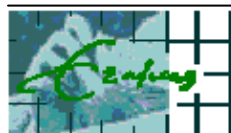


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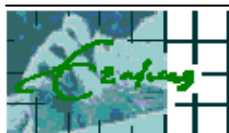
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## Summary

Last decades, due to socio-economic and demographic trends, the market structure of the aviation and airport business has changed quickly. By integrating activities which are complementary as well as non-complementary to aviation, airports transform into ‘Airport cities’ or ‘Aerotropolis’. Real estate development is becoming a crucial asset for airports to generate non-aeronautical income. Why is this, what trends influence real estate development at airports and what could be the economic contribution of real estate development at Amsterdam Airport Schiphol<sup>1</sup> to the improvement of its competitive position and maximization of welfare ? Therefore the main question of the survey is:

*“In which way can real estate development at Schiphol contribute in a spatial economic way to an optimal result for the airport, the government and the society in general ?”*

Recent developments at the airside and landside of the aviation industry and the interaction of airside and landside, changed the level playing field for airports. Globalization of the world economy and socio-economic developments lead to changing location behaviour and consumer patterns, resulting in an increasing demand for air transportation. With an average annual growth of 5%, the aviation industry is growing faster than the world economy (3%). This is changing the quantitative demand and qualitative requirements for real estate at airports. Liberalization, deregulation and harmonization leads to changing market structure of the aviation industry, with the rise of Low Cost Carriers as most affecting recent development. The aviation industry has become a market of severe competition with strong downward pressure on prices for air transportation, leading to increasing downward pressure on airport charges. Therefore airports are diversifying their business strategies to ensure the overall revenue growth and start developing real estate for cross-subsidizing.

As a result of globalization, city regions like the Randstad increasingly interact in a global network with city ports as high value connecting nodes. Airports as city ports are a crucial element in urban-regional and economic development of city regions, because the airport, the city region and the transportation network are an united, interdependent and integrated system with reciprocal influence. Airports increasingly integrate in the urban system, accommodating economic activities, adapting urban functions and closely resembling autonomic Central Business Districts. Specific location factors like the quality of the airport product however create a unique business climate at airports compared to regular Central Business Districts, making airports a high potential business location for economic activities. Therefore airports increasingly locate traditional urban functions, changing airports from traditional interchange nodes into new intermodal, multifunctional Central Business Districts of increasing strategic importance, strengthening the competitive position of the globalizing city region.

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<sup>1</sup> In this thesis Amsterdam Airport Schiphol is abbreviated to ‘Schiphol’ (See also: Definitions)



Real estate development at airport cities contributes positively to urban regional and economic development by creation of jobs and Gross Value Added. Each direct job at the airport generates 1.2 additional indirect job and 0.5 induced job in the airport region. The direct, indirect and induced economic effects of airports together contribute between 1.5% and 2.5% of the Gross Domestic Product. The *Airport City concept*, *aviation-related clustering*, the *Airport Corridor* and the *Aerotropolis concept* are identified as concepts for geographical spread due to urban regional development of airports. Besides this spatial impact, it is impossible to isolate and quantify the socio-economic impact of real estate development at airports measured in creation of jobs and Gross Value Added, because it is impossible to indicate and distinguish which part of the total socio-economic impact of airports is attributable to the real estate development at the airport itself and what is attributable to other factors. However, less tangible and softer aspects of the impact of real estate development at airport cities for the airport, the government and the society can be indicated.

Commercialized real estate development at airport cities contributes to the airport by a diversification of business activities of the airport authority, a reduction of its economic vulnerability and a spread of business risks. Airports generate high rent income and concession income on exploitation of commercialized real estate which can be used for cross-subsidizing. Real estate is an asset on the balance sheet, increasing the equity, giving more market value and creating more financial capacity for the airport authority. Real estate development increases the attractiveness of the airport as business location, attracting new and more diverse economic activities and it improves the airport (transportation) product. The competitive position of the airport increases and it strengthens the urban function and the economic importance of the airport in the city region, benefitting the image of the airport. A risk however is resistance from residents and real estate development threatening the primary transport function as core business of the airport due to congestion and space needed for commercialized real estate development.

Commercialized real estate development at airport cities contributes to the government by an improvement of the diversity and quality of the regional production structure and the socio-economic strength of the airport region and the wider city region. This improves the attractiveness of the city region as business location, increasing the competitiveness of the city region in a global network of city regions. The government also benefits by job creation, reducing unemployment, increasing purchase power, generating spending, income and welfare effects in the city region. It generated tax income and income by land leasing and land selling for real estate related project development. However, the government faces challenges regarding increased noise, air pollution, congestion, ecological damage and safety risks, requiring integrated policy on mainport development, urban regional and economic development, real estate development and the living environment. Moreover, real estate development at airports might cause Central Business Districts in the city region compete with the airport site as business location, causing unbalanced urban development and economic growth.

Commercialized real estate development at airport cities contributes to the society by an increase and diversification of economic activities, urban functions, facilities, an improved airport (transportation) product and investments in necessary landside infrastructure, which improves the quality of the living environment. It creates direct, indirect and induced jobs and income for residents. But also the society faces increased noise, air pollution, congestion, ecological damage and safety risks, which has negative impact on the quality of the living environment for the society.



For airports with a throughput of approximately 45 million passengers per year, between 30% and 36% of the total revenue is generated by real estate related activities. In '06 Schiphol Group generated 29% of the total revenue by real estate related activities, which means that Schiphol Group is lagging behind on real estate related revenue generation, compared to airports with comparable passenger throughput. This can be explained by the increasing share of transfer passengers at Schiphol (43%; '09), because transfer passengers make less use of commercial facilities at airports and spend much less on real estate related activities than domestic passengers. The other reason is the fact that Schiphol Group is state owned with a multi-level government authority owning the airport, which is one of the most inefficient ownership forms for airports.

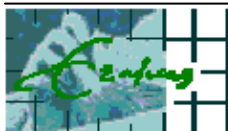
To make Schiphol Group, the local, regional and national government as well as the society benefit from commercialized real estate development at the airport site of Schiphol, Schiphol Group is recommended to increase its annual growth rate for real estate related revenue between 8.5% and 11.5% per year for the next 5 years, assuming that Schiphol Group will continue to maintain its average long term annual growth rate for total revenue of 7%. Preconditions to realize this growth are to privatize Schiphol Group, because airport privatization increases productive efficiency and operating profitability. Meanwhile, Schiphol Group has to create commitment from government and society for real estate development at the airport site by continuous, intensive and pro-active management of the airport area growth coalitions.

Schiphol Group is recommended to increase the overall capacity for commercialized real estate development at Schiphol between 1,992,000 m<sup>2</sup> (*Global Shift*) and 2,340,000 m<sup>2</sup> (*Balanced Growth*) in '20. To strengthen its position as multi-hub, Schiphol Group is recommended to allocate the potential for m<sup>2</sup> real estate at Schiphol to economic activities in the segments *Core business*, *Airport-related* and *Airport-oriented*. In meantime, Schiphol Group is suggested to focus on new, innovative economic activities in the clusters *Recreation*, *Knowledge* and *Health & wealth*. This strengthens the urban function of the airport, it generates high rents per m<sup>2</sup> and therefore are high potential clusters for revenue from commercialized real estate development at Schiphol.



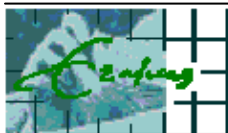
## Abbreviations

AAA	Amsterdam Airport Area
ACI	Airport Council International
AdP	Aéroports de Paris
ATM's	Air Transport Movements
BAA	British Airports Authority
BFS	Bestuursforum Schiphol
BRS	Bestuurlijke Regiegroep Schiphol
CBD	Central Business District
CdG	Paris Charles de Gaulle Airport
CPB	Netherlands Bureau for Economic Policy Analysis (' <i>Centraal Planbureau</i> ')
CROS	Commissie Regionaal Overleg luchthaven Schiphol
EU	European Union
EZ	Ministry of Economic Affairs (' <i>Economische Zaken</i> ')
F&B	Food&Beverage
FDI	Foreign Direct Investments
FIN	Ministry of Finance (' <i>Financiën</i> ')
GDP	Gross Domestic Product
GVA	Gross Value Added
ICAO	International Civil Aviation Organization
ICE	InterCityExpress-train
ICT	Information and Communication Technologies
KvK	Chamber of Commerce ( <i>Kamer van Koophandel</i> )
LAG's	Liquids, Aerosols and Gels
LCC('s)	Low Cost Carrier(s)
m <sup>2</sup>	Square meters
Mio	Million
R&D	Research and Development
RPB	Ruimtelijk Planbureau
SADC	Schiphol Area Development Company
Schiphol	Amsterdam Airport Schiphol ( <i>airport site</i> )
Schiphol Group	Schiphol Group N.V. ( <i>airport authority</i> )
SRE	Schiphol Real Estate
SWOT	Strengths, weaknesses, opportunities and threats
V&W	Ministry of Transport and Water Management (' <i>Verkeer &amp; Waterstaat</i> ')
VROM	Ministry of Planning (' <i>Volkshuisvesting, Ruimtelijke Ordening en Milieu</i> ')
VVO	Rentable floor area (' <i>Verhuurbare Vloeroppervlakte</i> ')



## Definitions

Aeronautical revenue	Revenue generated by core business activities of the airport like charges on carriers, passengers, freight, concessions on fuel, etc. (= aviation related revenue).
Aviation industry	The aviation sector as a whole, existing of the airline industry (airside) and the airport industry (landside).
Commercialized real estate	Real estate at the airport which is being exploited on commercial basis, not being the ground as private property, runways, platforms, terminals, gates, restrooms, roads, etc.
Cross-subsidization	The strategy of airports to use of revenue from non-aeronautical activities to fund the costs for aeronautical activities.
Direct real estate related revenue	Revenue which is directly generated by the development, management and exploitation of and investments in real estate at an airport site.
Indirect real estate related revenue	Revenue which is indirectly generated with real estate by the exploitation of commercial facilities (shops, F&B, hotels, etc), concessions, car parking, advertisements, etc.
Non-aeronautical revenue	Revenue generated by non-core business activities of the airport like consumers, concessions, alliances, participations, real estate, etc. (= non-aviation related revenue).
Non-office-space	Floor space for activities other than regular office activities.
Office-space	Floor space for regular office activities, being policy making, management, organisational, commercial supporting and administrative activities.
Real estate related revenue	Income, directly or indirectly generated by development, management or exploitation of commercialized real estate.
Schiphol	The airport site of Amsterdam Airport Schiphol.
Schiphol Group	The airport authority which as entity is managing and operating the airport site of Amsterdam Airport Schiphol.



## Chapter 1 - Introduction

### 1.1 Reason for the survey

Last decades, the market structure of the aviation industry has changed quickly. Trends like the liberalization of the airline sector, the rise of Low Cost Carriers, privatization of airports and increasing competition between airports led to major changes in the airline sector as well as in the airport sector. Due to restructuring, commercialization and diversification strategies of airports, the importance of revenue from non-aeronautical activities nowadays exceeds aeronautical revenues. Real estate development gains importance as asset for airports to generate this non-aeronautical income. By integrating activities which are complementary as well as non-complementary to aviation, airports transform into 'Airport cities' or 'Aerotropolis'. Why is this and how do the major trends influence real estate development at airports? What could be the economic contribution of real estate development at Amsterdam Airport Schiphol<sup>2</sup> to the improvement of its competitive position and maximization of welfare? This is the reason for the survey on real estate development at airport cities and Schiphol in particular.

### 1.2 Demarcation of the survey

Schiphol Group is a successful pioneer in developing and exploiting the Airport City concept (Kasarda '06). Therefore an estimation for Schiphol Group will be done. In this context, Schiphol will be compared to other international airports for as far as data are available because little or no research on real estate development by airports has been done yet. On top of that, besides Schiphol Group, international airports don't make financial data on real estate development public, for this is regarded as strictly confidential information. The analysis of real estate development at Schiphol will be made under the assumption that further airport development of Schiphol will take place at its current location. The survey is on commercialized real estate development at airports. Therefore impact of airports on land prices and residential real estate development in the airport region is excluded. Except from the economic downturn on traffic flows, the effect of the credit crisis on real estate development at airports is not taken into account, for this is an academic study on itself.

### 1.3 Objective and main question of the survey

The objective of the research is to *make an forecast of the development of commercialized real estate at Schiphol for the medium term*. During this survey, the next questions will be investigated:

- Which relevant developments are seen at the airside and landside of the airport city?
- How do airside and landside interact in an urban setting?
- Is there a certain growth path which can be identified for real estate development at airports?
- Which actors are involved in the level playing field of real estate development at Schiphol?
- What are the spatial and socio-economic effects of airports?

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<sup>2</sup> In this thesis Amsterdam Airport Schiphol is abbreviated to 'Schiphol' (See also: Definitions)





After explaining these questions mentioned, the focus will be on landside, more specifically on the real estate development at Schiphol. Given this focus, the main question of the survey is as follow:

*“In which way can real estate development at Schiphol contribute in a spatial economic way to an optimal result for the airport, the government and the society in general ?”*

To answer the main question, an analysis will be made of spatial economic effects on real estate development at Schiphol. These effects will be compared with the most optimal development seen from a scientific point of view and how this optimal situation can be realized.

IST:

- What is the spatial and socio-economic impact of airports ?
- Which part of this impact is attributable to real estate development at airports in general and, more specifically, at Schiphol ?
- What are the competitive advantages, strengths and business opportunities of Schiphol in real estate development ?

SOLL:

- What should the most optimal situation be ?
  - Financial balance between commercialized real estate development and other activities;
  - Necessary growth in pax related to growth in throughput and growth in m2 real estate.
- How should this most optimal situation be realized ?
  - Organizational structure: optimal form of ownership;
  - Management of external relations of the level playing field;
  - To be developed m2 and relative income per type of activity;
  - Type of real estate related activities.

#### **1.4 Structure of the survey and report**

The structure of the research and report are as follow (see figure 1.1 on page 10). After the introduction on the research (Chapter 1), the developments at the airside and the landside of the aviation industry will be analyzed (Chapter 2). In chapter 3 urban regional growth will be described by discussing city regions, the role of city ports, business climate and the interference of real estate development at airports as CBD's. The spatial and socio-economic impact of airports and real estate development at airports will be explained in chapter 4, by analyzing the job creation, added value and node value of airports. Subsequently, in chapter 5 the preconditions and the optimal situation for real estate development at Schiphol will be described and a forecast will be done for the real estate development at airport city Schiphol. Concluding, the research will end with conclusions and recommendations (Chapter 6). This turns the survey from a describing research into a scientifically declaring, analytic and forecasting research with synergy due to the combination of knowledge on transport economics and urban-regional economics.



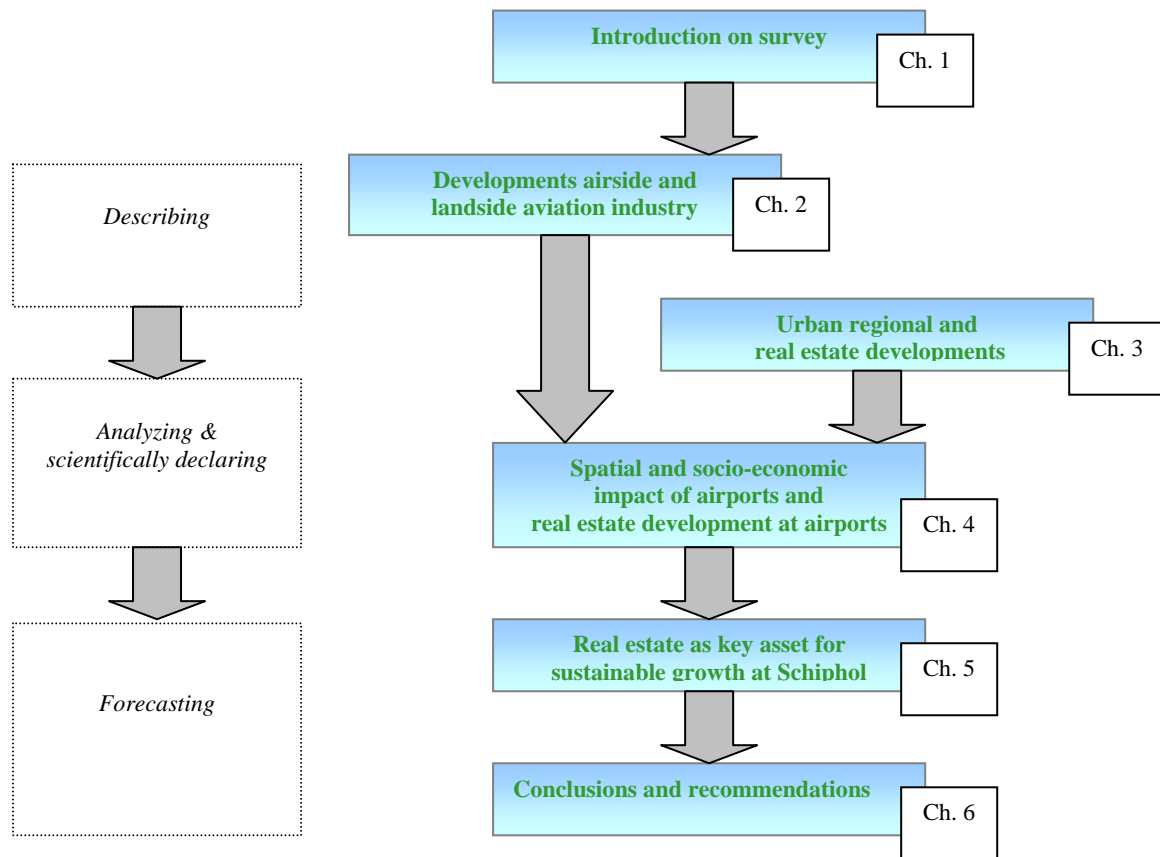


Figure 1.1: Structure of the survey



## Chapter 2 - Developments in the aviation industry

An analysis of urban regional development and the impact of real estate development at airports as Central Business Districts in globalizing city regions is impossible without understanding recent developments in the aviation industry. Recently, changes at the airside as well as at the landside of the aviation industry and the interaction between these sides structurally changed the market structure of the aviation industry. These developments have major spatial and socio-economic impacts on airports and the airport region as urban setting which airports as transport nodes are part of. Therefore, in this section major trends like globalization, liberalization of the airline sector, the rise of Low Cost Carriers, airport privatization, commercialization and diversification will be discussed. The main issues being questioned in this section are which relevant developments are seen at the airside (2.1), what the major trends occurring at the landside are (2.2) and how these developments interact (2.3).

### 2.1 Developments at airside

As part of the aviation industry, the airline sector has recently been influenced by several macro economic developments. Due to globalization, liberalization, deregulation, harmonization and the rise of Low Cost Carriers, the market structure has gone through a radical change which caused severe competition amongst airlines. Although these developments occur at the airside and mostly influence the airline industry, these trends also have influence on airports and therefore have impact on the business strategy of airports. This is why the developments at the airside have to be considered in the analysis of real estate development at airports and therefore will be discussed in this section.

#### 2.1.1 Globalization and growth of aviation industry

Since the early 90'ies, increased globalization has been the major trend in worldwide economic development. Due to relative high labour cost, outsourcing and tertiarization, companies are moving business activities to cheaper production locations. In spite of the rising costs of fuel as a result of increasing oil prices, the price for transport as means of production is still decreasing. Internet and telecommunication has increased demand for air travel by opening up longer-distance business networks and business opportunities. Globalization leads to increased economic activity and growth of international trade. Socio and demographic developments result in worldwide changing consumer patterns. Due to a worldwide increase of world population, wealth, standard of living, individualization, emancipation and the rise of 'old&ritch', purchasing power and mobility increase. Travellers have become 'multi-individualists' with different needs at different times. Together with a relative decline in the cost of air transport due to process integration and new logistic concepts, this changes global mobility and increases the demand for air transport.



The aviation industry now has become a main driving force for the world economy. Although differences between continents can be seen, with an average growth of approximately 5% per year, the worldwide aviation industry is performing better than the 3% growth of the world economy (Economic Research Service United States '09). The long term average growth of cargo is 6% while the long term growth rate of pax is 4.5% (IATA / Wikipedia.org / Matthews, '01). The Airport Council International (ACI) forecasts passenger volumes to grow annually with 4% and cargo with 4.5% (see table 2.1). On a global level, air transport is expected to grow between 200% and 300% between '00 and '30 (Jarach '06). Also Prins ('09) confirms that air traffic growth has always been 2 to 3% higher than GDP growth.

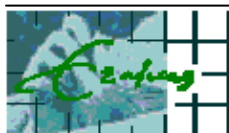
Growth rates (%)	Average Schiphol '94-'09	Average world '50-'03
Pax:	4.3	4 - 4.5
Cargo:	3.0	4.5 - 6.0
Net revenue:	6.6	5.0

Table 2.1: Growth rates aviation industry

This thumb rule is also seen when looking at the performance of Schiphol Group (see table 2.1), because the long term average growth rate for passengers at Schiphol is 4.3% and the long term growth rate for freight is 3.0% (both '94-'09). In meantime, with an average of 6.6%, the growth rate of the total net revenue of Schiphol Group over the same period ('94-'09) was even higher (Source: Annual Reports Schiphol Group '94-'09). This confirms that the performance of Schiphol is better than the average performance of the world economy and the Dutch economy. This shows the successful strategy of Schiphol Group to position the airport as an European hub, mainly being feeded by the operations of Air France-KLM. However, this growth can not only be declared by an increase in aeronautical income. As we will see in the next section, an increase in non-aeronautical activities and especially real estate development are very important sources of income for this growth in revenue. The forecasted growth in Air Traffic Movements (ATM's) and passenger volumes leads to congestion at airports and requires airport capacity and therefore terminal expansion. This necessary terminal expansion is an opportunity for revenue management, because terminals for example offer concession space which increases non-aeronautical revenue. The question therefore is, how Schiphol Group can benefit in the near future from this opportunity with real estate development.

### 2.1.2 Liberalization, deregulation and harmonization

Traditionally, due to strong international regulation, the aviation industry was not a market of entirely free competition. The airline industry was organized by bilateral and multilateral treaties between countries. However, since the mid 90'ies, a trend of withdrawal of national governments concerning the airline industry is seen. Due to interference of the European Commission, since '92 bilateral agreements are prohibited in the EU. Since '93, European airlines have been able to fly between member states without restriction and within member states being subjected to some control on fares and capacity. From '97, full cabotage was implemented and any airline with a valid air operator certificate could operate within Europe at market-determined prices. A new phase in liberalization had come when the European Court judged in '02 that also bilateral agreements between EU-members and non-EU-members were prohibited. This allowed EU-carriers to settle in other markets outside the EU, but also non-EU-carriers were allowed to choose European airports as their home base which led to footloose carriers. Also agreements on 'open skies' became more favourable. The first 'open skies' agreement dates from '92, when the Dutch government signed an 'open skies' agreement with the government of the United States. This was of strategic importance for the alliance between Northwest Airlines and KLM and led to increased passenger volumes at Schiphol.



As a result of the liberalization, the European aviation industry has moved towards a more competitive market. Carriers compete for market share and suffer from pressure on yield management. The carriers cope with this competition by consolidation to create economies of scale, scope, and density. Airlines are forced to redefine their market strategies and restructure their business by creating alliances with other carriers to share complementary networks, by mergers and take overs and by building partnerships with airports. A recent example of this is merger of KLM and Air France in '04. With the strategic cooperation between airline alliances and alliance hub-airports, the airline and airport industry are now integrating the different processes in the aviation industry. Both sides are striving for optimal performance of the logistic processes and maximum value adding in transport chain management.

Due to a relative decline in transportation cost by decreasing prices and increasing wealth, air transportation has become a more common mode of transport. To prevent passengers, employees and society from negative side effects of increased competition in the airline industry, the European Parliament decided in '00 to deregulate and harmonize legislation on safety, environment and labour in the European aviation industry. The European Parliament is striving for turning the European aviation industry into a Pan-European airspace. Capital injections of national governments in national carriers for financing their restructuring plans are prohibited and airport tariffs are being harmonized. However, in '08, the Dutch government decided to charge a tax on flight tickets (origin-destination Dutch airports) starting from July '08, to encourage environmental friendly consuming (see figure 2.2). This led to a difference in the international level playing field and unfair competition for carriers as well as for Dutch airports, which both suffered from an intense decline in demand. The throughput of passengers and ATM's at Schiphol dropped 8% in '09 compared to '08, partly because of the economic downturn, but mainly due to the 'ticket tax' (Source: Annual Result Schiphol Group '09). For as we will later see, passenger volume is the critical mass and therefore ATM's is the crucial factor for real estate development at airports.

