

Real Estate at Airports

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1 ABSTRACT

Real estate development still is a rather neglected issue at the majority of airports. Vienna International Airport's Skylink-Terminal expansion program was used as the background and motivation for this paper. Does non-aviation related airport development generate positive economic effects for both the airport and the adjacent business environment? In addition to that, does the organizational composition of the airport authority have an impact on entrepreneurial behavior in terms of real estate development? Three US airports (Raleigh-Durham, Charlotte, and Washington Dulles) have been selected as case studies to research these hypotheses.

2 INTRODUCTION

Real estate development at airports is still a rather neglected issue in both Europe and the US. Vienna International Airport's (VIE) Skylink Terminal expansion program, and the subsequent development of office properties at the airport have been used as background for this research. Additionally, there is literature and research available on both the topics of airports and airport development on the one hand, and real estate development on the other hand. But airport real estate development research, the intersection of both, is still in its humble beginnings.

The three US case studies, chosen by means of 10 selection criteria out of 47 different airports, are Washington Dulles Airport, Raleigh-Durham Airport, and Charlotte Douglas International Airport. This introduction will provide recent developments on this topic, as well as formulate the underlying two hypotheses for this article.

2.1 Aerotropolis

The currently most radical concept of airport and also airport real estate development is the "Aerotropolis Concept", a model developed by John D Kasarda (Kasarda 2006: 8). This brand-like concept very much resembles a model metropolis. The airport and the surrounding infrastructure such as retail, distribution, hotels, light industrial parks etc serve as the "central business district", and the "suburban area" can extend up to 30km away from the center, incorporating additional development, such as office and research parks, foreign trade zones, entertainment districts and the like (Kasarda 2007: 9). Most airports, which have applied this concept are more or less "greenfield developments", which can most often be found in Asia (see Singapore Changi International).

2.2 The Incentive for Real Estate Development

According to Jim Graaskamp, the real estate process is a constant interaction of three groups - space users (the consumers), space producers (developers and those, who have specific expertise), and public infrastructure (off-site services and facilities) (Graaskamp 1992: 231). The real estate development process also needs to incorporate the availability and condition of land, evaluate, whether the project is (financially) feasible, and also be aware of market, financial, management, legislative, or environmental components within the project's risk.

Various studies across the United States have proved negative effects of airport development at the surrounding residential markets by means of the hedonic price theory (see Jud, Winkler (2006) and Espey, Lopez (2000)). In order to prove positive economic effects of commercial real estate development at airports, the author will employ a modified formula, used by Espey/Lopez in a former study. The price function of a residential property (P_r) or a commercial property (P_c) can be defined as $P_{r/c} = f(S_w, \dots, S_{xyz}, N_w, \dots, N_{xyz}, Q_w, \dots, Q_{xyz})$, S, N, and Q indicating vectors of structural, neighborhood, and environmental variables, respectively. Or as Sherwin Rosen put it "When goods can be treated as tied packages of characteristics, observed market prices are also comparable on those terms" (Rosen 1974: 54). For residential properties, this function is a utility function, whereas for commercial properties, it is a profit function. The implicit price of one of these variables can be estimated as $\partial P / \partial X = P_x(X)$, X being one of the above-mentioned characteristics (either S, N, or Q). The partial derivative expresses the required change in expenditures in

order to obtain a property with one more unit of X , *ceteris paribus*. Given a positive value of the partial derivative, it is an amenity, a negative value of the partial derivative would then be a disamenity (air pollution, airport noise). The author will now explain the application of the model by means of two dummy variables: S_i (a model variable for traffic and infrastructure) may produce a positive value for the commercial property (production facility, logistics center, etc) close to the airport, as intermodal access from air to land (rail or road) is important for fast and seamless delivery. For residential properties, traffic and infrastructure close to an airport also include noise, which may be reflected in a negative value for the implicit price of that characteristic. Q_i (a model variable for environmental protection requirements) may produce an inverse positive value for the residential property (clean, and semi-natural environment) near the airport, as this will have a positive influence on the utility function of housing. On the other hand, for commercial properties close to the airport, this may imply additional construction or preservation cost and hence result in a negative impact on the implicit price of the profit function.

The first hypothesis of this article is that airport development generates positive economic effects on the surrounding commercial area.

