about these issues. Moreover, the possibility that the current system of regulation of US airports will change appears limited.
522. In general, market power of airports is not an issue currently on the radar of the US authorities. While it is acknowledged that the airports possess features of local monopolists, enabling them to potentially exercise market power; it is also believed that current system of regulation precludes airports from doing so.

7.6.1 Institutional characteristics of US airports

523. The Federal Aviation Administration (FAA) currently identifies 4851 civilian airports in the United States of America and its territories, which are both operating and open for general public. Of those, 3973 (or 82 percent) are publicly owned; and the remainder are identified as privately owned. At the same time, airports from which commercial airline services are performed are almost exclusively public enterprises.
524. Most of the airports are owned by the respective cities or counties. Many are also operated by them. For example, Miami-Dade County, Florida, owns Miami International Airport, along with three general aviation airports, and one training airport. All the airports are operated by the County's Aviation Department. Some local authorities set up authorities to operate the airports located within their jurisdiction. For example, Port Authority of New York and New Jersey, which operates New York's JFK and LaGuardia airports, as well as Newark Liberty (located in New Jersey), Stewart International and Teterboro airports, is set up by the States of New York and New Jersey. The Authority is governed by the Board, with each Governor appointing six Commissioners.
525. In general, public enterprises are created to serve various purposes. In case of airports, we can suggest that one of the purposes for organizing those as public entities is to tackle the problem of the natural (or local) monopoly. The other two ways of approaching this issue is regulation and awarding the right to operate via franchise bidding.
526. In the US aviation industry, airports are primarily and predominantly involved with the provision of infrastructure for take-offs and landings. It is extremely uncommon for the US airports to provide ground handling and other services. Ground handling is typically performed by the airlines themselves (or outsourced to specialized companies). Airports which do offer ground handling services to the airlines are typically small ones, with very limited scheduled services (so that neither airlines nor ground handling companies find the scale of operations at the airport sufficient).

527. Airports' involvement in operation of gates and terminal facilities can also be limited. There are three ways gates are assigned to the airlines. First, an airline can enter into a long-term lease agreement with an airport for exclusive use of gates. Second, gates can be leased to an airline, with the airport retaining the right to revoke the lease on 30-day notice (normally, this provision is invoked if an airline does not use the gate sufficiently). Third, some gates are designated as common use gates. As an example, in Atlanta airport, 131 out of 172 gates are under exclusive agreements; 12 are used through the 30-day permits, and the remaining gates are common use ones. Oakland International airport operates 21 out of its 24 gates on exclusive long-term leases; however, those leases are cancelable with 30-day notice by either party.
528. Airlines, especially those with dominant position at an airport, play an important role in determining directions for the airport's future development. In some cases (e.g., New York JFK airport) airlines own terminal buildings. At many airports, the airlines leasing the gates on the long-term basis take active part in discussions on the airports' strategic development.
529. Four US airports (New York LaGuardia, New York JFK, Washington Ronald Reagan National, and Chicago O'Hare) are designated slot-controlled airports, meaning the upper limit on the allowed number of take-offs and landings is set. The airlines are required to use the slots allocated to them; otherwise, the rights are lost, and the slots are reallocated using a lottery mechanism which favors new entrants over the incumbent airlines.
530. This institutional structure can create entry barriers at the airport level. There is ample evidence that fares are higher at the above-mentioned slot-controlled airports. A recent study suggests that exclusive gate arrangements contribute to higher fares charged by the airlines dominant at the airports. At the same time, use-it-or-lose-it provisions attached even to the long-term leases can serve to mitigate this potential entry obstacle.
531. There are a number of metropolitan areas served by several airports. The most vivid examples are New York – New Jersey metro area (served primarily by JFK, LaGuardia and Newark) and the San Francisco Bay Area (served by San Francisco International, Oakland International, and San Jose Norman Mineta airports). In the former case, all these airports are managed by a single authority, in the latter the ownership and management is separated. The adjacent airports, as we will see below, are not exactly free to compete for the airlines (while SFO does offer discounted aeronautical charges to new clients). Due to the way airport regulation is set; the best tool in the airports' toolbox is the cost.
532. Effectively, the airports' role in the US industry is limited to provision of related infrastructure. Effective control of terminal and gate facilities (and consequently the control of access to the airport) is largely in the airlines' hands, subject to certain rules and regulations.

7.6.2 Involvement of the Federal Government

533. Perhaps the most important tool at the Federal Government's disposal to ensure the airports do not try to take advantage of their potentially dominant position on the market is the Airport Improvement Program (AIP). Through this program, which is run by the Federal Aviation Administration, an airport can obtain a Federal grant for projects, involving land acquisition, as well as construction or improvement of the airport infrastructure. Over the last five fiscal years (2005-2009), \$16.7 billion has been distributed via this program. Grants are available to publicly owned, as well as the private designated reliever airports.
534. Over the above mentioned period, AIP grants have been distributed to over 1800 airports, including most if not all of the airports offering scheduled passenger transportation services. Thus, the AIP's scope is rather comprehensive.
535. The 1982 Airport and Airways Improvement Act mandates that any airport accepting AIP grants charge reasonable fees to its aeronautical users. The Final Policy Regarding Airport Rates and Charges, issued by FAA in 1996 establishes that the fees charged by the airports to its aeronautical users be cost-based. The cost of assets is to be determined by their historic rather than market value; and charges must be non-discriminatory. Finally, the 1994 FAA Authorization Act requires that airports be self-sustainable.
536. The three pieces of legislation mentioned above delineate the regulatory framework airports in the United States operate in. First, cost-based pricing is effectively imposed on the airports via AIP grants. An airport suspected of overcharging its airline customers for aeronautical charges risks losing access to AIP funds, which appears to be an effective deterrent. In 1988, Massport Authority attempted implementing quasi-congestion take-off and landing charges scheme for Boston Logan Airport. After the US Department of Transportation found that the proposed pricing schedule was in violation of the federal laws, the proposal was dropped. Until very recently, no other airport attempted implementing anything similar. Second, below-cost pricing is effectively prohibited by the self-sustainability requirement.
537. The Airport and Airways Improvement Act also regulates how aeronautical revenue can be used. The basic principle is that of "revenue retention", generally requiring that the aeronautical revenue obtained by the airport receiving AIP grants must be used at the airport. Effectively, this provision prevents the cities and counties owning the airports from using their enterprises for revenue generating purposes.
538. Non-aeronautical charges at the airport must be based on the 'fair market value', using either negotiated fees for similar uses at the airport or appraisal of comparable properties as a benchmark. Again, this is enforced for any airport accepting AIP grants.
539. Generally, the Federal Government, while not regulating the airports directly, is able to use conditions attached to the Airport Improvement Program grants to effectively enforce cost-based aeronautical charges. Airports' options for exercising the market power on the airlines are thus very limited.

7.6.3 General assessment

540. The system of airport regulation in the United States is very different from that observed in other parts of the world. Two things define it: the view of the airports as infrastructure rather than business; and enforcement of the cost-based aeronautical charges via AIP grants.
541. Because airports are considered infrastructure; the issue of the market power of airports, while acknowledged, is not raised. Airports' aeronautical charges are cost-based, and while they remain local monopolists, their incentive to inflate the cost (a usual problem for a regulated monopolist) is limited by the self-sustainability and the revenue retention requirements.
542. Airport-airline relationships tend to be both long-term and very close, with airlines (especially those with dominant positions at the airport) owning some of the airport infrastructure and participating in the strategic decision making. By obtaining exclusive or preferential access to the airports' gates and terminal facilities, the airlines can create entry barriers at the airport level. Thus, in the US aviation industry, the market power at the airport level is in fact in the airlines' hands.

8. Conclusions

543. This study assesses the market power of NVLS, the operator of Schiphol airport on the relevant market(s) for aviation activities, which are currently regulated according to the Dutch Aviation Act, and for aviation-related markets, which are not regulated, but necessary for the provision of airline services.
544. The core activity of Schiphol airport in terms of revenue is the provision of infrastructure to airlines. Moreover, the airport also provides access to its infrastructure to third parties, which offer ground handling services at the airport. Schiphol airport is not active in the provision of ground handling services itself, and it does not create revenue with the provision of access to the airport (with the exemption of concession fees for refueling). Furthermore, the airport rents facilities to the airlines, ground handling companies, and the government, which are used for purposes related to the airlines' services.
545. The market definition which we apply according to the principles of European competition policy identifies four markets for the provision of infrastructure to airlines, namely the markets for the provision of infrastructure to airlines serving O&D passengers, to airlines serving transfer passengers, to airlines offering cargo flights, and for local & instruction flights. Related to the access to the infrastructure for third parties offering ground handling services, the analysis identifies five markets following the commonly used clustering. These are the markets for the access to the airport infrastructure to companies which offer passenger handling services, freight and mail handling services, aircraft handling services, catering services, and refueling services.

Market for the provision of infrastructure to airlines

546. In our assessment of the market position of the airport with respect to the four markets for the provision of infrastructure, we have found varying intensity of competition, and some heterogeneous trends. Schiphol airport has market power in each of these markets, but the degree of market power varies. It is the strongest in the market for the provision of infrastructure for airlines serving O&D markets, and the weakest in the cargo market. Overall, downstream competition intensified over the last years, but it is not yet sufficient to discipline Schiphol at the upstream markets, as opportunities for the airlines to switch to the alternative airports are rather limited.
547. In the market for the provision of infrastructure to the airlines serving origin and destination (O&D) passengers, competitive pressure is rather weak but growing slightly. Passengers have become more mobile, as the outcome of the introduction of the ticket tax in the Netherlands indicates. However, it is very unlikely that a critical mass of airlines would leave Schiphol in favor of alternative airports in case of a charge increase at Schiphol airport. Furthermore, many alternative airports face capacity constraints. Even though over the last eight years three airports in Schiphol's catchment area have emerged as competitors for O&D passengers, Schiphol airport remains a clearly

- dominant gateway. Some rough price increase analyses based on price elasticities of demand and the current level of airport charges show that a price increase on the upstream market would be profitable for the airport, which points to economic market power.
548. In the market for the provision of infrastructure to airlines serving transfer passengers, competition among the main EU hub airports is slightly more intense (compared to the O&D markets), but there is a clear indication that Schiphol airport still has market power. Competition increased only modestly over the last decade. Price sensitivity of transfer passengers is likely to limit the potential exercise of market power by Schiphol airport only in downstream markets where fares for transfer flights are rather low and the individual airlines' price elasticity of demand is high. In this case an increase in airport charges would render a price increase unprofitable to the airport. This is due to the fact that airport charges are only a small part of the overall airlines' costs. However, there are indications that significant differences between the individual markets exist. Not only KLM, but also other large airlines, which are the most important customers of Schiphol airport, have significant sunk investments at Schiphol airport and their network system, and therefore will be unable to move larger parts of their operation from Schiphol airport to alternative airports. This is certainly an indication that the airport has market power in the market for the provision of infrastructure for airlines serving transfer passengers. But there is also some supply-side competition with respect to the transfer market, especially as a consequence of the Air France-KLM merger.
549. In the market for the provision of infrastructure to airlines offering cargo transportation, potential exercise of market power by Schiphol airport is to some extent limited by competition on the downstream market for cargo. Nevertheless, in this market segment large airlines with combi-freight services have significant switching costs, making a complete move to other airports rather unlikely. Our analysis of a hypothetical price increase using reasonable price elasticities confirms the market power position on this market as well.
550. The market for the provision of infrastructure for local and instruction flights is comparatively small in terms of revenue. As neighboring airports, which might serve as substitutes, are owned by the Schiphol group, the market position of the airport is rather strong, i.e. NVLS has economic market power.
551. Consequently, NVLS has economic market power for the provision of infrastructure in all four markets that we analyze, although the strength of the market power differs. Even intense competition on the downstream market might not be sufficient to constrain the airport's economic market power. This is due to the fact that airport charges represent only a small portion of airline's cost, and the share of airport charges with respect to the overall costs is smallest on the more competitive markets for transfer passengers and cargo. Furthermore, large customers have had sunk investment and are therefore not likely to move their operations. Only if we assume a very high price elasticity of demand on the downstream market, the economic market power of the airport on the upstream market would be limited. Nevertheless, if price elasticity of demand was that high, we would observe larger fluctuations in aircraft movements at different airports caused by charge variations. In other words, the fact that European hub airports differ in charges as well as in charge variations

without causing larger shifts of aircraft movements might be interpreted an empirical hint that demand for airport infrastructure at a given airport is less elastic than demand for airline services.

Market for the access to infrastructure for ground handlers and others

552. The second group of markets consists of markets for the access to the infrastructure to companies offering ground handling and other services. This group consists of five separate markets (access to the airport to offer passenger handling, freight & mail handling, aircraft handling, catering, and refueling services). Geographically, these markets are defined by the airport's space and nearby locations. Schiphol airport controls access to the infrastructure and has significant market power, although it currently charges no access fees to the airport (with the exception of concession fees for refueling). However, the rental of operationally required space is a crucial instrument which can be used to exercise market power.
553. On these markets for the access to Schiphol for companies which offer ground handling services, the airport has market power. Competition with other airports or with locations outside the airport area exists for very few services. However, we observed that, except for fueling, access to infrastructure is provided without an access charge, and the associated barriers to entry for customers are kept to a minimum. As a consequence, most services are provided by multiple suppliers (including self handling) in the framework of a competitive market structure. Exceptions are fuel and oil handling, which is dependent on a bottleneck infrastructure; and the tenancy of operational required spaces, which is provided by a single supplier. The observed situation might result from competitive pressure to provide those services at a high quality level and at minimum cost and is also in part required by the legal obligations (EC directive on ground handling).
554. All ground handling service providers, as well as airlines and the government, need some space or facilities at the airport. For many operational activities competition with off-site areas is very limited. Therefore, the airport might be considered to have a market power position with respect to the tenancy of space which is needed in the terminal for operational reasons for the production of airline services (including ground handling and governmental tasks).

International perspective and conclusion

555. From an international perspective, the presence of market power for Schiphol airport is in line with findings of regulators for other countries. As differences in the country airport industry situation, national government policies and the methodology employed to analyze market power exists, a comparison of the resulting market definitions gives only limited insights.
556. Overall we observe several developments in many (sub-)markets for the different aviation markets, e.g., the emergence of new competitors in the O&D market and a somewhat growing intensity of competition in the market for transfer passengers, introduction of high-speed rail connection alternatives, etc. These developments also affect the market position of Schiphol airport. Although in most markets the intensity of competition has slightly grown over

the last years, the overall position of Schiphol airport on the markets for the provision of infrastructure to airlines and for the access to infrastructure for companies offering ground handling services is still rather strong. Also with respect to the rental of space needed for the provision of airline services (and rented by airlines, ground handling companies and the government) we identify a dominant position.

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Appendix A: Services at Schiphol

Chapter 3 (Working Package 1):

The different services at Schiphol airport, according to the classifications developed in chapter 3.

ATO 1	Landing and take-off services
Definition	Use of runways, taxiways and apron areas; approach and aerodrome control, free parking between landing and take-off.
(In-)Dispensability / Competition between airports	Service is indispensable at the airport (bound to the airport).
Number of suppliers	Infrastructure with a single supplier.
Role of the airport operator	Airport operator is the only supplier.
Sources of revenues for the airport operator	Landing and take-off charges.

ATO 2	Aircraft parking
Definition	Parking of aircraft and their housing in airport-owned hangars, when not free.
(In-)Dispensability / Competition between airports	Service is bound to the airport but dispensable (opting out) An airline might change its schedule in order to avoid long-term parking at Schiphol.
Number of suppliers	Infrastructure with a single supplier.
Role of the airport operator	Airport operator is the only supplier.
Sources of revenues for the airport operator	Parking charges.

ATO 3	Passenger basic terminal infrastructure and services
Definition	Use of passenger terminal and other passenger processing facilities.
(In-)Dispensability / Competition between airports	Most services are indispensable at the airport (bound to the airport), nevertheless airlines might opt for disconnected handling.
Number of suppliers	Infrastructure with a single supplier.
Role of the airport operator	Airport operator is the only supplier.
Sources of revenues for the airport operator	Passenger charges (note that disconnected handling reduces the landing and take-off charge).

