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The airport business in a competitive environment

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The liberalisation of the European air transport market has introduced new dynamics in the airport industry. In recent decades, airports evolved from infrastructure providers in a monopolistic context, to commercially orientated enterprises in a competitive environment. Current studies of airport strategic management lack a comprehensive perspective that enables airport operators to best identify the opportunities created by such dynamics. This paper analyses an airport as a multi-service firm that interacts with a network of stakeholders – the airport business network – to deliver several service packages to different groups of customers. An integrated conceptual framework was developed to aid academics and practitioners in the appraisal and design of competitive strategies for airports. Such framework covers a clear gap in existing literature, partly due to the fact that current perspectives on airport management fail to address the complexity of the industry in the present competitive environment.

Keywords: Airport; Airport business; Airport competition; Airport strategy

1. Introduction

Airports were traditionally considered monopolistic utility providers with little potential to develop market opportunities (Graham, 2003). However, liberalisation of aviation markets introduced new dynamics that increased complexity in the airport industry, particularly in Europe. The emergence of competition between airports (Copenhagen Economics, 2012; Forsyth, Gillen, Müller, & Niemeier, 2010) and the transition in ownership towards privatisation or commercialisation[4] (de Neufville & Odoni, 2003; Donnet, Keast, & Walker, 2011) require a different perspective in airport management. That is, one that embraces the opportunities created by the existence of a variety of customers for the airport product (Doganis, 1992).

Some airports have already recognised the importance of strategy formulation to operate in a competitive market. For instance, Gatwick defined its strategy around the goal of "competing to grow and become London's airport of choice" (Gatwick Airport Limited, 2012). This paper aims at explaining the complexity of the airport business nowadays, and at defining some factors to

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4 Privatisation implies transferring some ownership rights (management control and residual income, but rarely property ownership), fully or in part, from government entities to private investors. Commercialisation involves a change in management attitude (increased orientation to profits and efficiency), even under full government ownership (de Neufville & Odoni, 2003).

differentiate airports in a competitive environment. It provides a comprehensive framework for managers to formulate strategies that deliver competitive advantage and added value.

Section 2 reviews related literature that offers a conceptual background for the research. Section 3 identifies three customer groups for the airport services. Section 4 analyses the competitive environment by identifying the areas in which airports compete nowadays. Section 5 describes the airport business network to model the interactions between the airport stakeholders that result in the production of a set of service packages. Section 6 introduces competitive strategies, particularly airport differentiation. Section 7 presents the conclusions of the analysis.

This study is based on a thorough and extensive review of research papers and airport documentation on planning and marketing. We complement the review with feedback obtained in non-structured interviews with key informants within the industry (e.g. ANA Aeroportos de Portugal, Fraport, Schiphol Group, and Athens International Airport), and technical visits to a variety of airports (e.g. Munich, Vancouver, Dallas/Fort Worth, Atlanta, Frankfurt am Main, Schiphol Amsterdam, Zurich and Athens).

2. Background

2.1 Theoretical framework

As the title suggests, this paper analyses an industry that is subject to competition. General frameworks to define competition in the fields of economics and strategic management aim at understanding the firm's environment and the dynamics of competition. They are based on the structure-conduct-performance model (SCP), dating back to the 1930s. Within this model, the 'conduct' refers specifically to the actions that a given firm can implement to produce competitive advantage (Barney, 2007).

Porter's five forces framework (Porter, 1979) builds upon the SCP model to identify the threats in the structure of an industry, as well as the opportunities in a firm's environment that allow it to be competitive. Yet the example of successful firms in industries with numerous threats and few opportunities challenged Porter's ideas. In response, the resource-based view of the firm claims that a firm builds competitive advantage by exploiting its unique resources (Barney, 2007), while other authors argue that the advantages depend on the firm's dynamic capabilities (Winter, 2003).

Porter (1996; 2008) replies to critics arguing the five force's framework is still valid and has been misunderstood. He reaffirms the idea that differentiation is in the core of competitive advantage. In this paper we take criticism to Porter's model into account and perform an analysis that is more specific to the airport industry, while acknowledging the value of differentiation in defining competitive strategies.

2.2 Competition in the airport context

Competition in the airport industry has been scarcely studied. Although Forsyth et al. (2010) compiled a selection of studies that discuss the topic with a broad scope, as Lian and Rønnevik (2011) summarise, previous works focused on modelling competition for passengers within the catchment area, especially in the case of several airports in a metropolitan area. A recent report (Copenhagen Economics, 2012) analyses airport competition in Europe with great detail and evidence. The conclusions of this study support our earlier research on the subject (Jimenez, Pinho de Sousa, & Claro, 2011), and allow us to provide a comprehensive description of the competitive environment that airports face nowadays (see section 4).

2.3 Changing perspectives on airport customers

Graham (2010) performs a competitive analysis for the airport industry based on Porter's framework. She concludes that the existence of more than one key customer for the airport,

among other factors, hinders the analysis of competitive strategies under this framework. Notwithstanding this, most research implicitly recognises passengers or airlines as the main customers without a detailed assessment (see Lian & Rønnevik, 2011).

Conversely, Doganis (1992) described eight different groups of potential customers that airport planners and commercial managers could target with different services. Similarly, Graham (2003) groups airport customers into three categories: trade (those who directly acquire aeronautical services), passengers, and other stakeholders. Our approach goes beyond typology and defines groups of customers that fit into the overall analysis of the airport business and strategy formulation.

2.4 Airport strategic management

Doganis (1992) and Graham (2003) stress the fact that, during recent decades, airports have been drifting away from the provision of infrastructure as their sole goal. Indeed, Macario (2008) highlights the need to shift the airport management logic towards a business-orientated focus. She argues that airport activity requires a complex interaction between agents of diversified interests, yet no formal model to easily manage such interactions is presented.

Donnet et al. (2011) analyse different airport management perspectives in relation to ownership structure. They argue their framework works for assessing privatisation schemes, but it may prove less useful to formulate competitive strategies. Kwakkel et al. (2010) introduced their Adaptive Airport Strategic Planning, which is more suitable to long-term airport development rather than to deal with managerial issues.

From an operational perspective, Schaar and Sherry (2010) describe the interrelationships between the airport stakeholders. Yet their model is based on common practices in the United States that do not apply worldwide. Moreover, it becomes too complex for the analysis of the airport operator role in defining the characteristics of the airport business.

From a marketing perspective, Jarach's (2001) "air transport pipeline" describes the business relations between all the actors around the airport, which operate in a complementary way to bundle service packages to final consumers. Although it allows an analysis with multiple customers and airport competition, this model is probably too simplified for developing strategies within the wider scope of the airport business nowadays.