2.3 Airport Authorities

When the Wright Brothers finally succeeded at Kitty Hawk, North Carolina on 17 December 1903, the place they took off from could hardly be called an airport (Wells 1996: 4). But in order to provide adequate service, airplanes required a place to take off, land, be repaired, fueled, etc: an airport. Ever since, airports have developed into huge systems. In terms of traffic growth, Atlanta Hartsfield-Jackson Airport is a vibrant example (Atlanta Airport 2007). It has seen an increase in passenger traffic from close to 2 million passengers in 1957 to 84.8 million in 2006. Frankfurt International Airport, Germany's biggest airport employs more than 70,000 people in 500 different businesses at its location and consumes about 180,000 times the energy a single occupancy house needs in an average year (Steckdose.de 2007).

Airport infrastructure consists of the two major areas, the airside and the landside area. Airside is anything aviation-related, such as terminal buildings, aprons, runways, taxiways, hangars, etc. Landside developments include the entire infrastructure such as parking lots, office buildings, hotels, public transportation stations (bus, shuttle, taxi, train) cargo and rental facilities, handling centers, access roads, etc. A dynamic example for excellence in both kinds of development is Hong Kong International Airport, one of the few quadramodal (air, highway, rail, and sea access) airports of this world. At the Sir Norman Foster-designed airport, travelers find a large shopping center, which features 150 stores, and the largest hotel in Hong Kong – the Regal Chek Lap Kok Hotel –, the Hong Kong Convention & Exhibition Center, and the world's largest stand-alone air-cargo and air-express facility and a 139,000 square meter mixed-use freight-forward center. In addition, DHL will open its Asia air express hub in that zone soon as well (Kasarda 2004: 3). Besides cargo, an office park was developed in the East Commercial District, SkyPlaza, a retail and shopping center directly connected to the airport. This center opened in 2006, and recently added a nine-hole golf course. A lot of this landside (= non-aviation) development is due to the fact that the Hong Kong Airport Authority (HKAA) is both financially and operationally independent of the Government of Hong Kong. It is designed as a separate government department, but acts totally autonomous. There are even plans to conduct an initial public offering and list the HKAA on the Hang Seng Hong Kong stock exchange.

This directly leads to the second hypothesis of this paper: The more financially and operationally independent an airport authority is of other (public) constituents, the more likely it is going to be entrepreneurial and hence engage in more non-aviation real estate developments.

3 METHODOLOGY

Case studies have been used as the research design for this article. The case study approach is most suitable for doing research on real estate at airports, because the study author does not have to control for behavioral events, and other factors, which have influence on the various reasons why and how property has been developed at the airport (Tellis 1997: 1). In this article, each airport will be treated as a separate case study embedded into the big picture "real estate at airports". The author will follow Yin's replication logic, a design employed for multiple case study analysis (Yin 2003: 1). As little or no research has been done on this field of interest so far, the author will employ an exploratory case study design. Hence, this kind of research helps to identify further questions, select measurement constructs and develop measures for the

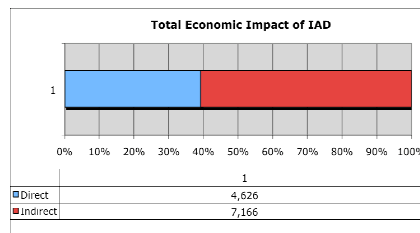
future. Prior to case study research, a case study protocol has been compiled, including an overview of the project, field procedures, questions, and finally a guide for the case study report (Yin 2003: 68).

4 CASE STUDIES

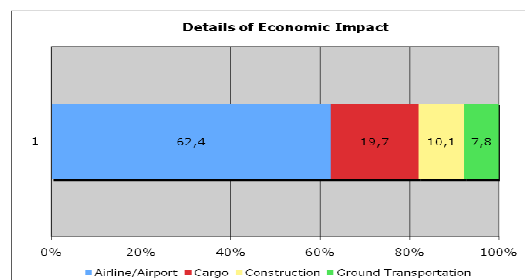
The following chapter will highlight the most important findings and results from the case studies¹.

4.1 Washington Dulles Airport (IAD)²

The total economic impact of IAD amounts to \$ 11.792 billion as can be seen on the figure below, whereas \$ 4.626 can be accounted to direct impact, whereas the remaining \$ 7.166 result from indirect economic impacts in the region.

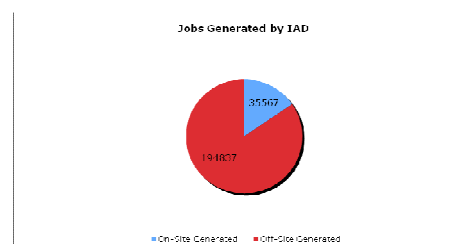


Total Economic Impact of IAD; „2005 Regional Economic Impact Study – MWAA“; Chart compiled by author



Details of Direct Economic Impact at IAD; „2005 Regional Economic Impact Study – MWAA“; Chart compiled by Author

The majority of 62,4% of direct economic impact goes towards airlines/airport-related activities, whereas cargo amounts for close to 20% of the revenues generated. Construction (the current D2 Development Project) and Ground Transportation amount for the remaining 17,9%.