GHS 1	Ramp handling
Definition	Marshalling the aircraft, assistance to aircraft parking, communication between aircraft and airside suppliers, loading and unloading of the aircraft, transport of crew and passengers, provision of units for engine starting, moving of the aircraft, loading/unloading of food and beverages.
(In-)Dispensability / Competition between airports	Service is indispensable at the airport (bound to the airport).
Number of suppliers	Service with multiple suppliers.
Role of the airport operator	Airport operator doesn't offer this service, but provides infrastructure and grants access to the airport.
Sources of revenues for the airport operator	No direct revenues, but aviation charges.

GHS 2	Aircraft services
Definition	External and internal cleaning of the aircraft, cooling and heating of the cabin, removal of snow, de-icing.
(In-)Dispensability / Competition between airports	Service is indispensable at the airport (bound to the airport).
Number of suppliers	Service with multiple suppliers.
Role of the airport operator	Airport operator doesn't offer this service, but grants access to the airport and provides some infrastructure.
Sources of revenues for the airport operator	No direct source, but aviation charges.

GHS 3	Passenger handling
Definition	Any kind of assistance to passengers.
(In-)Dispensability / Competition between airports	Service is indispensable at the airport (bound to the airport).
Number of suppliers	Service with multiple suppliers.
Role of the airport operator	Airport operator doesn't offer this service, but grants access to the airport and offers some infrastructure (e.g. check-in desks).
Sources of revenues for the airport operator	No direct source, but aviation charges (passenger charge).

GHS 4	Baggage handling
Definition	Handling and sorting of baggage in the sorting area and transporting baggage to the reclaim area.
(In-)Dispensability / Competition between airports	Service is indispensable at the airport (bound to the airport).
Number of suppliers	Service with multiple suppliers, dependent on bottleneck infrastructure.
Role of the airport operator	Airport operator doesn't offer this service, but grants access to the airport and offers infrastructure.
Sources of revenues for the airport operator	No direct source, but aviation charges.

GHS 5	Freight and mail handling
Definition	Physical handling of freight and mail (incl. documents and customs/security procedures).
(In-)Dispensability / Competition between airports	Service is indispensable at the airport (bound to the airport).
Number of suppliers	Service with multiple suppliers. Most activities (e.g., cargo and freight commissioning) might also be performed outside the airport.
Role of the airport operator	Airport operator doesn't offer this service, but grants access to the airport and provides parts of the infrastructure.
Sources of revenues for the airport operator	No direct source, but aviation charges.

GHS 6	Aircraft maintenance
Definition	Routine and non-routine services, provision and storage of spare parts, provision of suitable parking and/or hangar space.
(In-)Dispensability / Competition between airports	Routine and emergency maintenance are indispensable at the airport (bound to the airport), whereas heavy maintenance (planned maintenance) might also be performed at other airports.
Number of suppliers	Service with multiple suppliers.
Role of the airport operator	Airport operator doesn't offer this service, but grants access to the airport.
Sources of revenues for the airport operator	No direct source, but aviation charges.

GHS 7	Surface transport
Definition	Organization and execution of crew, passenger, baggage, freight or mail transport between terminals.
(In-)Dispensability / Competition between airports	Service is indispensable at the airport (bound to the airport).
Number of suppliers	Service with multiple suppliers.
Role of the airport operator	Airport operator doesn't offer this service, but grants access to the airport.
Sources of revenues for the airport operator	No direct source, but aviation charges.

GHS 8	Ground administration and supervision
Definition	Representation and liaison services with local authorities; load control, messaging and telecommunications; handling, storage and administration of unit load device; any other supervision service.
(In-)Dispensability / Competition between airports	Service is indispensable at the airport (bound to the airport).
Number of suppliers	Service with multiple suppliers.
Role of the airport operator	Airport operator doesn't offer this service, but grants access to the airport and provides some parts of the infrastructure.
Sources of revenues for the airport operator	No direct source, but aviation charges.

GHS 9	Flight operation and crew administration
Definition	Preparation of the flight at the departure airport; in-flight assistance; post-flight activities; crew administration.
(In-)Dispensability / Competition between airports	Service is indispensable at the airport (bound to the airport).
Number of suppliers	Service with multiple suppliers. Some activities might also be performed outside the airport.
Role of the airport operator	Airport operator doesn't offer this service, but grants access to the airport.
Sources of revenues for the airport operator	No direct source, but aviation charges.

GHS 10	Fuel and oil handling
Definition	Organization and execution of fuelling operations (incl. storage)
(In-)Dispensability / Competition between airports	Service might in some cases be purchased at other airports, in other cases (long-haul flights) it is de facto indispensable
Number of suppliers	Service with multiple suppliers, dependent on bottleneck infrastructure.
Role of the airport operator	Airport operator doesn't offer this service, but grants access to the airports and provides some parts of the infrastructure..
Sources of revenues for the airport operator	Concession.

GHS 11	Catering
Definition	Storage of food and beverages; preparation and delivery of food, beverages and equipment.
(In-)Dispensability / Competition between airports	Service is indispensable at the airport (bound to the airport), opting out possible according to airline's business model.
Number of suppliers	Service with multiple suppliers. Most activities might also be performed outside the airport.
Role of the airport operator	Airport operator doesn't offer this service, but grants access to the airport.
Sources of revenues for the airport operator	No direct source, but aviation charges.

TE 1	Rental to airlines
Definition	Rental of facilities to airlines.
(In-)Dispensability / Competition between airports	Service is indispensable at the airport (bound to the airport) or at an area close to the airport.
Number of suppliers	Service with single supplier (exception: airlines owning buildings). Most activities might also be performed outside the airport (e.g., employee parking), though for many activities, this will increase operational cost significantly (e.g., crew center).
Role of the airport operator	Airport operator is the only supplier within the airport, except for airlines owning buildings within the perimeter.
Sources of revenues for the airport operator	Rents.

TE 2	Rental to ground handling companies
Definition	Rental of facilities to ground handling companies.
(In-)Dispensability / Competition between airports	Service is indispensable at the airport (bound to the airport) or at an area close to the airport.
Number of suppliers	Service with single supplier. Several activities might also be performed outside the airport (e.g., employee parking), though for many activities, this will increase operational cost significantly (e.g., employee waiting rooms, spare part storage).
Role of the airport operator	Airport operator is the only supplier within the airport.
Sources of revenues for the airport operator	Rents.

TE 3	Rental to the government
Definition	Rental of facilities to the government (customs, Royal military police).
(In-)Dispensability / Competition between airports	Service is indispensable at the airport (bound to the airport) or at an area close to the airport.
Number of suppliers	Service with single supplier. Some activities might also be performed outside the airport (e.g., employee parking), whereas others have to be performed at the airport (e.g., customs).
Role of the airport operator	Airport operator is the only supplier within the airport.
Sources of revenues for the airport operator	Rents.

Appendix B: List of cases

Chapter 4 (Working Package 2): Case reference

Note: This list contains the cases which Chapter 4 cites. These cases are related to the provision of infrastructure by airports. The cases which are related to transportation markets are important for the line of argument of chapter 4

Case number	Case name	Transportation markets	Airport markets	Reference in paragraph
M.5440	Lufthansa / Austrian Airlines	x		161
M.5403	Lufthansa / BMI	x		161
M.5181	Delta Airlines / Northwest Airlines	x		229
M.5141	KLM / Martinair	x		161; 178; 185; 194; 195; 227; 229
M.4164	Ferrovial et. al.		x	162; 167; 168; 186; 198; 243
M.3823	MAG et. al.		x	167; 168; 197
M.3770	Lufthansa / Swiss			161; 162; 178; 185; 229
M.3280	Air France / KLM	x		162; 178; 185; 190; 229
M.2262	Flughafen Berlin (II)		x	186; 229; 243
M.1913	Lufthansa / Menzies		x	243
M.1255	Flughafen Berlin (I)		x	167; 268; 197; 226; 229; 241; 243
M.1124	Maersk Air / LfV		x	239; 241
M.1035	Hochtief et. al.		x	167; 241
M.786	Birmingham International Airports		x	167; 186; 197; 241
COMP/37.730	Deutsche Lufthansa / Austrian Airlines	x		161
COMP/35.767	Ilmailulaitos / Luftfartsverket		x	186; 241
COMP/35.737	PO / AENA		x	186; 241
COMP/35.469	Portuguese airports		x	186; 241

Reference in paragraphs 164f, 201, 219 is also given to the market definition of the UK Competition Commission:

Competition Commission (2009), “BAA airports market investigation”, section 2.

Reference to a recent case related to supply-side substitution:

Case number	Case name	Reference in paragraph
M.5046	Friesland Foods / Campina	215

Reference to NMa “Easyjet” is given in paragraphs 34, 35, 52:

NMa (2009), “Easyjet”, case number 200120/137.BT1377	189, 190, 207
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Appendix C: Commission notice - relevant market

Chapter 4 (Working Package 2): The Commission notice on the definition of the relevant market for the purposes of Community competition law (97/C 372/03).

The definition of the relevant market in chapter 4 is in accordance with the Commission notice on the definition of the relevant markets. This appendix summarizes the main ideas of the notice.

Paragraph 2 defines the aim of market definition: “Market definition is a tool to identify and define the boundaries of competition between firms. It serves to establish the framework within which competition policy is applied by the European Union.”

Paragraph 9 states that the relevant market is established by the combination of the relevant product market and the relevant geographic market. Paragraph 7 defines the term 'relevant product market': “A relevant product market comprises all those products and/or services which are regarded as interchangeable or substitutable by the consumer, by reason of the products' characteristics, their prices and their intended use.” Paragraph 8 defines the term 'relevant geographic market': “The relevant geographic market comprises the area in which the undertakings concerned are involved in the supply and demand of products or services, in which the conditions of competition are sufficiently homogeneous and which can be distinguished from neighbouring areas because the conditions of competition are appreciably different in those area.”

Paragraph 13 defines three main sources of competitive constraints: “Firms are subject to three main sources of competitive constraints: demand-substitutability, supply substitutability and potential competition.” Demand substitution “constitutes the most immediate and effective disciplinary force on the suppliers of a given product, in particular in relation to their pricing decisions. ... Basically, the exercise of market definition consists in identifying the effective alternative sources of supply for the customers of the undertakings involved, in terms both of products/services and of geographic location of suppliers.”

Paragraph 14 states that demand-side substitution is the main factor which determines the relevant market. Supply-side substitution plays a role only as described in paragraphs 20 to 23. Beyond this, supply-side substitution is taken into account at the stage of competitive assessment. This is also the case for potential competition, which is not regarded at the stage of market definition.

Demand substitution: Paragraph 15 states that the aim of demand substitution is to determine the “range of products which are viewed as substitutes by the consumer.” One way of doing so is the SSNIP-test. This test covers the question, if a hypothetical small but permanent relative price increase of 5-10 percent leads to substitution which makes the price increase unprofitable (if so the market is broader, if not the product market has been found). Paragraphs 16-19 explain the basic ideas of this test.

Supply substitution: Paragraph 20 states, that “supply-side substitutability may also be taken into account when defining markets in those situations in which its effects are equivalent to those of demand substitution in terms of effectiveness and

immediacy. This means that suppliers are able to switch production to the relevant products and market them in the short term without incurring significant additional costs or risks in response to small and permanent changes in relative prices.” ‘Short term’ in this context is defined as “a period that does not entail a significant adjustment of existing tangible and intangible assets”. Paragraph 21 states that supply-side substitution typically arises when “companies market a wide range of qualities or grades of one product”, which are not substitutable from a customer’s point of view. Paragraph 22 gives an example (paper industry), and paragraph 23 notes that when “supply-side substitutability would entail the need to adjust significantly existing tangible and intangible assets, additional investments, strategic decisions or time delays, it will not be considered at the stage of market definition.” In these cases, supply-side substitution may play a role at the stage of the competitive assessment, but not at the market definition stage.

Potential competition: Paragraph 24 states that potential competition is not taken into account at the market definition stage, but at the stage of the competitive assessment.

Paragraphs 25 to 52 cover the *evidence relied on to define relevant markets:*

First, the product dimension (paragraphs 25-27) plays an important role. Paragraph 25 states, that different types of evidence exist, and that “the Commission does not follow a rigid hierarchy of different sources of information or types of evidence.” Section 26 covers the idea, that “the question will usually be to decide on a few alternative possible relevant markets.”

Second, paragraphs 28 to 32 cover the geographic dimension. The definition has to start with a working hypothesis, and is based on the analysis of demand characteristics. If necessary, a further check of supply factors will be carried out. Paragraph 30 states that this may include questions related to “distribution channels, costs associated with setting up a distribution network, and the presence or absence of regulatory barriers arising from public procurement, price regulations, quotas and tariffs limiting trade or production, technical standards, monopolies, freedom of establishment, requirements for administrative authorizations, packaging regulations, etc.” Trade flows may also indicate the geographic dimension. Paragraph 32 states that the Commission takes the “continuing process of market integration” into account.

Paragraphs 33 and 35 refers to the *process of gathering information*, for instance through interviews.

Paragraphs 36 to 43 state what can be considered as *relevant evidence in terms of product dimension*. Product characteristics may be a first step, but the focus must be on substitutability. Paragraph 38 states that a shock-test may be relevant, (like the introduction of the air passenger tax at Schiphol airport), paragraph 39 refers to quantitative tests, paragraph 40 to the views of customers and competitors, and paragraph 41 to consumer surveys and other indicators of preferences.

Paragraph 42 addresses barriers and costs associated with switching demand. If they exist, this “might prevent the Commission from considering two prima facie demand substitutes as belonging to one single product market.” There are different

types of switching costs like regulations, constraints in downstream markets, sunk costs, necessary capital investments or the loss of customers.

Paragraph 43 addresses different categories of customers and price discrimination. It states: "A distinct group of customers for the relevant product may constitute a narrower, distinct market when such a group could be subject to price discrimination. This will usually be the case when two conditions are met: (a) it is possible to identify clearly which group an individual customer belongs to at the moment of selling the relevant products to him, and (b) trade among customers or arbitrage by third parties should not be feasible."

Paragraphs 44 to 52 state what can be considered as relevant evidence for conclusions on the geographic dimension. This may be past evidence (paragraph 45) or basic demand characteristics like national preferences (paragraph 46). The Commission will take the views of customers and competitors (paragraph 47), current geographic patterns of purchases (paragraph 48), trade-flows and shipments (paragraph 49), and barriers and switching costs associated to divert orders into account (i.e. transport costs, different types of legislation; paragraph 50).

Paragraphs 53 to 55 cover issues in the calculation of market shares (values versus sales), and the notice finishes with some additional considerations in which the application of the principles have to be undertaken with care (paragraph 56).

Paragraph 56 refers to primary and secondary markets. "A narrow definition of market for secondary products, for instance, spare parts, may result when compatibility with the primary product is important. ... A different market definition may result if significant substitution between secondary products is possible or if the characteristics of the primary products make quick and direct consumer responses to relative price increases of the secondary products feasible." Paragraphs 57 to 58 refer to chains of substitution.

Appendix D: Demand-side substitution

Chapter 4 (Working Package 2): The reasoning for demand-side substitution – explanation of the SSNIP test.

As shown in Appendix C demand side analysis is an important part of market definition and the SSNIP test is a tool that is often used in this analysis.

SSNIP is the abbreviation for “Small but Significant Non-transitory Increase in Prices”. It addresses the question if several imperfect substitutes belong to the same product market or not.