Tretheway and Kincaid (2010) use the classic paradigm of the 'four p's of marketing' to propose competitive strategies for airports. The authors discuss different dimensions of the airport product, and suggest several strategies regarding price (fees and facilitation of airline cost reductions), promotion (marketing and branding), and physical distribution (computer reservation systems and travel agents). However, they do not introduce a formal model to analyse the process of strategy formulation.

The existing literature lacks an integrated approach that enables managers, policy makers and scholars to assess airport strategic management in face of competition. This paper provides a framework that takes into account strategic and operational aspects, in combination with marketing and economic analyses. With this wide perspective, we examine the relationship between the airport and its stakeholders, and complement the scientific literature with a more comprehensive model, as section 5 presents. Our approach may help practitioners to formulate competitive strategies that differentiate the airport product and deliver added value to the customers, as section 6 describes.

3. The airport customers

Over the last decades airports have evolved from public utilities to commercial enterprises. As infrastructure providers, airports face airline opposition and regulation constraints to increases in

aeronautical charges, and government pressure to become financially self-sufficient (Doganis, 1992). As commercially-orientated enterprises, airports realised the potential of new sources of income in non-aviation activities (Jarach, 2001). Within this context, the perception of the airport customers has evolved too.

Airports allow the interchange between air and surface transport by providing aeronautical facilities and services to airlines, which in turn, sell seats to passengers and cargo space to shippers. They also take advantage of the passenger throughput to offer a variety of non-aeronautical services (European Commission, 2002) that have become more important for airport operators. Sometimes they represent a higher income than aeronautical revenues, especially in Europe, North America and Asia (Graham, 2003).

The liberalisation of the air transport market at different levels significantly cut the monopolistic margins of some airport operators in their aviation-related activities. To compensate the cuts, the traditional business as public utilities evolved towards a steady increase of non-aeronautical activities to foster revenues in commercial services (Jarach, 2001). Now multiple stakeholders interact to make the airport a multi-service provider firm, thus an airport-airline-passenger chain is no longer valid, in general, to define its customers.

3.1 The customer groups

Defining the airport customer is an ambiguous task that clearly reveals some conflicts of interest. Airport operators are interested in offering a good level of service to airlines and passengers by providing quick and easy access to aircraft. They also want passengers to spend more time - and money - by enjoying the non-aeronautical services (Francis, Fidato, & Humphreys, 2003).

We consider the interests shared between the diverse consumers to propose three customer groups (see Table 1). The *aviation trade* group includes the customers directly interested in using the airport as a gateway to provide air traffic. Their focus lies on the air-side facilities and aeronautical services that the airport and other suppliers provide; although they may be interested in land-side developments too, such as offices or warehouses.

The *individuals* group distinguishes the customers that do not represent any business perspective, thus act on their own behalf. Their main interest is to have a pleasant "stay" at the airport while they travel, shop or work there. It is important to differentiate between travellers (passengers) and non-travellers because their expectations and requirements differ, and due to the significant proportion of people accessing some airports without any intention to take a flight. This non-travellers subgroup (visitors, local residents and employees – including airport employees, airline crews and the employees of all the companies established in or around the airport) may benefit from surface commuting connections or from extended opening hours at retail shops.

The *commercial trade* group includes those customers whose main focus lies on the land-side developments of the airport. They are normally not interested in the aeronautical services, but rather in the opportunities presented by the passenger throughput (as hotels, car rentals and retail stores for instance), by logistics facilities, or just by the ease of connectivity provided by the airport. Moreover, given that the airport business is reaching a global scale (as the next section discusses), other airports are also potential customers of consultancy or managerial services.

Table 1 - Customer groups for the airport product.

Aviation trade	Individuals	Commercial trade
Commercial airlines	Passengers	Tenants and concessionaires (business partners)
General aviation	Visitors	Local and global businesses and institutions
Travel agents and tour operators	Local residents	Other airports
	Employees	

3.2 Non-user stakeholders

The three groups of customers mentioned above buy services provided by the airport, either directly or indirectly. In contrast, the *non-user stakeholders* are not directly interested in acquiring any of the airport services, but they may be crucial to provide funds and public support to the airport.

The *non-user stakeholders* group includes all the entities or institutions that are interested in promoting the airport, such as national and local governments (who may also share ownership in the airport), tourism promoters, and regional and local development or commercial associations. To this group airports may *sell* the benefits they can obtain from the airport activity.

The relationship between non-user stakeholders and the airport is described later as a trigger of competition for funding, and then as part of the airport business network. Since we focus on the promotion of the airport business, stakeholders that are negatively affected by the airport are not included in this group. The integrated analysis we propose does not neglect their importance, but it would be cumbersome to deal with all possible stakeholders for the scope of this paper. We refer to Schaar and Sherry (2010) for a more detailed analysis.

4. Airport competition

The airport business entered a competitive environment that was practically non-existing a few decades ago. Before liberalisation, the world of non-competing airlines (regulated by the Chicago convention of 1944) was mirrored by a world of non-competing airports (Barret, 2000). Airports now face competitive pressure from the airlines' freedom to choose any airport to operate in (de Neufville & Odoni, 2003; Graham, 2003). Liberalisation also favoured ownership changes towards privatisation or commercialisation that further contributed to the increase in competition between airports (Starkie, 2002). New perspectives forced airports to be more focused on costs and commercial revenue, and on the need to attract and retain airlines (Bush, 2010) and other customers.

Despite widespread liberalisation, regulation still plays an important role in limiting competition. Bilateral Air Service Agreements still abound for international markets, along with restrictions to airline ownership by foreigners, controlled access to slots in congested facilities and curfews or other artificial limitations to airport capacity (Belobaba, Odoni, & Barnhart, 2009). Yet airport competition is a reality, especially in the European context, where 63% of the population live within two hours' drive of at least two airports (Copenhagen Economics, 2012).

Figure 1 summarises the possible areas of competition that we identified from the literature and industry practice. Although currently not every airport may be able to compete in all areas simultaneously, we collected evidence to support their existence as the following sections describe.

4.1 Provision of services to airlines

Traditionally airports have been considered as competitors in two situations: when their catchment areas overlap, and when large hubs compete for transfer traffic (de Neufville & Odoni, 2003; Forsyth et al., 2010; Lian & Rønnevik, 2011). Under this perspective, competition is strictly

dependent on the network strategies adopted by the airlines. Therefore airports strive to provide services to the airlines in order to assure their presence (Morrel, 2010).