Jobs Generated by IAD; „2005 Regional Economic Impact Study – MWAA“; Chart compiled by author

According to the economic impact study, Dulles supports 35,567 jobs at the airport, and a total of 194,837 indirectly in the entire greater Washington DC area (Martin Associates 2002: 1-91).

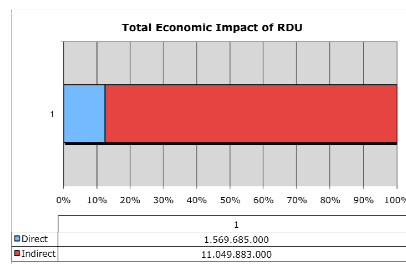
4.2 Raleigh-Durham International Airport (RDU)

The economic study calculated a total \$ 12.619 billion, economic impact by means of extrapolation. \$ 11.049 billion can be derived from direct economic impact, and \$ 1.569 billion can be derived from indirect impacts. The large proportion of indirect economic effects is due to RDU's proximity to the Research Triangle Park.

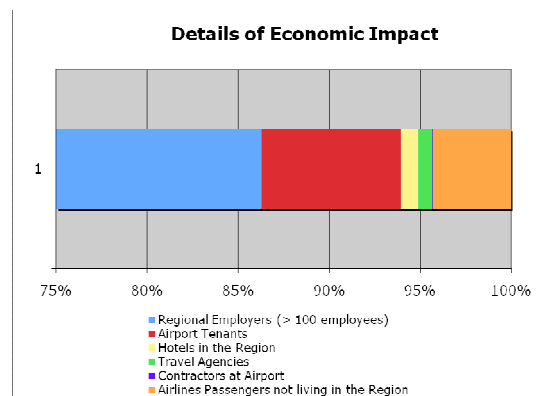
¹ Data for the case studies has been extracted from economic impact studies and the like, personal interviews, and data on real estate at airports has been derived from CoStar Industrial and Office reports; CoStar is a Real Estate Information Company in the US and delivers data on commercial real estate properties (office and industrial) on a quarterly basis for the biggest metropolitan areas in the country

² Data on Dulles International Airport is limited as a personal interview was not feasible.

The study has also shown that RDU supports 4,500 jobs directly, and 43,260 indirectly, hence a total of 47,760 in the region as a result of the airport.



Total Economic Impact of RDU; „Economic Impact Assessment of Raleigh-Durham International Airport“; Chart compiled by author



Details of Economic Impact at RDU; „Economic Impact Assessment of Raleigh-Durham International Airport“; Chart compiled by author

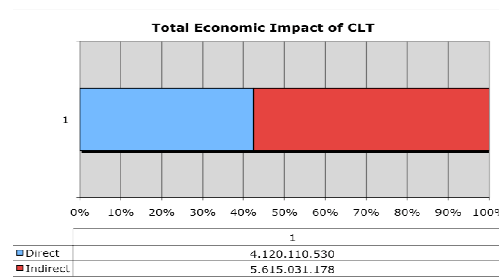
A detailed look at the total economic impact calculation reveals that almost 86% of the airport’s impact goes to the regional employers (> 100 employees). Even more clearly in this section, airports are the significant “transmission” for the region’s economic engine. Airport tenants are responsible for 7.5% of the economic impact, leaving the remainder of 6.5% to hotels, contractors, travel agencies, and the passengers. This underlines the significant impact of RDU on the Research Triangle Region (Hauser, Swartz 2006: 1-27).

The Raleigh Durham International Airport Authority was enacted by North Carolina State Legislation in 1959 and put together by the cities of Raleigh and Durham, as well as Wake and Durham County. It is a separate legal entity and is given all powers except tax; it hence maintains its own police force, firefighters, and can make laws, called ordinances. The airport authority is independent in its operations, and only responsible to the FAA with regard to grant compliance and its 8-member board, staffed by the four constituents of the region. The only existing non-aviation real estate development of RDU so far is its recently opened “Aviation Station” with “Sheetz” operating a convenience store and a service station. More developments will be based on the fact whether “ the return on investment is good, we will rather invest in there instead of creating simple interest payments from the bank” (John Brantley, Airport Director). As RDU does not have the capacity, but is willing to expand into another field, it is thinking about bringing in a “third-party developer”. Not on a simple ground lease, but “just similar to a retail outlet, where you own the ground, where you lease the ground, but you get at least over a certain point in time a percentage of gross sales (= rental fees) (RDU Interview). In the north of the airport, a piece of land, which overlooks interstate highway I-40, is said to be the perfect location for a hotel. The airport authority is planning on “joining forces” with the developer. Additionally, there are a couple of industrial facilities in the northwestern area, which do not have self-contained cafeteria, another field for RDU’s airport authority to open up a business. (RDU Interview 2007).