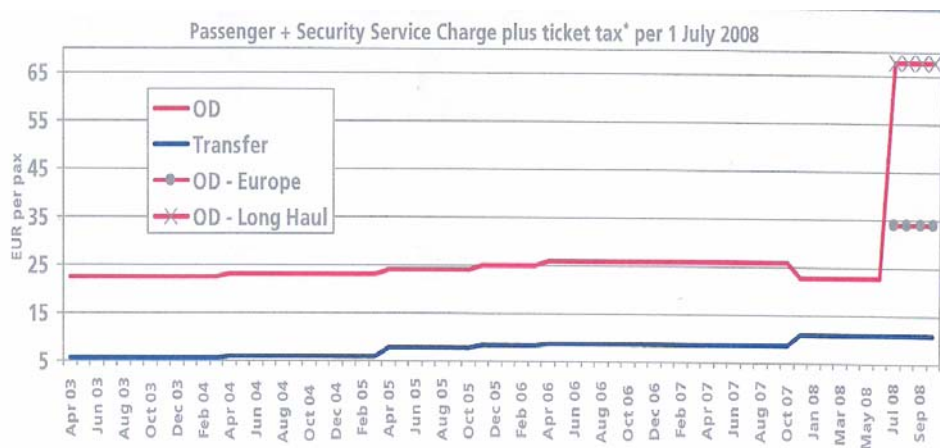


Figure 2.2: 'Ticket tax' at Schiphol (Source: Schiphol Group; '08)



### 2.1.3 Low Cost Carriers

As a result of the liberalization of the European aviation industry, since end of the year 90's Low Cost Carriers (LCC) entered the market, which had big influence on the aviation industry. LCC's have business models that differ from traditional intercontinental long-haul carriers. Short-haul LCC's offer continental point to point services from regional, smaller airports which charge lower airport taxes and which have more efficient handling, whereas long-haul carriers want to maximize connections and services. This shift in flight movements from hubs to smaller, cheaper and more efficient regional airports is called 'hub by-passing'. With simplicity of organisation, processes and services, LCC's want fast turn-around, have high productivity and high operational efficiency which makes LCC's able to offer tickets at lower prices. The overall impact on the airline industry was increased competition, which resulted in downward ticket prices. By making flying available for a much broader public, LCC's have gained a very high market share in a relatively short time and LCC's have been contributing tremendously to the growth of the passenger market in the aviation industry.

Besides impact on the airline market, LCC's also have impact on airports. By bringing in large numbers of passengers, LCC's generate a rapid growth in passenger throughput for airports, which makes airports benefiting quite substantially. It is proven that the catchment areas of all kinds of airports have widened when accomodating LCC's, which resulted into more competition between all airports over a longer range (Pantazis & Liefner '06). In meantime, LCC's are more footloose than traditional hub-and-spoke carries. It's relatively easy for LCC's to decide to stop operating from a certain airport in case of non-profitability, due to low investments of LCC's at the airport in question. Overcapacity of the airport might be the outcome, endangering the profitability of the airport. Same risk exists in case of bankruptcy of long-haul and home-carriers, due to fierce competition in the airline industry (i.e. Sabena and SwissAir). This leads to more volatility of the aviation industry. For airports have become more dependent on LCC's, LCC's have gained certain market power. By using this power, LCC's force airports to lower airport charges which make up a large percentage of total operating cost, about 12% compared to 6% for traditional carriers (Doganis, '01; Graham, '01). As LCC's continue to innovate, LCC's evolve their business models and start developing low-cost long-haul models, network models, product and price specialist models. So, there is no doubt that LCC's do directly influence airports nowadays and so they will in the future. But what are the implications for real estate development at airports ?

LCC's offer different quality on as well as off board. On board, LCC's do not offer duty free inflight sales and free inflight catering. Therefore passengers demand for more Food&Beverage facilities in the terminals than with traditional carriers. Some even argue that LCC passengers spend more at airport concession like shops and Food&Beverage than passengers travelling with long-haul carriers. Though, no real evidence for this assumption has been found (Gillen & Lall, '04). Off board, LCC's do not make use of luxury traditional terminals. To keep charges low, LCC's mostly handle their passengers off gate. Therefore LCC's demand off terminal services from airports, which requires different real estate. Airports had to create special areas and more simplified terminals to serve Low Cost Carriers. This difference in demand for airport services forces airports to change the offered facilities and therefore is influencing real estate development at airports. Airports have to be proactive by complementing the changing airline business models with real estate development.



## 2.2 Developments at landside

As we saw in section 2.1, recent macro economic developments increased severe competition at the airside of the aviation industry. But also the landside has gone through major changes like privatization, commercialization, diversification, harmonization and developments concerning safety. These trends lead to increased competition amongst airports, which directly effects their business models and marketing strategies. For real estate development is gaining increased importance in these strategies, in this section the mentioned landside developments will be discussed.

### 2.2.1 Airport ownership forms and privatization

Most airports are publicly owned from origin. The traditional function of airports was a public utility in the (air)transportation network: the airport infrastructure was seen as a political, military and generic macro-economic medium. Due to liberalization in the aviation industry, airports have been under growing pressure from governments to be more financially self sufficient and less reliant on government support. In meantime, airports try to reduce the influence of the government on its business by privatization.

Airports in New Zealand have been at the front of privatization and commercialization, being followed by airports in Australia and the United Kingdom. Decline of state control of airports has become a worldwide trend and is a hot issue, especially in Asia and Europe at this moment. Contrary to this worldwide trend, the United States and Canada have not embraced this privatization policy yet. The majority of airports around the world still have some form of public ownership, though the operational control faces a greater participation of the private sector.

Generally spoken, as ownership forms for airports public ownership, semi public / semi private ownership (public private partnership) and private ownership can be distinguished. However, these forms do not form homogeneous groups but show evident structural differences being partially or fully privately or publicly owned. Between each mode, there are differences in control device, allocation of managerial responsibilities and time horizon. In case of public ownership, airports are usually exploited under management or long term contracts. Oum et al. ('06) specify ownership forms and governance models into the following categories:

- A government agency or department directly operating the airport;
- Mixed public/private ownership with a public majority;
- Mixed public/private ownership with a private majority;
- Public ownership outsourcing operations to a management authority under a lease contract;
- Multi-level governments which form an authority to own and operate the airport;
- Government corporation ownership and operation (Oum et al.; '06).



The aim of the reform of airport ownership forms from (fully or partly) publicly owned to privately owned companies is to bring in a more commercial, strategic and long term orientation to the operations of the airport. Each ownership form has constraints and incentives that determine the type, quantity and quality of managerial and financial resources and commercial output. The major differences find expressions in the intensity and volume of key drivers like operational efficiency, asset utilisation in terms of phased investments, resulting in increased traffic throughput, capital productivity and capital structure. The effectiveness of each governance structure depends on the national institutional context. In chapter 5 we will see which governance structure is the most effective concerning real estate development as asset in revenue management for airports. But first we will have a look how privatization of airports leads to a diversification of airport activities and how it affects the commercialization of the airport business.

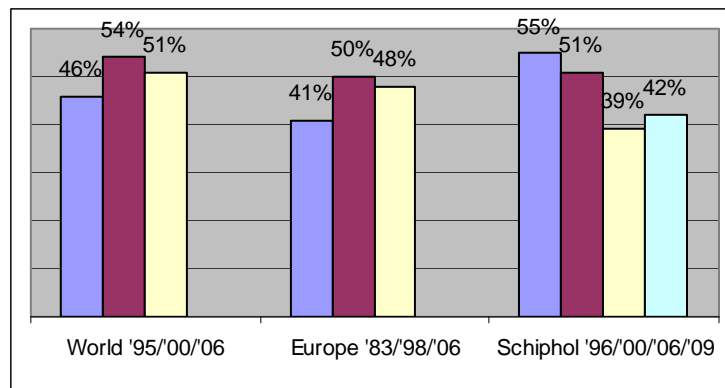
### **2.2.2 Airport commercialization and cross-subsidization**

The privatization of the airport industry resulted in decreased governance control and increasing pressure on airport management to find alternative sources of income to ensure revenue growth and profitability. In spite of the ongoing growth of the aviation industry, a higher volatility and uncertainty about future traffic volumes is a threat for the airport profitability. Due to this, non-aeronautical revenue has become an important source of income for airports. By commercialization, airports try to maximize non-aviation related income from both inside and outside the airport terminal. Non-aeronautical revenue nowadays has become so important for airports, that it accounts for about half of the total revenue of commercialized airports. Although the share of non-aeronautical revenues on the total airport revenue differs by continent, non-aeronautical income worldwide is of increasing importance. In '06, non-aeronautical income on average represents 53% in North America, Africa and Middle East, compared to 48% in Europe and 46% in Asia and the Pacific region. In the Caribbean and Latin America non-aviation related income is only 29% of all airport revenue (Graham '09).





The annual world airport economic survey of the ACI over 650 airports of varying size, shows that non-aeronautical revenues accounted for 46% in '95 and had a share of 54% of the total revenue in '00 (see graphic 2.3). Moodie ('07) states that non-aeronautical revenues represented 51% of the total revenue in '06-'07. A sample of 20 European airports (ranging in size from 2 mio pax to over 50 mio pax per year) shows the same trend: the share of non-aeronautical revenue increased from 41% in '83, to 46% in '93 and 50% in '98. In Europe, Dublin and the British Airport Authorities generate both even 66% of the revenue with non-aeronautical revenues, whereas Salzburg, Vienna, Florence and Cologne report only around a quarter of non-aviation related income (Graham '09).



Graphic 2.3: Trend share non-aeronautical revenue (% of total airport revenue)

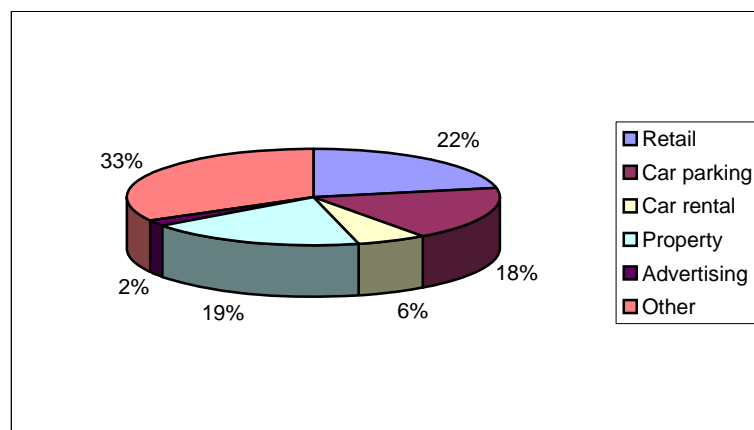
Vogel and Graham ('06) found that the share of non-aeronautical revenues varies with the size of airports in number of passengers per year. A sample of European airports shows that the average share of non-aeronautical revenues of airports of less than 4 mio passengers per year is 35%, of airports between 4 and 20 mio passengers is 45% and airports over 20 mio passengers is 56%. This conclusion is confirmed by the Airport Retail Study ('06-'07), which shows that commercial revenues per passenger is nearly twice as large for airports bigger than 20 mio passengers per year, compared to airports less than 10 mio passengers. Doganis ('92) states that by the time airports handle 10 mio passengers, commercial revenues should have risen to between 50 and 60% of the total income.

The importance of non-aeronautical revenues at Schiphol is varying in time (see graphic 2.3). Surprisingly, opposite to the trends mentioned above, on the long term the development of non-aviation related income as percentage of the total income for Schiphol Group is declining from 55% ('96) to 39% ('06). However, since the Air France-KLM merger in '04, non-aeronautical revenues for Schiphol Group have slightly increased again to 42% in '09. For an airport with a throughput of approximately 45 mio passengers per year, this percentage however is still much lower than airports with comparable throughput (50-60%). This can partly be explained by the fact that Schiphol has a relatively large share of transfer passengers, due to the fact that the hinterland of Schiphol is relatively small compared to competing European hubs<sup>3</sup>. Last decades, the share of transfer passengers at Schiphol increased, due to a successful joint strategy of KLM and Schiphol, transforming Schiphol from an international airport into an efficient major hub airport. Transfer passengers spend much less at the airport than domestic passengers, for the latter make much more use of commercial facilities at airports like car rental, parking and retail facilities (Gillen & Lall ('02), Van Dender ('06) and Freathy ('04)).

<sup>3</sup> Benchmark share of transfer pax / share of non-aeronautical revenue competing European hubs: BAA: 38%/65%; AdP: 26%/45%; Copenhagen: 28%/44%; Schiphol: 43%/42%, Frankfurt: 50%/30% (Source: Annual reports corresponding airports '09).



Looking at the composition of non-aeronautical revenues at world major airports in '06, Retail (shops and F&B), Car parking and Property, which are all real estate related activities, together are the most significant sources for non-aeronautical revenue: these activities together count for about 60% of non-aeronautical revenues (see graphic 2.4). For airports with a throughput of approximately 45 mio passengers per year, this means that between 30% and 36% of the total revenue is generated by real estate related activities. Therefore real estate is a crucial asset to generate revenue. In '06, Schiphol Group generated 29% of the total revenue by real estate related activities, which means that Schiphol Group is lagging behind on real estate related revenue generation, compared to airports with comparable passenger throughput.



Graphic 2.4: Breakdown non-aeronautical revenue at world airports (Source: ACI; '07)

So, nowadays non-aeronautical revenue is replacing the traditional aeronautical revenue as being the main source of income for commercialized airports. It can also be stated that there is a strong degree of complementarity between aeronautical and non-aeronautical activities, for the demand for air transportation increases the demand for related goods, services and rental properties at the airport and vice versa. But how does commercial revenue affect aeronautical charges ?

Liberalization of the airline industry led to increased competition between airlines and resulted in cost cutting by airlines. Because airport charges are a considerable share of operational costs for airlines, this leads to increasing pressure on airports to lower their airport charges. To keep aeronautical charges close to marginal cost, airports are 'cross-subsidizing' profits. This means that airports use the income from non-aeronautical activities to fund the costs for aeronautical activities. The reduction of airport charges is also seen at Schiphol: in April '09 the average of the airport charges at Schiphol has declined with 10% compared to '08 (Source: Annual Reports Schiphol Group '09). Aeronautical operations are nowadays less profitable than concession operations, for the average operating margin for aeronautical activities is -/7%, while operating margin for concession revenue is 64% (Zang & Zang, '03).



Morisson claims that airports, engaging in complementary non-aviation activities, will have lower aeronautical prices than airports that do not have non-aeronautical activities. He states that profit-maximizing airports also develop businesses that are non-complementary to airside activities. Additionally, he claims that cross-subsidizing profit will have a downward pressure on aeronautical prices, because it will consider all non-aviation revenues, including those from non-complementary business. The aeronautical prices are set at marginal cost or even below operating costs, which ensures maximization of the utility of the airport services as a whole. In this context, Morisson regards non-aeronautical income as being derived from passenger volume. This differs from Czerny, who claims that passenger demand for travel is derived from the joint benefits of air travel and consumption of non-aviation services provided by the airport. This means that lowering the price of non-aviation activities can increase demand for air travel. All profits created from non-aeronautical activities would result in lowering aeronautical prices. On the other hand, non-aeronautical profit can help funding investments for aeronautical as well as non-aeronautical activities.

Starkie ('01) argues that increased airport charges do not only reduce the demand for flights, but also the demand for commercial services. Following this reasoning, the airport might not want to raise aeronautical charges. In any case, all authors agree that airports do not charge monopolistic prices, so privatization does not necessarily lead to monopolistic airport charges. Zhang & Zhang ('03) also conclude that privatized airports are unlikely to abuse monopolistic power on aeronautical charges, due to the existence of a complementarity between the demand for aeronautical and non-aeronautical services. However, they conclude that privatized airports do charge monopolistic prices for non-aeronautical services.



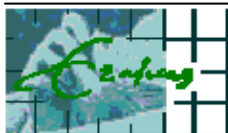
### 2.2.3 Airport diversification

The trend of airport commercialization as described above, is unmistakably related to a diversification of business activities, which leads to a growth path in airport development. Transport nodes like ports and airports develop in accordance with a certain growth path, which can be divided in several development stages (Langen&Nijdam '04). The typology of the transport node is based on several characteristics of an airport, like the size of the hinterland, passenger volume and type, network connections and network function. Each typology requires a different business strategy and the airport develops different activities which ask for different facilities and services (see figure 2.5).

	Stage 1: Minor airport	Stage 2: Regional / low cost airport	Stage 3: National airport / mainport	Stage 4: Primary hub / Airport city / brainport
Business activities :	Aviation	Aviation Retail	Aviation Retail Logistic services Real estate development	Aviation Retail Logistic services Real estate development (Inter)national participation & alliances Airport consultancy
Revenue sources :	Aeronautical	Mainly aeronautical & partly retail	Mainly aeronautical & partly non-aeronautical	Mainly non-aeronautical & partly aeronautical

Figure 2.5: Airport development stages (Based on Jarach '06, Kasarda '07, Langen & Nijdam '04 and RLD '95)

A minor, mostly cargo or military dominated mono-modal airport with exclusively aeronautical income develops into a regional airport when some carriers, mostly Low Cost Carriers, start exploiting point-to-point services from that specific airport. In that case, some small retail, food&beverage and sometimes hotel services are added to the basic terminal building. Under the precondition there's sufficient critical mass, a regional airport develops into a mainport, mostly the national airport, when multiple long-hall carriers as well as Low Cost Carriers start exploiting international and sometimes intercontinental connections to and from the airport. A clustering of activities takes place, services complementary to the aviation activities like logistic services are being offered and the airport becomes a node in an intermodal transportation network. The airport starts exploiting real estate on a bigger scale and more professional and commercialized base like retail, F&B, hotels and offices. The aeronautical income is supplemented with non-aeronautical revenue, mainly income from concessions. Mainports develop into knowledge based primary multimodal and multifunctional hub's who exploit activities which are complementary as well as non-complementary to the aviation activities, like (inter)national participations (horizontal integration) and consulting services on airport development. The wide range of activities and services make the airport function as a city on itself. The non-aeronautical revenue exceeds the aeronautical income. Depending on the development stage, the relative importance of real estate development as business activity for revenue management increases. Therefore, as we will see in section 3.4.3, also a growth path in real estate development at airports can be seen.



In a level playing field, where airports serve the same catchment area or hinterland, airports face horizontal competition for passenger volume and income. In accordance with the growth model, due to the earlier mentioned privatization and commercialization, airports are using diversification strategies in their business models to improve their revenues and limit their reliance on aviation related income. The split of generated income shifts from fully aeronautical to mainly non-aeronautical (Morrison '09). With multiple commercial opportunities being exploited, airports are increasingly becoming more than just air service providers. Due to this diversification, the traditional public utility model of airport management is being replaced by commercial business models. The essence of a successful concept is to offer a correct mix of facilities to meet the needs and preferences of the customers the airport serves. Where in a traditional business model the airlines and passengers are the primary customers of the airport, in new business models of airports the employees, visitors, meeters and greeters, concessionaires, retailers, caterers and tenants are added. The essence is to combine '*business to business*' with '*business to consumer*' approach.

Concerning real estate development, as a result of diversification, airports are focusing on widespread commercial revenues from real estate development like retail, Food&Beverage, advertisements, parking fees, hotels, congressional and logistic facilities, leisure zones, offices, business parks and enterprise zones. Jarach ('06) is even signalling that some airports have become event managers: Frankfurt airport opened a disco inside the terminal building, Schiphol launched a museum, a casino and imaginary golf facilities in the transit area and Milan Malpensa airport is organizing music concerts inside the new terminal. These visitors generate demand for retailing and food&beverage. In meantime, Frankfurt is developing into a '*medical hub*' by building a hospital to its new AirRail-terminal building with connection to the ICE. At the northeast of its airport, Schiphol is even creating apartments to accommodate business travellers and expats on a temporarily base. This all indicates that airports are integrating the business in which they operate.



### 2.2.4 Harmonization

Except on the airside, legal and fiscal harmonization across member states of the European Union also had its impact on the airside, like the abolition of the duty free shopping on intra European travel, the introduction of the Euro and health policy on consumption of alcohol and tobacco. As we saw earlier, the biggest impact on commercial revenue are retail activities. The introduction of the Euro in January '02 reduced the income for airports on money exchange activities, for instance. But far the most impact on commercial revenue was the acceptance of policy on European wide free travel of passengers and transportation of goods. This meant that from June '99 intra-EU duty and tax free sales at airports were abolished. The opportunity for duty and tax free sales was further reduced when in May '04 ten and in January '06 two new countries joined the EU. The future EU enlargement will decrease duty and tax free sales. But also restrictions on sales of tobacco and alcohol have a growing negative impact on retail sales at airports. This created a further drive for airports to develop other commercial opportunities, like real estate development.

### 2.2.5 Safety

The aviation industry is characterised by a high degree of uncertainty due to sensitivity for terrorist activity and health epidemics. The attacks on the World Trade Centre in September '01 and attempts of attacks with Liquids, Aerosols and Gels (LAG's) on the one hand, and epidemics like SARS and the Mexican flue on the other, have a direct negative effect on worldwide mobility and passenger volumes, but also on the safety policy and safety procedures at airports. Airports have been identified as potential targets for terrorists or other criminal activities. This affects the flows of passengers and goods in terminals and therefore the usage and lay out of terminal buildings. Passengers spend more than double time in airports than before '9-11', but security screening is a major component of the air travel process. This increases the free time of the passengers which can be spent at the airport by consumption and it reduces the available space for commercial facilities. Additional costs for airport security measures increase the pressure for airport management to generate additional income by commercial activities. In meantime, safety is being threatened when the original function of an airport is being taken over by more commercial functionalities like the development of real estate for commercial, (semi-)industrial and business areas. The more real estate development at the airport and its direct surroundings, the higher the risk of landside fatal accidents and so the lower the safety. This means that the development of real estate can have a negative effect on safety as a whole. All this has a permanent and increasing impact on real estate development at airports.



### 2.3 Interaction of airside and landside

In former sections the recent macro economic developments in the airline and the airport industry have been discussed. It are these trends themselves and the interaction between the airside and landside which have direct impact on real estate development at airports. Airports facilitate this interaction, because airports are the physical places where airside and landside activities meet.

Due to increased competition as a result of macro economic developments like the liberalization, deregulation and harmonization of the aviation industry, airlines are forced to scale enlargements by cooperation, participations, mergers and alliances. A limited number of worldwide airline alliances are dominating the intercontinental market. Airline alliances are leading traffic via a limited number of hub airports. A new development however is that airlines and airports start jointly managing the entire airport process to reduce operational cost and to improve quality of operations by increased connectivity and punctuality. By cooperating, airline alliances and hub airports are complementary and together focus on 'dual hub strategies' to increase economies of scale (frequency and volume), scope (services, destinations, hinterland and catchment area) and density in their networks.

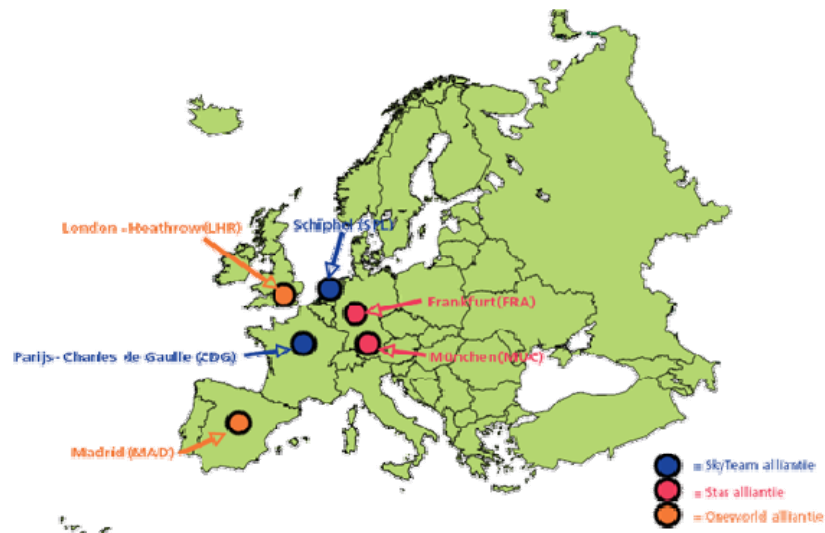


Figure 2.6: Dual hub strategies in Europe (Source: Schiphol Group; '06)

Where in the recent history competition was mainly between airlines and later on at the airline alliance level, competition nowadays is at alliance hub and multi-hub level (see figure 2.6 above and figure 2.7 on the next page). This means that, in former days, competition at the airside was separated from the landside, while nowadays competition at the airside and landside takes place at a common level playing field. An example of competition on alliance multi-hub level is the merger of Air France (home based at Paris - Charles de Gaulle) and KLM (home based at Schiphol) in '04, both member of SkyTeam Alliance, and the participation of Aéroports de Paris in Schiphol Group since '08. Together they compete the Star Alliance multi-hub system with Lufthansa home based at Frankfurt and Munich, and the Oneworld Alliance multi-hub system of British Airways home based at London Heathrow, and Iberia home based at Madrid Barachas.



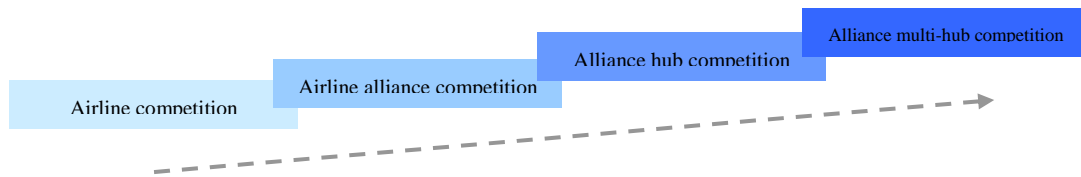


Figure 2.7: Changing level of competition in the aviation industry (Source: Schiphol Group; '07)

So, concluding from this chapter, it can be stated that due to recent developments at the airside and land side of the aviation industry and the interaction of airside and landside, the level playing field for airports is changing. Globalization of the world economy and socio-economic developments lead to changing location behaviour and consumer patterns, which results in an increasing demand for air transportation. With an average annual growth of 5%, the aviation industry is growing faster than the world economy (3%). This is changing the quantitative demand and qualitative requirements for real estate at airports. Liberalization, deregulation and harmonization leads to a changing market structure of the aviation industry, with the rise of Low Cost Carriers as most affecting recent development. The aviation industry has become a market of severe competition with strong downward pressure on prices for air transportation, leading to increasing downward pressure on airport charges. Therefore airports are diversifying their business strategies to ensure the overall revenue growth and to fund aeronautical activities with non-aeronautical revenue, nowadays representing about 50% of the total income of airports.