The idea of the SSNIP-test is as follows: Start with a very narrow definition of the possible relevant market and assume that all producers behave like a hypothetical monopolist, that is they jointly maximize their profits. If then a hypothetical price increase of 5-10 % increased profits of that monopolist, this is an indication that no substitutes exist, which from a customers' point of view serve as an alternative to the goods considered. Accordingly, the market should be defined that it only contains these goods, and it should not be enlarged further to also include other goods. In case the price increase was not profitable, this gives indication that substitutes (not yet considered in the market definition) are readily available, which from a customers point of view serve as alternatives. Hence it is necessary to also include them in the market, because they put a competitive constraint on the products just considered. Then the SSNIP-test has to be repeated again, now taking the enlarged market definition as a starting point which also includes the closest substitutes. This procedure needs to be repeated (hence the market is enlarged step by step) until it is not possible to find alternatives which exert a competitive constraint, that is in this case a hypothetical price increase was profitable. The appropriate market definition is now found. It is as wide as necessary to include all relevant substitutes, but not too broad to also include goods which are not considered as alternatives by the customers.

A hypothetical example might help to understand the idea. Think of a competition authority which has to decide on a merger in the apple-industry. The task is to find out if it is appropriate to define a market called “apples”, or a wider market called, say, “fruits”. The SSNIP-test then indicates that the competition authority should first start with a market called “apples”. It needs to assess if it was profitable for all companies which produce apples to jointly increase prices by 5-10%. If this was the case, other fruits do not exercise enough competitive pressure on apple-producers, because customers do not substitute apples against other fruit, say pears. The appropriate market definition is then “the market for the production of apples”. In case the answer to the test is “no”, there are other goods available, which make the price increase unprofitable. The competition authority in a next step has to identify the closest substitutes, say pears, and include it in the market definition. The exercise then starts again. Does a joint hypothetical price increase of *all* apple *and* pear producers increase profits? If so, the market has to be widened again, maybe up to a point where it is appropriate to include all fruits (in which case the appropriate market definition is the “market for the production of fruits”). If not, the exercise stops and it is appropriate to define the market as the “the production of apple and pears”.

It is noteworthy that the SNIPP-test can be used in two ways. First, it serves a tool aiming to think the right way about market definition. An estimation of demand effects

does not take place. Due to data and time restrictions, this is the way the SSNIP-test is usually applied in competition policy. Second and less often exercised are fully specified econometric estimations.

Appendix E: Supply-side substitution

Chapter 4 (Working Package 2): The reasoning for supply-side substitution

The test for supply-side substitution consists of two subtests, the “SSS-test” and the “NUS-test”. All citations given here are taken from the Commission's report on supply-side substitution, p. 4-6.¹⁸⁴ For a discussion of these aspects, also compare chapter 2.4 of this report. For a discussion of the role of supply-side substitution in EU case law, compare chapter 3.

The SSS-test checks if supply-side substitution may play a role in that particular case. The type of reasoning is as follows:

- “(a) What assets are needed to produce the relevant products? In this respect, competition authorities should assess whether the manufacturers of supply-side substitutes possess the required technology, know-how, machinery and facilities; have access to the appropriate transport infrastructure and distribution channels; and, finally, possess the relevant marketing assets, such as brand name, and/or the ability to develop those assets within a reasonable period of time.*
- (b) If any assets are missing, can these be acquired without the need for significant, irreversible new investments, by buying assets that involve no sunk costs and/or contracting with third parties? (c) Do manufacturers of supply-side substitutes have the (economic) incentives to engage in production of the relevant goods/services?*
- (d) Are they able to divert production from supply-side substitutes to the relevant products, or are they contractually committed to continue production of existing products?*
- (e) Do they possess unused plant capacity that can be brought into production at a reasonable cost?*
- (f) Will consumers regard their products as valid substitutes for the existing set of products?*

If the answers to these questions (which we denote as the “supply-side substitution test” or SSS test) were affirmative, we would be able to conclude that supply-side substitutability effectively constrains the behaviour of incumbents and that it does so as effectively as demand substitution.”

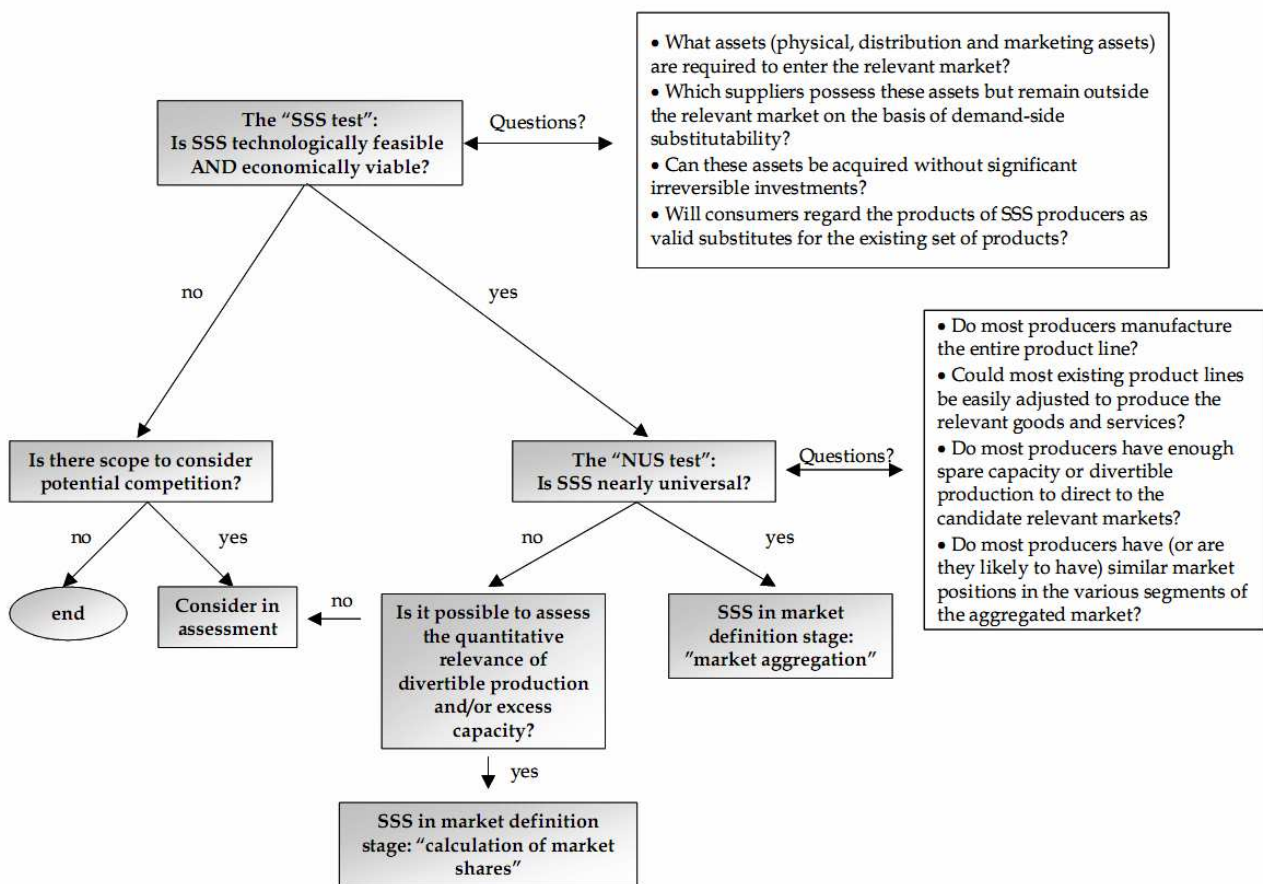
If this test leads to the conclusion that supply-side-substitution may play a role, in the second step it needs to be checked if supply-side substitution is “near-universal” (“NUS-test”). The test addresses the question if there is enough switching in terms of capacity, product range, ease of adjustment and market positions such that supply-side substitution effectively restricts competition. The report states:

“But market aggregation requires more than just the existence of a few producers able to adjust their production lines in response to higher prices for the relevant products. The supply-side response should be nearly universal.

¹⁸⁴ Padilla (2001), “The role of supply-side substitution in the definition of the relevant market in merger control. A report for DG Enterprise A/4, European Commission”. To be found at: http://ec.europa.eu/enterprise/newsroom/cf/document.cfm?action=display&doc_id=433&userservice_id=1&request.id=0.

Consequently, competition authorities should not only identify potential sources of supply-side substitutability but should also convince themselves about their universal character before moving on to aggregate markets for products that are not demand substitutes. This may require investigating whether most producers are already manufacturing the entire product line; most existing product lines could be easily adjusted so as to produce the relevant products; most producers have either enough spare capacity or could divert enough production from other goods to effectively respond to an increase in the prices of relevant products; and most producers have (or are likely to have) similar market positions for the various products that form the resulting (enlarged or aggregated) relevant market. This is what we shall denote as the “near-universal substitutability test” (or NUS test).”

Page 90 of the report provides a helpful summary:



Appendix F: Commission guidance – market power

Chapter 5 & 6 (Working Package 3 & 4): Communication from the Commission – Guidance on the Commission’s enforcement priorities in applying Article 82 of the EC Treaty¹⁸⁵ to abusive exclusionary conduct by dominant undertakings (2009/C 45/02).

The assessment of market power in working package 5 and 6 is in accordance with the Commission guidance on the definition of the market power. This appendix summarizes the main ideas of this communication.

Paragraph 9 introduces assessment of market power as a first step in the application of article 82 and its significance: “According to the case-law, holding a dominant position confers a special responsibility on the undertaking concerned, the scope of which must be considered in the light of the specific circumstances of each case.”

Paragraph 10 defines market power or market dominance: “Dominance has been defined under Community law as a position of economic strength enjoyed by an undertaking, which enables it to prevent effective competition being maintained on a relevant market, by affording it the power to behave to an appreciable extent independently of its competitors, its customers and ultimately of consumers.” It further explains this notion of independence in relation to the degree of competitive constraint exerted on the undertaking in question: “Dominance entails that these competitive constraints are not sufficiently effective and hence that the undertaking in question enjoys substantial market power over a period of time. This means that the undertaking’s decisions are largely insensitive to the actions and reactions of competitors, customers and, ultimately, consumers.” Finally paragraph 10 states that market power does not rule out competition: “The Commission may consider that effective competitive constraints are absent even if some actual or potential competition remains.”

Paragraph 11 defines the outline of how to assess market power: “The Commission considers that an undertaking which is capable of profitably increasing prices above the competitive level for a significant period of time does not face sufficiently effective competitive constraints and can thus generally be regarded as dominant.” It further explains this concept: “... the expression ‘increase prices’ includes the power to maintain prices above the competitive level and is used as shorthand for the various ways in which the parameters of competition - such as prices, output, innovation, the variety or quality of goods or services - can be influenced to the advantage of the dominant undertaking and to the detriment of consumers.”

Paragraph 12 refers to factors of the competitive structure of the market that need to be taken into account for the assessment of dominance:
“- constraints imposed by the existing supplies from, and the position on the market of, actual competitors (the market position of the dominant undertaking and its competitors),

¹⁸⁵ Now article 102 of the [Treaty on the Functioning of the European Union](#) (TFEU).

- constraints imposed by the credible threat of future expansion by actual competitors or entry by potential competitors (expansion and entry),
- constraints imposed by the bargaining strength of the undertaking's customers (countervailing buyer power)."

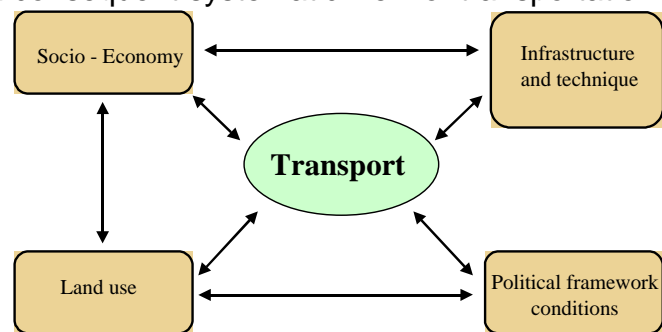
These factors are further explained in paragraphs 13-18. The rest of the communication is focused on abusive exclusionary conduct by dominant undertakings, which is out of scope for this study.

Appendix G: MKmetric Methodology

Chapter 5 (Working Package 3): Mkm Methodology - System approach VIA

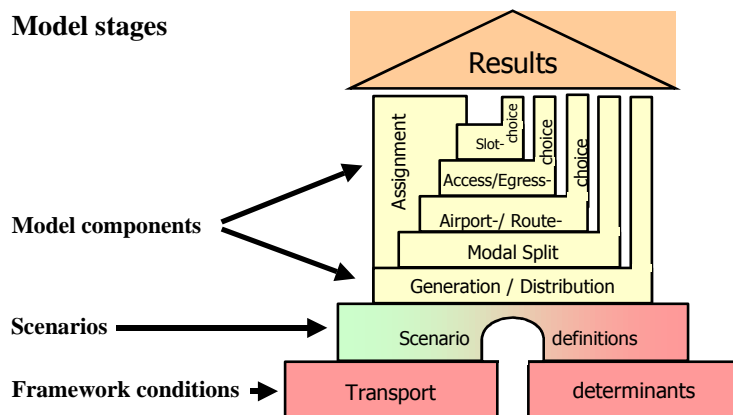
Within this section we describe the principle method and models which will be used to deal with the requests of forecasting different type of scenarios under consideration of the global transport market but the hereunder said is valid as well for complex analysis of the transport market. For the ones more interested in the academic background of the econometric models publications are listed for an in deep study of the mathematical details. In addition the description provides the essential characteristics and features a model must reflect when dealing successfully with the forecasting tasks outlined in the tender's specification.

The analyses provided are based on a consequent systematic view of transportation. It is therefore necessary to embed air transport forecasting and simulation in a framework of relevant relationships that include and take into account the whole transport market as well as demographic, economic, political, spatial and technical components. A modelling process based on these interrelationships explains the transport market by multimodal and multisectoral determinants. This approach ensures the consistency of the whole model system in every step of the simulation process as the models always process balanced figures of all endogenous measures. Hence, no transport activity appears or disappears unexplained within the system. Changes in the system's state are substitutive or complementary and synergetic effects, as well as competition, lead to new situations concerning diversion, accessibility or attractiveness. These effects can be analysed with respect to modes (e.g. road, rail, sea, air) and/or trip purposes (e.g. business, vacation, private).