Airlines can be established at a given airport with different kinds of operations. Burghouwt (2007) defines the role of the airports within an airline network in three categories: hubs, traffic nodes, and airline stations. Each category requires different characteristics that the airport operator must identify and accordingly provide with the right infrastructure and services.

Regardless of the type of operations, airports can also serve as a permanent position for one or more airlines' aircraft (so called *airline base* or *focus airport*). A base provides the airport the opportunity to generate additional revenues associated to aircraft and crew services, and brings more visibility and economic benefits (e.g. employment generation). In fact, Copenhagen Economics (2012) considers bases are similar to hubs in what concerns airport competition.

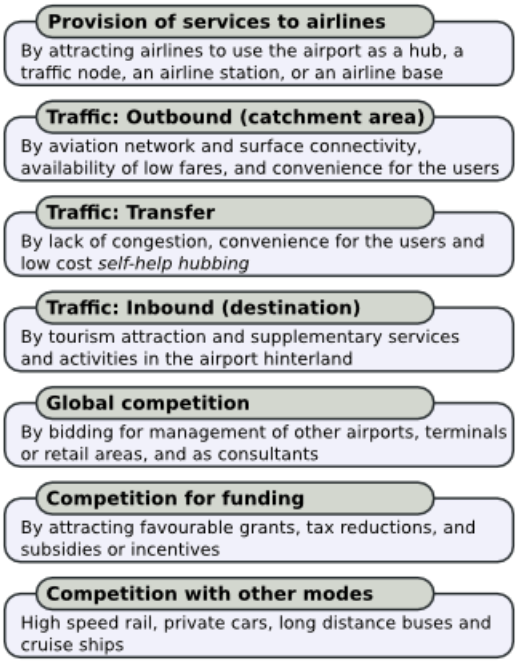

Figure 1 - Summary of the areas of competition for airports.

The concept gains relevance for low-cost carriers (LCC), but is different from a hub in the sense that LCCs normally do not operate coordinated schedules. However, bases are not restricted to this type of carrier, nor are they used exclusively by passenger airlines. Freight integrators deserve particular attention, since they are becoming increasingly important in total air traffic (European Commission, 2003).

To illustrate how airports compete in this regard, we provide some examples, by no means extensive, but easily replicated elsewhere. For an airline hub, Munich Airport attracted Lufthansa to create their second major hub there instead of a second terminal at Frankfurt Airport (de Neufville, 2008). For an airline traffic node, TAP Portugal currently handles most of their operations in Lisbon, but their services could be significantly reduced if the airline is sold to another carrier operating large hubs elsewhere. For an airline station, an Asian airline introducing a new service to Europe evaluates multiple airports, either in terms of local market, connection opportunities with other airlines in the same alliance, or both (Morrel, 2010). For an airline base, easyJet "selected Lisbon over a number of other European cities because of its market potential" (easyJet, 2010).

The steady growth of LCCs has had a particular effect on airport competition. LCCs catalysed the development of low-cost airports, and forced legacy airports to compete back. As de Neufville

(2008) explains "many legacy airports have lost their previous virtual monopolies. This fact has to motivate their management to build facilities that will be more competitive with low-cost airports".

Attracting and retaining airlines is crucial for airports because these airlines will strive to compete with the services offered by other carriers in other airports. If airports are considered mere infrastructure providers, the burden of competition may fall entirely on the airlines' side. If, however, the footloose character of airlines (especially, but not limited to, LCCs) and the active role that airports play beyond utility provision are taken into account (Copenhagen Economics, 2012), the role of airports in competition is strong and diverse as the following sections explain.

This is not to say airports are not able to exert some market power, especially regarding legacy network carriers who are captive to their home base. Some of these airlines have invested heavily to develop and operate a hub at their main airport, to which they are also restricted by bilateral agreements for some international services. Consequently, network carriers more strongly depend on their own home market and have fewer incentives to switch between airports.

4.2 Passenger demand in the catchment area

The catchment area of an airport is the geographical location of most of the existing or potential demand. This rather dynamic concept varies with the type of services offered by the airport and the particular characteristics of the passengers (e.g. long-haul leisure flights have a larger catchment area than short-haul business trips). The specific ways in which airports compete for demand within their catchment areas reflect these dynamics, since passengers and journeys are not homogeneous.

Firstly, airports compete in terms of network provision. On the air side, they compete to offer the most desired destinations. Thus closely located airports compete more strongly for passengers travelling to comparable destinations. On the land side, competition occurs because a good connection with the surface transport network makes an airport accessible from longer distances, widening its catchment area. Porto airport, in Northern Portugal, illustrates both aspects. Porto offers a larger set of direct destinations than Vigo (a neighbour airport in Spain), and is accessible via motorways, light rail and buses, while Vigo is only reachable by car and bus.

Secondly, airports compete for passengers willing to have access to low fares. Airports that attract LCCs gain a competitive advantage in the sense that these airlines can offer remarkably lower prices for their flights (Malighetti, Paleari, & Redondi, 2009), expanding the catchment area by attracting price-conscious passengers. Again, Porto competes with surrounding airports, Lisbon included, thanks to the presence of Ryanair.

Finally, airports sharing similar catchment areas compete for outbound traffic by providing a more convenient service to some passengers. Airports with more non-stop services allow travellers to bypass hubs, delivering higher quality in terms of travel time. Likewise, small airports offer an alternative for passengers wishing to stay away from the confusion of large airports. Other airports offer products that are more convenient for business travellers, such as a central location, a speedy check-in process or the availability of lounge areas. Airport convenience leads Londoners to Stansted for a direct trip to Jerez, instead of Heathrow which implies passing through Madrid (de Neufville, 2008).

4.3 Transfer traffic

Attracting transfer traffic at large hubs is widely recognised as a form of competition between airports (de Neufville & Odoni, 2003; Forsyth et al., 2010; Starkie, 2002). This is true for airports with airlines that use hubbing strategies. Therefore, it is crucial for those airports to provide space and capacity for the *network* airline(s) to use infrastructure that facilitates their transfer processes. The rapid growth of Emirates and Dubai International Airport in competition with the European airlines and hubs (e.g. London/Heathrow, Amsterdam, Frankfurt, Paris/Charles de Gaulle) illustrates this (CAPA Centre for Aviation, 2010).

Airports can also attract passengers that want to choose their preferred point of connection. Travellers may be attracted by the loyalty program of their favourite airline or alliance, thus using the airports in its network. Alternatively, a given airport may offer a wider network with better opportunities to connect to more destinations. The particular characteristics of an airport may also enhance its competitiveness: by a location that minimises detours; an efficient design that minimises connecting time; or shopping and leisure facilities that increase the desirability of longer layovers.