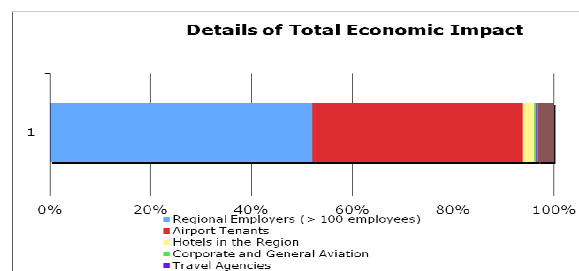
4.3 Charlotte Douglas International Airport (CLT)

This economic impact study calculated a total \$ 9.735 billion economic impact by means of extrapolation. \$ 4.120 billion can be derived from direct economic impact, and \$ 5.615 billion can be derived from indirect

impacts, as explained earlier on. The study has also shown that CLT supports 20,072 jobs directly, and 80,644 indirectly, hence a total of 100,176 in the region as a result of the airport.



Total Economic Impact of CLT; Economic Impact Assessment of Charlotte Douglas International Airport – UNC Charlotte 2005;
Chart compiled by author



Details of Total Economic Impact; ; Economic Impact Assessment of Charlotte Douglas International Airport – UNC Charlotte 2005;
Chart compiled by author

A detailed look at the total economic impact calculation at CLT reveals that more than 50% goes to the regional employers (> 100 employees). Airport tenants and these regional employers combined make up for more than 90% of the impact, leaving the remainder of 7% impact to the other 5 sectors of the study (Hauser, Swartz 2005: 1-34).

Charlotte Douglas International Airport is owned and operated by the City of Charlotte. The airport authority is hence a city department, the authority reports to the city manager and the city council. There is no specific staff dedicated to real estate development, which is handled through the “community programs division”. This department handles all sorts of business-related activities and developments at and around the airport. Besides the grant-related responsibilities to the FAA, the entire business, constructions, and operations have to be approved by the city council. This council meets only twice a month, which requires a lot of prior preparation for the airport authority to get projects approved; if a project is above a certain amount, it has to get approval from downtown, which does not allow full flexibility for operations. Charlotte’s non-aviation real estate developments are limited to a facility called Park 160 cargo development, which is located at the south end of the airport. The land with the buildings was purchased back in the 1980’s, and since the airport authority “does not throw away a dime”, it stays there until it is needed for other aviation related developments. Currently, it is leased out to tenants at the airport. Any other non-aviation development at the airport was never built by the airport authority itself, but has been purchased in the course of layout conversion plans, just stayed on the land and maybe has been leased out. Even supposed the airport authority had resources available it would “focus on aeronautical development such as aircraft hangars, cargo hangars, cargo facilities, and maintenance facilities”. The authority’s stance on real estate, seeing it as “venture capital”, does express its conservative position towards such development.

5 CONCLUSION AND OUTLOOK

The three case studies above have presented several examples of positive economic effects of airport development on the region. Airports do have positive economic effects on both airport tenants, as well as the surrounding firms. Potential negative effects on the residential market have not been examined in the case studies. These obvious positive economic effects now bring up a question: What can airports do in order to maximize these effects in order to be beneficial to airport development and the surrounding area? This

automatically leads to the second “hypothesis” of the case studies: the entrepreneurial impact of airports’ authority structures. Even though the Washington Dulles case study is limited, as no insights and details on certain issues could be provided, Raleigh- Durham and Charlotte Douglas have proved to be two extreme cases. RDU’s airport authority is an independent authority, not responsible to any public constituents in its operational day-to-day business. CLT’s airport authority on the other hand is a city department, directly responsible to the city council and city manager. These airports’ approaches to non-aviation real estate development and general development could not be more different. RDU is beginning to make first entrepreneurial steps, underlined for example by its recent “Aviation Station” development, whereas CLT has never even actively approached this issue and is more or less focused on its aviation-related operations.

Despite these findings, airports especially in the United States still very rudimentarily pursue active non-aviation real estate development. This still leaves a lot of room for development opportunities such as implementation alternatives of the “Aerotropolis” concept, the most radical current combination of airport and real estate development.

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