In the light of the complexity stated above it is obvious that there must be a sequence of models dealing with all the interrelationships and dependencies. A generation-

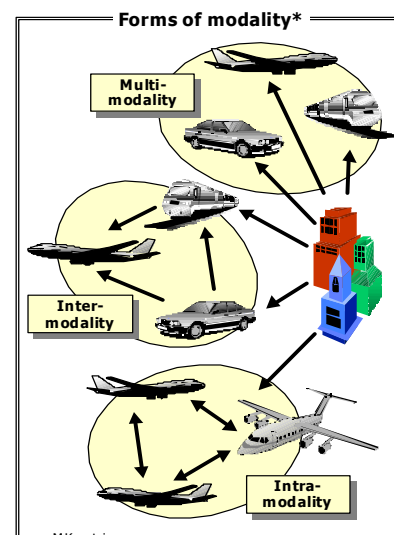
Model stages



distribution model computes the total traffic volumes, where they emerge and whereto they are directed (see the detailed publications: 'Entwicklung eines gekoppelten Verkehrserzeugungs- und verteilungsmodells für den Personenfernverkehr - Development of a linked trip generation and distribution model for long distance

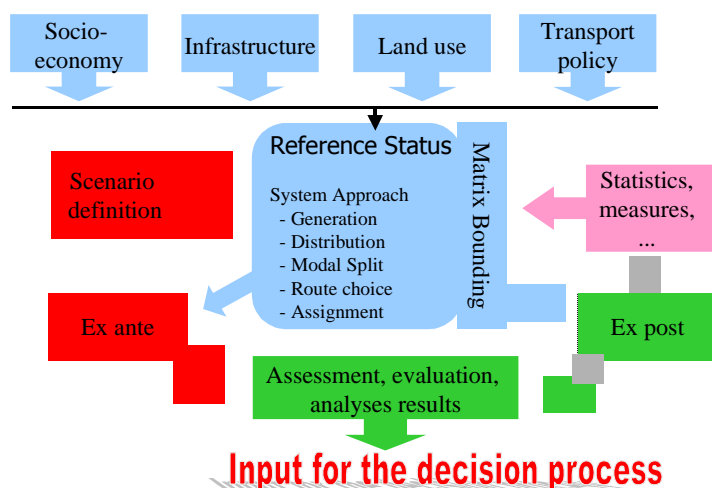
passenger traffic' on behalf of the German Ministry of Transport FENr.: 60307/92; Université de Montréal Centre du Recherche sur les Transports (C.R.T.), MKmetric GmbH, University of Karlsruhe (TH) Institute of Economic Policy and Research (IWW); Gaudry M., Mandel B., Rothengatter W.; and 'Introducing Spatial Competition

through an Autoregressive Contiguous Distributed (AR-C-D) Process in Intercity Generation-Distribution Models within a Quasi-Direct Format (QDF)' Université de Montréal C.R.T., MKmetric GmbH Karlsruhe, Universität Karlsruhe (TH) Institute of Economic Policy and Research (IWW); Gaudry M., Mandel B., Rothengatter W.; CRT-971). A mode choice model is used to identify the consumer's elasticities with respect to the alternative modes air, rail and road (see the detailed publication: 'Schnellverkehr und Modal Split - High Speed Transport and Modal Split' Baden Baden: Nomos Verlag; Mandel B.). Some additional models are needed to face the problems of access/egress choice to the airports and route choice to explain the consumers selection of services (see the detailed publications: 'Airport Choice & Competition - a Strategic Approach', Mandel B.; 3rd Air Transport Research Group (ATRG) Conference; Hong Kong; and 'Measuring Competition in Air Transport'; Airports and Air Traffic - Regulation, Privatisation and Competition Hamburg, Germany, HWWA; Peter Lang Press; Mandel B.; and 'The Interdependency of Airport Choice and Travel Demand; Taking stock of air liberalisation' Proceedings of the International Symposium at the ICAO; Kluwer Academic Press; Mandel B.). Last but not least, assignment procedures are required to compute impedances which reflect the attractiveness of each alternative based on the infrastructure networks of all modes. Concerning the terms transport determinants, scenario definitions and results we refer to the input, objectives and output sections of our proposal which display in detail the data and information used respectively produced in context of the scenarios requested by the tender.



To encounter the effects from one decision level respectively model level to the other, one links the modelling steps by the quasi-direct format using the representative utility function of the lower level models in the upper ones as an additional explanatory variable, which is called modal utility index. The details can be depicted from the following publication: 'Methodological Developments within the Quasi-Direct Format Demand Structure: the Multicountry Application for Passengers MAP-1'; Strategic European Multi-Modal Modelling Gaudry M., Heinitz F., Last J., Mandel B.; Working Paper BETA n°9815. The linkage of the model levels is as well a prerequisite for the reflection of the interdependencies within the decision process of a consumer. This may concern the relationship of the consumer's choice and travel demand as well as the one concerning the competition of modes (multi-

modality – rail-road-air-sea), the co-operation of modes (inter-modality – transport chains across modes like rail&fly, sea-road) and the competition within a transport mode system (intra-modality – e.g. selection of different routes including various transfer hubs and airports at the origin and destination). As example it is referred to the classical example of the



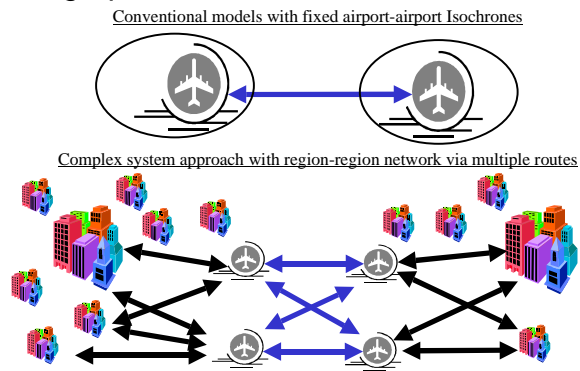
establishment of high speed rail services like the TGV which reduced the air traffic significantly between Paris and Lyon, Brussels or Strasbourg (multi-modal effect). On the other side the establishment of a new high speed rail service station at an airport like in Frankfurt resulted in a huge extension of the catchment area (intra-modal effect) and substituted short haul flights (inter-modal effects). In the light that consumers always try to maximise their utility and do not follow a static behaviour such effects have to be considered to draw a realistic picture of the transport system and the effects which occur when taking strategic, tactic and operational decisions.

The analysis of the forecast can either be based on an ex post or ex ante scenario. While the basic framework data of a reference year for an ex post analysis are available from national statistical offices or published respectively commercial sources like schedules, the data for an ex ante scenario have to be worked out for the specific year to be forecasted. The scenario definition is the client's freedom if requested.

The ex-post forecasts can be used in two ways. First of all the representation of a given reference year is important to validate the systems output in front of the reality, say measured observations like statistics. This exercise is envisaged by a matrix bounding approach and has to be executed always at first when setting up the system for a project to ensure a high quality of results. Second the ex-post forecast can be used to answer the question: 'What would have been the effects, if a certain determinant of transport would have been changed?'. So without any bias due to uncertainties every assumption of future developments have, one can investigate transport policy actions or strategic respectively tactical changes of the market participants. In addition market potentials of new routes can be investigated under *ceteris paribus* conditions of the existing market.

The ex-ante forecasts allow for a wide range of scenario simulations. Any change of the transport determinants described within the framework conditions can be applied and will lead to effects. Whether one or a bunch of determinants change does not matter for the system approach as all influencing factors will interact consistently according to the linkage of all econometric models engaged. Therefore a scenario can consider the effects of e.g. implementation of kerosene tax, the establishment of a new airport, the instalment of new high speed rail services and a change of the home base carries network strategy at the same time. Obviously network dynamics as well as more complex socio-economic interrelations are covered across all modes. To reflect a realistic picture of the transport activity itself it is necessary to mirror the situation a consumer is facing to a maximum extent. Therefore the base to start up concerns the location of the travelers, respectively the place they live and the place they want to go to as usually people neither live nor make vacation at an airport, they just use transport systems to overcome the impedance between two locations e.g. their home or office as origin and the destination beach or business place in focus. In respect of this principle the transport flows have to be modeled from door to door respectively region to region. The system approach uses for the European member states the NUTS 3 level as representation of the travelers location and the rest of the world is reflected by larger zones based on administrative boundaries on NUTS 2, 1 or 0 level (in total about 2000 regions).

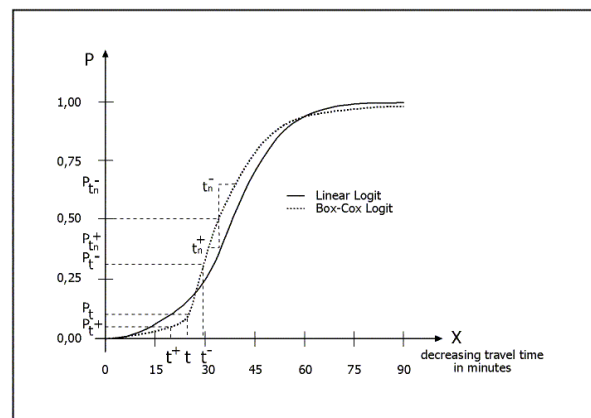
The graph embedded in the text shows for the example of the air mode the difference of the conventional static approach and the more complex dynamic network approach we follow. In consequence of the regionalisation all the mode specific networks have to be compatible with this level of detail. So the road network consists out of links down to the third order of streets (ca. 2.8 Mio. links) and the rail network considers rail services according to the published schedules reflecting



different service types. The air mode considers within Europe all airports with published services in the OAG plus more than 150 representative airports for the rest of the world. Of course the air services are reflected as published in the schedules as well. Only in combination of detailed regionalisation and detailed network representation a model is flexible enough to deal with the network dynamics of the transport market. Thus results of the system approach are dynamic, e.g. the catchment of an airport depends on the air services offered at all competing airports and can be different for each route and passenger segment (resp. trip purpose).

Besides other specifics like the competition and the complementarity of destinations, the importance of services at the right time slices / slots, the effects of regional differences in purchase power or geo-metrics and the interrelationship of mobility and oil price which could all be discussed at this point we finally want to draw your attention to some technicalities of the functional forms encapsulated in the models.

Even if models fulfil all the before mentioned criteria it is essential to know what type of functional form do they use. Analysis based upon observations drawn from travel surveys and traffic counting show that consumer do not behave linear. First they tend to reverse their decision according to changes in the attractiveness of an alternative (e.g. the reduction of a trip duration by 30 minutes will have larger effects on short haul routes than of long haul routes as it makes a proportional higher difference to travel one hour instead of 1:30 h in comparison to travel 7 h instead of 7:30 h) and second they are as well to a certain extend inelastic (e.g. one day return trip above 600 km distance requires air mode and the reverse some people fear to fly). To encounter these behavioural issues the mathematical form of a model has to allow for adjustments of the curvature measured on the base of observations. Such additional freedoms must be estimated simultaneously so that each characteristic describing an alternative is weighted correctly in relationship to all the other characteristics to reflect the balance of its influence upon the traveller. The freedoms we talk about concern the non-linearity (see the graph embedded in the text) and the captivity of functional form. To explain their importance two simple interpretations out of daily live are provided in the following. People with a certain low monthly budget could not afford to travel by air 10 years ago, today with low cost offers from LCC's and legacy carriers they can, so a certain threshold was passed and people started to travel by air. Another example



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concerns the saturation effect captured as well by captivity as people have a certain time budget available for trips which can not be extended even interesting offers are available at the market, e.g. limitation of vacation time.

Please note that the methodological description provided just sheds a light upon the principles of the system approach but all publications can be withdrawn from the following web site: www.mkm.de section publications/papers which allows an in deep study and discussion of the mathematical background of each model component including the reflection upon the transport related effects reflected by the case studies displayed in the papers. As a principle MKMetric shares know how with the scientific community by publishing research results and contributing to conferences.

Input data and sources of information

Various information is necessary to describe the framework of air transport determinants. Whenever possible the source of information used will be withdrawn from national administrations to ensure a consistency with the overall policy. If information are not available from these official sources the most appropriate data will be used from well known and widely accepted sources like UN, world bank, European Commission (Eurostat, DG-TREN incl. available project data) and commercial suppliers like OAG, Hafas, PKP, stock markets, Airbus, Boeing, Embraer, Bombardier, ATR, ICAO, IATA, ACI as well as in house sources to encounter data gaps for the forecasting task.

Moreover the air transport statistics provided to Eurostat by each EU member state according to regulation (EC) No. 437/2003 of the European parliament and the council of 27. February 2003 on statistical returns in respect of passengers, freight and mail by air are used. Missing information from EU-member states as well as of non EU-member states will be used as published by the national statistical offices. Data gaps will be handled by the in house databank and modelling tools.

The following tables list the data and information to be implemented and reflect the framework information of the system approach.

Concerning the infrastructure the following information is required:

Infrastructure determinants	
Airports	<ul style="list-style-type: none"> – Air schedule – Runway length, capacity/h, MTOW – Number of aprons – Operation time – Check-in, check out time for domestic, Schengen and international flights – Minimum connecting time for DD, DI, ID, II flights (where D= domestic and I= Intercontinental) – Average walking time (entrance - check-in / check-out - entrance) – Any restrictions in operation
Rail	– Rail schedule
Road	– Road network

It has to be noted that the status of the implemented infrastructure concerns about 450 airports in Europe and more than 150 in the rest of the world, the existing road network connecting all regions in Europe on NUTS 3 level and the actual rail schedules of 2008 as well on NUTS 3 level for Europe (ferries are included in the rail and road network where appropriate).

Concerning the computation and distribution of the air transport potential the following information is required for implementation:

Socio-economic determinants	
Social	<ul style="list-style-type: none"> - Population, age structure, gender - Migration (incl. distribution)
Economic	<ul style="list-style-type: none"> - GDP by three sectors, employment, purchase power - Oil / kerosene fuel price (concern forecasts / assumptions) - Trade flows (by commodity group if available)
General	<ul style="list-style-type: none"> - Globalisation trend - Liberalisation slope - Privatisation activities

Please note that most information for the EU are already covered by the published statistics of EC-Eurostat or at organisations like UN and world bank in the one or other way and therefore already available. To a certain extent there is a trade off between homogeneity of data and the priority of national compatibility across different Ministries. The priority has to be assigned in the light of available national sources and the project schedule. In case of no priority of the client we recommend to go for the maximum homogeneity of data which can be obtained.

The land use determinants are restricted to new infrastructure implementations at the usual stage. But it would be as well possible to change the regions character in case the housing etc. exceeds the usual developments. The basic information about land use is derived from satellite pictures on a 200x200 square meter base where the land use is accordingly classified to the geographic rules.

Concerning the forecasts of the air transport potential a variety of information can be modified. As example the following information about transport policy is usually required for a more general scenario definition but in principle any variable within the models can be changed like any network can be modified:

Transport policy determinants	
Environment	<ul style="list-style-type: none"> - Emission trading, night bans, air noise restrictions
Consumer relevant cost components	<ul style="list-style-type: none"> - Kerosene tax, fuel tax - Security charges, landing fees - Tolls
Air service agreements	<ul style="list-style-type: none"> - Bilateral agreements of Poland with other non EC-countries
Policy relevant initiatives and regulations driven by the EC	<ul style="list-style-type: none"> - Security, safety - Ownership clause - Secondary slot trading - Public service obligations - Subsidy constraints - Tariff publication - Single sky instalment - Galileo - Air service agreements (horizontal, open sky)
Stakeholder strategy	<ul style="list-style-type: none"> - alliance structure (incl. hub strategy) - share deals in the airline and airport industry

	<ul style="list-style-type: none"> - airport co-operations and investments - carrier structural trends (LCC, legacy, charter, cargo)
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Remark concerning modelling

For the model estimations as well various data have been used as there are

- national mobility surveys
- panel data, household surveys
- DATELINE EC survey,
- airport surveys (executed by airports or Civil Aviation Authority)
- tourism survey

The surveys we use are inter-linked by us due to the fact that we consider all modes and not just air transport. So we can use mobility and panel surveys from national and international sources which are usually not in the focus of the airports or airlines as they do not maintain train schedules or road network models and all the routines and algorithms dealing with the mode specifics. In addition we are happy that a lot of airports value our work and allow us to do research upon internal data as well.

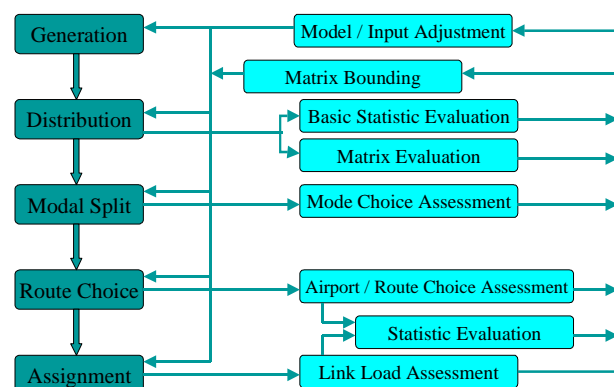
The principle way forward to make use of these surveys is as follows:

- check of the surveys for outliers, mistakes,
- harmonise their coverage and representation
- add the mode specific impedances to the observed trip
- add competing trip alternatives to the data set and
- include the mode specific impedances accordingly
- add region specific socio-economic data
- add region specific attractors

Having prepared the data sets, we extract the estimation base, run regression analyses whereby we prefer TRIO software, test variables on significance, stability, functional form etc. and like usual we hope that our modellers ignorance will be minimal.

Concerning the model test we

- implement the models in the data and algorithm frame
- run an ex post simulation of the observed year
- control the results on different levels by link and node statistics
- identify gaps or model misbehaviour
- check for modellers ignorance, the model, input, survey database



Finally we iterate this sequence until no improvement can be observed or misbehaviour can be explained by outliers. Once this calibration process terminated the final ex post simulation will be executed to produce the reference case as base for all further simulation scenarios.