Real estate development is of increasing importance in non-aeronautical revenue. For airports with a throughput of approximately 45 million passengers per year, this means that between 30% and 36% of the total revenue is generated by real estate related activities. In '06 Schiphol generated 29% of the total revenue by real estate related activities, which means that Schiphol is lagging behind on real estate related revenue generation, compared to airports with comparable passenger throughput. This can partly be explained by the increasing share of transfer passengers at Schiphol (43%; '09), because transfer passengers make less use of commercial facilities at airports and spend much less on real estate related activities than domestic passengers. However, real estate development goes far beyond the airport site, because the airport has spatial and economic impact not only on the airport region located in the vicinity of the airport, but also on the total urban city region the airport in question is located at. But how do the airport and this urban region interact? What is the function of the airport in this urban region and how is urban regional development related to real estate development at airports? These questions will be examined in the next chapter (chapter 3) on urban regional and real estate development.





## Chapter 3 - Urban regional and real estate development

Now we know the developments in the aviation industry which are affecting the level playing field for airports and which form the potential for real estate development at airports, question is how the airside and landside as discussed are related to urban regional development. Due to a worldwide internationalization of the economic system, also city regions are increasingly competing on an international scale. Airports as nodes in (inter)national transportation systems of globalizing city regions play a major role in urban regional development. Therefore, in this chapter, the globalization of city regions (3.1), city ports in city regions (3.2), the business climate determining location behaviour (3.3) and the consequential real estate development at Central Business Districts (3.4) will be discussed. These developments will be related to the specific function of airports as city ports in city regions. It will lead more specifically to an explanation of the location factors at airports as CBD which create so much potential for real estate development and it describes the growth path according to which real estate at airports develops (3.4).

### 3.1 City regions

As mentioned above, city regions are increasingly competing on an international scale because of a worldwide increasing internationalization of the economic system. In this section, the major driving forces behind the internationalization and globalization of city regions will be explained. Due to the fact that the survey is on real estate development at Schiphol, the general trend as described will be projected on the Randstad as globalizing city region and Schiphol airport.

#### 3.1.1 Globalizing city regions

Macro-economic trends like globalization and development of new (information and telecommunication) technologies lead to global interaction, worldwide relocation of economic activities and new global networks. Relocation of activities leads to clustering of related business activities. This globalization needs a regionalization counterpart in order to become locally embedded. The processes of city region formation stimulate the process of regional integration which provides variety on larger markets that city regions need, to be able to specialize and take position in the new global hierarchy (Van Wijk; '07). Therefore global city regions compete for economic activities by development of knowledge, innovation, entrepreneurship and creativity by connection to transportation networks for passengers, goods, capital and information (Schiphol Group; '07). Competitiveness can be defined as *'the ability of an urban economy to attract and maintain firms with stable or rising market shares in an activity while maintaining or increasing standards of living for those who participate in it.'* (Storper; '97). Competitiveness of global city regions can be measured by benchmarking on indicators as economic structure, growth, productivity, employment and by more subjective indicators as infrastructure, governance and business efficiency, which determine the quality of the business environment (Van Wijk; '07). Creation of a competitive, first in class business environment by investing in a diversified economic structure, accessibility and quality of the physical environment leads to increased attractiveness to make use of the economic potential of the global city region (Schiphol Group; '07). Friedman ('01) expects city region formation for a limited number of city regions that are the nodes and focal points of the globalizing economy, where city regions have much to gain by associating with other regions in international networks. This trend of focussing on the position on the international market place is called interconnectivity (Thornley and Kreukels; '02). Acting of the city regions in competition with other international city regions is essential here. There is no single interest of all actors or one representative actor. Therefore the focus is in the dominant development coalition in developing the airport as city port in the city region. The airport as city port will be discussed in section 3.2.2.



An agglomeration can be attractive due to its economics of scale based on critical mass, and economies of scope based on diversity and specialisation (Scott; '86 and Storper; '97). Regional cities have the potential to be connected to the globalizing economy, particularly when they have the ambition to become a metropolitan economy. The growth of the economic potential of the city region is not only based on productivity growth as a key element of competitiveness Porter ('01), but also on the creation of new activities (Lambooy and Boschma '01). Kleyn and Tordoir ('00) emphasize three strategic clusters for diversification and productivity growth for metropolitan economy: distribution services (which gives access to markets and is the basic for market increase in metropolitan economies), management functions (to manage transaction costs by creating efficient organization of production) and creativity (for R&D and cultural diversity). Increased importance of knowledge makes human capital the leading factor for businesses. A global city region plays an important role in the innovation process as an incentive and selection device, where accumulation and reproduction of knowledge lead to a variety of activities (Boschma and Kloosterman; '05). The competitiveness of the global city region shows that the regions are becoming a meaningful and relevant entity which affects the behaviour and performance of companies. Therefore, in section 3.3 we will see which location factors determine the location behaviour of firms. First the competitiveness of the Randstad area as global city region will be discussed.

### 3.1.2 The Randstad area as global city region

The Randstad area is an example of a global city region which competes with other global city regions like the Ruhr area in Germany, the Flemish Diamond in Belgium and the global city regions of Paris and London (Van Wijk; '07 and Schiphol Group; '07; see figure 3.1). Due to decreasing transportation costs, metropolization of the poly-nuclear structure of the city region can take place in the Randstad, as did mono-nuclear urbanization in cities such as London and Paris. The importance of infrastructure with the development of urban networks is therefore increasing, for it can be seen as generating and structuring spatial developments (Van Wijk '07). Schrijnen ('00) adds, that it's not the infrastructure itself, but real estate investments near infrastructure caused by relations between businesses which are the important generators of economic development.

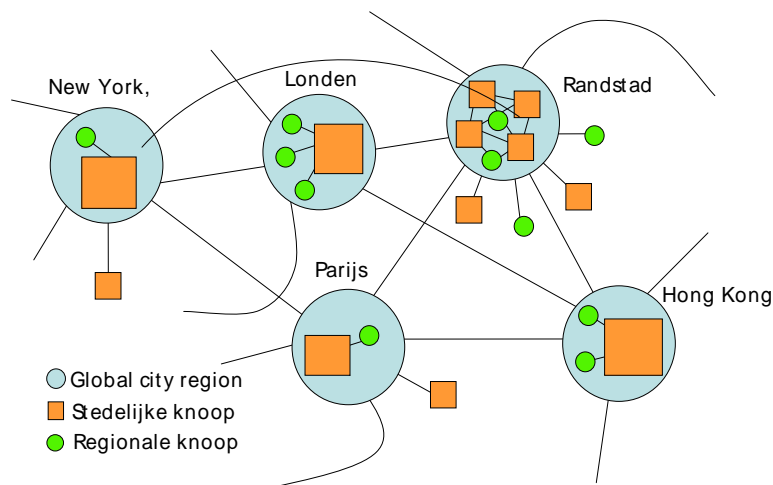


Figure 3.1: Worldwide network of global city regions (Source: Schiphol Group; '07)



The Randstad contributes almost half of the national income (CBS-Statline '05), which means it is of strategic importance for the Dutch economy. The regional economic performance of the Randstad can be characterized as trade and business oriented, with equally spread employment and income. The Randstad shows a polycentric urban development without a dominant centre: each of its four main cities has its own specialization. Amsterdam is the financial and business service centre, the main city for headquarters of banks and multinationals and is the dominant hub for air transportation and greenport clustering. Rotterdam is one of the largest seaports in the world which is the prime transportation hub for bulk goods and containers in Western Europe with increasing offshore industry and petrochemical industry. The Hague is the governmental capital, location of embassies and other international political institutes as the international war tribunal, combined with headquarters of telecom and insurance companies. Utrecht is the national railroad network hub and developed as a centre for national corporate headquarters for service and software, has a rapidly growing university area and is linked to the media cluster in Hilversum.

Compared to other global city regions, the quality of the business environment or investment climate of the Randstad is best performing on air, water and freight rail transportation, development of the financial market, market size and access, availability of offices, services, suppliers and urban environment. On the other hand, it performs worse on availability and quality of labour and housing, education level, accessibility by road, attitude of government, tax climate, wage level and is lacking coherence of public transportation in the polycentric region (Source: Ecorys-NEI ('01), Porter et al, ('00), IMD ('95/'00) and Takeuchi ('01)). Van Wijk ('07) adds that R&D is relatively weak developed in the Randstad compared to other global city regions, while the high labour productivity of Amsterdam competes with other European capital regions. On the one hand the strength of the Randstad is that the four main cities in the Randstad all have their own specialisations. Though on the other hand, the Randstad is an incoherent region of individualistic medium-sized cities.



### 3.2 City ports

Globalizing city regions show a variety of locations that are catching up and get connected to the international network, and other location that lag behind (Van Wijk; '07). Martin and Sunley ('03) argue that it's impossible to draw geographical boundaries for economic activities, for inter-firm activities take place at different spatial scales at the same time and the spatial range of activities is unlikely to be stable over time. Therefore Rutten and Boekema ('04) suggest to see spatial processes as the outcome of economic activities instead of starting with geography. In this sense, the outcome of economic development of the city region are places with concentrations of economic activities, which are places to stay, which are traffic nodes and which function on it selves as ports for the city region, the '*city ports*'. City ports are a frame to understand the increasing polarization of economic activities in city regions, because it gives insight in the relation of economic activities, transportation and urbanization.

#### 3.2.1 City ports in city regions

Within the city region economy, economic clustering at the city level leads to concentration. Economic actors cluster to benefit from different agglomeration advantages which improves the output of the companies on the one hand and which improves the quality and level of services towards the international competitive level of the city region on the other. In meantime, diversity of economic activities in the city ports make the city region more attractive, less vulnerable for economic changes and gives a broader basis for economic performance an a local, regional, national and international level as well. It seems to be paradoxal, but the city region benefits from diversity within the region itself, while in the meantime concentration, clustering and specializtion at the city ports take place. The competitive disadvantage of polycentric city regions in comparison with monocentric city regions decreases. Variety in the internal geography of the polycentric city regions is an outcome of changing socio-economic patterns. The traditional downtown is no longer the only centre in the city region (Van Wijk; '07). Hall ('01) distinguishes six different types of city ports in the polycentric network: the traditional downtown city centre, new business districts, internal edge cities, external edge cities, remote edge cities and specialized sub centres. All types of city ports are accessible by car, are more or less close to urban centres, show a variety of economic activities but mostly focus on the service economy sectors, but develop a profile that is suited to the specific location.



### *City port typology*

The *traditional downtown city centre* is mostly located around the central railway station.

Infrastructure is transit oriented. It shows high level of inhabitants and labour force and traditionally included the oldest information services as banking, insurance and government.

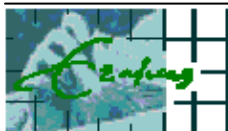
Economic expansion of headquarters, media and new business services led to *new business districts* due to high real estate prices at the traditional centres and the fact that these economic activities did not fit the traditional city centre or the need for more working space. New business districts are usually located near prestigious residential quarters and depend more on car accessibility and less on public transport than the traditional downtown city centres (i.e. the Zuidas in Amsterdam; Van Wijk; '07).

The pressure of space in traditional centres also led to a recently speculative redevelopment of older industrial sites, which Hall defines as *internal edge cities*. These offer a mixed and progressive urban environment with good car accessibility for a variety of economic service activities (e.g. IJ-river banks and Sloterdijk area in Amsterdam; Van Wijk; '07).

The *external edge city* is often located at the axis of airports or new high-speed train stations and are internationally orientated without the need to be located in the traditional downtown city centre (i.e. Schiphol; Van Wijk; '07). Concentration of jobs and inhabitants is required on calculable distance, but not on walking distance as in the standard business centres. It contains economic activities that are more standardized, which can not afford the downtown city centre and which do not need the urban dimension of the city itself.

Often located on bigger distance from the related main city but near train stations, outermost *remote edge city* complexes are found for back offices and research and development. The urban and economic dimension is less developed (i.e. Almere; Van Wijk; '07).

The sixth type of city port is *specialized sub centres*. These locations are centres of education, entertainment, sports, shopping and conventions. They function more independently from traditional city centres and attract customers by their unique specialization and convenience of economic activities (i.e. Amsterdam Southeast / Bijlmer Arena area).



### City port value

Socio-economic activities like living, working, shopping, recreating and socializing increasingly take place in a variety of city ports which show an amount of diversity, intensity and volatility of visitors and visits. Major examples of these city ports are traffic and transportation nodes like urban squares, railway stations and airports. Bertolini and Dijst ('00) however use a wider definition of accessibility of city ports or nodes, for they state that it's not only the number of visits and visitors, but also the diversity of activities at the node and the final group of end users of the node. Therefore they developed the node-place model (see figure 3.2). The accessibility is expressed by *node value* and the activities taking place at the node are expressed by *place value*. The essence of this model is that accessibility of a node needs to be in place with the activities at the node. Imbalanced nodes need either investing in infrastructure or in economic activities. Both require real estate investments.

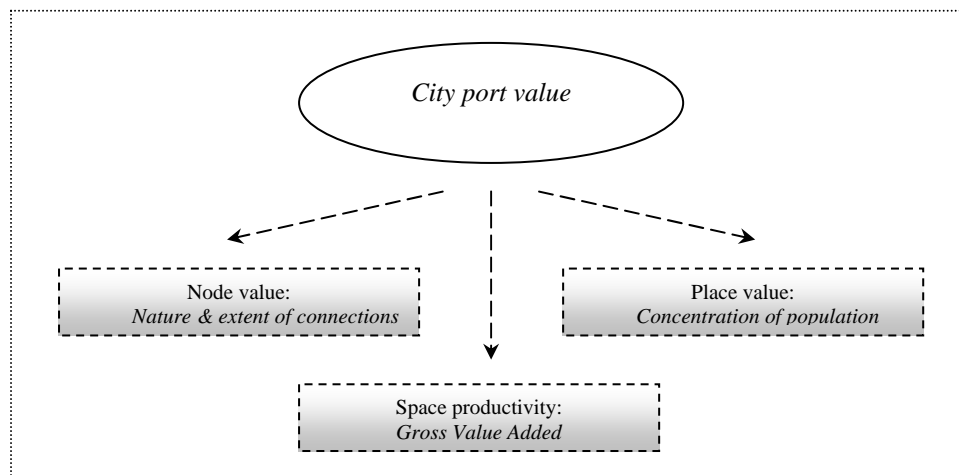


Figure 3.2: City port value (Based on Bertolini & Dijst and Van Wijk)

In the city port model the node value is seen as the infrastructure dimension of the city port which expresses the accessibility of the city port, because availability, types and quality of connections calculate the connecting or unlocking value. The place value is seen as the urban dimension, which expresses the concentration of population (citizens as market and employees as labour force production factor) in the city port. Van Wijk ('07) adds the economic dimension to this, which expresses the *space productivity* of the city ports and which can be measured in Gross Value Added (GVA) of the economic activities. Concerning real estate development, it can be stated that higher demand for economic activities and higher added value often lead to higher rents and real estate value. In meantime, there is no one-on-one relation between space productivity and rents since densities might vary (Van Wijk; '07). However, analyzing the real estate market at city ports can help to determine and understand the node-place value of city ports and polycentric urban development in globalizing city regions.



### 3.2.2 Airports as city ports

As explained in section 3.1.1 and 3.2.1, city regions interact in a global network with city ports as connecting nodes. City ports are locations which combine economic activities, infrastructure and urban dimensions and fulfil the role as port, a place and a node in a globalizing city region. The airport is a particular kind of city port that rapidly develops due to its economic importance in the polycentric regional economics. Hartwing ('00) states that airports on it selves don't necessarily fulfil the function as city port, for this function requires a less isolated airport function and a more reciprocal relationship between airport and city region. Airport infrastructure and real estate development are the most important business settlement conditions for airports. The embeddedness of the airport in the city region is essential for its development towards a city port. Spatial and economic conditions are crucial in the success of the airport environment as a business location, for example the status of the airport, user value, user costs, services to travellers and employees, attractiveness to businesses, land development in the airport vicinity and indirect and induced effects of airport-related business elsewhere in the city region (Van Wijk; '07).

As stated before, the quality of transportation networks is a crucial element in urban development of city regions. In this context, an airport is of vital importance for the location of business activities of international companies and multinationals in globalizing city regions. In meantime, an internationally orientated urban region feeds the transportation network with passengers and cargo. To support the network, accessibility by air and land are crucial for the airport to compete with other hub airports on capacity and catchment area and to serve hinterland at competitive visit cost. So the transportation network, the airport and its surrounding region must be considered as united, interdependent and integrated (see figure 3.3). In that sense, based on the model for city ports of Hall, airports as city ports can be qualified as *external edge cities*.

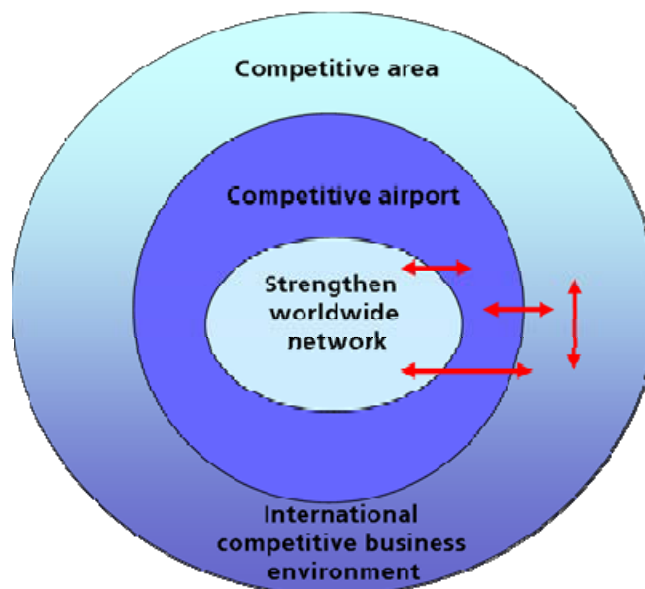
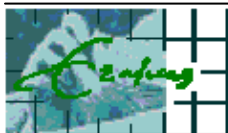


Figure 3.3: Interaction of airports, networks and business areas (Source: Schiphol Group; '06)



The airport function changes from a traditional interchange node in a transportation network, to an intermodal, multifunctional, privatized, profit orientated commercial venture in a global business network with increased strategic importance where aviation revenue is only a part of the business. This leads to a redevelopment of business strategies by airports and to a diversification of their activities. Due to excellent connections to global transportation networks as well as to the global city region, airports turn out to be attractive locations for business activities, because the main location factors for international companies and multinationals are the availability of excellent infrastructure, knowledge, suppliers and business locations (Schiphol Group '07).

To create horizontal and vertical functional synergy, companies prefer to locate in proximity of companies with related business activities and facilities. At airports, this leads to a clustering of transportation and distribution activities. Clustering strengthens the relative competitive position of the airport location. Airports are magnets for business in the city region, which leads to tension between exploiting the potential of the airport for business (*'exploit the site'* approach) on the one hand and not hindering the aviation related activities (*'protect the site'* approach) on the other. So not only the trends in the aviation industry as described in chapter 2, but also spatial and socio-economic factors do explain the developments of airports as city ports in the globalizing city region and its economic dynamics.





### 3.3 Business climate

City port development at globalizing city regions and real estate development at airports as city ports on a local level can not be isolated from business climate development in general. The business climate at a specific business location is determined by location factors. The way these location factors match companies' needs and requirements to a business location, leads to location behaviour of companies at this location. In this section, location behaviour in general and location factors at airports as business location will be described.

#### 3.3.1 Location behaviour in perspective

Companies have different business activities, therefore have different location criteria and show different location behaviour. Concerning location decision, three different motives can be distinguished: demand for real estate due to increased business activities at the current business location, relocation of business activities at the current location and establishment of business activities at a new location. Location decisions are influenced by push and pull factors of different locations. Push factors involve the current location and pull factors involve the alternative location.

Lambooy ('97) and Van der Pol ('01) explain location behaviour based on a difference between (neo-)classical and modern location theories. Classical location theories are input orientated, centralize cost aspects and assume full use of production factors and a market of full competition. These theories are based on concrete aspects and have a deductive approach. Main examples of classical location theories are the models of agrarian land use (Von Thünen) and industrial land use (Weber), whereas land use based on a service economy are neo-classical theories (Christaller, Hotelling, Hoover, Isard and Moses) (Lambooy; '97) and Van der Pol; '01). It states that location decision is a rational decision making process and an economic trade off which leads to locating business activities where production costs are minimized and output is maximized (Lambooy; '97).

Nowadays, classical theories are less suitable for explanation of location behaviour, due to increased complexity of economic structures. Classical theories don't take into account the fact that location and transportation are non-homogeneous production factors which need differentiation. Modern location theories on the contrary are market orientated, have an inductive approach and assume that decision making has to do with inequality in information, uncertainty, risks, bounded rationality and cognitive dissonance, making decision makers '*satisficers*' instead of '*optimizers*' (Lambooy; '97). Therefore location behaviour is led by soft aspects like cognition, aspirations, culture, image and '*mental maps*'. Main examples of modern location theories are behavioural location theory, growth-pole theories (Myrdal and Perroux), cluster theory (Porter) and approaches of strategic spatial behavioural (Hakanson, Vernon and Dunning) (Lambooy; '97).

Whereas behavioural theories in a certain sense underexpose the difference between spatial preferences and actual spatial behaviour, strategic approaches assume location decisions as being fully strategic decisions. Location decisions are being influenced by backwash and spread effects of growth-poles and advantages of integration by regional and local clustering. Finally, location behaviour depends on the type of economic activities, relative competitive advantages of regions is crucial and psychological polarisation effects are of increasing importance in location behaviour (Van der Pol; '01).



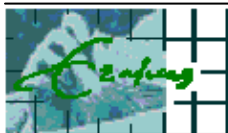
### 3.3.2 Location factors at airports

Regarding the business climate of airports and airport regions, in different literature related to location factors at airports, several location factors are repeatedly mentioned. These factors can be categorized under three main elements, being the overall airport product, the spatial-economic profile of the airport and its region and 'soft elements' (see table 3.4). The potential for development of commercialized real estate at airports is determined by the interaction of these elements and will be discussed below.

Main element	Location factor
Airport product	Air transportation product (destinations and frequencies) Terminal product (capacity, services and facilities) Multimodal landside accessibility (hinterland connections)
Spatial-economic profile of airport area	Regional production structure & economic strength of region (markets, suppliers, labour and knowledge) Business area (space, quality and price of real estate) Quality of living environment (health, housing, education and culture) Politics (stability, mainport policy and tax climate)
Soft elements	Image, status, visibility of the site and location

Table 3.4: Location factors at airports

The characteristics which define the quality of the overall airport product are the air transportation product (variety of destinations and frequency of air transportation to and from these destinations), the terminal product (capacity, high quality standard services and facilities) and the multimodal landside accessibility from the airport to the hinterland and vice versa (Buck Consultants International; '99). The airport product determines the level of activity at the airport which leads to the critical mass of passengers, cargo and services. It contributes to the attractiveness for establishment of new business with a potential for real estate development at the airport. The rise of Low Cost Carriers as mentioned in section 2.3 for example increases the critical mass and transportation product of an airport and therefore benefits the overall airport product. Nijkamp and Rietveld ('95) state that good national and international transportation links, high quality information and telecommunication networks and good accessibility to markets are the top-three of essential location factors for companies to invest at a certain business location. Accessibility is related to the logistic performance of the infrastructure of the airport as city port in the city region and the city region as a whole. By improving speed, reliability and flexibility of the logistic chain and links to other chains, not the most attractive mainport on itself but the mainport with the most attractive logistic chain will achieve the largest growth in volume because they contribute to an optimization of the production factor cost (Lambooy and van Keulen; '90). Another aspect which contributes to the accessibility and which is mentioned as relevant location factor is the availability of parking space in the near proximity of the business location for an affordable price.



The spatial-economic profile of an airport and the airport region are the more general location factors which are influencing the location behaviour, despite of the type of business activity being (re)located. The quality of the spatial-economic profile is firstly determined by the regional production structure (diversity) and the economic strength of global city region (productivity). The input factors for this are the proximity of the markets and the purchasing power of the buyers, presence of suppliers, availability of the labour market (quality, quantity and costs) and available knowledge (universities, R&D and technological development) (Graham; '08). Crucial location decisions in the global economy favour well-accessible locations with spatial qualities where a pool of high potential labour forces is available, factors which favour metropolitan areas. Changing trends in the organisation of production and the behaviour of enterprises like more footloose production due to new technologies, lead to a change over time in the way behaviour of actors is embedded in regional structures (Van Wijk; '07). Technology, knowledge and communication infrastructure are also important factors in the regional business climate of Schiphol CBD (Lambooy and van Keulen; '90). Secondly, the business area is mentioned which is being determined by the quantity of the available space and the quality and price of real estate, for this immediately influences the companies' accommodation costs. A third important location factor is the quality of the living environment, reflected by a clean, healthy and well organized environment with good and affordable basic facilities like housing, health care system, education, culture and a socio-cultural balanced society (Van der Pol; '01). Politic related issues like political stability, mainport policy and attractive tax climate are the fourth relevant location factor influencing location behaviour at airports. The development of business locations of regional and local authorities is derived from the economic and mainport policy of the national government. The policy is aimed to create an attractive business climate, to attract business activities, to stimulate regional and local economy and to create employment. The development of real estate by real estate developers and the airport authority and the provision to companies to accommodate their business activities, is the outcome of this policy. Regarding all these location factors, Gout, Haffner and Van Sinderen ('97) state that quality and costs of labour, taxes and the local transportation system are important but to some extent less relevant than all the other location factors.