Additionally, LCCs allow smaller airports to compete for medium-haul transfer passengers using *self-help hubbing* (Burghouwt, 2007). Low cost airports (e.g. Brussels/Charleroi, Paris/Beauvais, Frankfurt/Hahn or Rome/Ciampino) effectively offer connection opportunities for passengers travelling between Eastern and Western Europe. Although Reynolds-Feighan and McLay (2006) claim that such transfers are impractical; Malighetti *et al*. (2008) provide evidence that suggests the potential of such interconnections, and Franke (2004) argues that legacy airlines may reduce the complexity of their hub models following the example of LCCs practices.

The point is that, since such connections are based on point-to-point services, passengers are not penalised if they transfer to a different carrier; airlines may not provide compensation and special arrangements for missed connections, and airports do not have to deploy expensive and complex transfer facilities. Moreover, given that transfers are not ensured by the airlines, passengers are encouraged to increase their *connecting* time, so that airports can profit to increase non-aeronautical revenues.

4.4 Inbound demand

Another form of airport competition that is barely discussed is destination competition (Tretheway & Kincaid, 2010). It is related to the possibility to appeal to passengers or other users solely by the attractiveness of the surrounding environment (the hinterland) or by the characteristics of the airport itself. This occurs in airports with a large share of inbound traffic, which are normally located nearby tourist destinations.

For instance, Faro Airport in Portugal describes itself as "a competitor of all the airports that serve tourist destinations which compete with the Algarve" (ANA, 2007). The attractiveness of the hinterland is a key factor that is particularly challenging, since the airport operator has little or null control over what the region has to offer.

Nevertheless, airports have higher control of their land side development in order to promote the airport itself as a destination. Some airports offer supplementary services or activities that range from hotels and convention centres to concerts, sport events and airport tours. Other airports actively develop real estate projects to diversify the land use, far beyond a land-air modal interchange. Amsterdam Schiphol airport city and airport corridor, Frankfurt airport city and The Circle project at Zurich airport are some examples of such activities (see Macario, 2008 for details on other airports).

4.5 Global competition

Nowadays there is a well-established process of globalisation for the airport industry, substantially increased with airport privatisation, but not limited to private companies (de Neufville & Odoni, 2003; Graham, 2003). This led airports to compete at a global scale: airport companies can compete to buy, or get the concession of, other airports; they can compete with their consultancy services in areas such as engineering, economics or construction; they can operate retail facilities in other airports; and, they can operate terminal buildings in other airports.

Graham (2003) provides a number of examples in which airport companies (e.g. BAA, Aéroports de Paris, Aer Rianta, Schiphol Group, Fraport) have interests in airports around the globe. The sample is not restricted to companies previously related with the airport business. In fact, many property developers, construction companies, financial investors and other transport companies

also have large shares in airports. Not surprisingly, airlines also have interest in airport operations, as easyJet unsuccessfully trying to buy London/Luton airport, Ryanair proposing the construction of its own low-cost passenger building at Dublin, or Lufthansa successfully partnering with Munich Airport to build terminal 2. Indeed, in Australia and in the United States the relationship between airlines and airports is more direct, for carriers can lease terminals from the airports through long-term contracts.

4.6 Competition for funding

Airports may also compete to obtain funds for developing expansions or upgrades, aiming at achieving more competitive positions. Funds can be in the form of grants with special conditions (low interest rates or long repayment periods), tax reductions or subsidies (where allowed by regulators). These funds can come from governmental or private institutions, such as tourism authorities (all of them part of the *non-user stakeholders* group). These entities are interested in providing funds as a means to foster economic development, tourism and employment in the airport's hinterland. Additionally, some governments may be keen to invest in regional airports in order to reduce the pressure of congestion or environmental constraints in major airports (Davison, Ryley, & Snelgrove, 2010).

In fact, Bel and Fageda (2009) show how the Spanish airports compete to attract public expenditure. According to their analysis, between 1994 and 2003 Madrid/Barajas received 60% of the total investments made by AENA, with the remaining 40% invested in the other 46 airports managed by the Spanish authority.

Additionally, privatisation of airports creates new opportunities to raise funds. In fact, these moves are expected to "remove airports from a position where they compete for public expenditure" (Davison et al., 2010, p. 180). On the other hand, airports that are not privatised (in the sense that local, regional or national forms of government maintain the ownership), but that have been delivered as a concession to private operators, are likely to raise private funds more easily to gain competitiveness.

4.7 Competition with other modes

So far we have focused on competition between airports. However, competition between air transport and other modes also impacts airports (Tretheway & Kincaid, 2010). The expansion of high speed rail networks in Europe has proven an effective way of competition with air transport. In France, domestic air traffic declined 7% between 2000 and 2007 mostly due to the growth of the TGV network (International Transport Forum, 2009). Unlike airports, train stations are normally better located and provide a more efficient boarding process that increases passenger throughput and decreases wasted time.

Indeed, the European Union promotes the substitution of air services for high speed rail to reduce congestion and limit CO_2 emissions from aviation (European Commission, 2001). However, there is potential in exploring the complementarity between both modes. Cooperation between airlines and rail companies may prove quite beneficial for all parties (Givoni & Banister, 2007).

Competition also occurs between air transport and other modes, such as private cars and long distance buses. Moreover, airports may also compete inside their hinterlands with local providers of retail, food and beverages (Tretheway & Kincaid, 2010). Nevertheless, in this paper we focus on *inter-airport* competition exclusively.

For some of the areas of competition it is clear that the relationship between airports and airlines is becoming increasingly important for the success of the airport business (Starkie, 2012). This hinders a strict separation of the role of airports and that of the airlines in airport competition. But instead of devising the roles of each one, we consider airports must cooperate with all relevant actors to enhance their position. In this sense, the next section discusses how the airport could interact with airlines and other key stakeholders to formulate competitive strategies.

5. The airport business network

An airport typically provides a wide range of facilities, activities and services, offered by a number of different agents. Moreover, the level of involvement of the owner or operator in providing such activities and services varies a lot from airport to airport. Thus the business environment in an airport is composed by a highly diverse interaction among disparate actors.

Figure 2 presents the airport business network, a representation of the complex interactions between the network agents (on the left) and the airport (acting as a multi-service firm) that result in the creation of several *service packages* (the airport product) targeted at the three customer groups described earlier. This model provides a more specific tool for the current airport business context that is also sufficiently general to be applied to different airports according to their particular characteristics.