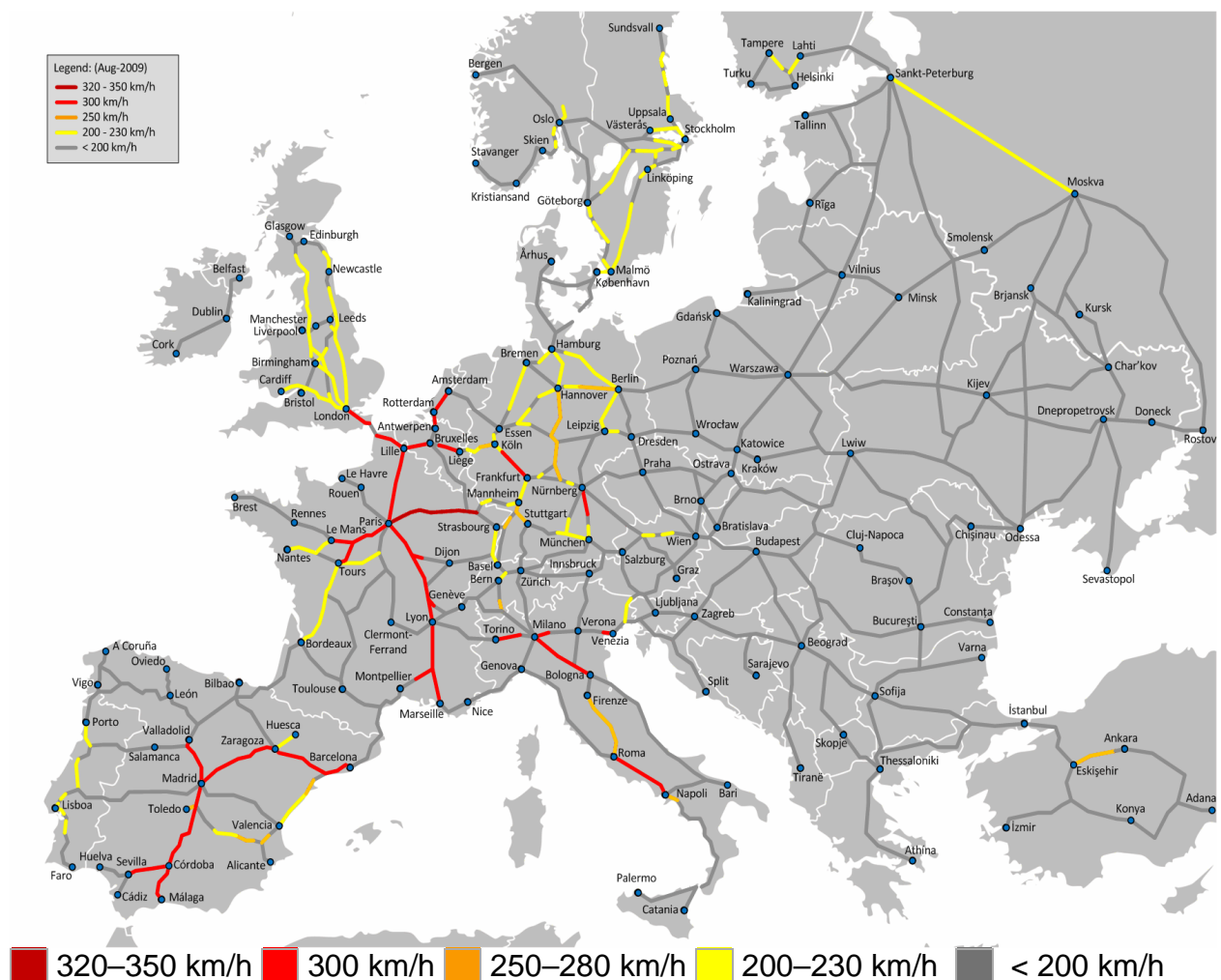
Appendix H: Literature survey – high-speed rail

Chapter 5 (Working Package 3): A literature survey on the potential of high-speed rail and competition with air travel

As can be seen from the Figure below, we are still rather far from realizing the full potential of high speed train travel. Despite presence of a number of markets on which high speed rail led to serious decrease in or complete disappearance of the air services (Paris-Lyon, Paris-Brussels, Madrid-Sevilla); a substantial number of metropolitan areas are still not connected by high-speed rail service, and in general a lot of rail network development happens at the national level.

Amsterdam is currently connected to a very limited number of cities with HSR services. HSL-Zuid made rail service on important Amsterdam–Paris and Amsterdam–London markets attractive relative to air travel; however, railroad connections with other countries, especially Germany, remain underdeveloped.

Figure 1: High-speed lines in Europe, August 2009



Studies on air-rail substitutability

Gonzalez-Savignat (2004) conducts a survey of travelers on Barcelona-Madrid HSR line to evaluate responsiveness of business and leisure travelers to price and non-price characteristics of rail services. In addition to discovering the obvious fact that leisure travelers are more price sensitive, the author finds that business travelers are found to be more sensitive to travel time changes than leisure travelers.

Greengauge 21¹⁸⁶ (2006) investigate the effects of introduction of high-speed rail at Heathrow and find that such a development will likely bring a transformation in general rail access to the airport from such geographical regions as North England and Scotland, as well as the near-continent (France, Belgium, the Netherlands and parts of Germany). New opportunities for rail freight access to Heathrow may also emerge. This in turn can increase competitiveness of Heathrow Airport. According to the authors, rail competes with air transport on journeys lasting 2 to 3 hours, where otherwise air transport has an advantage over rail. The report also lists the routes vulnerable to HSR competition, as well as evaluates the corresponding passenger volume at risk. Routes from London to Edinburgh, Manchester and Glasgow have been determined as vulnerable to HSR competition. In total, competition with high-speed rail is expected to encompass up to 5,483,000 passengers on the UK domestic market. Paris, Frankfurt, and Amsterdam are examples for the European routes that are subject to high-speed rail competition; total exposure of international routes to HSR competition is estimated at 7,335,000 passengers per year.

Studies evaluating effect of HSL Zuid

Introduction of HSL Zuid or High-Speed Line South on September 7, 2009 has considerably shortened travel time on a number of routes. The travel times from Amsterdam to Paris decreased by one hour (25%) and from Amsterdam to London by two hours (by 33%).

Beek (2008) expected market share of air travel to Paris to drop by 15 % and to London by 33%. Brown (CEO of Eurostar high speed rail company) expected the impact to be even higher, suggesting the number of Dutch people travelling to London by train would increase fivefold from 100.000 to 500.000 per year.

Jorritsma (2009) analyses the substitutability between air and rail transport in the Netherlands. According to this research, approximately 1.6 million passengers may switch from air transport to the HSR by the year 2020. This is estimated to be roughly 2.5% of total air travel volume in 2020. Substitution potential on the Amsterdam-Brussels, Amsterdam-London and Amsterdam-Paris routes were estimated with logistic regressions.

Terpstra (2009) evaluated the impact of HSL Zuid on market share of Amsterdam airport. The results suggest a strong market position of AMS in comparison to the other airports. AMS is likely to steal some market share from DUS and FRA, whereas BRU is likely to capture some market share from CDG. In addition to that, it is suggested that an improvement of the access times to AMS will have more impact on BRU than the other way around. The author ultimately concludes that AMS may indeed gain some market share after HSL-Zuid at the expense of the competing

¹⁸⁶ Greengauge 21 was founded in 2006 by Jim Steer, one of the UK's leading transport sector specialists, as a not-for-profit organisation which aims to research and develop the concept of a high speed rail network, and to promote its implementation as a national economic priority.

airports (DUS, BRU, FRA, CDG). Note that Terspstra does not analyze potential impact of HSL Zuid on Amsterdam-London market.

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Appendix I: Literature survey – market power

Chapter 5 (Working Package 3): A literature survey on the assessment of market power of airports

Airport competition – general

Airport choice behavior is the major element of airport competition. This decision generally depends on such factors as the size of the catchment area, access to transfer traffic, the operating performance, etc. We can talk about airport choice by both airlines and (where alternatives are available) passengers.

Starkie (2009) suggested that the expected reaction of an airline to airport charges depends on substitution possibilities between competitive airports and the price elasticity of its customers, i.e. the perceived attractiveness of the airport from the viewpoint of passengers. This perception mainly depends on the location of the airport due to its importance for access times. Moreover, the location of an airport is also important for airport choice of airlines as it represents income levels and business activity of passengers, tourism potential and the level of transport connections.

A number of factors determine airport choice by passengers. These factors include airport characteristics and airport location relative to passenger's origin or destination. The former includes availability of flights, flight time, ticket price, frequency of flights. Here availability can take form of either flights towards a certain destination or flights from a certain favoured airline through frequent flyer memberships. Higher frequency of flights leads to broader selection of departure or arrival times. Flight time matters when deciding between direct and indirect flights. Factors related to the passenger's location primarily relate to airport accessibility, including access time and costs, and also parking facilities and costs (Kouwenhoven, 2008).

Location is an important factor determining the decision of both passengers and shippers (Tretheway & Andriulaitis, 2010). In order to be regarded as good substitutes, airports should have low enough access times as well as costs. But the degree of substitutability depends on the type of traffic, namely leisure or business. Leisure traffic is more price conscious than business so the nature of competition between airports differs. This is true for both O&D and transfer markets, with the former being much more price-sensitive.

A number of empirical studies use publicly available San Francisco Bay Area travel survey data to examine airport choice in the area served by three airports (San Francisco – SFO; Oakland – OAK; and San Jose - SJC). In general, passengers do not always choose the airport closest to their home or place of business (see also Ishii et al., 2006). San Francisco residents (and/or travelers whose destination is in San Francisco) are rather eager to choose airport other than SFO, in which case they tend to prefer OAK over SJC. Pels et al. (2001) show that travelers appear to choose airport first and airline later; Pels et al. (2003) demonstrates that travelers surveyed at the area airports exhibit high value of time. Basar and Bhat (2002, 2004) indicate that access time is an important determinant in travelers' choice of the airport.

Competition between area's major and secondary airports is also a determinant of airport competition. General costs of use such as airport charges for airlines and access costs and car parking costs for passengers are important factors here. Forsyth (2010a) examined this issue and concluded that it is difficult for major airports to compete with secondary airports as the former cannot change their price structure so easily due to sunk costs. Besides, major airports rely on the regulatory environment limiting their ability to quickly respond to price competition. As a result, prices cannot reflect costs as major airports want to recover their costs by prices quite above marginal costs and secondary airports use subsidies in order to set low prices. Hence, price competition between secondary and major airports does not necessarily lead to efficient outcomes.

Tretheway (2007) defines the characteristics of airport competition via four components: competition for shared local market, connecting traffic, cargo traffic and modal competition. Connecting traffic is regarded as the most important part of the total traffic at many airports, while cargo traffic is quite price sensitive and can be easily moved to alternative airports. Intermodal competition is most important for short-haul markets.

Competition for O&D and transfer passengers

Airports located in the same catchment area and/or offering overlapping routes tend to compete amongst each other intensively for O&D passengers. Particularly there is strong competition for LCC operations because the catchment area tends to be larger, so that kind of competition eliminates potential market power of airports which only serve low cost carriers (Forsyth 2010b).

Starkie (2002) suggested that an airport is likely to be most dominant when it acts as a major hub and when many passengers use this airport as a transfer point between their flights. Yet, the author also suggests that airport's market power may be limited if hub operator has a multi-hub network.

Adler and Berechman (2001) analyze performance of airports from the viewpoint of airlines and consider various quality factors that have direct impact of on airlines' cost of operation. These factors mainly involve delay data, runway capacity, local labour force costs and airport traffic control reliability. For this they develop a "multi-hub network" model to evaluate the profitability of potential airport networks for airlines. They use data envelopment analysis in order to measure the relative efficiency of airports and for quality ranking of given airports.

Burghouwt and De Wit (2009) apply the NetScan model in order to assess the competitive position of indirect as well as direct connections. The NetScan model quantifies an indirect connection and scales it into a theoretical direct connection so that the competitive position of airports can be analyzed in an integrated way, including also hub-and-spoke systems.¹⁸⁷

¹⁸⁷ The model mainly computes the number of direct and indirect connections for a given airport and weighs it for its performance regarding transfer and detour time. For all connections connectivity units (CNU) are used as indicator.

Airport-airline relationships

Button (2010) argues that an airport dominated by an airline may not be able to exercise its market power on this captive user freely. That is, a dominant airline may have a countervailing power. Such power depends on the accessibility of substitute airports and also on the switching costs that can occur even though the alternative airport has sufficient technical airport capacity.

We do not observe vertical integration between airports and airlines; however, there has been some changes. For instance, Lufthansa has participated financially in the construction of a terminal at Munich airport, which in turn gave Lufthansa the right to determine and influence the usage of terminal. Such a partnership has not only benefited the airline side but also helped the airport by reduction of its supplier infrastructure as well as the integration of its primary activities in inbound logistics. Hence such kind of alliances between airlines and their hub-airports can benefit both partners by enhancing the quality of transfer connection as well as other airport facilities. Albers et al. (2005) document similar partnerships and demonstrate that they are most common between the airports and the corresponding hub operators.

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Appendix J: Additional tables and figures

Chapter 5 (Working Package 3): Tables and figures

Table 5.1 Number of overlapping destinations with AMS – airport-pair market level

Year	BRU	CRL	DUS	EIN	ENS	GRQ	MST	NRN	RTM
2002	105	5	84	4	0	0	3	0	16
2003	99	7	98	4	0	2	3	1	15
2004	99	9	105	5	1	3	5	17	14
2005	105	6	114	6	0	1	0	1	15
2006	110	13	114	14	0	2	1	2	11
2007	111	19	121	14	0	2	3	11	13
2008	120	26	109	16	0	1	3	19	15
2009	127	32	111	24	0	2	4	32	16

Table 5.2 Number of overlapping destinations with AMS – city-pair market level

Year	BRU	CRL	DUS	EIN	ENS	GRQ	MST	NRN	RTM
2002	100	8	81	3	0	1	4	0	15
2003	95	11	95	3	0	2	4	1	14
2004	94	13	101	6	1	3	7	21	15
2005	98	10	111	7	1	2	2	5	16
2006	102	17	109	15	0	2	3	5	10
2007	105	24	115	17	0	2	4	14	12
2008	115	31	104	18	0	1	4	24	15
2009	120	39	104	25	0	2	5	37	16

Table 5.3 Exposure of AMS to nearby airports – airport-pair market level

Year	BRU	CRL	DUS	EIN	ENS	GRQ	MST	NRN	RTM
2002	53.30%	2.54%	42.64%	2.03%	0.00%	0.00%	1.52%	0.00%	8.12%
2003	46.05%	3.26%	45.58%	1.86%	0.00%	0.93%	1.40%	0.47%	6.98%
2004	42.86%	3.90%	45.45%	2.16%	0.43%	1.30%	2.16%	7.36%	6.06%
2005	44.30%	2.53%	48.10%	2.53%	0.00%	0.42%	0.00%	0.42%	6.33%
2006	47.62%	5.63%	49.35%	6.06%	0.00%	0.87%	0.43%	0.87%	4.76%
2007	45.31%	7.76%	49.39%	5.71%	0.00%	0.82%	1.22%	4.49%	5.31%
2008	51.95%	11.26%	47.19%	6.93%	0.00%	0.43%	1.30%	8.23%	6.49%
2009	54.04%	13.62%	47.23%	10.21%	0.00%	0.85%	1.70%	13.62%	6.81%

Note: Reported percentages correspond to the share of overlapping destinations relative to the total destinations served out of AMS