Other factors which are being mentioned, are the image and status of and visibility at the business location. These factors are more difficult to quantify and are less tangible, though these are very relevant factors influencing location decisions and location behaviour at airports. Therefore these factors can be qualified as '*soft elements*'.



### 3.4 Real estate development

As discussed in the former sections, location factors at city ports need to match economic actors' requirements concerning the business location. This gives a business location economic potential, making the actors locate at the location in question, which consequently creates demand for real estate. This section discusses the actual real estate development at Central Business Districts in general and explains real estate development based on a growth path for real estate development at airports as CBD's.

#### 3.4.1 Real estate development at CBD's

The term '*Central Business District*' (CBD) was introduced in the year seventies and originally referred to the city's central commercial district, also known as '*downtown business district*'. Due to geographical spread and clustering (spatial deconcentration) of economic activities mainly in the year nineties, the economic functions and strategic importance of the different districts in a certain city region changed and new business districts arise (Murphy; '08). Nowadays the term 'CBD' is more commonly used for any district in city regions of major economic importance.

In the average city the CBD developed around railroad terminals and more recently to highway network and rapid transit systems. The boundaries of the CBD are mostly on walking distance. Horwood and Boyce ('08) state that the CBD consists of a core and a frame. The core is the area with the greatest concentration of daytime population and there is a general absence of permanent residential population. Here the major mass transit interchange for the city is located. The frame of the CBD tends to fill in interstices of highway and rail transportation routes. Land use in the frame is semi-intensive. In general, an outward decline continues in the proportion of business usage and a lessening tendency of the mixture of uses. Except physical (natural or artificial) borders like rivers or railways, delimitation of the core, the frame and boundaries of the CBD usually is rather difficult. A transition zone separates the CBD from city areas with a more homogeneous usage. Burgess ('08) states that the core of the CBD expands to this transitional zone, while Ullman ('08) states that growth is usually more upward through the construction of taller buildings than horizontal.



The CBD is characterized by intensiveness of land use and a high concentration of social and high grade economic activities. It shows a high concentration of people during business hours and is reflected by tall multi-storeyed buildings. The CBD offers the convenience of functional integration. Based on studies of the floor-space proportions devoted to various uses of different CBD's, Murphy ('08) comes to an average pattern of functions being represented in CBD's. Service, Financial and Office uses are the most represented (43%), being followed by Retail Business Uses (30%) and Non-Central Business Uses (26%) (see figure 3.5). This type of functions cluster in the CBD for advantages of direct negotiation and conferring. The CBD is a centre of specialized professional and business services, a focus on headquarter offices, financial institutions, institutional uses and government with extensive use for executive and policy making functions. Advertising agencies, accounting firms, office suppliers and other service providers find it advantageous to locate at the same area as their major clients. The CBD offers opportunities for lunch-hour shopping, after-hour recreation and entertainment. The CBD usually also has hotels and sometimes, however usually more towards the edge of the CBD, apartments. Also Lambooy and Van Keulen ('90) state that management activities, trade and services are dominantly represented in the CBD and confirm that the CBD's usually have a high density of shops and entertainment centres.

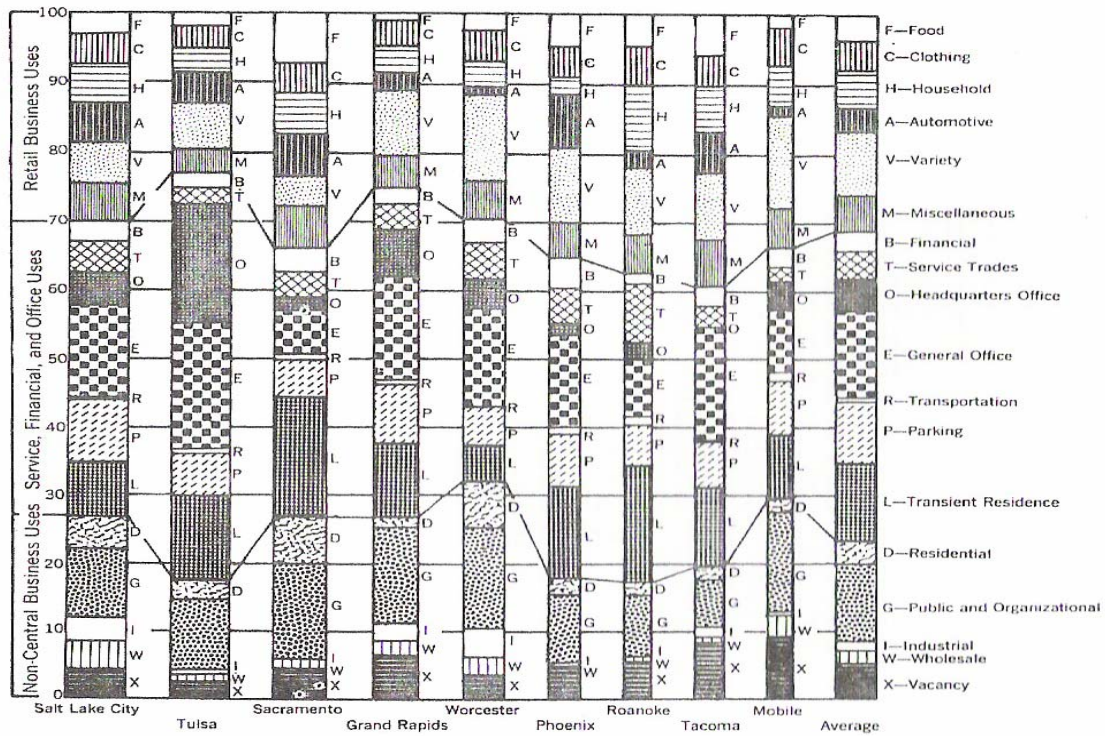


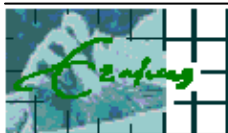
Figure 3.5: Floor-space proportions CBD's by function (Source: Murphy; '08)



### 3.4.2 Airports as CBD

Due to economic development, functional diversification and real estate development as mentioned in section 2.2.3, airports integrate more and more in the urban system and develop from traditional traffic nodes in the city region's transportation network into city ports and autonomic CBD's. As mentioned in section 3.2.2, this urban development at airports is internationally orientated without the need to be located in the traditional downtown city centre. The concentration of jobs and inhabitants is required on calculable distance, but not on walking distance as in the standard business centres. For airports, this is logical because due to noise and air pollution as well as safety precautions, inhabitants are located on several kilometres distance from the airport, though in urban centres in the vicinity of the airport site. It contains economic activities that are more standardized and which do not need the urban dimension of the city itself. In terms of urban economic development of Hall, the development of Central Business Districts at airports in globalizing city regions is qualified as 'external edge cities'.

This is also the case for Schiphol, for Schiphol is increasingly showing the main characteristics of a CBD as mentioned in the former section. Schiphol developed into a multifunctional and dynamic concentration of high grade economic activities like management activities, distribution, transport, trade and services, which are closely related to the urban region it is part of. As satellite of the Amsterdam city region it became a self-supporting specialized business district. Schiphol developed at and around an intermodal traffic node, shows intensified land use, has a high concentration of social and economic activities and has a clear core and a frame. Schiphol Centre is the core with the greatest concentration of daytime population and major mass of passengers and goods transiting at the freight and passenger terminals. It has a CBD-like mixture of uses and increasing functional integration of specialized professional and business services. It has offices, is locating some headquarters (e.g. Microsoft) and offers shops, restaurants, entertainment, recreation and hotels. Though, due to the specific airport function of Schiphol, it is also missing some of the typical characteristics of the CBD. Schiphol has an absence of residential population: due to noise and air pollution, the accessory urban agglomeration is not contiguous to the CBD but located on several kilometres distance and as a circle surrounding the airport area. The boundaries of the CBD are relatively easy to indicate and there is no real transition zone with a more homogeneous usage. Growth of the CBD is not upwards with taller buildings due to safety precautions, but is more horizontally by intensified usage of the existing area and efforts by Schiphol Group to expand the airport area as a whole. In spite of the multifunctional usage, traditional and large-scale financial institutions and institutional and governmental usage is missing.



### 3.4.3 Growth path real estate development at airports

Due to the fact that airport diversification strategies and commercialized real estate development at airports is very premature and financial data of airport companies are strictly confidential, scientific research and availability of knowledge and data on commercialized real estate development at airports is almost not available. However, Koomen ('99) and Oosterwegel ('06) both analyzed the development of commercialized real estate at and in the near surrounding of airports in the Netherlands. It is assumed that these analyses for Dutch airports are representative for real estate development at airports in general. Based on these analyses, it can be concluded there is a certain quantitative and qualitative growth path in real estate development at airports.

Based on a regression analysis over the period '67-'98, Koomen ('99) concludes that there is a perfect positive correlation between the growth of Schiphol measured in Air Transport Movements and the development of commercialized real estate measured in available space (m<sup>2</sup> VVO) at the airport (see figure 3.6). This causal relation means that at Schiphol every single ATM is related to 4 m<sup>2</sup> of commercialized real estate (1:4)<sup>4</sup>.

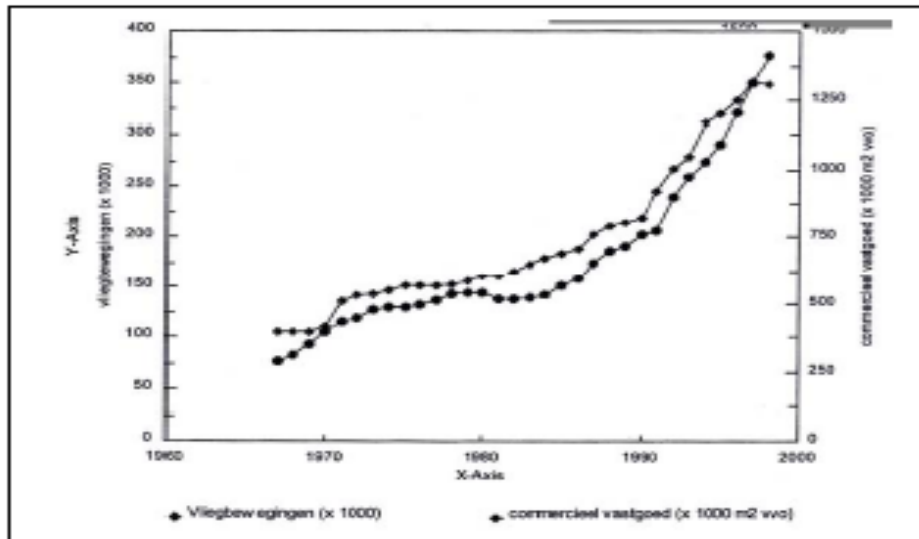


Figure 3.6: Correlation between ATM's and commercialized real estate development at Schiphol (Source: Koomen '99)

<sup>4</sup> The number of ATM's at Schiphol exists of the total ATM's generated by passenger and cargo transportation.



Koomen ('99) distinguishes three different categories, based on the functional relation between the business activities of companies located at the airport and the airport itself:

**Basic:** Companies with business activities which are absolutely necessary for the realization of Air Transport Movements or which are an essential link in the chain of air transportation (i.e.: airport operator, airlines, air traffic control, customs, freight and luggage handlers, etc.)

**Direct market:** Companies which don't necessarily have to be located at the airport area, but which do face a direct sales market at the airport area for consumption for their products or services (freight shippers/-forwarders, employment agencies, retail, F&B, hotel, etc.)

**Location:** Companies for which the airport itself is not a sales market, but for which the proximity of the airport benefits the overall business processes (distribution centres, (inter)national sales offices, headquarters, etc.)

In addition Koomen ('99) distinguishes two types of spaces related to real estate development: office space<sup>5</sup> and non-office space<sup>6</sup>. Oosterwegel ('06) and Koomen ('99) allocated the available m2 commercialized real estate at airports to the different segments. The sum of these m2 per segment led to the ratios in the table on the next page. Based on the surveys of Koomen ('99) and Oosterwegel ('06), it can be stated that at minor airports, except airport infrastructure and basic terminal facilities, there is hardly any commercialized real estate development. Therefore the commercialized real estate development at minor airports is neglectible. Looking at regional and hub airports on the contrary, there an interesting trend in commercialized real estate development can be seen.

It has to be mentioned that in the survey on real estate development at regional airports, most of the respondents are being located off airport site, while in the survey on real estate development at hub airports most of the respondents are being located on airport site. A nuanced interpretation of the data therefore is necessary, for the primary processes of companies being located on airport site are usually more strongly airport related than these of companies off airport site. This partly explains the relative high share of m2 in the segment 'Basic' at hub airports compared to regional airports. On top of this, the data concern the relative share of floor space per functional relationship, which does not say anything about either the absolute m2 of floor space, or the number of companies in the different segments being located at regional and hub airports. Taking this into account, a general conclusion on real estate development at regional and hub airports however can be made and is as follows.

<sup>5</sup> Floor space for regular office activities, being policy making, management, organisational, commercial supporting and administrative activities.

<sup>6</sup> Floor space for activities other than regular office activities.





When looking at the functional relation of the type of business activity with the airport, we see that the total share of available space for ‘office’ at hub airports (39%) is higher than at regional airports (32%) and therefore the category ‘offices’ is more important for hub airports than for regional airports (see table 3.7). In meantime, the functional relationship at hub-airports is more diversified when looking at the total share of available space per segment compared to regional airports. At a hub-airport 68% of the available space is related to the segment ‘Basic’, 25% is related to ‘Direct market’ and 7% is related the segment ‘Location’, while at regional airports these shares are 4%, 19%, respectively 77%.

The fact that 93% of the space at hub airports is aviation related activity (segments ‘Basic’ and ‘Direct market’), confirms the statement found in literature that the main location factor at hub airports is the overall airport product and, more specifically, the air transportation product. Due to economies of scale at hub airports, these airports have relatively many and large facilities for (European) distribution centres and cargo handling services. It offers excellent distribution possibilities, solutions in the logistic chain and direct and easy access to the markets. In meantime, hub airports attract more (inter)national sales offices and headquarters than regional airports, because airside accessibility is essential for the business processes of these activities.

<i>Regional airport</i>	<i>Basic</i>	<i>Direct market</i>	<i>Location</i>	<i>Total</i>
Office:	3%	2%	27%	32%
Non-offices:	1%	17%	50%	68%
<b>Total</b>	<b>4%</b>	<b>19%</b>	<b>77%</b>	<b>100%</b>
<i>Hub-airport</i>	<i>Basic</i>	<i>Direct market</i>	<i>Location</i>	<i>Total</i>
Office:	13%	21%	5%	39%
Non-offices:	55%	4%	2%	61%
<b>Total</b>	<b>68%</b>	<b>25%</b>	<b>7%</b>	<b>100%</b>

Table 3.7: Average share of m<sup>2</sup> real estate at airports (Source: Oosterwegel '06)

The segment ‘Direct market’ is higher for hub airports (25%) than for regional airports (19%). This can be explained by the fact that at hub airports more diversified economic activities take place, which created a bigger local market. This generates a demand for offices for recruitment, employment agencies, freight shippers and forwarders, but also non-office space like retail, F&B and hotels. Literature mentions also that ‘soft elements’ like image, status and visibility are the most important location factors for companies to locate at regional airports, instead of choosing non-airport locations in the regional airport area. This is being confirmed by the fact that at regional airports, nearly 80% of the total available space is provided to the segment ‘Location’. Which segments have the biggest growth potential and biggest contribution to the revenue of the airport company, depends on the generated rents and margins per m<sup>2</sup>. Unfortunately, quantified data are not available. In general, the estimation is that the rents and margins per m<sup>2</sup> for ‘offices’ is higher than for ‘non-offices’ due to the fact that added value for high grade activities being carried out at offices, are higher than that of low grade activities being carried out at placed other than offices.



### 3.4.4 Level playing field for real estate development at Schiphol

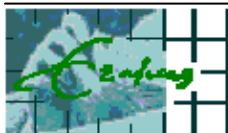
Real estate development is a very complex process, with many public and private actors being involved in the spatial and economic development of the airport region. An analysis of real estate development at Schiphol is not possible without an analysis of the level playing field for real estate development at Schiphol. The level playing field can best be explained by distinguishing different groups of operating actors like the government, the airport authority, Schiphol Real Estate, Schiphol Area Development Company as real estate developers and its shareholders, the investors, the end users, society in general and other actors. All these actors have varying power on different levels and therefore can positively or negatively influence the real estate development. The level playing field is shown in figure 3.8 on page 44.

#### *The government*

On the Dutch national level, four ministries are involved with airport planning: the Ministry of Transport and Water Management (V&W), the Ministry of Planning (VROM), the Ministry of Economic Affairs (EZ) and the Ministry of Finance (FIN). Urban planning is within the Ministry of Planning. The Ministry of Transport is in charge of the landside accessibility of the airport in terms of roads, rail and other infrastructure and is the coordinator of the Mainport project. The Ministry of Planning is responsible for the national planning for regional urban development and regulation on noise pollution, construction and housing and draws strict noise and safety contours and environmental impact studies. VROM makes legally binding land use plans. The Ministry of Economic Affairs focuses on national economic issues and is member of the interdepartmental Mainport Schiphol project and attributes to make optimal use of the economic potential and opportunities of Schiphol. The Ministry of Finance organizes financial relations between Schiphol and the Dutch state (Van Wijk; 07).

On the regional level, in the Schiphol airport area four provinces are involved (Noord-Holland, Zuid-Holland, Utrecht and to a minor extent Flevoland), with Noord-Holland being the most influential. Noord-Holland is the coordinator between the local and national level as well as public and private interests. It supervises the land-use plans, has active development roles and sets strict zoning regulations for tests for airport-relatedness for offices and industrial locations: the closer the land is to the airport, the more airport-related the activity should be, to be allowed to locate at the parcel in question (Van Wijk; 07). Due to these tests, Schiphol Group has to build on a very strong and cooperative relation with Noord-Holland, for flexible interpretation and maybe even a review of this zoning regulation might be necessary, to develop further urban functions at Schiphol.

On the local level, at least thirty municipalities are involved in the urban-economic development of Schiphol, most of them profiting from positive economic impact, generating direct, indirect and induced jobs, economic activities and tax income, but also being negatively effected by noise contours and noise pollution. Schiphol is officially located at the municipality of Haarlemmermeer, being responsible for the land use plan of the airport, aiming at an active strategy for land and real estate development plan and sells land to project developers for real estate development (Van Wijk; 07). Therefore Amsterdam and Haarlemmermeer are both shareholder in the Schiphol Area Development Company (SADC); Amsterdam is also 20% shareholder in the Schiphol Group.



### *Real estate developers*

Schiphol Group is the airport authority managing and operating Schiphol (see also: Definitions). Real estate development at Schiphol however is not done by Schiphol Group itself, but is realized by Schiphol Real Estate (SRE) and Schiphol Area Development Company (SADC) which are project developers and area developers. Schiphol Group is full shareholder of SRE and 33,2% shareholder of SADC. The SRE develops platform related industrial sites and airport-related office locations, while SADC develops airport-related industrial activities. In practice, SADC is outsourcing real estate development to real estate developers. SADC is involved in tests for airport-relatedness of economic activities. SADC is sharing services with Amsterdam Airport Area (AAA) for foreign marketing and sales of business locations (Van Wijk; '07).

### *Shareholders*

As shareholders, the State of the Netherlands, the Municipality of Amsterdam, Aéroports de Paris and the Municipality of Rotterdam all have commercial interest in commercialized real estate development, for this creates assets for Schiphol Group and generates revenue, which increases the market value of Schiphol Group as company. Contradictory in this situation however is that the State of the Netherlands and the Municipality of Amsterdam both are stakeholders as well as government. This can create conflicts of interest, for as national, regional and local government, they have legislative and supervising tasks on the one hand and as shareholder have commercial interest on the other. The simultaneous role as policy maker, policy maintainer / controller and project developer is identified as problematic.

### *Investors*

Schiphol Group can use aeronautical as well as non-aeronautical revenue to fund real estate development. But also external actors as investors can prove the necessary capital for real estate development. This can be the shareholders, institutional investors as well as commercial banks.

### *End-users*

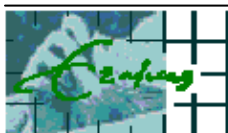
The end-users of the airport like carriers, passengers, shippers, freight forwarders but also the real estate users like buyers, tenants and concessionaires are involved with real estate development. As potential users of the airport and the real estate being developed, they are the critical mass for real estate development and therefore are an important group of actors which requirements need to be matched to make them use the airport, locate at the airport and use the real estate.

### *Society*

The society consists of residents (mostly being represented in interest groups) as well as employees working at the airport, both mainly indirectly involved with and influencing the real estate development at the airport. As we will see in chapter 4, the society benefits from business activities generated by real estate development generating jobs, and the provision of urban functions at the airport. However, society is also exposed to negative externalities due to environmental pressure as a result of increased economic activities in the airport region due to real estate development, needed to facilitate these economic activities and urban functions.

### *Other*

Besides all actors mentioned, also other actors like constructors, consultants on real estate development and advisory institutions like the Netherlands Bureau for Economic Policy Analysis (CPB), the Chamber of Commerce (KvK) and the Ruimtelijk Planbureau (RPB) mainly consulting the Dutch government, platforms and coalitions are either directly or indirectly involved in real estate development at Schiphol.



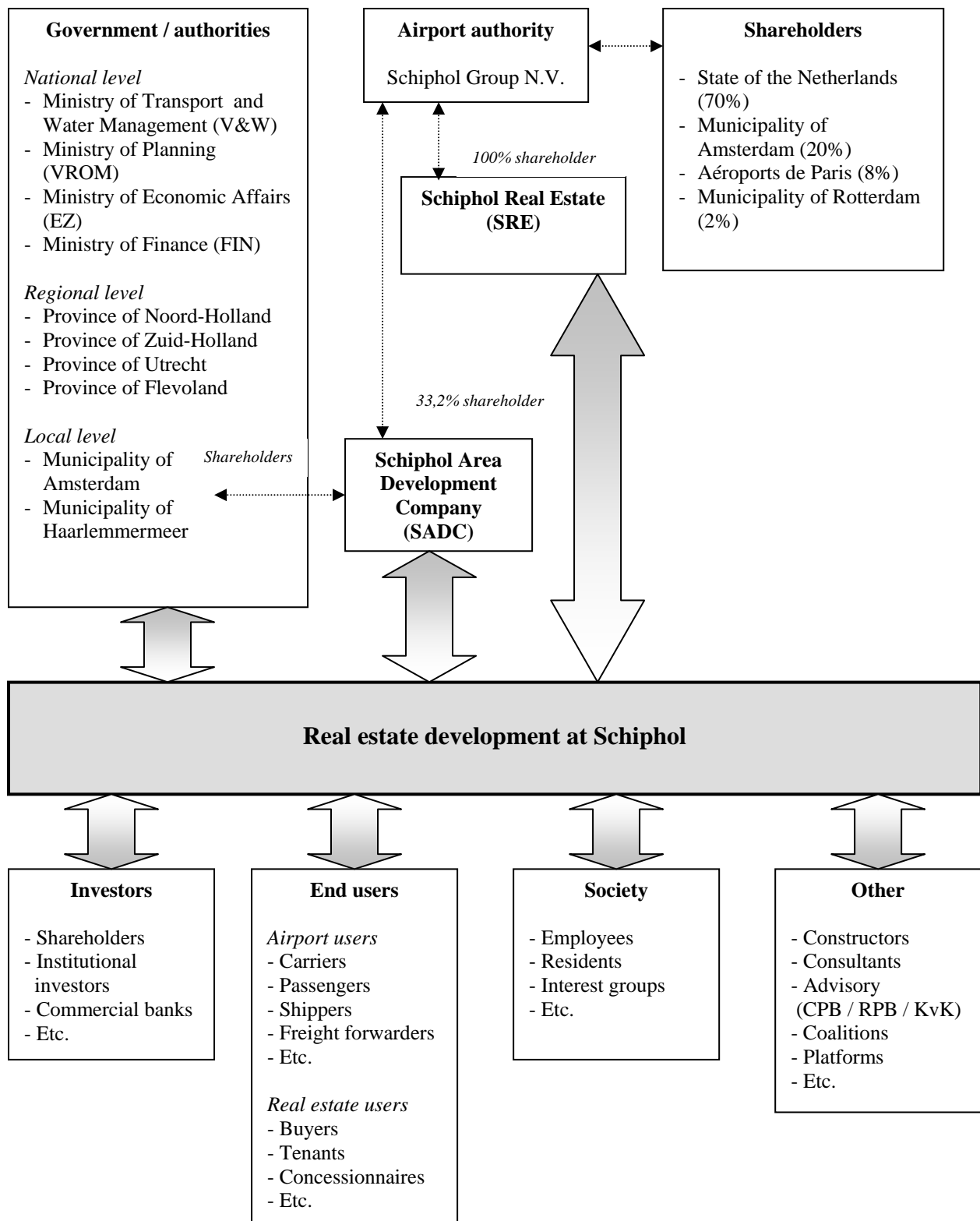


Figure 3.8: Level playing field for real estate development at Schiphol



### 3.4.5 Relative importance real estate development at Schiphol

As concluded before, as a result of a successful hub-strategy being feeded by Air France - KLM, the growth of passenger throughput at Schiphol with a long term average of 4.3% is equal to the worldwide growth rate of passenger throughput (4-4.5%). With a long term average of 6.6% the growth rate of the total revenue of Schiphol Group is also far above the overall growth rate of the worldwide aviation industry (5%) and the average long term growth of the world economy (3%).