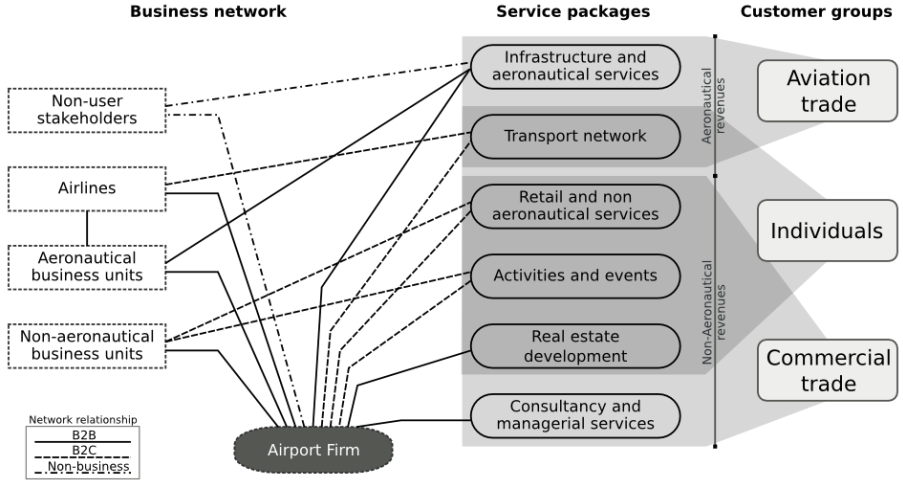

Figure 2 - The airport business network.

5.1 The agents in the network

The concept of an "airport business network" emerges when the airport acts as a commercially-orientated company (the airport firm) to harmonise the relationships with other players, inside and outside the industry. We have identified three types of network relationships: a) Business to Business (B2B), when the agents are companies that interact to provide integrated or complementary services; b) Business to Consumer (B2C), when the relationship is intended to provide a product or service for final consumption; and c) Non-business, when the relationship is not directly mediated by commercial interests (such as profit maximization), or when those interests are not the main driver of the interaction.

In addition to the airport firm, four different groups have been identified as agents in the airport business network: non-user stakeholders, airlines, and aeronautical and non-aeronautical business units.

Non-user stakeholders

The non-user stakeholders, as mentioned before, include entities and institutions whose interest is mainly driven by the positive impacts produced by the airport (e.g. social and economic development of the surrounding communities), or by the alleviation of negative externalities (e.g. pollution and noise).

The non-business relationship between the airport and the non-user stakeholders is normally associated with the airport role as a promoter of employment, tourism and trade opportunities. With this group, the airport firm acts as a facilitator to establish common goals for infrastructure development and sustainable growth. Besides directly investing in improving or expanding the

airport, non-user stakeholders may as well provide (or cooperate with the airport in the provision of) incentives for air services.

Despite the trend towards privatisation, national, regional or local forms of governments are also shareholders or whole owners of many airports (de Neufville & Odoni, 2003). In those cases they may act beyond the non-business relationship, given their additional interest in airport self-sufficiency or profitability. This interaction is included within the airport business network inside the airport firm structure, as with any other shareholder to whom the airport operator is liable.

Airlines

Airlines comprise a second group of agents, including commercial airlines (scheduled and charter, passengers and cargo) and executive and general aviation. Airlines are key customers and they are, of course, in the core of the airport business. However, the traditional perception of the airlines as the main airport customer is being challenged. In the current context, the airport business network suggests a B2B approach between the airport firm and the airlines.

This kind of relationship implies a better understanding of the real requirements of airlines in terms of infrastructure and operations. Thus airports should implement flexibility and adaptations to serve the diverse business models of different carriers and alliances. In addition, a closer cooperation between airports and airlines is a key factor for the airport business success, partially because besides aeronautical fees, airlines provide customers for the non-aeronautical services of the airport. Indeed, an airport may influence the carriers' decisions regarding network expansion, and market new destinations together to attract more users.

Aeronautical business units

Airlines also follow a B2B relationship with the third actor in the airport business network, the aeronautical business units. These units comprise a series of agents that provide services to the airlines, and to the airport, that are essential for aviation-related activities (such as air traffic control, meteorological services, communications, baggage handling, passenger handling, aircraft cleaning, fuel provision, aircraft maintenance, in-flight catering, airport security and fire fight, and general safety services). Some of these services may be provided by the airport itself, but they are often delivered by third-party providers (Doganis, 1992).

Airlines can contract the services of the aeronautical business units, or they can perform some of the related activities by themselves. Thus the airport firm is linked to the aeronautical business units through a B2B relationship as well. The airport must guarantee airlines the access to competitive services and a sufficiently attractive business environment for the aeronautical units, while fulfilling all applicable regulations.

The B2B relationship between the aeronautical business units and the airport firm should contribute to an efficient use of the infrastructure and to the provision of aeronautical services for the aviation trade group of customers, as indicated in Figure 2. Similarly, airlines offer their networks of destinations to their own costumers (B2C), while the B2B relationship between the airport and the carriers implies that the airport is also offering the aviation network provided by all the airlines (through a B2C relationship). Moreover, the airport must create synergies with other transport modes in order to be able to offer a complete transport network for both air and surface travelling.

Non-aeronautical business units

Like its aeronautical counterpart, the non-aeronautical business units are not necessarily part of the airport company, but they provide essential services that complement the airport product with non-aviation activities. Among others, the tenants and concessionaires of retail shopping, parking or car rental are part of these business units, as well as the providers of security and cleaning services for the terminals. There is a B2B relationship between these units and the

airport firm. Both the non-aeronautical business units and the airport firm hold B2C links to customers of retail and non-aeronautical services and activities and events.

Finally, the airport firm may, itself or through business partners, provide real-estate development of the land surrounding the airport, and offer consultancy and managerial services, mainly to other airports worldwide. These two groups complement the *airport service packages* that bundle the several products and services that the airport offers as a result of the interactions in the airport business network.

5.2 The airport service packages

According to Jarach (2001, p. 119) the airport firm concept can be achieved "through the implementation of more complex forms of service packages in order to satisfy evolving needs of enriched audiences". In fact, practice shows that airports can successfully bundle their portfolio of activities and products into service packages targeted at particular groups of customers. Moreover, these packages are the result of conscious interactions between the airport firm and the other players in the airport business network. As Figure 2 illustrates, six types of such service packages integrate the airport products and are targeted at one or several customer groups.

The first two types of packages – infrastructure and aeronautical services, and transport network – are directly related to aeronautical revenues, and the other four to non-aeronautical revenues. This structure highlights the possibilities of increasing income from non-aviation activities, as an increase in aeronautical fees normally faces opposition from airlines and regulators. Therefore, to increment aeronautical revenues without raising fees, it is usually necessary to increase traffic levels, which implies high levels of uncertainty.