Table 5.4 Exposure of AMS to nearby airports – city-pair market level

Year	BRU	CRL	DUS	EIN	ENS	GRQ	MST	NRN	RTM
2002	54.95%	4.40%	44.51%	1.65%	0.00%	0.55%	2.20%	0.00%	8.24%
2003	47.50%	5.50%	47.50%	1.50%	0.00%	1.00%	2.00%	0.50%	7.00%
2004	43.93%	6.07%	47.20%	2.80%	0.47%	1.40%	3.27%	9.81%	7.01%
2005	44.55%	4.55%	50.45%	3.18%	0.45%	0.91%	0.91%	2.27%	7.27%
2006	47.66%	7.94%	50.93%	7.01%	0.00%	0.93%	1.40%	2.34%	4.67%
2007	46.67%	10.67%	51.11%	7.56%	0.00%	0.89%	1.78%	6.22%	5.33%
2008	53.24%	14.35%	48.15%	8.33%	0.00%	0.46%	1.85%	11.11%	6.94%
2009	54.79%	17.81%	47.49%	11.42%	0.00%	0.91%	2.28%	16.89%	7.31%

Note: Reported percentages correspond to the share of overlapping destinations relative to the total destinations served out of AMS

Table 5.5 Exposure of nearby airports to AMS – airport-pair market level

Year	BRU	CRL	DUS	EIN	ENS	GRQ	MST	NRN	RTM
2002	78.36%	50.00%	56.38%	80.00%	N/A	N/A	75.00%	N/A	88.89%
2003	76.15%	58.33%	64.47%	80.00%	N/A	100.00%	100.00%	100.00%	88.24%
2004	81.15%	52.94%	71.43%	62.50%	100.00%	100.00%	71.43%	80.95%	73.68%
2005	78.95%	42.86%	71.25%	75.00%	0.00%	50.00%	0.00%	16.67%	75.00%
2006	83.33%	56.52%	69.09%	87.50%	N/A	100.00%	33.33%	33.33%	73.33%
2007	77.08%	61.29%	72.46%	73.68%	N/A	100.00%	75.00%	61.11%	86.67%
2008	71.01%	57.78%	67.28%	76.19%	N/A	100.00%	75.00%	57.58%	71.43%
2009	76.97%	50.79%	69.81%	77.42%	N/A	50.00%	80.00%	54.24%	72.73%

Note: Reported percentages correspond to the share of overlapping destinations relative to the total destinations served out of the corresponding airport

Table 5.6 Exposure of nearby airports to AMS – city-pair market level

Year	BRU	CRL	DUS	EIN	ENS	GRQ	MST	NRN	RTM
2002	79.37%	80.00%	57.04%	100.00%	N/A	100.00%	100.00%	#DIV/0!	93.75%
2003	77.87%	91.67%	65.97%	100.00%	N/A	100.00%	100.00%	100.00%	93.33%
2004	83.93%	76.47%	73.19%	100.00%	100.00%	100.00%	100.00%	100.00%	88.24%
2005	80.99%	71.43%	74.00%	100.00%	100.00%	100.00%	100.00%	83.33%	88.89%
2006	84.30%	73.91%	71.24%	100.00%	N/A	66.67%	75.00%	83.33%	76.92%
2007	78.36%	80.00%	73.72%	94.44%	N/A	66.67%	80.00%	77.78%	92.31%
2008	73.25%	70.45%	67.97%	94.74%	N/A	50.00%	80.00%	75.00%	83.33%
2009	78.43%	63.93%	70.27%	89.29%	N/A	50.00%	100.00%	67.27%	80.00%

Note: Reported percentages correspond to the share of overlapping destinations relative to the total destinations served out of the corresponding airport

Table 5.7 Total destinations served, airport-pair market level

Year	AMS	BRU	CRL	DUS	EIN	ENS	GRQ	MST	NRN	RTM
2002	197	134	10	149	5	0	0	4	0	18
2003	215	130	12	152	5	0	2	3	1	17
2004	231	122	17	147	8	1	3	7	21	19
2005	237	133	14	160	8	1	2	1	6	20
2006	231	132	23	165	16	0	2	3	6	15
2007	245	144	31	167	19	0	2	4	18	15
2008	231	169	45	162	21	0	1	4	33	21
2009	235	165	63	159	31	0	4	5	59	22

Table 5.8 Total destinations served, city-pair market level

Year	AMS	BRU	CRL	DUS	EIN	ENS	GRQ	MST	NRN	RTM
2002	182	126	10	142	3	0	1	4	0	16
2003	200	122	12	144	3	0	2	4	1	15
2004	214	112	17	138	6	1	3	7	21	17
2005	220	121	14	150	7	1	2	2	6	18
2006	214	121	23	153	15	0	3	4	6	13
2007	225	134	30	156	18	0	3	5	18	13
2008	216	157	44	153	19	0	2	5	32	18
2009	219	153	61	148	28	0	4	5	55	20

Figure 5.1 Diffusion of catchment areas, O&D traffic (Source: MKmetric)

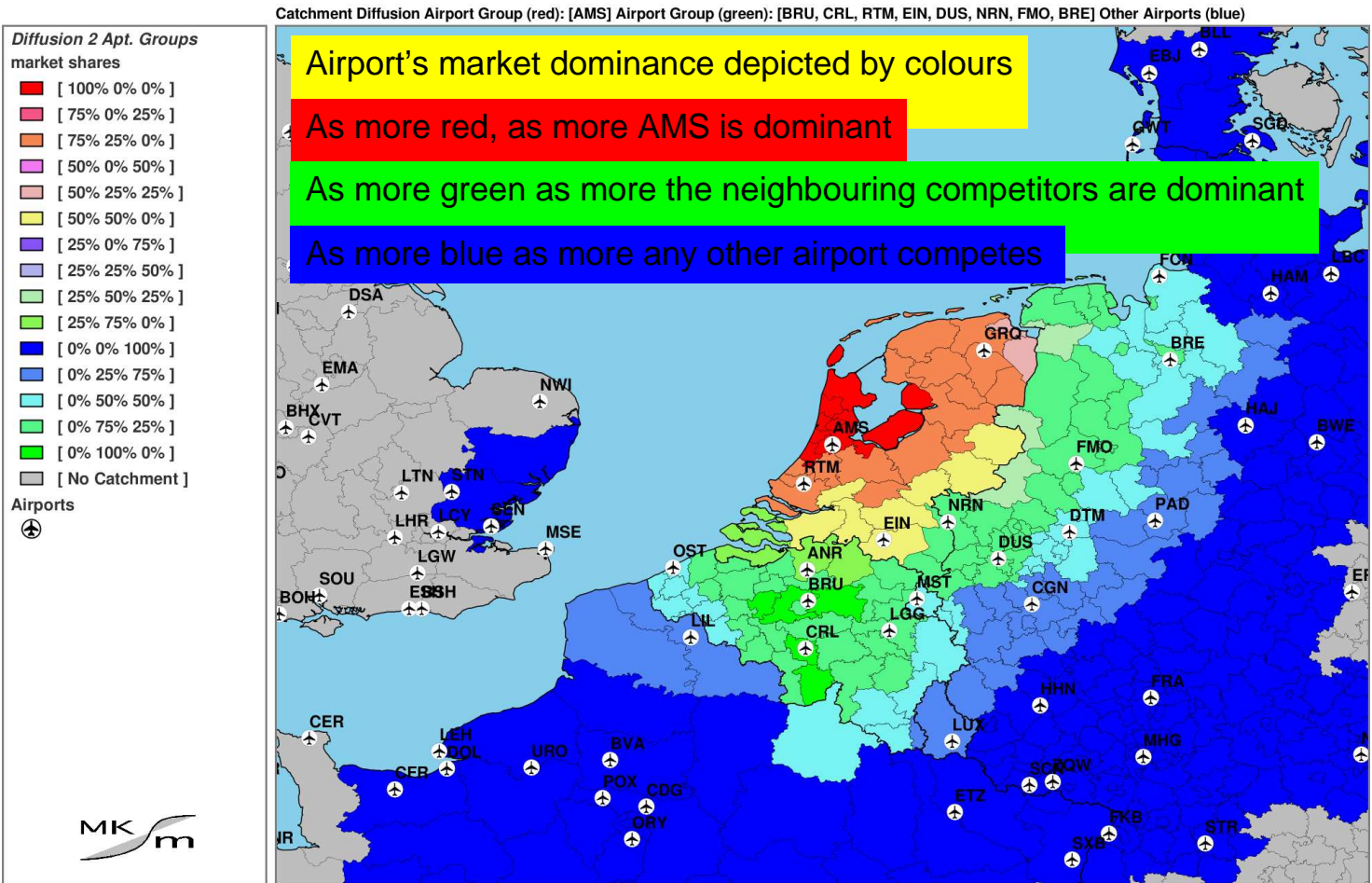


Figure 5.2 AMS catchment area – O&D passengers to Middle East (Source: MKmetric)

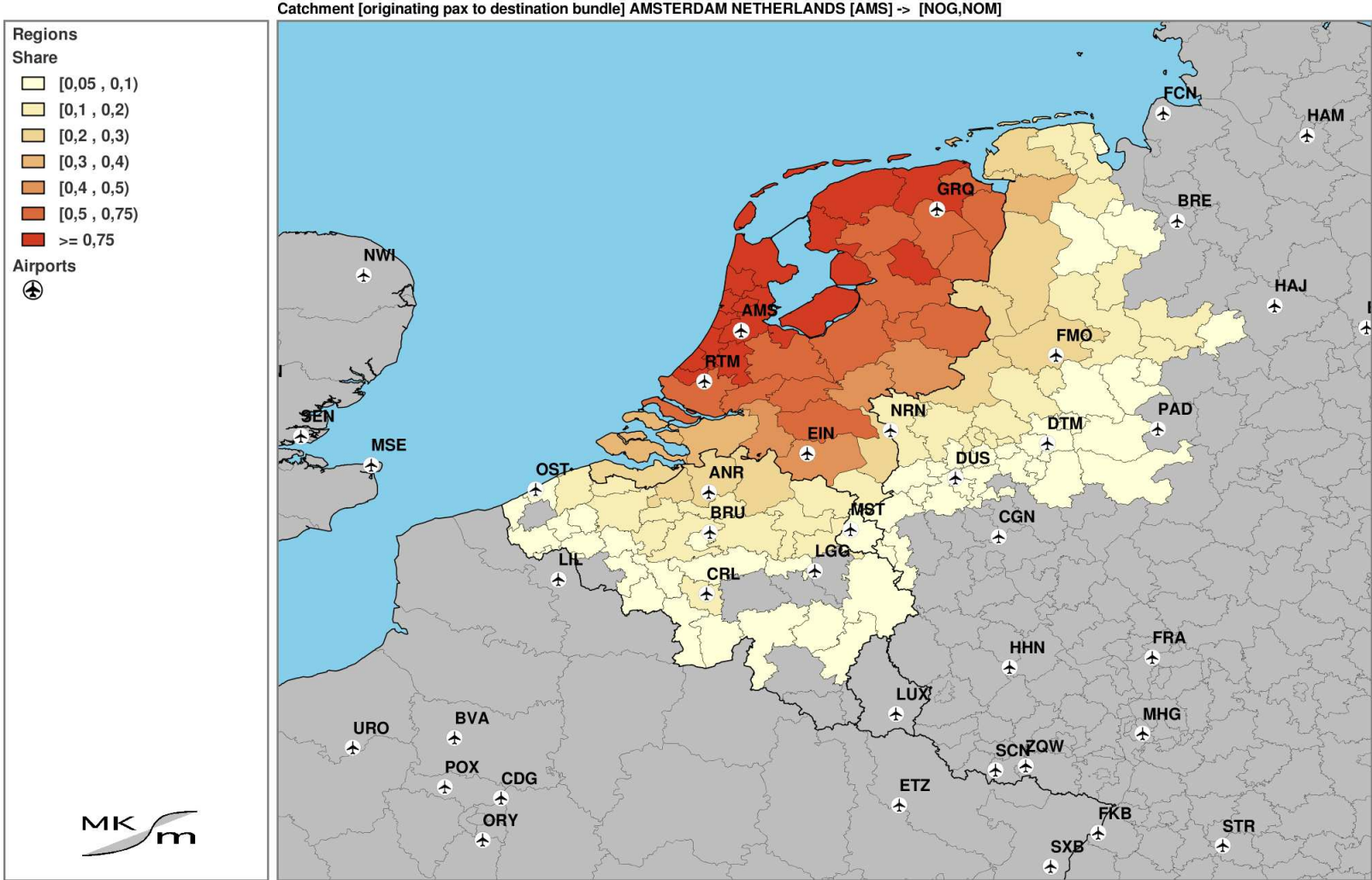


Figure 5.3 AMS catchment area – O&D passengers to North Africa (Source: MKmetric)

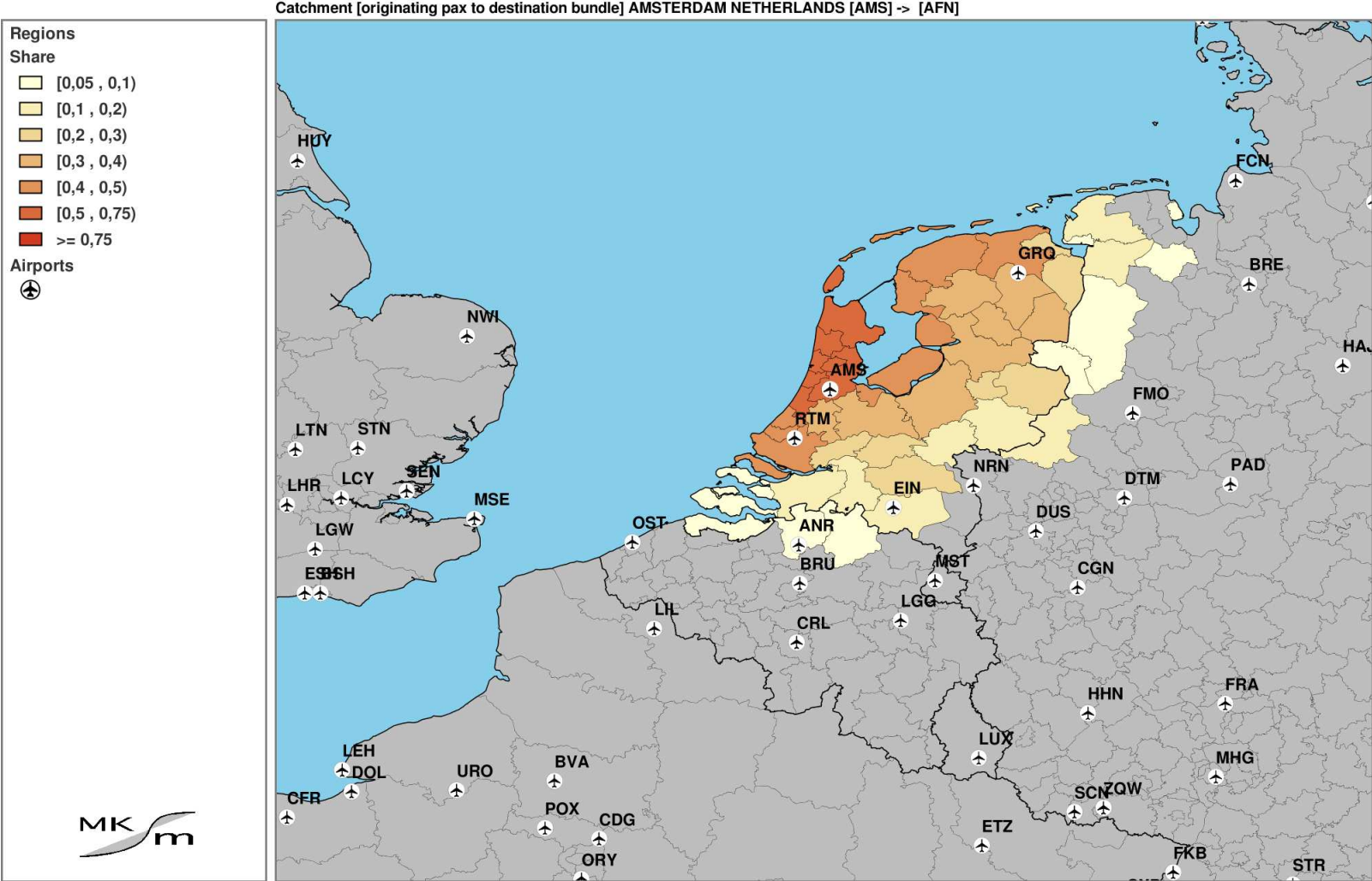


Figure 5.4 AMS catchment area – O&D passengers to North America (Source: MKmetric)