For airports with a throughput of approximately 45 mio passengers per year, between 30% and 36% of the total revenue is generated by real estate related activities. In '06 Schiphol Group generated 29% of the total revenue by real estate related activities, which means that Schiphol Group is lagging behind on real estate related revenue generation, compared to airports with comparable passenger throughput. However, in the period '96-'09, the growth rate of real estate related income at Schiphol (205%) is much higher than the growth rate of the total revenue of the airport (159%). This means that real estate as asset is of increasing relative importance for the overall financial performance of Schiphol Group. The share of investments in real estate by Schiphol Group as percentage of the total investments increased from 8% ('04) to 27% ('08). Also the output of this investment shows a positive trend: the Return on Net Assets (Rona) on Real estate increased from 3.7% ('04) to 10% ('07), while in meantime the Rona on Aviation was stable at 4%.

Concerning real estate development, last decade Schiphol Group is increasingly facing competition on a national (regional and local) level as well as on an international level. Recent years, the Airport City concept of Schiphol Group as development strategy has been copied by several other airports elsewhere in as well as outside Europe (i.e. Frankfurt, Dubai and Bangkok). Due to development of new CBD's in the airport region of Schiphol, Schiphol is competing with local CBD's like the CBD of the Zuidas, Zuid-oost, Sloterdijk and in lesser extent Hoofddorp, Haarlem and Nieuw Vennep (Buck Consultants International; '10). Due to the strong impact of the credit crisis ('08) and the resulting worldwide recession ('09-'10), national as well as international companies are reviewing business strategies, are restructuring organizations and are redeveloping business processes, which could result in a changing business community and changing socio-economic behaviour. This could mean a changing demand for business locations, which might possibly influence the location behaviour and could lead to increased complexity of spatial-economic structures. For instance, the strategic function of a hub-airport as node of interaction for meetings, trainings and conferences might increase. Soft aspects in location behaviour at hub airports like 'experiencing' a business location are gaining importance compared to hard aspects like physical and technical requirements of real estate. This might mean that the Airport City concept of Schiphol Group needs to be reviewed to create distinctive capacity in the supply of real estate, or maybe even needs to be re-developed to create a premium up-to-date business location for the near future, compared to competing CBD's (Buck Consultants International; '10).



Beholding this chapter on urban regional and real estate development, we can conclude that due to globalization, city regions like the Randstad increasingly interact in a global network with city ports as high value connecting nodes. Airports as city ports are a crucial element in urban-regional and economic development of city regions, because the airport, the city region and the transportation network are a united, interdependent and integrated system with reciprocal influence. Airports increasingly integrate in the urban system, accommodating economic activities, adapting urban functions and closely resembling autonomic Central Business Districts. Specific location factors like the quality of the airport product however create a unique business climate at airports compared to regular Central Business Districts, making airports a high potential business location for economic activities. Therefore airports increasingly locate traditional urban functions, changing airports from traditional interchange nodes into new intermodal, multifunctional Central Business Districts of increasing strategic importance, strengthening the competitive position of the global city region.

The degree of real estate development at airports depends on the development stage an airport is in. Real estate develops conform a growth path and at Schiphol is perfectly positive related to the total Air Transport Movements at the airport. While real estate development at minor airports is neglectible, it is substantial respectively large scale at regional and hub airports. Non-offices (68% resp. 61%) is far the most important real estate in m<sup>2</sup> at airports, while at hub airports real estate is much more diversified based on the functional relationship with the airport compared to regional airports. The direct relationship of economic activities with the airport is the most important location factor for business activities at hub airports, while at regional airports soft elements like airport image are determining location behavior.

Now the interaction of the airport and the urban region and the function of the airport as city port in the city region is known and urban regional development is related to real estate development at airports, the question now is what the spatial and socio-economic impact of airports in general is and which part of these effects can be attributed to real estate development at airports. Therefore, in chapter 4, the spatial and socio-economic impact of airports and real estate developments at airports will be questioned.



## Chapter 4 - Spatial and socio-economic impact

The former chapter made clear what the urban functions of airports are and how economic and real estate development at airports as CBD's and city ports is related to urban and regional development of globalizing city regions. This consequently leads to the question what the spatial and socio-economic impact of airports are and, if possible to identify, which part of these effects can be attributed to real estate development at airports. Therefore in this chapter, based on the case study of Schiphol, the spatial development of airports (4.1) and socio-economic impact of airports measured in employment (4.2.1), Gross Value Added (4.2.2) and city port value (4.2.3) will be expressed. Section 4.3 contains the impact of real estate development at airports for the airport authority itself (4.3.1), the government (4.3.2) and the society (4.3.3).

### 4.1 Spatial development

Airports are increasingly recognized as economic generators and catalysts for business activities, in addition to being critical components of efficient infrastructure. Burghouwt ('02) assigns landside and airside accessibility as the primary function of airport as transport node. He adds the urban function (e.g. retail, employment, entertainment and accommodations) as third dimension, which is increasingly being exploited, which is a derivative from the primary function and which arises when the airport develops into an economic and social cultural formation with a diversity of activities and services. He states that the development of the urban function of airports is like an upward spiral: an airport with more urban functions is more attractive for air travellers, is a more attractive business environment, leads to higher added value and has a bigger spin off to the airport region. As more companies use the airport and are increasingly dependant on the airport for their core business process, companies are willing to move to regions surrounding the airport or the airport site itself. Depending of the physical location of the development of economic activities and related real estate development, this leads to different concepts of spatial spread in urban development (see figure 4.1 on page 48).

Compared to the traditional relation between the standard airport and the city region, in the *Airport City Concept* the land value of the airport is optimized without compromising on the functionality of the airport by integration of functions and centralizing intensive, effective and optimal economic usage of the airport site and its business locations inside the airport fences (airport site exploitation; Van Wijk; '07). Airport Cities are mainly hub airports with multimodal landside connectivity which turn from 'airside oriented service providers' to 'multi service airports'. Schiphol Group is mentioned as trendsetter and successful pioneer in the rise of Airport Cities, for it attracted European headquarters and distribution centres and it generates retail and office facilities at the airport complex.



When aviation-related business is more or less clustering outside the airport fence in a decentralized and unplanned way, an *Aviation-related Cluster* is arising. In case of Schiphol, the main clusters of business activities are logistics, financial and business services, creative sector and tourism. Due to increased connectivity, the urban region of Amsterdam is also relatively good at attracting European headquarters of multinationals (Duijvestein; '07). When development of economic activities outside the airport fence occurs along major transport lines like rail links and motorways in a more long-drawn but planned way, an *Airport Corridor* arises. Schiphol, as Airport City for example, is a strategic business location in the Amsterdam Airport Corridor, which faces competition as well as synergies with the traditional city centre of Amsterdam, the Zuidas and Sloterdijk.

The *Aerotropolis concept*, introduced by Kasarda, regards the transshipment from airside to landside as the primary function of the airport. In the ideal situation, non-aviation-related activities are banned from the airport site in favour of aviation related activities at the airport site and landside accessibility of the airport (site protection; Van Wijk; '07). This leads to a spatial spread of economic activities over a wider airport region outside the airport fence (TNLI '98). The surrounding infrastructure and facilities such as retail, offices, trade zones, distribution, industrial parks, hotels and even entertainment districts serve as an entire business district (Kasarda '06). This results in an integrated development of the airport and the entire city or urban region. In addition to the clustering of commercial activities, the Aerotropolis has emerged as an important component of regional and international economic growth. The Aerotropolis becomes an area of vulnerability for activities broader than just air transport. Stevens defines the '*Airport Metropolis*' as 'the identification of the airport as a trade, logistic and passenger locus for time-sensitive urban development over an extended area' (Stevens et al; '09). In the latter three concepts, the economic spin off of the airport goes beyond the airport site, up to 25 kilometre away from the airport (Duijvestein; '07).

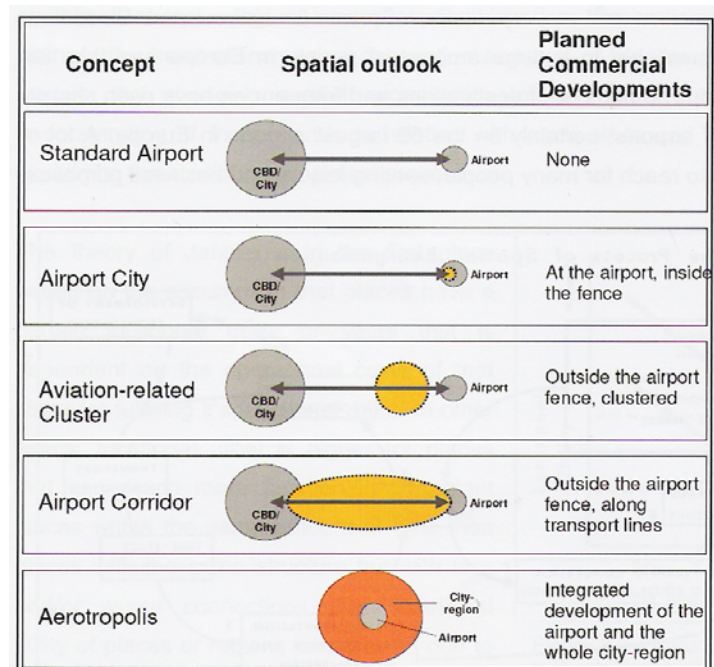


Figure 4.1: Spatial developments airports  
(Source: Duijvestein; '07)





## 4.2 Socio-economic impact in general

The mainport concept of airports combines various economic activities, spread over several different economic sectors. Different researchers agree that the economic impact of airports is considerable. The most common economic indicators used in different literature and statistics to quantify this economic importance are *employment* and *Gross Value Added (GVA)*. The total economic impact is divided in direct impact, indirect impact, induced impact and catalytic impact (See figure 4.2; Graham; '08).

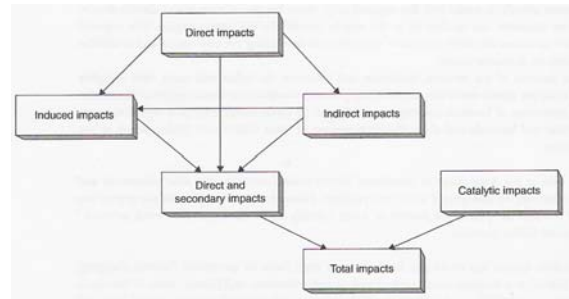


Figure 4.2: Socio-economic impact (Graham; '08)

*Direct impact* is the economic effect of the core of the airport. It concerns the direct employment and Gross Value Added to be found at the geographical centre of the airport, related to the direct operations or basic activities of the airport (i.e. airport-related processes of the airport operator, concessionaires, airlines, handling agents, air traffic control, customs, security, car hire and parking, in-flight catering, freight forwarders, hotels, etc.). Direct impacts vary depending on a combination of factors, like structure and volume of passengers, amount of freight, capacity utilization, function and development stage of the airport and the degree of commercialization and are the easiest to measure.

The *indirect impact* is the total amount of employment and Gross Value Added of the backward and forward linkages (Graham; '08 and Van den Bossche; '97). Backward linkages are activities in the supply chain of goods and services to the direct activities of the airport, so upstream the logistic value chain. To perform their core activities, economic actors comprised in the direct effects use goods and services from contractors who need subcontractors and so on. Examples are the utilities, fuel suppliers, construction and cleaning companies, food and retail good suppliers, etc. Forward linkages are the actual users or consumers of the direct activities, so downstream the logistic value chain. Without the presence of the airport, these activities would take place against higher operating costs, would be located elsewhere (outside the economic system), or would not take place at all. Relevant economic sectors often referred to (European) distribution centers and the distribution sector in general.

*Induced impact* is employment and income generated by expenses of direct and indirect employees. The indirect and induced effects together are known as the *secondary effects* (Graham; '08). Indirect and induced effects are more difficult to measure, for interaction of the airport and other sectors are not always clear. In general, airports in liberal market economies show higher direct and indirect impacts compared to coordinated market economies, due to outsourcing with flexible labour contracts.

Airports also are attracting and sustaining wider economic activities in the city region in terms of business and tourism, which is the *catalytic impact*, also called 'magnetic' or 'spin-off' impact. This can be defined as the employment, income, investment and tax revenue generated by the wider role which an airport plays by being a magnet for the city region.

Besides economic impact, it is also claimed that air travel and therefore airports contribute to wider benefits to society in the form of strengthening ethnic and cultural links between countries, enhancing opportunities to travel, and increasing consumer choices for foodstuffs and other products. Also living patterns will change with implications for housing, health and education. A successful airport also may cause labor shortage, resulting in rising labor costs, insufficient housing facilities and rising house prices. Though, these social effects are all very general impacts which are very hard to quantify.



#### 4.2.1 Employment

At a global level for the overall air transport industry, in '05 every 1,000 direct jobs generate 1,160 indirect jobs and 540 induced jobs. This means that every on-airport-site job generates 1.7 additional jobs in the airport region (see table 4.3). A study of employment at European airports in '01 showed that in Europe on average, international airports created 950 direct jobs per 1 mio passengers, which is more than the 750 direct jobs per 1 mio passengers which national airports created (Graham; '08). For smaller airports the employment rate was higher than larger airports: airports with an annual passenger throughput less than 1 mio passengers generated 1,724 direct jobs, for airports of 1 – 4 mio passengers this was 1,034; for airports of 10 – 19 mio passengers it was 934 and for airports of 20 – 49 mio passengers it was 867 jobs. This might be due to lower economies of scale at smaller airports, resulting in a lower productivity per employee. Airlines and handling agents are the largest employers at airports (64%), followed by the airport operator (14%), concessionaires (12%), Air Traffic Control (6%) and Other (4%) (Graham; '08).

Similar result can be seen when looking at the job creation at Schiphol. With an annual passenger throughput of 25.4 mio in '95 and 41,800 direct employees, Schiphol generated 1,649 direct jobs per 1 mio passengers (see table 4.3). In '07 however, with an annual passenger throughput of 47.8 mio and 57,000 direct employees, Schiphol generated 1,193 direct jobs per 1 mio passengers. This is quite close though slightly higher than the global average of 1,000 jobs per 1 mio passengers and higher than the average of 867 jobs per 1 mio passengers of European airports with a throughput of 20 – 49 mio passengers per year. The fact that the employment density at Schiphol is relatively high can be explained by the fact that Schiphol as a hub is a major airline bases which has substantial employment development. As mentioned in section 2.3, Schiphol is part of the dual-hub system of the SkyTeam Alliance with KLM being home based at Schiphol. Meanwhile, Schiphol bases relatively few Low Cost Carriers, which have lower values of employment density because the number of airline staff at LCC's is kept to a minimum. The decline of the rate for Schiphol over the period '95 – '07 can be explained by the fact that passenger throughput grew faster than the employment at the airport, which is a result from an increased labor productivity<sup>7</sup>.

	# pax (mio):	Direct jobs	# direct jobs / 1 mio pax	Indirect jobs	Ratio Indirect / Direct	Induced jobs	Ratio Induced / Direct	Total jobs
Schiphol '95:	25.4	41,800	1,649	37,600	0.90			
Schiphol '07:	47.8	57,000	1,193	59,000	1.04	27k-31k	0.50	143k-147k
Global '05:			1,000	1,160	1.16	540	0.54	2,700

Table 4.3: Job creation by Schiphol (Based on: Graham; '08, Van den Bossche; '97, Annual Reports Schiphol Group '95 and '07)

<sup>7</sup> Output per full time equivalent



The global average ratio of indirect versus direct jobs generated by airports (1.16) is also being confirmed for Schiphol (1.04), because in '07 Schiphol generated 59,000 indirect jobs compared to 57,000 direct jobs (Van Wijk; '07 and Annual Report Schiphol Group '07). This estimation of the direct and indirect jobs of Schiphol for '07 is close to the estimation of a total of 104,000 direct and indirect jobs as estimated by Schreuder ('06) for Schiphol for the year '06. Based on the fact that the ratio for indirect versus direct jobs at Schiphol in '07 is quite similar to the global rate, and under the assumption that the rate of induced jobs versus direct jobs for Schiphol is also similar to the global rate (0.54), the estimation is that Schiphol generated 27,000 – 31,000 induced jobs in '07. This makes that the total job creation by Schiphol in '07 was 143,000 – 147,000 jobs. Added to this, to compare economic impact of mainport Schiphol with the other national mainport as driving force for the Dutch economy, it can be stated that the impact of Schiphol generated half of the total jobs as generated by mainport Rotterdam, because the port of Rotterdam generated a total of 160,500 jobs (Van den Bossche; '95).

In '93, the *Ministerie van Verkeer en Waterstaat* forecasted the economic growth of Schiphol. This forecast is based on CPB-scenarios of economic development on the one hand and development scenarios of the aviation industry on the other. Based on these two type of developments only three combinations of development scenarios are consistent (see table 4.4): *Global Shift and Business as Usual* (GS/BU; liberalization of trade, though absence of international coordination resulting in low annual economic growth of 1.5 – 2.0%, no liberalization of transport, no mergers of carriers, existence of flag-carriers, no hub-and-spoke models), *European Renaissance and European Liberalization* (ER/EL; economic revival of Europe resulting from governmental policymaking, European integration, expansion of European Union, protectionistic multipolar economic regions resulting in medium annual economic growth of 2.5 – 3.0%, liberalization of aviation industry is limited to European market, mergers and alliances of Euro-carriers using multi-hub networks home based in Europe, conservation of intercontinental connections), and *Balanced Growth and Global Liberalization* (BG/GL; increased European integration and internationalization, strong annual economic growth of 3.0 – 3.5% due to autonomic market developments, worldwide liberalization and scale increase of aviation industry, mega-carriers operating with worldwide networks with multiple hubs per continent).



Aviation scenario: Economic scenario:	<i>Business as Usual</i> (BU)	<i>European Liberalization</i> (EL)	<i>Global Liberalization</i> (GL)
<i>Global Shift (GS)</i>	Consistent combination (1.5 – 2.0% growth)		
<i>European Renaissance (ER)</i>		Consistent combination (2.5 – 3.0% growth)	
<i>Balanced Growth (BG)</i>			Consistent combination (3.0 – 3.5% growth)

Table 4.4: Scenario's of economic growth (Source: Ministerie van Verkeer en Waterstaat; '93).

Based on the development at the land side as well as at the air side of the aviation industry (see chapter 2) combined with the economic developments in the first decade of the 21<sup>st</sup> century and the current economic situation, it can be stated that the scenario of *European Renaissance and European Liberalization* (ER/EL) is best matching the general economic development as well as the developments in the aviation industry. However, if the forecast for '03 is being compared with the throughput of 41 mio passengers as realized by Schiphol in '03, it can be stated that the realized average annual growth of passenger throughput was higher than the forecast related to this scenario. On the contrary, unstable economic developments in the first decade of the 21<sup>st</sup> century, led to several periods of economic downturns, and recessions. This caused worldwide very instable passenger flows and a much lower average growth rate of passenger throughput at Schiphol of 1.2% over the period '01-'09; the 'growth' of ATM's at Schiphol over the same period was even zero (-/-0,1%) (Source: Annual Reports Schiphol Group '01-'09). Despite the forecasted increase of worldwide passenger flows, the passenger throughput for Schiphol is quite uncertain due to strong competition amongst European airports and uncertain developments in the European air transportation sector. Therefore former annual growth rates of 3.5 to 5.2% are not realistic for the near future. To forecast the passenger throughput of Schiphol for the period '10-'20, it is more realistic to calculate with the lower general growth rates of the economic developments scenarios, being 1.5 to 3.5%. These lower growth rates for the short term are also forecasted by Schiphol Group itself (Annual Report Schiphol Group; '09).



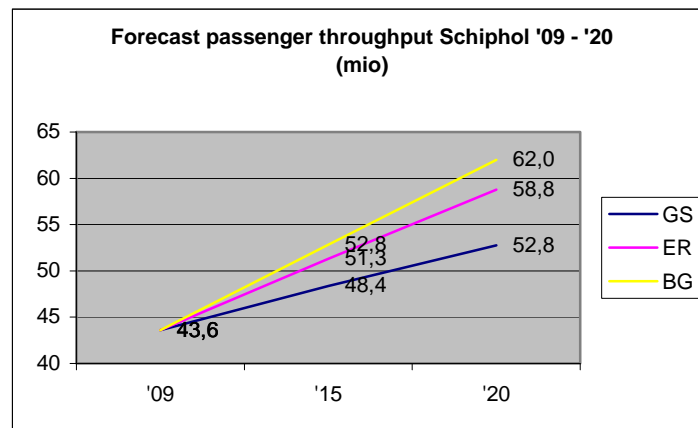


Figure 4.5: Forecast passenger throughput Schiphol '09- '20

Based on the realized passenger throughput of 43.6 mio passengers in '09, the passenger throughput will range from 48.4 (Global Shift) to 52.8 (Balanced Growth) mio passengers per year in '15, respectively will be between 52.8 (Global Shift) and 62.0 (Balanced Growth) mio passengers per year in '20 (see figure 4.5). As stated in section 3.4.3, there is a direct relation between passenger throughput and job creation of an airport. Based on this relation, based on the passenger throughput as estimated above, and under the assumption that the average global ratio's for 1,000 direct jobs, 1,160 indirect jobs and 540 induced jobs per 1 mio passenger throughput are representative for Schiphol, an estimation of the total job creation at Schiphol can be made. The estimation is that the total number of all jobs generated by Schiphol will vary from 132,000 (Global Shift) to 144,000 jobs (Balanced Growth) in '15, respectively will be between 144,000 (Global Shift) and 170,000 jobs (Balanced Growth) in '20 (see figure 4.6). From these jobs, 37% are direct jobs, 43% are indirect jobs and 20% are induced jobs.

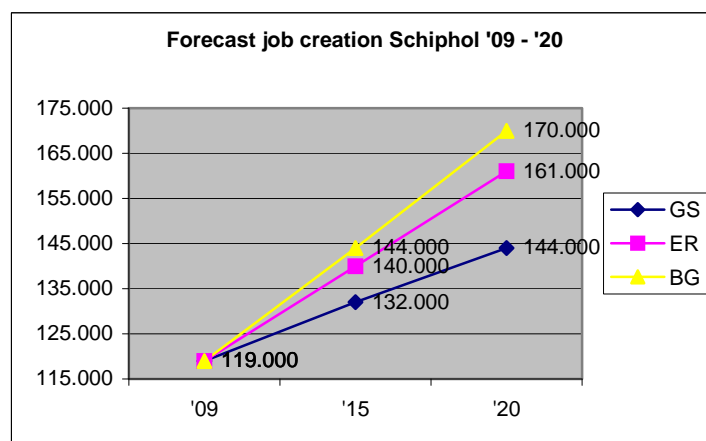


Figure 4.6: Forecast passenger throughput Schiphol '09- '20



### 4.2.2 Gross Value Added

Looking at the Gross Value Added (GVA), it is estimated that direct, indirect and induced economic effects of airports together contribute on average to 2.4% of the GDP (Air Transport Action Group; '05). More specifically within the European airport sector, it has been found that the contribution to the economy was in the range of 1.5% to 2.5% to the GDP (York Aviation; '04). The GVA of Schiphol to the GDP in '95 was 5.8 billion euro, which was 2.2% of the GDP (Van den Bossche; '95). Schreuder ('06) states that the GVA of Schiphol for '06 was between 5.1 and 6.2 billion euro which is 1.5% of the GDP in '06 (see table 4.7). This decline in GVA matches the weak economic development over the period '00-'06, compared to the economic boom in the year nineties. To compare the economic impact of mainport Schiphol concerning the GVA with the mainport Rotterdam, it can be stated that the impact of Schiphol is again half of the economic impact of Rotterdam, for the port of Rotterdam contributed 4.4% to the GDP in '95 (Van den Bossche; '95).

	<i>GVA (€ bio)</i>	<i>Share of GDP</i>
Schiphol ('95)	5.8	2.2%
Rotterdam ('95)	11.4	4.4%
Schiphol ('06)	5.7	1.5%

Table 4.7: Gross Value Added by Schiphol

### 4.2.3 City port value

A benchmark of Schiphol as city port in the Randstad area shows a mixed picture of spatial and economic dynamics. Schiphol as a mainport has a crucial function for the Randstad area as city port in this global network. The mainport as competing hub is connecting the transportation network with this global city region as international competitive business environment (Schiphol Group; '07). Schiphol is accommodating alliances of (inter)national carriers (Air France-KLM as SkyTeam Alliance members) and Low Cost Carriers, who contribute not only to the mainport network, but even more important, also to the international accessibility of the Randstad as global city region. As we saw in section 3.3.2, this accessibility is one of the major location factors in location behaviour of companies and therefore is crucial in the attractiveness and competitiveness of the Randstad as global city region.

Traditional downtowns remain dominant in terms of productivity of city ports, but a shift towards medium-sized towns and external edge cities like Schiphol is seen, due to geographical spread. In terms of accessibility, office rents and growth of added value, these new city ports show a better performance (Van Wijk; '07). Based on a benchmark of node value, space productivity and local rents at different city ports in the Randstad area by Van Wijk ('07), it can be concluded that Schiphol has by far the best access which leads to the highest rank of the node value in the Randstad area, due to its links to national and international multimodal transportation networks with frequent and high quality connections (see figure 4.8 on page 55).