Conversely, non-aeronautical revenues can be obtained from previously unexplored opportunities and less regulated markets. To frame their revenue structure, airports are usually constrained to two types of regulation: single till, when all types of revenue are considered to set aeronautical charges; and dual till, when only aeronautical revenues are used. Even though the Single Till approach to airport regulation is widely used (CAA, 2000; Teixeira, 2012), evidence suggests that airports are increasingly focusing on commercial activities to increase revenues and profits, and that such focus may be even greater as the pressure to control aeronautical revenues grow (Graham, 2009).

An approach taken by airports worldwide consists of offering retail (e.g. duty free stores, food and beverages, books and magazines) and complementary non-aeronautical services (e.g. car parking and car rental) taking advantage of the passenger throughput created by the aeronautical services. This package can be expanded according to the airport possibilities in such a way that passenger buildings may turn into actual shopping malls.

Furthermore, airports can implement a fourth type of service package (activities and events), in order to entertain passengers or to attract visitors, and to satisfy the needs of other customers in the individuals customer group (e.g. local inhabitants or employees of the airport and the companies settled in or around it). These services can range from open concerts and sport events, to art and commercial exhibitions, to business meetings and congresses.

Real estate development, the fifth type of service package and a natural extension of the previous one, includes all sorts of projects in the airport vicinities to explore the opportunities created by the airport. Possibilities abound; from logistic parks, hotels, office buildings and convention centres; to medical centres for quick surgeries and academic clusters for top management graduate schools (as in The Circle of Zurich airport); or research centres for high-mobility scientists (as in Frankfurt airport city); or other developments such as the photovoltaic park for electricity generation in Athens airport. Some airports choose to keep land-side development departments inside their organizational structure, while others opt for creating separated companies or joint ventures with property developers.

In the process of developing all these service packages, the airports gain expertise and know-how in several areas, and accumulate valuable technical and human resources. Therefore, the final type of service package includes the consultancy and managerial services that the airport firm offers to other airports or actors within the airport industry.

Not all airports implement the entire set of service packages. Nonetheless, no current evidence suggests that it is impossible for any airport to implement all of them, except for the lack of available physical space that limits the scale of some of the packages (especially real estate development). In fact, all packages are scalable and may be implemented according to the particular characteristics of each airport and its surrounding area.

5.3 Approaches to the airport business

The extent to which each airport has implemented the different service packages indicates the business approach their managers pursue (see Figure 3). A rather small airport that offers only its infrastructure and associated aeronautical services adopts a *public utility provider* business focus. This may be the case of airports specialised in serving particular niches, such as general aviation, pilot training, aerial services (e.g. aerial footage or topography), rescue services, and sport or leisure activities; or airports in less developed or remote regions that lack enough resources or traffic to implement additional services.

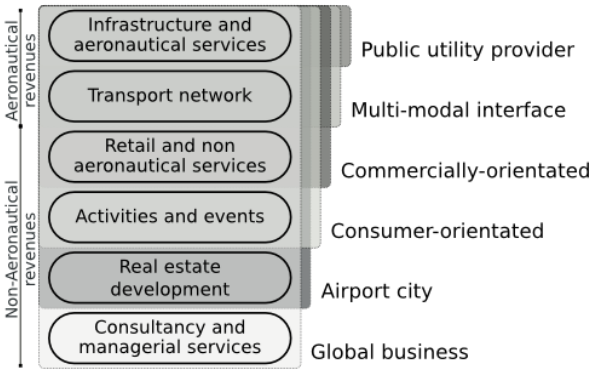

Figure 3 - Different approaches to the airport business in relation to the types of service packages developed.

As airports gain relevance in their catchment areas, an intended connectivity with surface transport emerges as passenger and cargo traffic increases. Then the airport becomes a *multi-modal interface* that offers air services for public access. Services provided by commercial airlines are essential at this point, since the attractiveness of the airport is strongly linked to its destinations. In this approach airlines are the most important customers.

When traffic increases significantly, airports are more likely to engage in a *commercially-orientated* approach. In this case, non-aeronautical revenues are important for the airport to sustain income levels and to less depend on the variability of air traffic.

If operators realise that airports attract different types of customers, and that they can actively influence the preference of those customers, a more *consumer-orientated* business approach is reached. At this level, the airport can implement the "activities and events" type of service package in order to satisfy the varying needs of the users.

Depending on the space available, or the ability of the airport to acquire surrounding land or partner with its tenants, the business approach turns into the development of the *airport city* concept. Although this is normally associated to large airports, Peneda et al. (2011) suggest that it is rather scalable and applicable to smaller airports too.

Finally, airports can be a truly *global business*. These airports bid for management contracts or acquisition of other airports, and provide consultancy on airport planning, construction or operation.

The different types of packages can be implemented sequentially in order to move from one business approach to the next one. Also, the inclusion of the types of service packages within the airport business network (Figure 2) helps identifying the most relevant agents in the network to "produce" the packages. Similarly, the connection between the packages and the customer groups facilitates the formulation of differentiation strategies to tackle the customers at whom each package is targeted.

6. Competitive strategies for airports

The seminal work of Porter (1980) defines three generic competitive strategies. For a broad market, cost leadership and differentiation are sources of competitive advantage. Alternatively, one can focus on a particular market segment or niche.

Graham (2010) briefly discusses Porter's generic strategies in the context of the airport industry. To her, the relevance of cost leadership is questionable in the case of airports that lack competitive pressure, are subsidised or are part of an airport group that practices common prices. In contrast, her analysis provides examples of airports that pursue differentiation and focus strategies. Arguably, Porter's approach does not consider the complexity of the airport context. Graham's ideas, on the other hand, hinder generalisation to any type of airport, which is one goal of our work.

To support airport firms in the construction of competitive strategies, this section discusses differentiation and cost leadership within the context of the airport industry and under the framework of the airport business network. First, we propose a series of differentiation factors that may be selected independently or in combination, and used to promote the airport to the customer groups analysed. Second, we summarise some arguments about the implications of airport pricing as a competitive strategy.

It is worth noting that some airports may practice a pure focus strategy to target a selected niche. There are airports specialised in particular segments, such as general aviation (e.g. Cascais Tires Airport in Lisbon, Portugal), executive aviation (e.g. Le Bourget Airport in Paris, France), air cargo (e.g. Liège Airport in Belgium) or low-cost carriers (e.g. Beauvais-Tillé Airport near Paris, France). However, in practice, most commercial airports (including some of the examples above) serve several segments with a broader market scope. In this case, it is more relevant for airports to select a set of differentiation factors that may be used to target different customer groups with different value propositions.