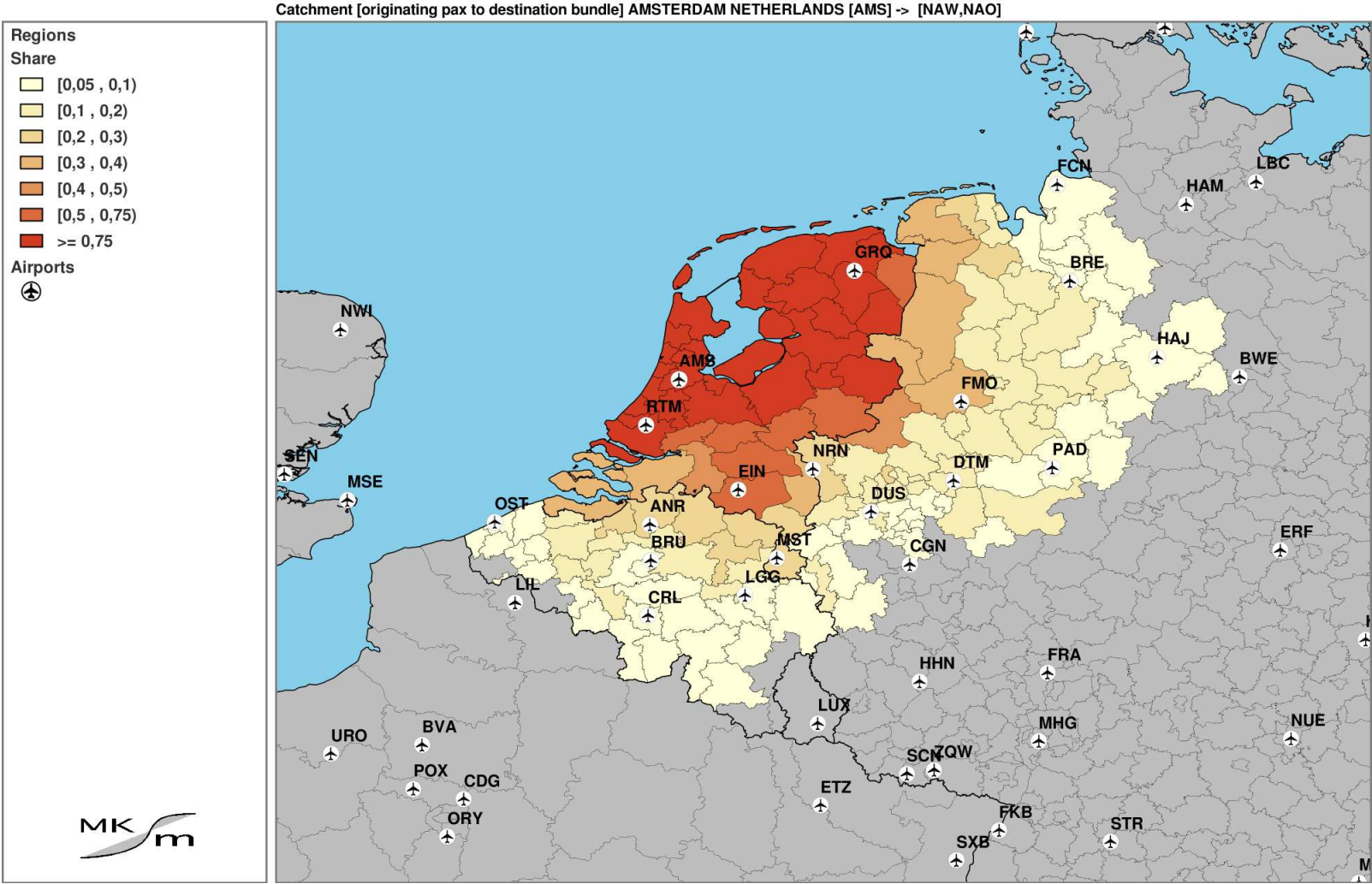


Figure 5.5 AMS catchment area – O&D passengers to South America (Source: MKmetric)

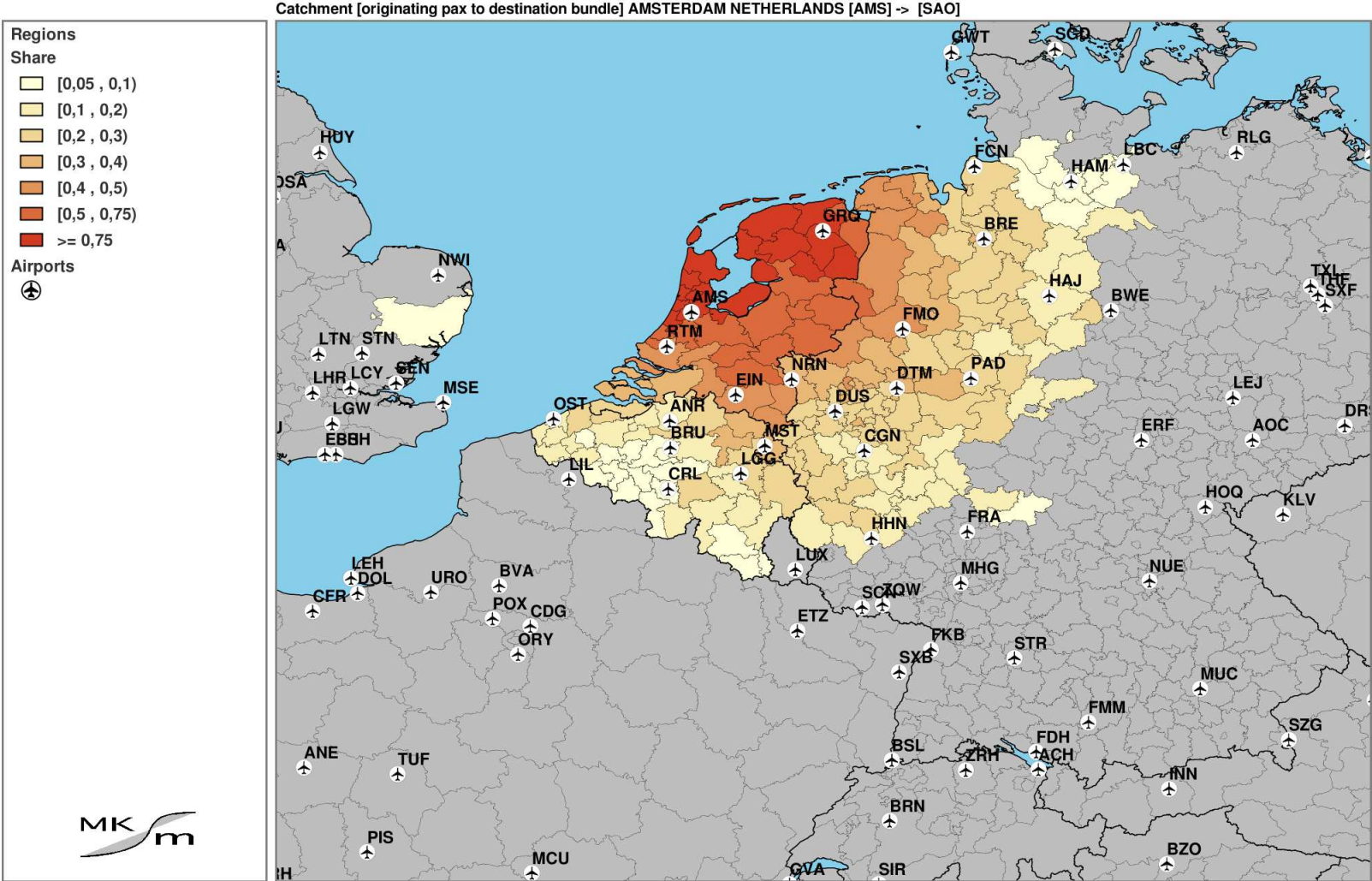


Table 5.9 Total guided connections

MCT plus two hours						MCT plus three hours					
Year	AMS		CDG	FRA	LHR	Year	AMS		CDG	FRA	LHR
	KL-KL; KL-NW	Skyteam	Skyteam	Star	Oneworld		KL-KL; KL-NW	Skyteam	Skyteam	Star	Oneworld
2002	4797		11178	15311	8104	2002	6263		15918	19218	11636
2003	7081		11253	14387	8369	2003	9139		16210	18030	12003
2004	7649		11498	16208	8988	2004	9865		16743	21199	13019
2005		10232	12926	17417	9566	2005		13451	18889	23411	13777
2006		9927	13735	17370	9647	2006		13720	20068	23458	13860
2007		10298	14202	18675	8512	2007		14243	20700	25075	12265
2008		10862	15633	19368	8045	2008		15011	22578	26374	11614
2009		10285	15250	17281	7708	2009		13826	20959	23537	11116

Figure 5.6 Total airport-pair markets covered by guided connections, MCT plus two hours

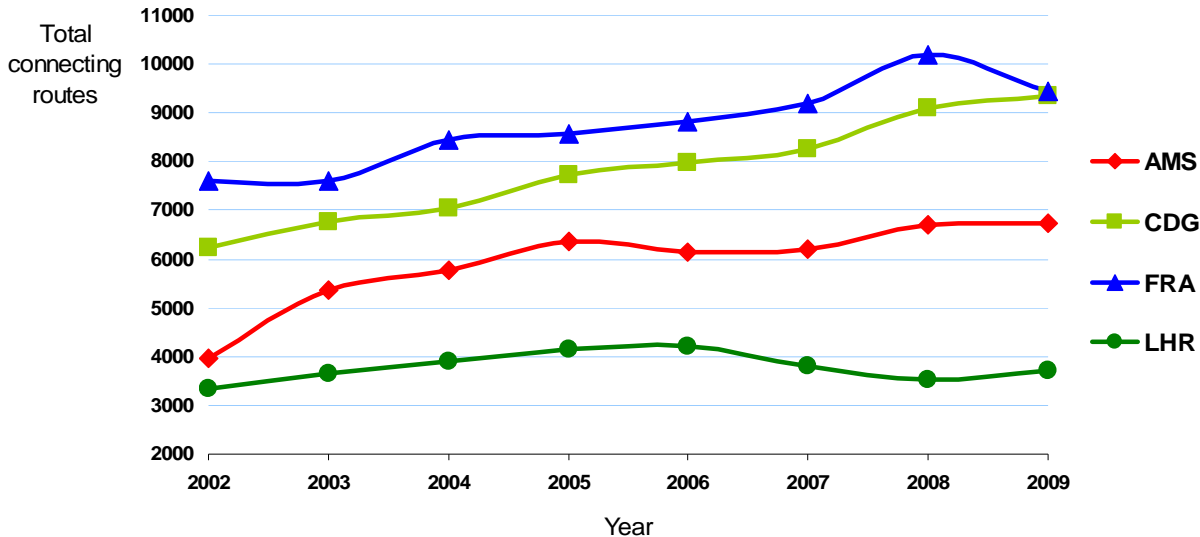


Figure 5.7 Overlapping airport-pair markets, MCT plus two hours

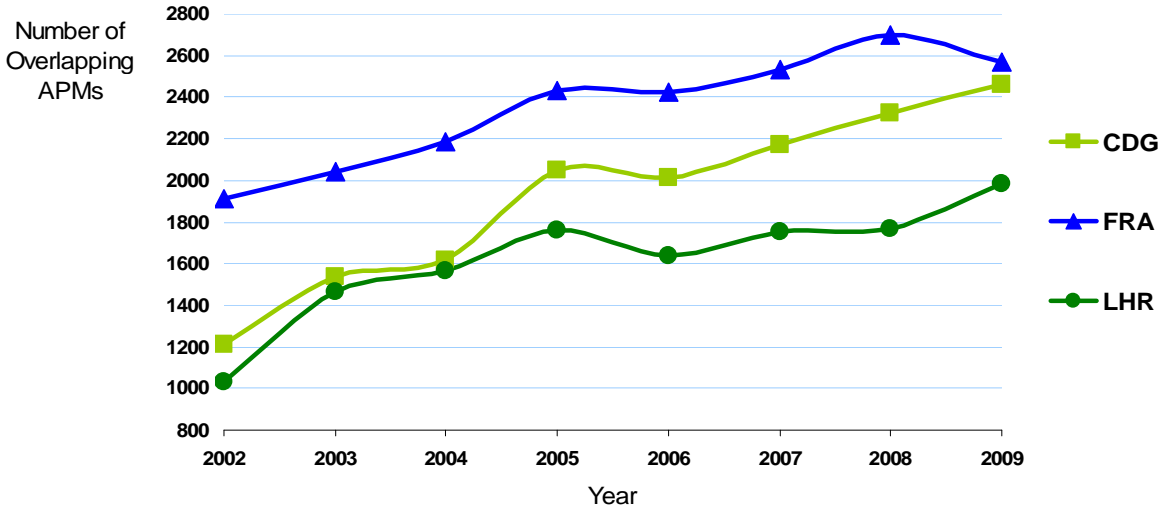
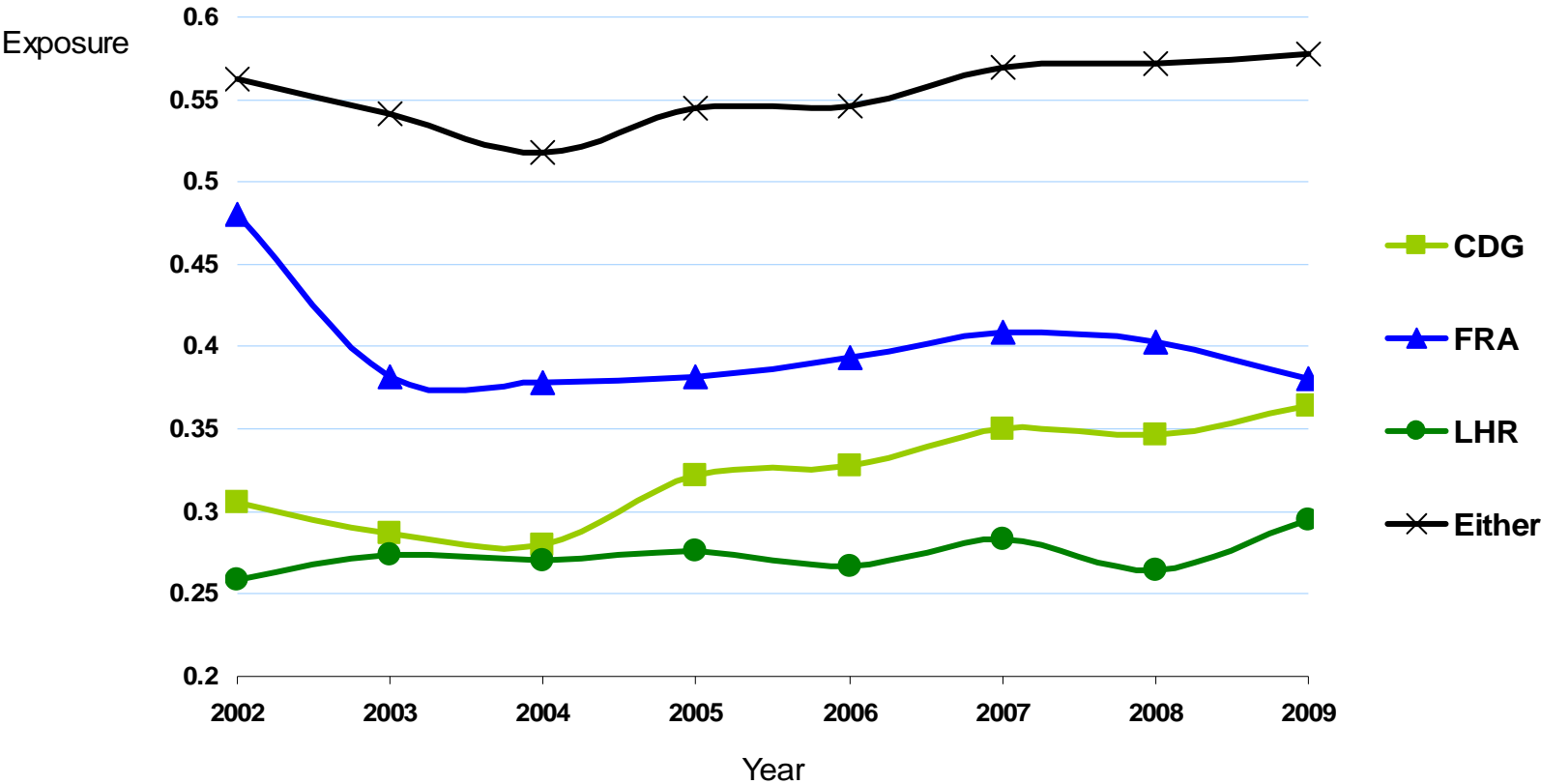
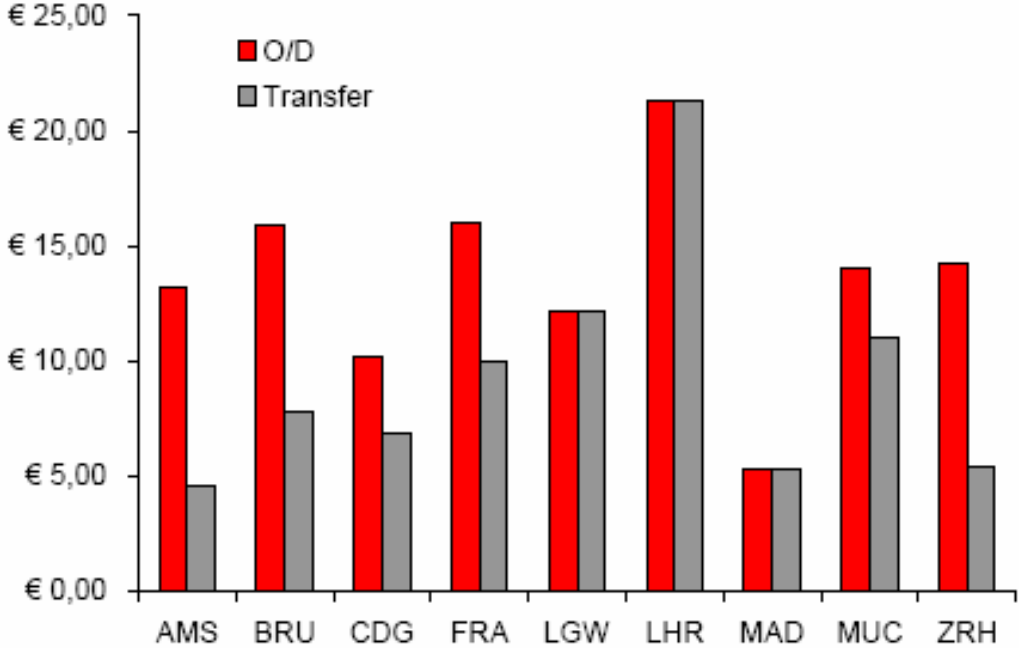