The space productivity (gross added value €mio/km<sup>2</sup>) at Schiphol of €800 mio/km<sup>2</sup> is mediocre of the Amsterdam city region compared to the range of €300 mio/km<sup>2</sup> at the Zuidas and €1,400 mio/km<sup>2</sup> at the city centre, though relatively high compared to other city ports in the Randstad area. This can be explained by the fact that the output is related to the surface of the city port and, due to the fact that airports are space intensive, the output per km<sup>2</sup> is relatively low compared to other city ports. During the period '96-'01 Schiphol showed the most rapid growth of space productivity in the Randstad area, which is leading to a considerable economic spin-off.

Also for the place value, as measure for the urban dimension, it can be stated that, due to space intensity of the airport, the density of approximately 1,000 inhabitants per km<sup>2</sup> is relatively low compared to the 5,000 at other city ports in the Amsterdam city region and the peak of 8,000 at other city ports in the Randstad area. This can be explained by the fact that inhabitants are not located in the direct near surroundings of the airport but in the rural areas close to the airport, due to noise pollution.

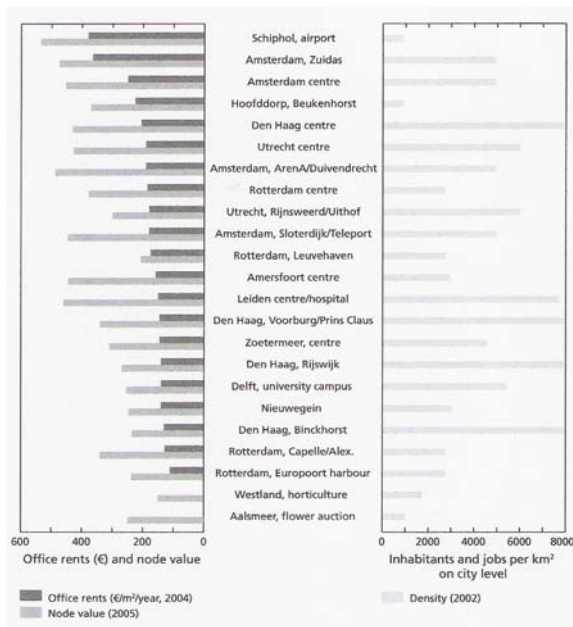


Figure 4.8a: Benchmark node value city ports in the Randstad '05 (Source: Van Wijk; '07)

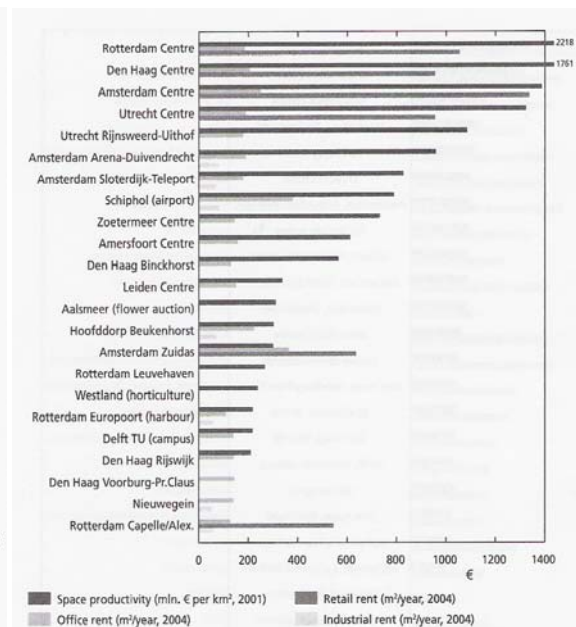


Figure 4.8b: Benchmark space productivity and rents city ports in the Randstad '05 (Source: Van Wijk; '07)

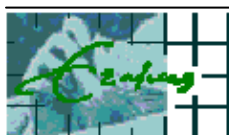


Figure 4.8b does not show a direct relationship between office rents and space productivity. However, due to the fact that rents are a resultant of supply and demand on the real estate market, it can be seen as a good indicator for space productivity of city ports and it shows a positive relationship between rents and accessibility in general. Office rents are relatively equal in the Randstad area. Most rents of class-A locations in the Randstad are approximately €200/m<sup>2</sup> and attract local, regional and national operating companies. However, highest rents are being paid at Schiphol and at the Amsterdam Zuidas: the price close to €400/m<sup>2</sup> at these locations is comparable to international competitive levels, attracting mostly internationally operating companies which is a different market niche. This is even higher than the average rent of €250/m<sup>2</sup> being paid at the traditional city centre of Amsterdam, which is striking because traditionally rents at the city centres are higher than elsewhere in city regions. The prices of commercialized real estate at different city ports in the Amsterdam city region are shown in figure 4.9 below. Also the direct returns on investment of these locations are close to the common 7%. Industrial rents in the Randstad area are relatively equal, with again a maximum of €80/m<sup>2</sup> at Schiphol.

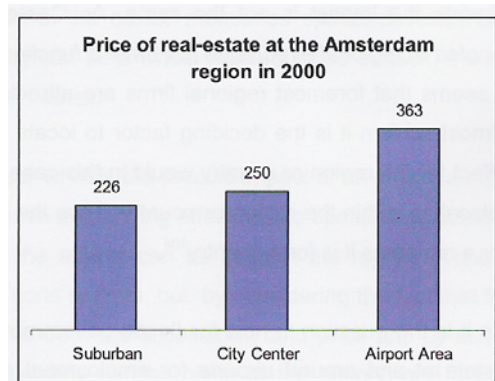


Figure 4.9: Rents / m<sup>2</sup> of commercialized real estate at the Amsterdam city region (Source: Duijvestein; '07)





### 4.3 Spatial and socio-economic impact of real estate development at airports

So, real estate development at airports does positively contribute to urban regional and economic development and therefore has a positive impact on employment and Gross Value Added. The question however is, how can job creation and added value at airports be related to real estate development? What exactly are the socio-economic effects of real estate development at airports in terms of employment and added value? To which extent does real estate development at airports and more specifically at Schiphol contribute to employment and Gross Value Added?

Based on different interviews with airport consultants and extensive literature study on economic and business, urban regional development, real estate development and airport development, it has to be concluded that, besides the spatial impact as explained in section 4.1 and the general conclusion that real estate development at airports positively contributes to urban regional and economic development and therefore has a positive impact on employment and Gross Value Added, it is extremely difficult if not impossible to really isolate and quantify the socio-economic impact of real estate development at airports. The reason for this is that it is impossible to indicate and distinguish what impact is specifically attributable to the real estate development at the airport itself and what is attributable to other factors. However, due to the functional relation between the airport, the city region and the transportation network as a united, interdependent and integrated system with reciprocal influence as indicated in chapter 3, general conclusions on the less tangible and softer aspects of the spatial and socio-economic impact of real estate development at airports for the airport, the government and the society can be drawn. The figure below contains all impacts discussed in the next sections.

	<i>Airport</i>	<i>Government</i>	<i>Society</i>
Economic impact:	<ul style="list-style-type: none"> <li>- Diversification business activities</li> <li>- Revenue</li> <li>- Cross-subsidization</li> <li>- Reduction of vulnerability and business risks</li> <li>- Increased equity</li> <li>- Financial capacity</li> </ul>	<ul style="list-style-type: none"> <li>- Income</li> <li>- Gross Value Added</li> <li>- Contribution to Gross Domestic Product</li> <li>- Job creation</li> </ul>	<ul style="list-style-type: none"> <li>- Employment</li> <li>- Income</li> </ul>
Urban regional impact:	<ul style="list-style-type: none"> <li>- Allocation and attraction of economic activities and urban functions</li> <li>- Attractive business location</li> <li>- Improved airport (transportation) product</li> <li>- Spin-off and catalytic effect</li> <li>- Improved competitive airport position</li> <li>- Strengthened urban function and economic importance</li> <li>- Increased city port value</li> </ul>	<ul style="list-style-type: none"> <li>- Urban economic development of city region</li> <li>- Improved quality of regional production structure and socio-economic strength</li> <li>- Increased attractiveness city region as business location and living environment for residents</li> <li>- Improved competitive position in global network of city regions</li> </ul>	<ul style="list-style-type: none"> <li>- Provision of urban functions and facilities</li> <li>- Landside infrastructure</li> <li>- Improved airport (transportation) product</li> <li>- Improved living environment</li> </ul>
Negative externalities:	<ul style="list-style-type: none"> <li>- Congestion airport site</li> <li>- Threat for primary airport function as core business</li> <li>- Resistance from residents</li> </ul>	<ul style="list-style-type: none"> <li>- Noise</li> <li>- Air pollution</li> <li>- Congestion</li> <li>- Ecological damage</li> <li>- Safety risks</li> </ul>	<ul style="list-style-type: none"> <li>- Noise</li> <li>- Air pollution</li> <li>- Congestion</li> <li>- Ecological damage</li> <li>- Safety risks</li> </ul>

Figure 4.10: Impact of real estate development at airport cities for the airport, government and society



### 4.3.1 Impact for the airport

The impact of real estate development at the airport site for the airport itself can be distinguished in economic effects and functional effects. Concerning economic effects, it can be stated that real estate development at airport cities leads to a diversification of business activities of the airport authority, which matches the trend of diversification strategies of airports as discussed in chapter 2.2.3. This reduces the economic vulnerability of the airport authority, due to a spread of business risks. Airports are business locations which can offer real estate for business activities with low, medium and high added value, which means that airports can generate high rent income and concession income on exploitation of commercialized real estate. Therefore real estate development as business activity is of increasing importance for airport authorities, which is also the case for Schiphol Group as demonstrated in section 3.4.5 on the relative performance of real estate development at Schiphol. The revenue generated by commercialized real estate development can be used for funding of existing and new business activities which can be aeronautical as well as non-aeronautical activities. This cross-subsidizing is a recent trend in airport industry, as mentioned in section 2.2.2. In meantime, real estate is an asset on the balance sheet, which increases the equity of the airport authority. It gives the airport authority more market value and therefore creates more financial capacity.

Concerning the functional effects, it can be stated that airport cities can allocate different economic activities to the developed available m<sup>2</sup> real estate at the airport site. An increase, diversification and clustering of economic activities at the airport improves the attractiveness of the airport as business location. Improved attractiveness of the airport as business location attracts new economic activities, which creates more critical mass for carriers to start new operating services or to expand existing operating services to and from the airport in question. An improvement of the air transportation product improves the overall airport product, which as location factor increases the overall attractiveness of the airport as business location. As a spin-off, this attracts new economic activities, because as stated in chapter 3, economic activities tend to cluster to profit from agglomeration advantages. In meantime, diversity in a city port makes the location more attractive. This also counts for airports as city ports, because a diverse regional production structure and strong economic region is an important location factor for airports. Consequently, due to the improved business climate and airport product, the relative competitive position of the airport is strengthening, compared to the competing (inter)national regional and hub airports. A quantitative and qualitative improvement of economic activities and urban functions at airports strengthens the urban function of the airport in the city region and increases the economic importance of the airport. In section 3.2 is mentioned that the nature and extent of connections, the Gross Added Value and concentration of population determine the node value, space productivity and place value of a city port, resulting in the total city port value. Based on this causal relation, it can be stated that real estate development at airports leads to a higher total value of the airport as city port in the city region. This consequently benefits the image of the airport, which again as location factor adds value to the attractiveness of the airport as business location.

Despite the positive economic and functional effects, the risk of commercialized real estate development at the airport site could be that increased economic activity at the airport site leads to congestion to and from the airport site, harming the landside accessibility of the airport. This might threaten the primary airport function as transportation node. Also the space needed for commercialized real estate development is threatening the space needed for the primary airport function as core business. On top of that, the spatial and economic pressure on the airport region might lead to resistance from residents, due to an affected living environment.



### 4.3.2 Impact for the government

Also the impact of real estate development at the airport site for local, regional and national government can be distinguished in functional effects and economic effects. The functional effects can be related to urban regional development of the city region. Because of the functional relation between the airport and the city region, urban economic developments at the airport site and in the city region are cross-fertilizing each other. Real estate development at airport cities leads to an increased allocation of economic activities and urban functions at the airport, improving the attractiveness of the airport as business location with a spin-off for urban and economic development of the airport itself. This spin-off also has impact on the airport region as well as the entire globalizing city region. The urban regional economic development of the city region, due to real estate development at airports, is being reflected in an overall improvement of the diversity and quality of the regional production structure and the socio-economic strength of the airport region and the wider city region. Section 2.2.3 mentioned that, due to diversification strategies of airports, a certain growth path for airports development can be identified. The function and size of an airport determines the development stage an airport is in. Each stage has different spatial and socio-economic impact, which means that the geographical spread of the externalities in the region depends on the development stage of the airport. Whereas the spatial and socio-economic impact of regional airports is limited to a periphery of 25 kilometre distance from the airport site, the spatial and socio-economic impact of hub airports are found between 50 and 100 kilometre distance from the airport (Graham; '08). The regional production structure and the socio-economic strength of the city region is a location factor on itself. Therefore the improvement of this location factor is increasing the attractiveness of the city region as business location for economic activities on the one hand, and increasing the competitiveness of the city region in global network of city regions on the other hand.

The economic effects for the local, regional and national government can be related to cash income for the government, because the government indirectly benefits from increased economic activities by income taxes of residents, regular value added tax on products and services generated at the airport site, increased airport taxes due to increased ATM's and passenger throughput, etcetera. The cumulated effects together are the Gross Value Added of the airport as mainport, which contribute to the Gross Domestic Product as mentioned in section 4.2.2. The real estate development also generates income for the government by leasing the land as landlord or by selling the land as property for real estate related project development. In meantime, the government benefits from real estate development at airport cities by the fact that increased economic activities creates jobs, reducing unemployment at the region, increasing the purchase power, generating spending, income and welfare effects in the region. This all leads to increased strength of the socio-economic structure of the city region.

Besides the positive externalities, the city region is also facing negative externalities like noise, air pollution, congestion, ecological damage and safety risks, due to increased economic activities, ATM's and traffic flows in the city region as a result of real estate development at the airport. This has negative impact on the quality of the living environment. The government is responsible for the overall quality of the living environment and economic development as well. Therefore the government on local, regional and national level have to make integrated policy on mainport development, urban regional and economic development, real estate development and the living environment. As stated, the quality of the living environment is a location factor on itself, in this case reducing the attractiveness of the region for companies and residents. In section 3.4.1 is explained that airports increasingly adapt urban functions, resembling traditional CBD's. Increased attractiveness of the business climate at the airport as CBD makes the other traditional CBD's in the city region compete with the airport site as business location. This could cause undesirable side effects in urban regional and spatial planning, like unbalanced urban development and unbalanced economic growth.



### 4.3.3 Impact for the society

The statement that the impact of real estate development at airport cities for the government depends on the development stage of the airport and therefore varies with the distance to the airport site, also counts for the impact for society. As earlier mentioned at the impact for the airport as well as for the government, by development of real estate, airport cities attract economic activities and urban functions, which increases the attractiveness of the airport as business location and results in an improved airport and air transport product. The society benefits from an increase and diversification of economic activities and urban functions at the airport, because it leads to more and more different facilities like shops, Food&Beverage, entertainment and hotels. As explained in section 2.2.3, the further an airport is on the growth path for airport development, the more diversified the urban functions at the airport are and the more this improves the quality of the living environment for the residents. Section 4.2.1 on job creation by airports explained the relation between direct, indirect and induced jobs at airports. The economic activities and urban functions at airports create direct, indirect and induced jobs and therefore generate income for residents in the airport region and city region. Besides jobs, the urban development of the airport due to real estate development leads to investments in necessary landside infrastructure like roads, railways and public transport systems to guarantee landside accessibility of the airport. New infrastructure improves the quality of the living environment. On top of that, society benefits from an improved air transportation product, because the residents in the catchment area of the airport as travellers face more destinations and more frequent connections.

The negative externalities which are mentioned for the local, regional and national government also count for society, because also for society commercialized real estate development at airport cities has a downside. Increased business activities, ATM's and traffic flows within the airport region lead to the same negative externalities for society as mentioned for government like noise, air pollution, congestion, ecological damage and safety risks. This has negative impact on the quality of the living environment for the society.

Now the spatial and socio-economic impact of airports and the impact of real estate development at airport cities for the airport, the government and society are indicated and the background of these effects are known, question is what the most optimal situation for commercialized real estate development at Schiphol is to maximize the contribution to the airport, the government and society and how and under which circumstances and preconditions this situation can be realized. This will be worked out in the next chapter (Chapter 5) on real estate as key asset for sustainable growth.



## Chapter 5 - Real estate as key asset for sustainable growth at Schiphol

To define the most optimal situation for commercialized real estate development at Schiphol to maximize the contribution of commercialized real estate development at Schiphol for the airport, the government and the society as discussed in the former chapter, first a SWOT of Schiphol on real estate development is worked out (5.1). The SWOT beholds all internal and external influences for real estate development at Schiphol. To focus on the internal position, the most optimal airport governance structure for real estate development will be described in section 5.2. Managing the external relations with the actors of the level playing field for real estate development at Schiphol is essential, for this directly involves the government and the society (5.3). Section 5.4 contains the growth in real estate for Schiphol in m<sup>2</sup> based on the forecast of Air Transport Movements and section 5.5 suggests the real estate related activities to be developed at Schiphol. Together, these aspects form the best conditions for optimized real estate development as key asset for sustainable growth at Schiphol.

### 5.1 Strengths, weaknesses, opportunities and threats for real estate at Schiphol

Before quantifying the real estate opportunities for Schiphol Group and to identify high potential real estate related activities, first the competitive advantages, strengths and business opportunities of Schiphol in relation to real estate development will be discussed. To create the right conditions to realize an optimal business climate at Schiphol, to develop and allocate the potential m<sup>2</sup> real estate to high potential real estate activities and to maintain the relative high occupancy rate on real estate, Schiphol Group has to create an optimal business location and has to develop real estate with location factors matching the needs and requirements of the demand side of the real estate market. Therefore Schiphol Group has to make use of its strength, develop its weaknesses, utilize its opportunities and seize its threats on real estate development. Table 5.1 on page 64 contains an overview of the identified strengths and weaknesses as well as the opportunities and threats, which will be discussed below.

#### *Strengths*

Schiphol Real Estate (SRE) as full subsidiary of Schiphol Group develops, manages and owns real estate at Schiphol and airport related locations in the airport area. It has specialized knowledge and specific experience on the development and exploitation of real estate. This lead to a very well developed, professional and commercially successful exploitation of the Airport City concept. Meanwhile, Schiphol Group has a for-profit governance structure, which is an excellent position for commercialized real estate development. Schiphol is an airport with a 'single-terminal' concept with very modern airport facilities and diversified business activities and logistic services. It offers good intermodal hinterland connections by road and rail (HSL) and has a relatively high number of airside connections. This makes Schiphol to a very attractive hub airport for carriers as well as for passengers. Meanwhile, Schiphol Group is good in lobbying with local, regional and national government as well as with interest group which is important for commitment for further airport development.



### *Weaknesses*

On the other hand, Schiphol has some weakness concerning real estate development. Schiphol Group is a non-privatized organization which is multi-level governmentally owned, operated and controlled. This results in contradictory and conflicting interest of the company, local, regional and national government concerning economic development, growth and environment. Schiphol has a relatively small home market and small hinterland due to the coastal area. There is an ongoing downward pressure on operational cost, which increasingly makes the airport business a very competitive business. Meanwhile, Schiphol Group has the image being an unreliable partner to residents and local competing commercial real estate and property developers. Schiphol Group has been an aggressive player on the real estate market, creating a monopolistic position on real estate development at the airport site. Resident have lost faith in the ongoing discussion on air and noise pollution in relation to stretching the environmental capacity, facilitating growth of ATM's and passenger throughput, putting increased pressure on the surrounding living environment.

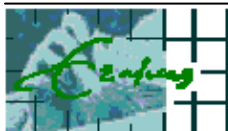
### *Opportunities*

The world economy, world population is annually growing and mobility, wealth and purchasing power are increasing, creating an increasing potential of passenger volume. With five runways, Schiphol has the technical capacity to facilitate this passenger growth, giving the airport a capacity of a throughput of 600,000 ATM's per year. Meanwhile, competing multi-hub systems (Frankfurt, Paris - Charles de Gaulle and London Heathrow) currently are facing capacity restrictions on short-term. Schiphol is one of the home bases of Air France – KLM being member of SkyTeam Alliance. It is one of the biggest alliances in the airport sector with a relatively big intercontinental transportation network and healthy financial position as key for mainport development. The airport and city region Schiphol is located at, has a strong, diversified local and regional economy and social structure which is an important location factor to attract business activities and creating an attractive business climate. The Dutch Airport Authority and the national government have developed a mutual mainport strategy, which is the basis for further airport development. Schiphol Group has planned to build a second terminal building ('North-west') in the year 2015, offering new business opportunities for commercialized real estate development.



### *Threats*

The airport region of Schiphol is a very congested area with relatively high visit costs, threatening the accessibility. Despite of the technical capacity of 600,000 ATM's per year, Schiphol is heading its environmental capacity of 480,000 ATM's per year which is based on noise restrictions and stimulated by increased perception of noise nuisance. From 1 November '10, Schiphol Group will start an experiment with a new noise reduction system by a change of runway usage, increasing its environmental capacity to 510,000 ATM's per year in '20 (Nu.nl; August '10). However, capacity restrictions are a threat for further growth of ATM's, which is a crucial element for real estate development (see section 3.4.3). Schiphol Group is facing increased competition from point-to-point carriers and hub-bypassing via regional and secondary airports and the privatization and diversification strategies of competing airports. Also the threat of Air France – KLM moving the main part of its intercontinental connections to Paris - CDG, the forecasted capacity increase of competing multi-hub systems on the medium term and the upcoming hubs in the Middle East (Dubai) are threatening growth at Schiphol. Schiphol Group is also facing increased competition of local and regional real estate developers with assets close to the airport and increased attractiveness of the business environment of competing global city regions and local-regional CBD's. Regarding the recent economic development, it has to be mentioned that the financial crisis and economic downturn has impact on the real estate market on the short term as well as on the mid-term. The crisis led to a relatively high vacancy rate of office space at different CBD's in the city region of Amsterdam (13-20%; Nu.nl; '10) and funding real estate development by attracting public, private and institutional funders as well as attracting Foreign Direct Investments (FDI) is more difficult, directly influencing and threatening the opportunities for real estate development at the airport.



<i>Strengths</i>	<i>Weaknesses</i>
<ul style="list-style-type: none"> <li>- Schiphol Real Estate (SRE) developing real estate.</li> <li>- Well developed and commercially exploited Airport City concept</li> <li>- Knowledge and experience on real estate development and Airport City concept.</li> <li>- For-profit governance structure.</li> <li>- Single-terminal concept.</li> <li>- Modern airport facilities and diversified business activities and logistic services.</li> <li>- Intermodal hinterland connections by road and rail (HSL).</li> <li>- Relatively high number of airside connections.</li> <li>- Lobby with local, regional and national government.</li> </ul>	<ul style="list-style-type: none"> <li>- Non-privatized organization.</li> <li>- Multi-level governments to own, operate and control the airport.</li> <li>- Relatively small home market and hinterland due to coastal area and competition from other European hubs.</li> <li>- Ongoing downward pressure on operational cost.</li> <li>- Image to neighbours and local competing commercial real estate and property developers as unreliable partner.</li> </ul>
<i>Opportunities</i>	<i>Threats</i>
<ul style="list-style-type: none"> <li>- Increasing passenger volume.</li> <li>- Growth airport capacity to 600,000 ATM's / year.</li> <li>- Capacity restrictions competing multi-hub systems on short-term.</li> <li>- Home base of SkyTeam Alliance with relatively big intercontinental transportation network and healthy financial position as key for mainport development.</li> <li>- Strong, diversified local and regional economy and social structure (Amsterdam and Randstad).</li> <li>- Mutual mainport strategy Dutch Airport Authority and national government.</li> <li>- Development of second terminal building ('North-west') year 2015.</li> </ul>	<ul style="list-style-type: none"> <li>- Congested area.</li> <li>- Relatively high visit costs.</li> <li>- Capacity restriction of 480,000 ATM's / year based on environment capacity (noise restrictions).</li> <li>- Increased perception of noise nuisance.</li> <li>- Increasing competition (hub-bypassing via regional and secondary airports, privatisation competing airports, intercontinental connections via CDG, increasing capacity competing multi-hub systems on long-term and upcoming hubs Middle East).</li> <li>- Competition from local and regional real estate developers with assets close to the airport.</li> <li>- Increased attractiveness of business environment competing global city regions and local- regional CBD's.</li> <li>- Loss of pax to other (inter)national regional airports due to ticket tax.</li> <li>- Short and mid-term effects of financial crisis and economic downturn on real estate market and fund raising.</li> </ul>

Table 5.1: SWOT Schiphol on real estate development (Based on: *Lange termijn visie op de ontwikkeling van de mainport Schiphol; Schiphol Group; '07*)





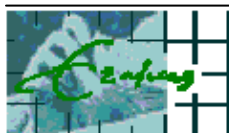
## 5.2 Airport governance structure, performance and real estate development at Schiphol

The strengths and weaknesses as identified in the SWOT on real estate development mainly involve internal aspects of the airport. As strengths, the facts are mentioned that Schiphol Group has a for-profit governance structure, that it owns Schiphol Real Estate (SRE) which developed the Airport City concept at Schiphol, which owns knowledge and has experience on real estate development. However, as weaknesses are identified that Schiphol Group is a non-privatized organization with multi-level governments owning, operating and controlling the airport. As stated in chapter 2, airport privatization is the main incentive for airports to diversify activities and commercialize business, which increases airport performance. Airport performance can be measured in terms of productive efficiency (number of passengers, volume of cargo and the number of Air Transport Movements) and in operating profitability in terms of generated income and profit margin from aeronautical and non-aeronautical activities.