6.1 Differentiation factors

Figure 4 summarises the factors identified as possible sources of differentiation for airports. These factors are linked to specific customer sub-groups, at whom the strategies that implement each (or a combination) of the factors may be targeted. These sub-groups are contained in the three main customer groups for the airport service packages.

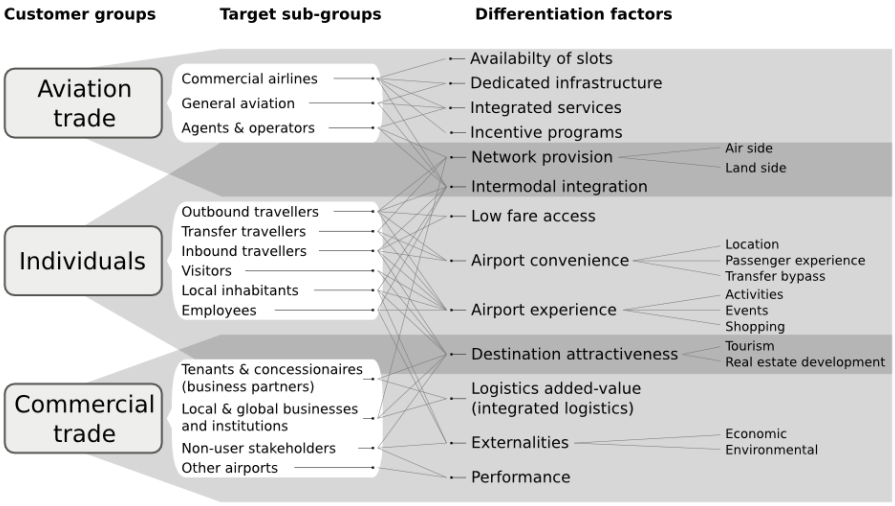

Figure 4 - Differentiation factors for airports.

Factors mainly targeted at aviation trade customers

The first differentiation factor, the *availability of slots*, is extremely important and is targeted specifically at commercial airlines. In fact, this is one of the advantages for low-cost airports when attracting airlines (Barret, 2000). It is undeniable that any airport willing to establish a competitive position must provide available capacity to accommodate the desired increase in traffic. However, the question is not only about spare capacity, since slots assigned to particular times of the day may be associated to a more attractive market. Moreover, the current methods to allocate slots usually favour incumbent airlines that already have the right to use them (de Neufville & Odoni, 2003). Therefore, availability of slots is also crucial for an environment of competition between airlines that may benefit passengers through lower prices.

A second differentiation factor consists of *dedicated infrastructure* targeted mainly at commercial airlines and general aviation. This may include the use of exclusive terminals, parking stands, boarding gates and/or check-in areas in the passenger buildings. Initially, dedicated infrastructure appears attractive to airlines using the airport as a hub or a traffic node (in order to gain visibility, improve branding and influence airport planning). However, it may also be used to separate market segments with dedicated areas for low-cost carriers (e.g. Kuala Lumpur Airport in Malaysia), freight integrators (e.g. Memphis International Airport in the United States), or premium passengers (e.g. Lufthansa's First Class Terminal at Frankfurt Airport in Germany).

Integrated services, the third differentiation factor, are targeted at all aviation trade customers. This factor may be interesting for airline alliances willing to provide a seamless travel experience to their passengers, or for LCCs by providing integrated ground handling that supports cost reductions in ground staff. As another factor, airports may implement strategies that include *incentive programs* to support route development of commercial airlines, and attract more customers to the airport.

Factors mainly targeted at individual customers

Network provision is a key factor, central to airport competitiveness. A wider network (offered through improved connectivity or non-stop destinations), in combination with adequate frequencies and timetables, is essential to define the airport catchment area in dynamic terms. Network provision is also related with the land side connectivity of surface transportation. This factor may be targeted at travel agents and tour operators, outbound and transfer travellers, and local and global businesses and institutions.

Intermodal integration is also a key differentiation factor that may be targeted at all customers in the aviation trade group, especially airlines that offer complementary services (such as air-rail, air-cruise, or air-bus origin to destination travel); and at all kind of travellers, as well as local inhabitants and employees in the customer group of individuals.

The *access to low fares,* strongly linked to the presence of LCCs, may differentiate airports by providing the cheapest alternative for outbound and inbound travellers. Similarly, all travellers may base their airport choice on the *airport convenience*. This may be assessed in terms of the airport location (in relation to the trip's origin and/or destination), the overall passenger experience at the airport[5], or the possibility to avoid transfers.

Previous research on the factors that determine traveller's choice of departure airport coincide in signalling access time and cost, and level of service (flight frequency, timetable and flying time) as key aspects, while flight fare seems to be more important for leisure passengers (Hess & Polak, 2006; Lian & Rønnevik, 2011).

All customers in the group of individuals may also be targeted with the *airport experience* as a differentiation factor (not to be confused with passenger experience which, as referred above, is intended only for travellers). Strategies to improve the airport experience must encourage individuals to enjoy the airport as a place to be at, and not only to pass by. Therefore they should include activities and events (airport tours, viewing terraces and so on), airport shopping and services such as banks or pharmacies.

Destination attractiveness is another factor, and is based on the promotion of the airport or its hinterland as a destination. This is targeted mainly at inbound travellers, visitors, local inhabitants, tenants and concessionaires, local and global businesses and non-user stakeholders[6]. Destination attractiveness may be explored in terms of tourism and the opportunities created by the real estate developments around the airport (for instance, the centre for quick surgeries in The Circle project at Zurich Airport, to attract "medical tourists").

Factors mainly targeted at commercial trade customers

An additional factor of differentiation consists of *integrated logistic* services targeted at business partners established inside the airport (such as aeronautical and non-aeronautical business units), as well as local and global companies and institutions located (or willing to be located) in the airport hinterland. These logistic activities may attract companies that have no relation with the aviation business if they perceive an advantage in the synergies created by clustering different activities (e.g. a supermarket distribution centre is located inside the Frankfurt Airport City, even though air cargo is not an essential part of their business model).

Taking advantage of the growing development around the airports, a further differentiation factor arises related to the *side benefits* produced by an airport in economic and environmental aspects. Strategies to explore positive impacts can be targeted at local inhabitants, employees and, particularly, at some of the non-user stakeholders.

The last factor is related to the airport firm's *performance*. Airports with a reputation of good performance have an advantage when targeting other airports and non-user stakeholders as customers of business and engineering consulting services.