Figure 5.8 AMS exposure to competition for transfer passengers, MCT plus two hours



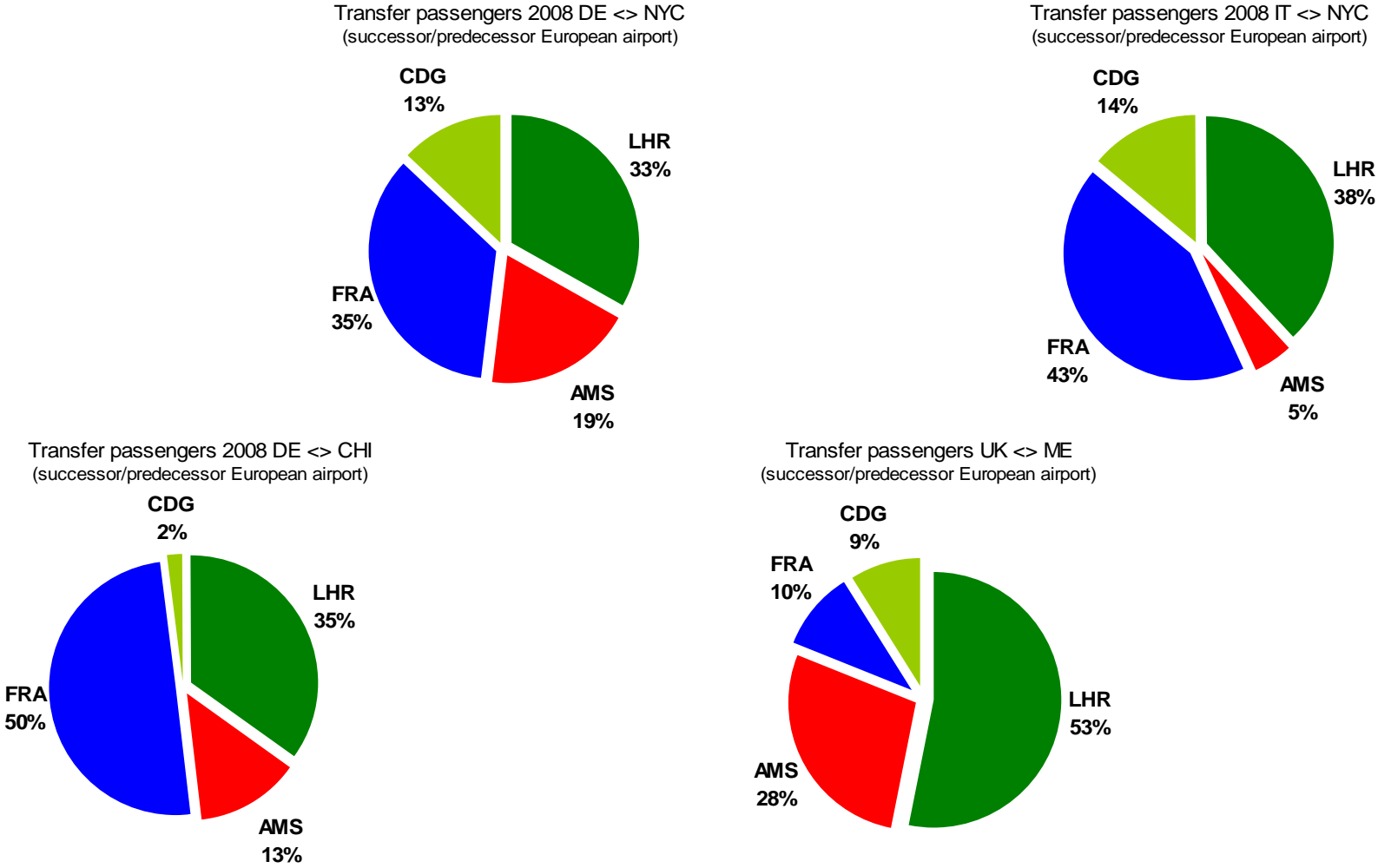
Note: Reported here are the numbers of overlapping airport-pair markets divided by the total number of guided connections available via AMS. "Either" covers markets where AMS overlaps with at least one of the three gateways.

Figure 5.9 Differentiation between transfer and O/D passenger charges, 2007



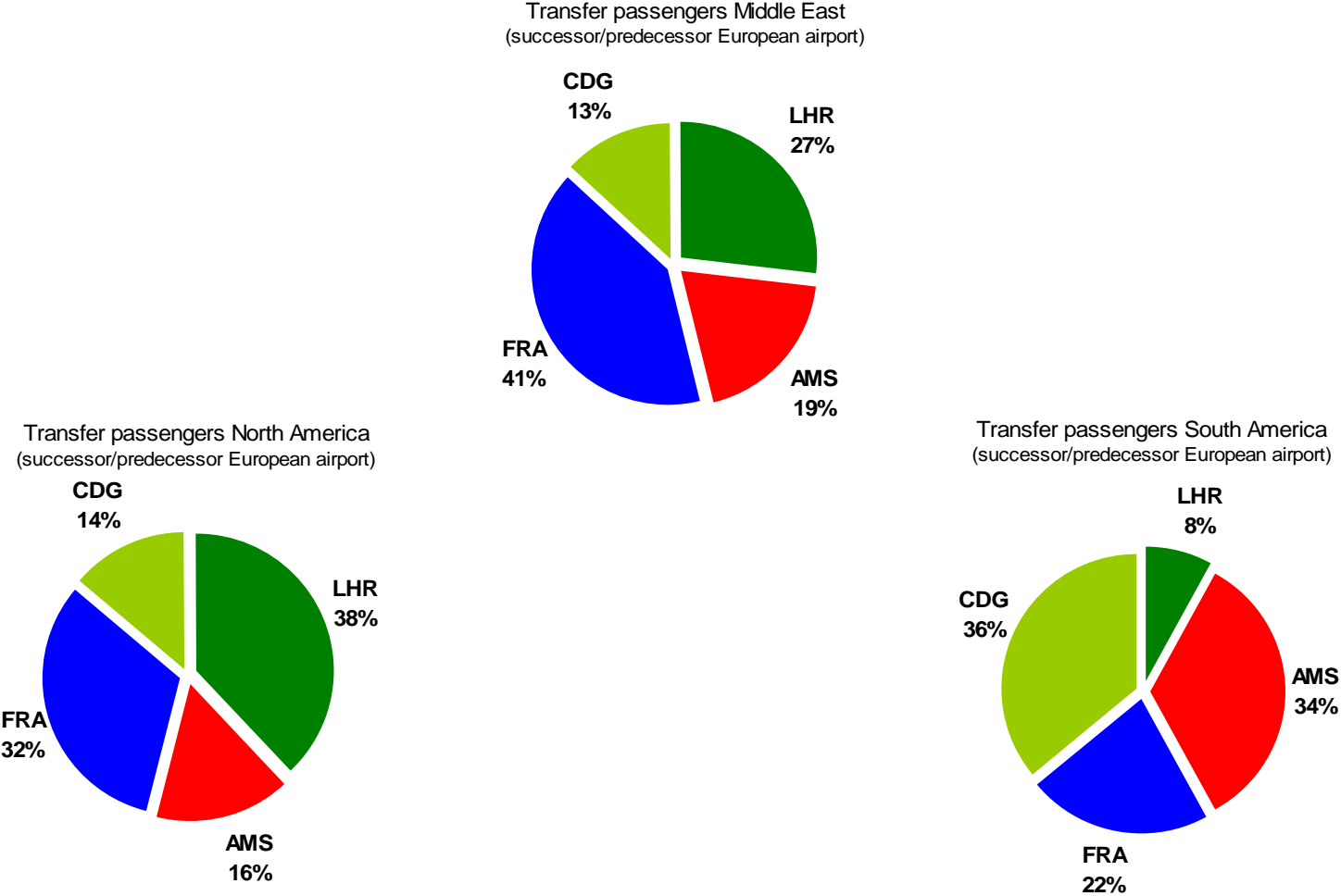
Source: SEO Economic Research (2008), Benchmark for airport charges and governmental taxes

Figure 5.10 Competition for transfer passengers – demand side estimation of market shares



Source: MKmetric

Figure 5.11 Competition for transfer passengers – demand side estimation of market shares



Source: MKmetric

Figure 5.12 Definition of markets included into demand side hub competition analysis



Source: MKmetric

Appendix K: List of interview partners

Name of the company	Persons interviewed	Date
Aéroports de Paris (ADP)	Isabelle Wallard (Head of Strategy) Jacques Blaison (Deputy Head Airport Charges & Economic Regulation) Michel Maman (Head of business planning and economic regulation)	15.10.2009 10.12.2009
Air France (AF)	Georges Lachenaud (Airport and ATC charges) Christian Forgues (Aviation charges) Jean Mark Salagnac (Planification, Strategy)	16.10.2009
Amsterdam Schiphol Airport (AMS)	Pieter M. Verboom (Executive Vice President & CFO) Enno Osinga (Sr Vice President Cargo) Daniel dos Reis Miranda (Aviation Statistics and Forecasts) Monique Schouten (Pricing and Regulatory Affairs) Julianne Wormsbecher (Pricing and Regulatory Affairs) Hans Martens (Market Research and Intelligence)	20.10.2009 17.11.2009 10.12.2009
Aviapartner	Rob Spaan (General Manager)	20.10.2009
Austria, Ministry of Transport,	Herbert Zulinski (Deputy Director of Economics)	30.11.2009
Austrian Competition Authority	Thanner Theodor (Chief Executive of the Austrian Bundewettbewerbsbehörde)	1.12.2009
Board of Airline Representatives In the Netherlands (BARIN)	Frank Allard (Secretary General) William Vet (Executive Board Member Airport Affairs)	3.11.2009 10.12.2009
Dublin Airport Authority	Mary Coveney (Manager Industry Affairs)	24.11.2009
easyJet	Chris Gadsden (Policy unit)	09.12.2009
InterVISTAS Consulting	Mike Tretheway (Executive Vice President & Chief Economist)	20.11.2009
Martinair Holland NV	Diederik Pen , (COO) Andre Lorier (Director Corporate Control)	26.11.2009
Menzies	Korstanje, Gilles (Director Ground Handling Passengers)	29.10.2009
Panalpina World Transport B.V	Charles van-der-Steene (Area Manager Benelux)	13.11.2009

Royal Dutch Airlines (KLM)	Hans de Bruijn (Charges) Erik van Goor (Legal office, environmental issues noise restrictions, GHS, ATC) Pieter Cornelisse (Network department, Timetable, Network Strategy) Gijs Van Oostveen (Ground Services, Long-term AMS Development, Airport charges)	20.10.2009 17.11.2009 10.12.2009
Swissport	Wouter Brand (General Manager)	3.11.2009
Transavia	Rob Melchiot (Directeur Financiën & ICT)	10.12.2009
Viggo	Martijn Limburg (Managing Director)	17.11.2009
Vienna Airport	Dieter Haselsteiner (Aviation Marketing & Business Development)	30.11.2009

Appendix L: List of abbreviations

ADP	Aéroports de Paris
AF	Air France
AIP	Airport Improvement Program
AMS	Amsterdam Airport Schiphol
ATO	Air Traffic Operations
BAA	Company name (British Airport Operator)
BRU	Brussels Airport
CAA	Civil Aviation Authority
CC	Competition Commission
CDG	Paris Charles de Gaulle Airport
CGN	Cologne Airport
CRn	Concentration Ratio
DUS	Düsseldorf Airport
EC	European Commission
ECAD	European Center for Aviation Development
EIN	Eindhoven Airport
EMP	Economic Market Power
EU	European Union
EUR	European currency, Euro
FAA	Federal Aviation Administration
FRA	Frankfurt Airport
FSA	Full Service Airline
FSNC	Full Service Network Carrier
GAP	German Airport Performance Project
GHS	Ground Handling Services
HSL	High Speed Line
HSR	High Speed Rail
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
KLM	Royal Dutch Airlines
LCC	Low Cost Carrier
LHR	London Heathrow Airport
MCT	Minimum Connecting Time
MTOW	Maximum Take Off Weight
NVLS	N.V. Luchthaven Schiphol
O&D	Origin and Destination
OAG	Company Name (Consulting and Data Provision)
PAX	Passengers
PC	Productivity Commission
PSC	Passenger Services Charge
SSC	Security Service Charge
SSNIP	Small but Significant and Non-transitory Increase in Price
TE	Tenancy
UK	United Kingdom
USA	United States of America
VLM	Vlaamse Luchttransportmaatschappij (Airline)
WLU	Work Load Unit