Efficient and effective airport management is crucial to make use of the potential in real estate development and to optimize the performance of the real estate related activities. Based on a survey on the effects of ownership forms on productive efficiency and operating profitability, Oum et al ('06) state that airports with a private majority ownership are more efficient than airports owned with a public majority or multi-level government. In meantime, airports with a private majority ownership have significantly higher operating profit margins than other airports; airports with government majority ownership or multi-level government ownership have the lowest operating profit margin. Airports owned and operated by multiple governments rely more on aeronautical charges than airports with other ownership forms, because ownership by multiple governments is one of the most inefficient ownership forms Oum et al ('06).

Airports with private majority ownership generate a much higher average part of their total revenue from non-aeronautical activities (57%) than airports under other ownership forms (37%), while they charge significant lower fares for aeronautical services, due to complementarity between aeronautical and non-aeronautical activities and cross-subsidizing Oum et al ('06). So higher operating profitability is not a result of monopolistic pricing. In sense of performance, private-public-partnerships with minority private sector participation and multi-level government ownership should be avoided. Airports operated by port authorities should consider to transfer ownership and management to independent airport authorities. Due to competition for air traffic between airports which serve the same hinterland, commercially run airports are more willing to develop non-aeronautical activities that lie outside the traditional activities, but which are complementary to the airside.

Besides the fact that privatized airports perform better on generation of non-aeronautical revenues, Pargfrieder ('08) concludes that privatized airports also perform better on real estate development and adds that this has a positive economic effect on the airport tenants, the commercial area at the airport, its firms and the entire airport region, due to a positive spin-off. Pargfrieder adds that 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-aeronautical activities and real estate development.



In New Zealand the privatization of airports contributed very much to the commercial performance of the airports. The average of commercial revenue of the 7 main airports in New Zealand increased from 43.6% ('99) to 50.4% ('04) which is an increase of 6.9% in 5 years, while the growth in passengers over the same period was 32.5% (Lyon and Francis; '06). In comparison: over the period '99-'04, at Schiphol commercial revenue as share of total revenue decreased from 50% to 40%, while passenger throughput over the same periode increased with 21% (Annual Results Schiphol Group '99-'04). Forsyth ('04) and Morisson ('09) both found that airport privatization in Australia supports the positive relation between privatization of airports and their commercial performance. In Australia privatization has also led to expansion of non-aeronautical activities. Australian airports have improved income per employee with 33% (Carney & Mew; '03). Also Eichholtz and Ouwerkerk ('06) claim that privatized airports are more profitable once they are privatized. They state that privatized airports are more able to generate non-aeronautical revenues than non-privatized airports, which leads to a structurally higher profitability. Based on a benchmark of European benchmarks, they proved that the long term growth rate of the value of privatized airports at the stock exchange is 2 to 4 times higher than the growth rate of that national stock exchange itself from the moment they have been privatised (see figure 5.8).

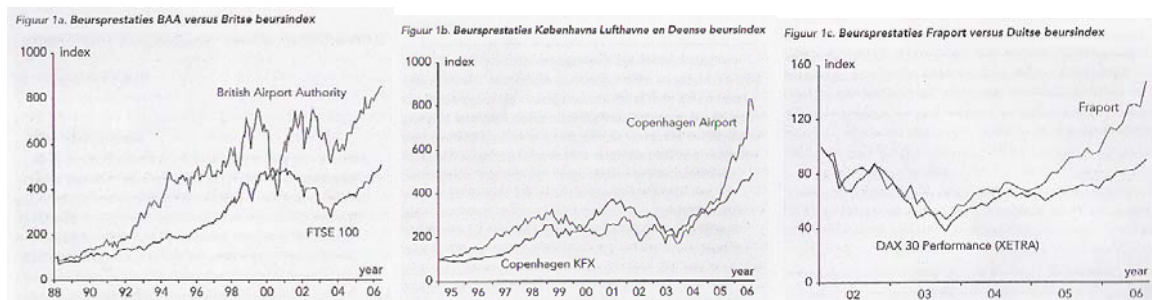


Figure 5.8: Performance stock exchanges and airport performances (Source: ESB '06)

Looking at Schiphol, we see that Schiphol Group as airport operator is owned by the State of the Netherlands (70%), the municipality of Amsterdam (20%), Aéroports de Paris (8%) and the Municipality of Rotterdam (2%) (Source: Annual report Schiphol Group '08). This means that Schiphol is mainly state owned (92%) with a multi-level government authority owning the airport (Oum et al; '06). Schiphol Group itself has a for-profit governance structure and acts like a private actor with commercial interest. In this construction, public and private interests seem to mingle. This makes the development of Schiphol Group in terms of decision making and maximizing economic return on investment more difficult.



The statement that airports with ownership by multiple governments rely more on aeronautical charges than other ownership forms, is being confirmed by the fact that the relative importance of commercial revenue for Schiphol Group is much lower than would be expected compared to the average based on benchmarks (see section 3.4.5). Therefore the most efficient governance structure for Schiphol Group would be to be privatized. Being privatized, Schiphol Group would face the following advantages concerning real estate development:

- Privatized airports have easier access to private sector financing and foreign direct investments, due to higher profitability. Governments are financially and fiscally constrained, especially since the huge government investments during and after the recent credit crisis. Governments can not fund the huge investments in airport infrastructure and real estate expansion which are needed to facilitate the forecasted growth in the aviation industry. Privatized airports can have international orientation and access to capital that enables them to manage large-scale capital intensive projects and assets like real estate development (Carney and Mew; '03);
- Under private ownership, an airport is run to maximize profit and shareholder value (Oum et al '06), raises performance and efficient utilization of existing assets like real estate and lowers operating costs (Carney & Mew; '03), while under government ownership an airport is run by optimization of a trade off between of social welfare and personal agenda's (Oum et al '06);
- Privatized airports have a more efficient governance structure which allows them to operate more effective and more decisive. Efficient management is a requirement to compete with other (inter)national airports. Airports with mixed ownership forms perform worse because of conflicting interests between public and private shareholders. Objectives are vaguely defined and tend to change as the political situation and relative strengths of interest groups change (Oum et al '06). It would also terminate the conflicting role of the Dutch state as legislature, controller and owner of Schiphol;
- Privatization stimulates the adoption of new technologies, capital investments and acts as a catalyst for innovation (Cowan; '00). A dynamic airport management is a catalyst for regional urban economic growth by generating positive externalities for related industries, which will develop the economic potential of the region (Carney and Mew; '03). This will again increase the need for real estate development, due to increased business activities.
- Besides the fact that airport privatization leads to an improvement of the quantitative performance by increased non-aeronautical revenue and higher profit margins, it also results in a qualitative improvement of operational processes. Privatized airports provide better services, because they are more customer orientated (Carney and Mew; '03).

In '07, Dutch government decided not to privatize Schiphol Group because the Municipality of Amsterdam is against privatization and used its veto right. Main reasons for this were to loose control over Schiphol's operations to an investor which interests could be opposite to the ones of the airport, the airport region, the airport users, the public interests and the nation as a whole due to the economic and environmental impact of Schiphol as mainport. However: in relation to real estate development, which is the scope of this survey, it can be concluded that the strategic advantages overcome these disadvantages.



### 5.3 Managing the level playing field for real estate development at Schiphol

Main opportunities and threats as identified in the SWOT are external factors and therefore very hard to influence by Schiphol Group. However, due to the fact that real estate development at airport cities has spatial and socio-economic impacts as discussed in chapter 4, also managing the external relations of the level playing field as described in section 3.4.4 is essential. Do to the fact that detailed elaboration of the management of all actors involved in the level playing field is too complex for the scope of this section and the survey, it will stay with the quintessence concerning airport area growth coalitions, the environment, marketing and rent policy in relation to real estate development at Schiphol.

#### *Airport area growth coalitions*

As mentioned in section 3.4.4, the level playing field for real estate development consists of a lot of public and private actors. Within the airport region of Schiphol, a large number of actors are involved in planning, land and real estate ownership, development and airport usage. Majority of these actors are cooperating and therefore represented in platforms and coalitions. The actor coalitions can be subdivided at the national level for the growth of aviation and airport expansion ('*airport growth coalition*') on the one hand, and the spatial-economic development on the regional level on the other hand ('*airport area coalition*') (Van Wijk; '07).

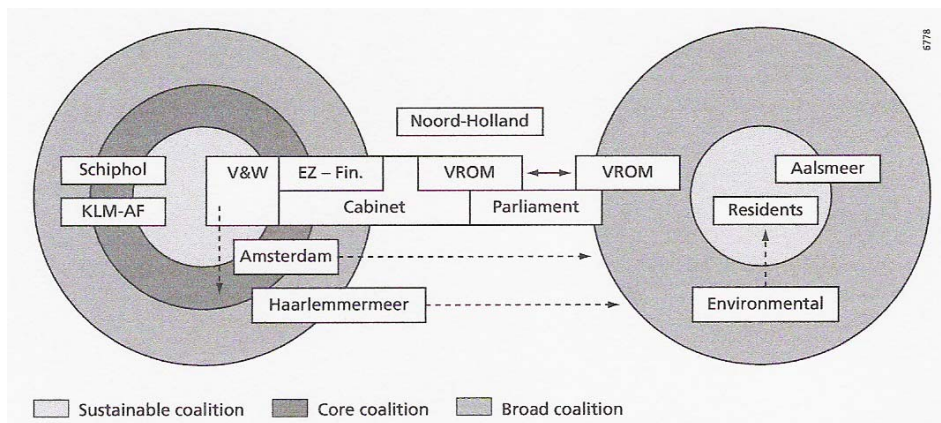


Figure 5.9: Schiphol growth coalition (left) and environment coalition (right) (Source: Van Wijk; '07)

Besides Schiphol and Air France-KLM, actors of the national, regional and local government are represented in the airport growth coalition, for the Ministries of Transport and Water Management, VROM and Economic Affairs as well as the province of Noord-Holland and the Municipalities of Amsterdam and Haarlemmermeer have been active in the Schiphol debate on a long-term basis (see figure 5.9). The Ministry of VROM introduced the mainport concept. Concerning the growth of Schiphol, political consensus was reached under the condition that economic as well as environmental target should be reached, known as the 'double target' ('*dubbeldoelstelling*').



In the airport area coalition a wider range of regional cooperation platforms exist on a legal basis, legislative powers or voluntary basis. The actors are institutionally embedded in the SADC, large regional coordination organisations like the Bestuurlijke Regiegroep Schiphol (BRS) and the Bestuursforum Schiphol (BFS), as well as in the Commissie Regionaal Overleg luchthaven Schiphol (CROS), the latter being a citizens' consultation platform. They aim to improve economic and spatial development at the airport and a wider region by nominating industrial and office locations for development, and focus on environmental and safety issues of aviation in the airport area (see figure 5.10). The Netherlands is a country where political consensus amongst all actors involved in the level playing field is essential for spatial and economic development (*'poldermodel'*). Nowadays, the growth coalition is facing lack of confidence at the local level and recent conflicts of Schiphol Group with actors in the environmental coalition show that Schiphol's formal relations with the region have weakened (Van Wijk; '07).

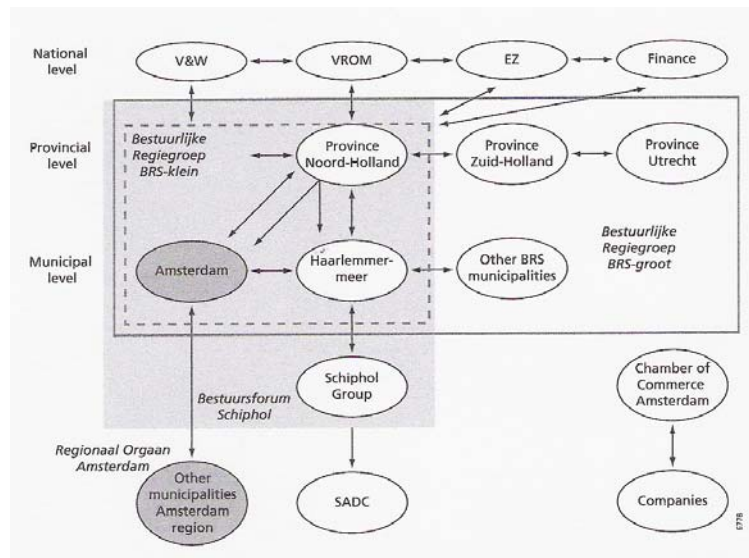


Figure 5.10: Coordination platforms Schiphol (Source: Van Wijk; '07)

Concerning real estate development, Schiphol Group continuously has to maintain sustainable relations with the coalitions mentioned, striving for positive economic trade-offs for actors in the level playing field, to keep the government and society positively involved in the mainport strategy and real estate development at the airport site. Schiphol Group has to manage the airport growth coalitions and the airport area coalition more pro-actively. Maintaining strong links with residents and ensuring a continual public dialogue with all actors involved should be considered as an important role. Schiphol Group has to build on commitment amongst the coalitions for *Airport-image* related activities at the airport, instead of focussing just on *Core-business* and *Airport related* activities, because the airport-related tests for the allocation of economic activities at Schiphol leads to a monocentric urbanisation of the airport site. Therefore these platforms should as optimal as possible and actively be used by Schiphol Group for lobbies to create commitment for further development of the Airport City concept, to continue development of new urban functions and to develop additional commercialized real estate at the airport site.



### *Environment*

Besides spatial and socio-economic impact as discussed in chapter 4, airports also have environmental impact like noise, air pollution, ecological damage and safety risks (Graham; '08). This negatively affects the image of the airport, the quality of life of residents in the airport region and the attractiveness of the airport as business location, for as stated in section 3.3.2 on location factors at airports, quality of the living environment does affect location behaviour. Airport operators themselves however produce relatively little of the direct environmental impact generated by the entire airport (Van Wijk; '07). As mentioned in chapter 4, it is very hard to indicate which socio-economic impacts of airports can be assigned to real estate development. The same is with negative externalities in relation to the environment. The development of real estate at airports does have environmental impact and does generate environmental costs. Not only by construction of real estate, but also in the exploitation phase, because business activities for example generate traffic flows to and from the business location. This will increase traffic on the highly congested roads, even more increasing the environmental pressure on the entire airport region.

In 2001 the International Civil Aviation Organization (ICAO) agreed a concept of a balanced approach to management of environmental impact, comprised of elements like reduction of noise at the source and land-use planning and management measures. The appropriate control of land-use near the airport is vital when the reduction of the environmental impact is being considered. To overcome for example the noise pollution, noise zoning is often applied to airports, which involves the definition of a certain area around an airport where construction of noise-sensitive buildings like houses is not allowed (Graham; '08). Many airport operators have made environmental policies as core component of their business strategy and have developed their environmental control processes into comprehensive environment management systems (Graham; '08). Airports address some of the social issues raised by airport operations within the framework of a broader environmental or sustainability strategy. Environmental pressure from governments, residents, users and other bodies made it essential for airports to address environmental issues very seriously. As a result, major airports have well-established environmental strategies and sophisticated policies, aiming for reduction of environmental impact (Van Wijk; '07).

In relation to real estate development, this business activity should integrally be incorporated. While planning an expansion of business activities like real estate development, environmental impact assessments are part of the planning approval process, examining the potential impacts of the proposed development during the construction and operational stages. Due to increasing awareness and social pressure for environmental friendly entrepreneurship, also Schiphol Group is increasingly focussing on sustainable entrepreneurship. As key to a successful environmental strategy is a partnership with all interest groups of the airport site. Another key element is the identification of suitable environmental indicators which can be used to monitor performance and set targets (Graham; '08). Considering real estate development, this could be parameters of climate or Co2 neutral, usage of sustainable materials and focus on energy saving consumption construction and exploitation.



### *Marketing and rent policy*

Marketing as a concept did not exist at airports until the late 80'ies and early 90'ies. Airports considered it was solely the role of airlines to identify business opportunities for new or expanded services and activities; it was up to the airport to provide an efficient and safe airport with good facilities. Even promoting the air services was not considered to be a responsibility of the airport. It was rare to find airport marketing activities and resources being allocated to airport marketing were very small, if any. Promotion was basic, limited to the production of timetables and reactive response to items in the media (Graham; '08). This passive approach has gone since the year 90'ies. As mentioned in chapter 2, the modern-day aviation industry in many ways has transformed from a regulated and public sector controlled activity into a liberalized and commercially orientated business. This gave airports the incentive to develop innovative marketing strategies and tactics to meet the varying needs of all airport users. This requires a professional marketing-orientated approach. Marketing nowadays is considered as core activity which is of vital importance for airport success and marketing is an integral part of the airport business (Graham; '08). Defining marketing in the broadest sense of meeting and satisfying all customer needs, also marketing on real estate development has to be considered. Therefore Schiphol Group is forced to do marketing and clear branding of Schiphol for the exploitation of the Airport City concept.

Stakeholders identified regarding real estate development at Schiphol are all airport users, businesses, (potential) tenants, concessionaires, travellers, visitors, meeters&greeters, employees but also (potential) investors. Each group needs a specific approach so that they can be targeted appropriately. In January '10, Schiphol Group changed its logo, more emphasizing '*Schiphol*' and giving less attention to '*Amsterdam Airport*'. On the one hand, this can be seen as a way of branding Schiphol as Airport City, functioning independently of the city of Amsterdam. Though, on the other, as described in chapter 3, city regions are increasingly globalizing. Therefore Schiphol Group should consider an alternative approach concerning the marketing of real estate development at Schiphol. This approach could be not to do just marketing of the airport site, but to cooperate with the city of Amsterdam, promoting the entire airport region and city region as node in a global network with CBD Schiphol as an international A-location with an attractive business climate in a strong socio-economic city region.

Section 4.2.3 demonstrated that the average rents at Schiphol for offices (€400/m<sup>2</sup>) and (semi-) industrial real estate (€80/m<sup>2</sup>) are highest in the Amsterdam city region as well as in the entire Randstad area. Despite of the fact that Schiphol Group has continuously been increasing its real estate capacity, the occupancy rate at Schiphol has been steady at a relatively high percentage (93%; '98-'09). This means that Schiphol Group has made use of its unique location factors, creating an attractive business climate and binding real estate users to the airport site. Schiphol Group has created an optimal balance in real estate capacity and rent policy. Schiphol Group should therefore maintain this balance by efficient and effective marketing strategies, and maintaining its current rent policy matching the price level of competing international premium business locations.



#### 5.4 Growth in real estate development for Schiphol

As stated in section 3.4.5, Schiphol Group is lagging behind on real estate related revenue generation, compared to airports with comparable annual passenger throughput. To improve real estate development at Schiphol, in section 5.2 is stated that privatizing Schiphol Group is the most efficient governance structure, while in section 5.3 is explained that managing external relations of the level playing field by continuous, intensive and pro-active management of the airport area growth coalitions is a precondition to create commitment from government and society for real estate development at the airport. To match the most optimal performance for real estate related revenue generation as realized in the market, Schiphol Group has to increase its relative performance from 29% ('06) to a minimum of 30% to 36% of the total revenue, assumed that this increase will not be realized by a relative decline of the non-real estate related revenue or the total revenue, as happened in the period '07-'09 (Source: Annual Reports Schiphol Group '94-'09). The relative increase seems to be marginal, though considering the long term growth rate of 7% for the total revenue generated by Schiphol, this means that the growth rate for real estate related revenue has to be higher than 7%. Due to the relative long and intensive process of development, planning, financing and constructing, real estate development is a medium term activity (5 till 10 years). Therefore Schiphol Group will need at least 5 years to catch up and increase its relative performance on real estate related revenue. Under the assumption that Schiphol will continue to maintain its average annual growth rate for the total revenue of 7%, Schiphol Group has to realize an annual growth rate for real estate related output between 8.5% and 11.5% per year, to increase its relative performance on real estate related revenue in 5 years from 29% to a range of between 30% and 36%.

As mentioned in section 3.4.3, with factor 1:4 the number of ATM's at Schiphol is positively related to the real estate development in m2. In the year 80'ies and 90'ies, Schiphol Group has realized a stable increase of number of passengers and ATM's. However, last decade Schiphol is facing increased uncertainty on the demand for air transportation, for the period '00-'09 has shown a strong trend break in the ATM growth rate at Schiphol. This resulted in a stagnation of growth in passengers and ATM's over the period '00 – '09, while the long term average growth in passengers and ATM's in the decennia before was 5% to 6%. Figure 5.2 clearly shows the impact of 9/11 ('02), Sars ('03), the implementation of the Dutch ticket tax ('08) and the economic downturns ('05 and '09) on the ATM growth rate at Schiphol. This leads to uncertainty in forecasting the demand for real estate at Schiphol.

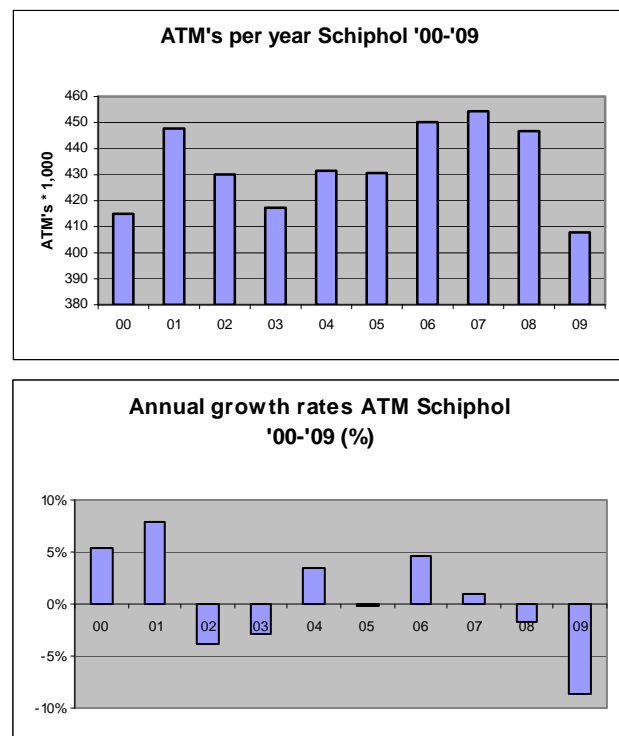


Figure 5.2: ATM development at Schiphol '00 – '09  
(Source: Annual reports Schiphol Group)





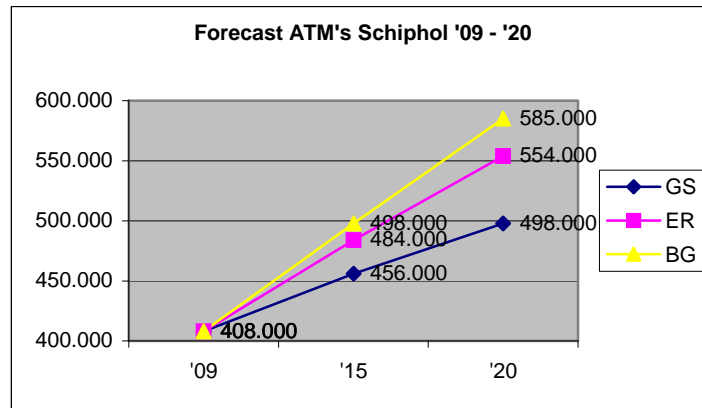


Figure 5.3: Forecast Air Transport Movements at Schiphol '09-'20

However, for forecasting the overall potential for real estate development at Schiphol, it is assumed that Schiphol will be able to maintain and continue this perfect positive correlation of 1:4 between ATM's and m<sup>2</sup> real estate development in the future and that this correlation is representative for real estate development at airports in general. Taking into account that the average long term occupancy rate for real estate at Schiphol is 93% (Annual reports Schiphol Group '98-'09), it is also assumed that there is no overcapacity in real estate at Schiphol. Based on the three growth scenario's (*Global Shift*, *European Renaissance* and *Balanced Growth*) as introduced in section 4.2, the future number of ATM's for Schiphol can be forecasted. Based on the realized number of 408,000 ATM's in '09, the number of ATM's will range from 456,000 (Global Shift) to 498,000 (Balanced Growth) in '15, respectively will be between 498,000 (Global Shift) and 585,000 (Balanced Growth) in '20 (see figure 5.3). The assumption is made that, due to technological developments of more quiet and cleaner aircraft, this demand will match Schiphol's current technical capacity of 600,000 ATM's per year, as well as its future environmental capacity (currently 480,000 ATM's per year and expected to increase to 510,000 ATM's per year in '20). Consequently, it can be forecasted that the overall potential for real estate development at Schiphol in m<sup>2</sup> will range from 1,824,000 m<sup>2</sup> (Global Shift) to 1,992,000 m<sup>2</sup> (Balanced Growth) in '15, respectively will be between 1,992,000 m<sup>2</sup> (Global Shift) and 2,340,000 m<sup>2</sup> (Balanced Growth) in '20 (see figure 5.4). In section 5.5 we will see to which activities these m<sup>2</sup> can best be allocated. First, the locations for real estate development for Schiphol Group will be discussed.