Implementation of differentiation strategies

The schemes for the airport business network (Figure 2) and for the differentiation factors (Figure 4) share the airport customer groups as a common element. An integrated framework to assess

[5] Simple layouts and easy navigation; simplified processes for checking in, security screening and aircraft boarding; added-value services like home delivery of airport shopping, internet access or showers, are all examples of strategies to provide an enhanced passenger experience.

[6] Non-user stakeholders are included as 'customers' because airports can attract them as investors or promoters to improve competitiveness.

competitive strategies emerges when merging both schemes around the customers groups, as Figure 5 shows. The resulting framework is useful to identify the network agents that are involved in the implementation of differentiation strategies. It is also possible to link the strategies to the specific target customers and the service packages that materialise such strategies.

To provide an example, imagine an airport that wants to formulate a strategy around *network provision* as a differentiation factor, in particular regarding the air side (i.e. the provision of direct flight destinations). As the integrated framework suggests, such strategy would be primarily targeted at travel agents and tour operators (who can sell the destinations through their distribution channels), outbound and transfer travellers (who demand the destinations), and somehow to local and global businesses and institutions (because they may take advantage of the improved mobility for their top managers).

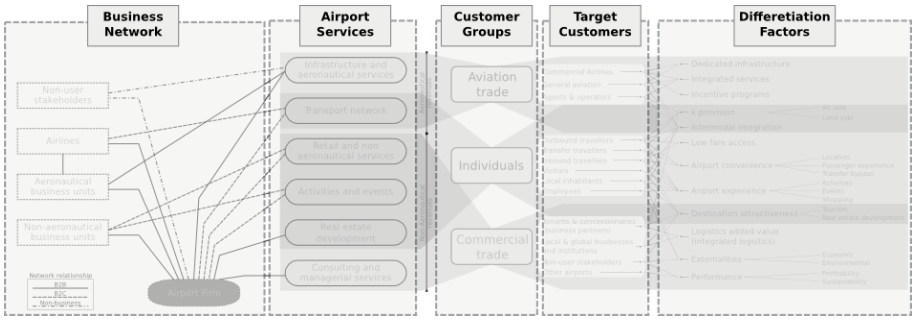

Figure 5 – Integrated framework for the assessment of airport differentiation strategies.

In order to follow the strategy, the type of service package that the airport should strive to provide to these customers is the *Transport network*. The key stakeholders to implement this service package are the airlines and the aeronautical business units that satisfy the airlines' requirements. Therefore the airport managers should pursue a close collaboration with these stakeholders in their strategic directive.

6.2 Airport cost leadership

Before the growth of LCCs, airport charges normally accounted for a small proportion of air fares charged to passengers (European Commission, 2002). In a regulated market that prevented airline competition, a 'cost-plus' environment generated inefficiencies along the business chain (de Neufville, 2008). Under those conditions, differences in airport fees were not reflected in the ticket prices.

Economic liberalisation creates a completely different environment. Price competition between airlines leads to lower costs that are passed on to passengers. In this context, airport charges gain relevance as a source of competitive advantage.

As a result of the discount scheme for airport charges implemented by Aer Rianta, traffic at Dublin doubled between 1993 and 1998. Congestion also rose significantly, but Ryanair was seeking further discounts to promote new routes to mainland Europe. Unsuccessful, the airline shifted its route development to London/Stansted. Therefore, as Barret (2000) states "in a competitive airport environment airport managers will have to engage in price negotiations with airlines rather than present a fixed set of charges on a take it or leave it basis".

When regulation on single or dual till approaches allows it, airports offer reduced fees to increase passenger numbers and non-aeronautical revenues, expecting higher general profitability. However, when aeronautical charges are reduced, "there is a need to ensure adequate retail facilities are in place to generate commercial revenue" (Francis et al., 2003). Otherwise, there is no opportunity to compensate for the loss of income in the aeronautical side.

Forsyth (2010) argues that competition through aeronautical charges is not always welfare enhancing. When competition occurs between a major airport and a secondary one located nearby, and the major airport has spare capacity, the marginal cost of handling extra flights there may be much lower than for the secondary airport. Consequently, the allocation of new services to the secondary airport would result in higher overall costs and less general welfare.

Conversely, price competition from the smaller airport would act as an incentive for the major airport to improve efficiency, especially since airports and airlines still bear burdens of a former regulated era that affect their price structures. Competition then helps by changing mind-sets and pushing for new and more efficient methods.

Low airport fees may be so "successful" that they could lead to significant congestion problems. In the long run, the strategy may put the airport in a less competitive position (Graham, 2010). Therefore cost leadership strategies must be closely linked to infrastructure planning, pursuing the achievement of common goals.

As a final remark it should be noted that, regardless of the weight of airport charges in their overall costs, airlines do obviously consider all costs incurred when operating at an airport. Consequently, the framework we propose supports the formulation of strategies that consider the elements required to create advantages in the competitive environment that airports face nowadays and, most probably, will prevail in the near future.

7. Conclusions

This paper presents three elements for the analysis of the global airport industry: a new definition of customer groups for the airport as a multi-service firm; the airport business network, i.e. a model to examine the interactions between the agents involved in producing the airport product (the service packages); and a set of differentiation factors that airport managers may combine to formulate competitive strategies. We propose the integration of these elements, in order to provide a common framework to support the analysis of the current competitive environment within the industry.

Furthermore, this analysis is viewed as a contribution for the current discussion on airport competition by providing a comprehensive, broad scope review of the issue. The existence of competition between airports, in the different ways presented in this paper, adds to existing evidence to challenge the idea of airports as monopolies.

New dynamics in liberalised markets (such as the opposition of airlines and regulators to increases in aeronautical fees, the pressure from governments for airport self-sufficiency, and the emergence of multiple customers for the airport services) are forcing airport managers to develop strategies for creating real competitive advantage. This paper highlights how airports may implement successful strategies, particularly by exploring several differentiation factors.

The process of strategy development implies a close involvement of the airport with other players in the airport business network. It is of paramount importance to align the goals of competitive strategies with those of infrastructure planning, in order to ensure the sustainability and the success of the overall airport business.

Future research can apply the proposed framework for the definition of competitive strategies in a given airport, or to analyse strategies already implemented by some airports. A more detailed description of the relationship between the airport firm and the other agents, including case studies of successful and unsuccessful interactions, may be valuable to provide a better understanding of the airport business network. Finally, it would be worth studying the influence of some features of the airport design, such as flexibility, on the generation of strategies and on the implementation of the different service packages.

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