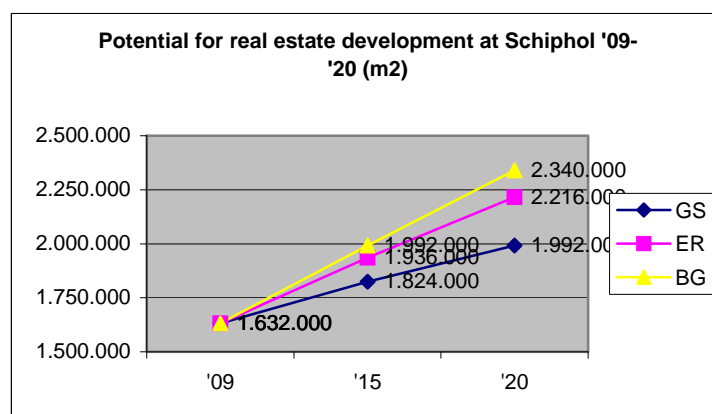


Figure 5.4: Potential for real estate development at Schiphol '09-'20



### Location Schiphol

As mentioned, an important strength of Schiphol is the single-terminal concept (see section 5.1), having major advantages for carriers and for passengers. A single terminal facilitates the hub concept by optimized transfers and makes the airport an efficient and practical hub airport for domestic and transfer passengers. The current terminal building located at Schiphol Center has a capacity of 65 mio passengers per year. With a passenger throughput of 47 mio per year, Schiphol is using 72% of this terminal capacity. For maintaining this efficient hub function, Schiphol has planned to keep the main carriers (e.g. Air France-KLM of the SkyTeam alliance) concentrated at the central terminal and in meantime keep other carriers at this terminal as long as the maximum terminal capacity allows. In the long-term planning Schiphol Group forecasted that the current central terminal would realize its maximum capacity in '15 and it was foreseen that a second new terminal building was needed, which is planned at the North-west of the airport site (see figure 5.5) close to highway intersection Badhoevedorp<sup>8</sup>. Due to the economic downturn and the stand still in the growth of the passenger throughput in the period '00-'09 as discussed before, this is not likely to happen in the year '15. Based on the forecast as done in section 4.2.1, passenger throughput at Schiphol in '15 will be between 48.4 (Global Shift) and 52.8 (Balanced Growth) mio passengers per year. In the most positive scenario, passenger throughput at Schiphol in '20 will be maximum 62.0 mio (Balanced Growth) per year. Therefore a second new terminal building is not needed before '20. Concerning non-terminal related real estate, Schiphol Group has business locations as Schiphol East, Schiphol North and Schiphol Rijk.



Figure 5.5: New terminal building Schiphol North-west (Source: Schiphols Luchtvaartagenda voor de komende vier jaar; '06)

### Participations

As mentioned, due to the relative long and intensive process of development, planning, financing and constructing, especially in the Netherlands due to a democratic and bureaucratic decision making, real estate development is a strategic activity for the medium term. This means that real estate at the current location of Schiphol can not be developed instantly. A trend which is recently seen, is the participation of airport companies in other airports. Also Schiphol Group has started participations in other national as well as international airports, like Rotterdam, airport, Eindhoven airport, Brisbane airport and New York JFK airport. Most recent development is the full management and exploitation of terminal 4 at New York JFK by Schiphol Group. Schiphol Group has to intensify and expand international participations by searching for international airports that are still in the early beginning of airport development (see section 2.2.3), which have very high potential to increase throughput and ATM's based on their hinterland and catchment area, and which therefore have high potential for real estate development. Schiphol should exploit existing real estate at these airports and should seriously consider to start developing and exploiting real estate at these airports too.

<sup>8</sup> Schiphol is also planning to develop new business districts at the south side of the airport site. However, this is still in the development phase, therefore no concrete data on this project are available.



### 5.5 Real estate related activities at Schiphol

Now the overall potential for real estate development in m<sup>2</sup> for Schiphol and the locations are known, question is to which activities the potential real estate capacity can best be allocated. Although qualitative data on added value per m<sup>2</sup> real estate at airports are not available, Güller and Güller ('02) have come to a relative performance of added value per m<sup>2</sup> real estate at airports. They distinguish four segments of activities: *Core business*, *Airport-related*, *Airport-oriented* and *Airport-image*. These segments are more or less similar to the segments as distinguished by Koomen ('99) (see section 3.4.3), for both segmentations are based on the functional relationship between the activity and the airport in question. The Core business of the airport, Airport-related activities, Airport-oriented activities as well as activities which contribute to the Airport-image can generate high, average as well as low added value per m<sup>2</sup>. Some of these activities add more value per m<sup>2</sup> than others. The figure below shows which activities generate high, medium and low added value. The activities in the segments *Core business* and *Airport-related* are very well developed at Schiphol and the activities in the segment *Airport-oriented* are partly developed. This can be explained by the development stage Schiphol is in (see section 2.2.3), for Schiphol is a primary hub and as Airport city the urban functions are relatively well developed.

The increase of m<sup>2</sup> real estate at Schiphol as calculated in section 5.4 can be realized by developing real estate at current locations (e.g. Schiphol Center, Schiphol East, Schiphol North and Schiphol Rijk), as well as by constructing the new terminal North-west around the year '20 and the new business area at the south of Schiphol. The potential for m<sup>2</sup> real estate at Schiphol should be allocated to the more basic and traditional airport functions of the segments Core business, Airport-related and Airport-oriented, to strengthen its position as multi-hub. This means that Schiphol Group should increase real estate activities like freight handling, logistic service centers, transportation, (European) distribution centers, shops, F&B, restaurants and hotels. To a very minor extent also offices match this profile, though currently the average vacancy rate of offices in the Randstad area is relatively high between 10 and 15% ([www.nu.nl](http://www.nu.nl); July '10). At Schiphol, the average vacancy rate on real estate has also declined from 91% ('08) to 89% ('09). Due to the recent economic recession and resulting credit crisis, offices as real estate for the medium term therefore is not considered as being a growth market.

Added value per m <sup>2</sup>	Core business	Airport-related	Airport-oriented	Airport-image
High	Terminal-services: duty-free, IT, etc.	International Logistics Company Headquarters	Intl. business activities HQ's/WTC	Shopping ICT-business Other offices
	Ground handling	Post services Test & training Catering	Medical care Hotel Conference Restaurants	Entertainment Science park R&D Education
Average	Airplane maintenance	Flower-fair European distribution Parts centre	Value-added logistics Intl. exhibition centre	Pharmaceutical High-Tech Electronic Food industries
Low	Freight centres		Expo centre region Intl. large-scale distribution	Regional transport and distribution Recreation & golf

Figure 5.6: Added value per m<sup>2</sup> real estate at airports (Source: Van Wijk; '07)



When looking at the activities from the *Airport-image* segment, it can be stated that some of the activities mentioned are not yet developed at Schiphol at all, or are in a relatively premature phase. This means that Schiphol has quite some potential for the development of urban functions at the airport site. To enter a new phase in the Airport City concept and to continue real estate development at Schiphol, the suggested strategy for Schiphol Group is to continue in real estate development by focusing on some specific activities of the *Airport-image* segment which previously, traditionally were exclusively urban functions, which generate high added value per m<sup>2</sup> and therefore could generate relatively high rents per m<sup>2</sup> for Schiphol Group. Therefore, besides increasing real estate on basic and traditional airport functions, the suggestion for Schiphol Group is to start developing real estate in new, innovative activities which can be grouped in the three different clusters: *Recreation*, *Knowledge* and *Health & wealth*.

### *Recreation*

Schiphol should continue increasing revenue generated by activities like shops, F&B, restaurants and hotels, especially when the new terminal North-west will be realized around the year '20. But probably even more effective, it should develop new high value recreation activities like entertainment (a cinema, museum, casino, gambling house, etc), large scale concerts and indoor or (semi-)open air dance and music festivals. As mentioned in section 3.2.2, as city ports, airports increasingly become places to stay. Event management is a booming business. The youth is spending an increasing amount of money on events and therefore could be a lucrative source of income. Schiphol offers the physical space, infrastructure and public transport to facilitate large visitor flows to and from the location. Residents are located on a sufficient distance from the airport site due to noise and safety precautions, therefore events do not hinder them. Schiphol could offer an innovatory location: old unused hangars for example are a perfect scenery for dance events and therefore are excellent locations. Milan Malpensa Airport as pioneer has proved to be successful in doing this too. Schiphol Group should seriously consider starting to exploit a cinema at Schiphol Centre, because in competing CBD's like Amsterdam Zuidooost this facility has turned out to be a successful, pulling, binding and high value adding urban function. Key of the *Recreation* cluster is to make many people stay as long as possible at the airport site and make them spend as much as possible during their visit.

### *Knowledge*

As we saw in section 3.3.2, availability and quality of labour, knowledge and education, as part of a strong regional-economic production structure and living environment, are essential location factors for creating an optimal spatial economic profile at the airport region to turn the airport into an attractive business location. Meanwhile, in section 3.1.2 is concluded that the quality of labour, the education level and availability of R&D are relatively weak developed in the Randstad area, compared to other globalizing city regions. Therefore the suggestion for the second high value adding cluster is the development of the *Knowledge* cluster. Schiphol is not (yet) accommodating education centers and the nearest high schools and universities are located on a relatively far distance from the airport at other CBD's in Amsterdam. The focus should be to make education and other knowledge intensive activities locate at the airport site and turn the location from an airport into a '*brainport*'. Schiphol should facilitate the increased importance of knowledge as production factor in present world economy. This can be realized by accommodating colleges, academies and universities, as well as centers for R&D and technological development and centers to host congresses, exhibitions and conferences. As '*science park*', the *Knowledge* cluster will be a flywheel for the exchange and sharing of knowledge, generating a positive spin-off for the overall attractiveness of the airport as business location, attracting other business activities. Additional advantage is the fact that knowledge and especially education are relatively less sensitive for the economic cycles and economic downturns, making this cluster a stable source of income on real estate.



### Health & wealth

As found in section 2.1.1, socio-economic and demographic developments result in changing behaviour and consumer patterns. Wealth, a high standard of living, purchasing power and mobility of young and elderly increase. Travellers become ‘*multi-individualists*’ with different needs at different times and increasingly appreciating quality time, comfort and luxury. Due to increased awareness of the importance of having a healthy lifestyle, sport and wellness face increasing attention in daily life. Schiphol Group can make use of these trends by developing a *Health & wealth* cluster. Offering a wellness center with a sauna, fitness, gym, beauty and massages facilities has big potential for the exploitation of real estate. A wellness center should be offered in the terminal building on such a way that visitors at the landside as well as at the airside both can make use of the facilities, as long as the airside and landside are physically separated, due to the fact that the airside is customs area and in favor of safety precautions the processes of landside and airside are not supposed to mingle. Visiting a wellness center is a sublime and comfortable way of time passing for domestic passengers being checked in, safety checked and waiting for boarding, or for transfer passengers spending hours of waiting for their connecting flight. A wellness center facilitates passengers recovering from tiredness and stress which travelers experience (see figure 5.7) and it makes intercontinental passenger overcoming their jetlag. In section 2.2.2 is mentioned that the share of transfer passengers is increasing, that these passengers traditionally make less use of real estate related activities and currently spend less money than domestic passengers, while on average they spend more free time at the airport. This makes transfer passengers a valuable market segment for undiscovered sources of income by real estate exploitation.

Regarding health, Schiphol Group should seriously consider diversifying the cluster of *Health & wealth* by locating pharmaceutical industry, medical care, hospital facilities and/or a private clinic. Frankfurt has recently located and opened a flourishing hospital at the airport. Due to increased aging, health care is rapidly gaining importance for the economy. Healthcare is also qualified as a high value activity by Güller and Güller, therefore is potentially generating high rent income, is knowledge intensive and therefore complementary to the knowledge cluster.

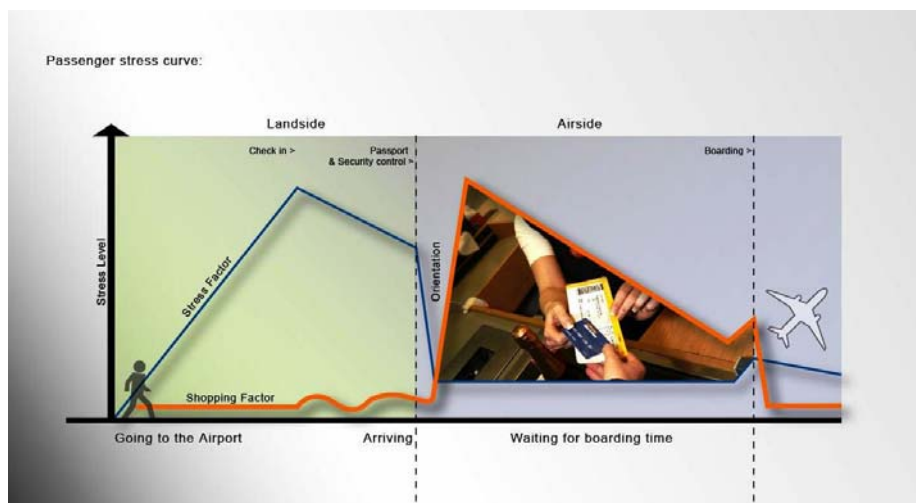


Figure 5.7: Passenger stress curve (Source: Duijvesteijn; 07)



A further breakdown of m2 real estate and investments per activity requires specific knowledge on real estate development, is a very specific step in the real estate development process and is a study on itself. Therefore a detailed allocation of m2 per specific activity is not in the scope of this survey and this section will stay with an identification of clusters for Schiphol Group to focus on, as done. As mentioned, the clusters and activities abbreviated might deviate from the primary function and core business of an airport as well as from more traditional real estate development. However, to remain competitive with other airport cities (e.g. Frankfurt and Paris - Charles de Gaulle), Schiphol Group needs to be creative and has to think *'out of the box'* concerning real estate development. This leads to the development of unconventional real estate activities which can be of high value for Schiphol Group, meanwhile matching the need for real estate in regional urban development and suiting the further development of urban functions of the airport city which Schiphol is. By developing activities in the clusters of *Recreation, Knowledge* and *Health & wealth*, Schiphol Group can develop the full potential for urban functions at the airport site, attract high value activities and generate high revenue from real estate development.



## Chapter 6 - Conclusions and recommendations

This chapter contains the conclusions based on the survey on real estate development at airport cities and gives recommendations for commercialized real estate development at Schiphol as key asset for sustainable growth. Section 6.1 contains the conclusions and chapter 6.2 the recommendations.

### 6.1 Conclusions

It can be concluded from this survey on real estate development at airport cities that airports in general do positively contribute to urban regional and economic development by creation of jobs and Gross Value Added. Each direct job at the airport generates 1.2 additional indirect job and 0.5 induced job in the airport region. The direct, indirect and induced economic effects of airports together contribute on average between 1.5% and 2.5% of the Gross Domestic Product. The Airport City concept, aviation-related clustering, the Airport Corridor and the Aerotropolis concept are identified as concepts for geographical spread, due to urban regional development of airports. Besides this spatial impact, it is impossible to isolate and quantify the socio-economic impact of real estate development at airports measured in creation of jobs and Gross Value Added, because it is impossible to indicate and distinguish which part of the total socio-economic impact of airports is specifically attributable to the real estate development at the airport itself and what is attributable to other factors. However, due to the functional relation between the airport, the city region and the transportation network as a united, interdependent and integrated system with reciprocal influence, general conclusions on the less tangible and softer aspects of the contribution of real estate development at airport cities for the airport, the government and the society can be drawn.

#### *Impact for the airport*

Real estate development at airport cities leads to a diversification of business activities of the airport authority, which reduces its economic vulnerability of the airport authority, due to a spread of business risks. With a relative high and stable average annual growth rate of 5%, last decades the aviation industry has been performing much better than the world economy (3%). However, during the period '00-'09, the growth in Air Transport Movements and passenger throughput at airports has been much more dependent of external factors and sensitive to economic downturns. Also increased competition in the aviation industry led to a downward pressure on airport charges. Therefore aeronautical revenue for airport authorities is not anymore as self-evident as it was in the decades before. Airports are business locations which can offer real estate for business activities with low, medium but also relatively high added value, which means that airports can generate high rent income and concession income on exploitation of commercialized real estate. Therefore real estate development as business activity can be a real cash cow and is of increasing importance for airport authorities. The revenue generated by commercialized real estate development can be used for funding of existing and new business activities which can be aeronautical as well as non-aeronautical activities. This makes airport authorities less dependent of aeronautical income and funding by financiers. In meantime, real estate is an asset on the balance sheet, which increases the equity of the airport authority, giving the company more market value and creating more financial capacity.



By development of real estate, airport cities can allocate different economic activities to the available m<sup>2</sup> real estate. An increase, diversification and clustering of economic activities at the airport improves the attractiveness of the airport as business location. Here the catalytic effect for economic development at the airport starts working, because improved attractiveness of the airport as business location attracts new economic activities, which creates more critical mass for carriers to start new operating services or to expand existing operating services to and from the airport in question. An improvement of the air transportation product improves the overall airport product, which as location factor increases the overall attractiveness of the airport as business location. As a spin-off, this attracts new economic activities, and so on. In addition to this, due to the improved business climate and airport product, the relative competitive position of the airport is strengthening, compared to the competing (inter)national regional and hub airports. A quantitative and qualitative improvement of economic activities and urban functions at airports strengthens the urban function of the airport in the city region and increases the economic importance of the airport. This results in a higher node value, higher place value as well as higher space productivity of the airport, increasing the total value of the airport as city port in the city region. This consequently benefits the image of the airport, which again as location factor adds value to the attractiveness of the airport as business location.

The biggest threat for the airport, due to commercialized real estate development at the airport, is a threat of the primary transport function as core business of the airport due to congestion to and from the airport site harming landside accessibility and space needed for commercialized real estate development. On top of that, the spatial and economic pressure on the airport region might lead to resistance from residents, due to an affected living environment.

#### *Impact for the government*

As stated, real estate development at airport cities leads to an increased allocation of economic activities and urban functions at the airport, improving the attractiveness of the airport as business location with a spin-off for urban and economic development of the airport itself. However, this spin-off also has impact on the airport region as well as the entire globalizing city region. The urban regional economic development of the city region, due to real estate development at airports, is being reflected in an overall improvement of the diversity and quality of the regional production structure and the socio-economic strength of the airport region and the wider city region. The degree of geographical spread of the externalities in the region depends on the development stage a specific airport is in. Whereas the spatial and socio-economic impact of regional airports is limited to a periphery of 25 kilometre distance from the airport site, the spatial and socio-economic impact of hub airports are found between 50 and 100 kilometre distance from the airport. The regional production structure and the socio-economic strength of the city region is a location factor on itself. Therefore the improvement of this location factor is increasing the attractiveness of the city region as business location for economic activities on the one hand, and increasing the competitiveness of the city region in global network of city regions on the other hand. The spin-off and catalytic effect for economic development of the airport itself also counts for economic development of the city region, because urban regional development is a driving force on itself and a self strengthening process moreover.





The local, regional and national government benefit from real estate development at airport cities by the fact that increased economic activities creates jobs, reducing unemployment at the region, increasing the purchase power, generating spending, income and welfare effects in the region. This all leads to increased strength of the socio-economic structure of the city region. The government indirectly benefits from increased economic activities by income taxes of residents, regular value added tax on products and services, increased airport taxes due to increased Air Transport Movements and passenger throughput, etcetera. Real estate development at airport cities also generates income for the government by leasing the land as landlord or by selling the land as property for real estate related project development.

Besides the positive externalities as mentioned above, the city region is also facing negative externalities, like noise, air pollution, congestion, ecological damage and safety risks, due to increased economic activities, Air Transport Movements and traffic flows in the city region as a result of real estate development at the airport. This has negative impact on the quality of the living environment. The government is responsible for the overall quality of the living environment and economic development as well. Therefore the government on local, regional and national level have to make integrated policy on mainport development, urban regional and economic development, real estate development and the living environment. As stated, the quality of the living environment is a location factor on itself, in this case reducing the attractiveness of the region for companies and residents as well. Moreover, increased attractiveness of the business climate at the airport as Central Business District, makes the other traditional Central Business Districts in the city region compete with the airport site as business location. This could cause undesirable side effects in urban regional and spatial planning, like unbalanced urban development and unbalanced economic growth. However, this risk is estimated to be low, because the airport as business location mainly creates a niche for specific economic activities. This can be on the one hand airport core business and airport related activities due to the functional relationship with the airport like (European) distribution centres, or on the other hand high value adding activities like (international) headquarters and sales offices, because the airport is a relatively expensive business location due to relatively high rents.

#### *Impact for the society*

The statement that the impact of real estate development at airport cities for the government depends on the development stage of the airport and therefore varies with the distance to the airport site, also counts for the impact for the society. As earlier mentioned at the impact for the airport as well as for the government, by development of real estate, airport cities attract economic activities and urban functions, which increases the attractiveness of the airport as business location and results in an improved airport and air transport product. The society benefits from an increase and diversification of economic activities and urban functions at the airport, because it leads to more and more different facilities like shops, Food&Beverage, entertainment and hotels, which improves the quality of the living environment. The economic activities and urban functions in meantime create direct, indirect and induced jobs and therefore generate income for residents in the airport region and city region. Besides jobs, the urban development of the airport due to real estate development leads to investments in necessary landside infrastructure like roads, railways and public transport systems which increases the landside accessibility, all again improving the quality of the living environment. On top of that, the society benefits from an improved air transportation product, because the residents in the catchment area of the airport as travellers face more destinations and more frequent connections, as a result of urban economic development due to real estate development and at the airport.



But also for society commercialized real estate development at airport cities has a downside, because the increased business activities, Air Transport Movements and traffic flows within the airport region lead to the same negative externalities for society as mentioned for government like noise, air pollution, congestion, ecological damage and safety risks. This has negative impact on the quality of the living environment for the society.

## 6.2 Recommendations

The growth rate of real estate related income for Schiphol Group (205%; '96-'09) is much higher than the growth rate of the total revenue of the airport authority (159%; '96-'09), which means that real estate is of increasing importance for the overall financial performance of Schiphol Group. However, Schiphol Group is still lagging behind on real estate related revenue generation as share of the total revenue (29%; '06) compared to airports with comparable passenger throughput (30%-36%; '06). This can partly be explained by the relatively high share of transfer passengers at Schiphol (43%; '09) which traditionally spend less on real estate related activities. However, main reason is the fact that Schiphol Group is state owned with a multi-level government authority owning the airport, which is one of the most inefficient ownership forms for airports. To make Schiphol Group, the local, regional and national government as well as the society benefit from commercialized real estate development at the airport site of Schiphol, Schiphol Group is recommended to increase its performance on real estate development to market conform performance. This implies that Schiphol Group has to increase its annual growth rate for real estate related revenue between 8.5% and 11.5% per year for the next 5 years, assuming that Schiphol Group will continue to maintain its average long term annual growth rate for total revenue of 7%.

Preconditions to realize this growth are to privatize Schiphol Group, because airport privatization is the main incentive for airports to diversify activities and commercialize business, which increases airport performance. Privatized airports are run to maximize profit and shareholder value, have effective and more decisive management and therefore have higher productive efficiency in throughput and higher operating profitability in terms of generated income and profit margins. Due to this higher profitability, it will have easier access to private sector financing and Foreign Direct Investments. Investments in the airport stimulate urban economic development of the airport site which is a catalyst for regional urban economic growth. Meanwhile, to create commitment from government and the society for real estate development at the airport site, Schiphol Group is recommended to manage the external relations of the actors involved with the level playing field for real estate development by continuous, intensive and pro-active management of the airport area growth coalitions.

Based on different growth scenario's for economic development and the aviation industry, it is forecasted that the number Air Transport Movements at Schiphol will increase from 408,000 ('09) to 498,000 (*Global Shift*) to 585,000 (*Balanced Growth*) in '20. Schiphol Group is recommended to increase the overall capacity for commercialized real estate development at Schiphol between 1,992,000 m<sup>2</sup> (*Global Shift*) and 2,340,000 m<sup>2</sup> (*Balanced Growth*) in '20. This forecast is made under the assumptions that Schiphol Group will be able to maintain and continue the perfect positive correlation of 1:4 between Air Transport Movements and m<sup>2</sup> real estate development in the future, that the average long term occupancy rate for commercialized real estate at Schiphol remains 93%, that there is no overcapacity in commercialized real estate at Schiphol, and that due to technological developments resulting in more quiet aircraft, the forecasted Air Transport Movements will match Schiphol's current technical capacity (600,000 ATM's per year) as well as its future environmental capacity (currently 480,000 ATM's per year).



Schiphol is a primary hub and Airport city with urban functions, which means that economic activities in the segments *Core business*, *Airport-related* and *Airport-oriented* are well developed. To strengthen its position as multifunctional hub, Schiphol Group is recommended to increase these economic activities by allocating the calculated potential for m2 real estate at Schiphol to the economic activities of the segments just mentioned. However, due to the fact that activities from the *Airport-image* segment are in a relatively premature phase, Schiphol has quite some potential for further development of urban functions at the airport site. Therefore the suggested strategy for Schiphol Group for real estate development at Schiphol is to focus on new, innovative economic activities in the clusters *Recreation*, *Knowledge* and *Health & wealth*, which strengthen the urban function of the airport, which generate high added value per m2, which generate relatively high rents per m2 for Schiphol Group and therefore are high potential for revenue from real estate development. Due to a stagnation of growth in passengers and Air Transport Movements over the period '00 – '09, for terminal-related real estate development Schiphol Group is recommended to postpone the exploitation of the second new terminal building *North-west* till '20. Meanwhile, Schiphol Group is also recommended to increase real estate development by participations in (inter)national airports which have high potential to increase passenger throughput and Air Transport Movements and therefore have high potential for real estate development.



## Literature

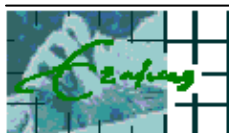
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# ANNEXES

