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Airport development in Sub-Saharan Africa: opportunities for public private partnerships

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2016

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Langeslag, Marcel (2016) Airport development in Sub-Saharan Africa: opportunities for public private partnerships, University of the Witwatersrand, Johannesburg, <http://hdl.handle.net/10539/23222>

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Research Report

22 June 2016

Airport Development in Sub-Saharan Africa:

Opportunities for Public Private Partnerships

Report submitted in partial fulfilment of the requirements for the degree of

Master of Management in Finance and Investment

Faculty of Commerce, Law and Management

Wits Business School

University of the Witwatersrand

Johannesburg, South Africa

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Abstract

The development of transportation infrastructure, including airports, plays a vital role in economic growth in emerging markets. However, government budget allocations for this purpose are often insufficient to realise the full benefits. Project finance and Public Private Partnerships (PPPs) in particular, have been used to enable private sector participation in the financing of airport development. Airports PPPs have successfully been implemented worldwide, including, to a lesser extent, in emerging markets and Sub-Saharan Africa (SSA).

There is a lack of literature on the benefits, risks, challenges and opportunities associated with airport PPPs in SSA, which this research aims to address. Case studies of recent airport PPPs in Brazil and India provide an outline of the emerging market context and insight into factors that affected these airport PPPs. In-depth interviews with two representatives of governments in SSA provide a rich view on the perceived benefits, risks, challenges and opportunities associated with airport PPPs in Africa.

This research has found that airport PPPs can contribute to airport developments in SSA by enabling the private funding of airport upgrades and expansions. However, governments have an important role to play in providing an enabling environment for private investors by improving investability and implementing clear and practical PPP legislation, aviation policies and economic regulation of airport services. The limited institutional capacity and domain expertise of SSA governments is perceived as a challenge to the implementation of airport PPPs in the region. The low level of air traffic and small number of airports that handle more than one million passengers per annum further limit the opportunities for airport PPPs in SSA, although strong GDP growth provides an encouraging sign.

Successful airport PPPs require the participation of private consortia with expertise in airport operations, construction and infrastructure concessions. Financing of airport PPPs is done preferably from domestic sources and development finance can play an important role. There are risks associated with the foreign ownership of key national infrastructure and a reliance on private sector to provide public infrastructure. Lighter forms of PPPs that limit the private sector risk exposure may be more suitable to the low-traffic and high-risk environment in SSA.

Declaration

I, Marcel Langeslag declare that this research report is my own unaided work. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in Finance and Investment at the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other University.

Acknowledgements

Firstly, I would like to thank my supervisor Dr. Odongo Kodongo for his valuable comments and guidance. Secondly, this research would not have been possible without the kind contributions of the respondents, for which I am grateful. Thirdly, thanks go out to Tessel Severs and the management of NACO for providing me with the opportunity to pursue the MMFI degree.

Finally, I would like to thank my parents and sister for their continued support and for being a great source of motivation and inspiration.

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1. Introduction and Motivation

Even though Africa is the second most populous continent with approximately 1.1 billion people, or 15% of the world total (UN, 2012), it accounts for only around 3% of global air passenger traffic, measured in revenue passenger-kilometres (RPK) (IATA, 2012; Airbus, 2012). The propensity to fly of the African population is by far the lowest in the world, at an average of 0.06 trips per capita in 2013 (Airbus, 2014). However, this is set to change; with economic growth and increasing urbanisation, air traffic to and from Africa, as well as within the continent, is expected to rise. The International Air Transport Association (IATA) expects passenger traffic in Africa to grow on average by 4.7% per annum, reaching a total of 294 million passengers by 2034, compared to global annual average growth of 4.1% (IATA, 2014). The International Civil Aviation Organisation (ICAO) is even more optimistic, predicting an average annual growth rate for Africa of 7.2% from 2012 to 2032, with intra-African passenger traffic growing at 9.4% over the same period (ICAO, 2013a).

Table 1-1: Global air passenger traffic distribution and propensity to fly (from: Airbus, 2012 and 2014)

Region	Percentage of world passenger traffic (RPK)		Propensity to fly (Average trips originating in the area, per capita)	
	2012	2032 forecast	2013	2033 forecast
Africa	3%	3%	0.06	0.13
Asia/Pacific	29%	34%	0.24	0.69
CIS [1]	4%	4%	0.25	0.76
Europe	26%	22%	0.99	1.87
Latin America and the Caribbean	5%	7%	0.36	0.87
Middle East	8%	12%	0.38	0.92
North America	25%	18%	1.59	2.14

[1] CIS stands for Commonwealth of Independent States, a regional organisation of former Soviet Republics

For the projected growth to be realised there are several challenges to be addressed. Not least are the prevalence of peace, political stability and the sustainable growth of economic activity and welfare that are paramount to increased demand for air travel. The regulatory environment is a particularly important factor to be considered; notably the regulation of air space. Research by InterVISTAS for IATA has estimated the potential benefits of liberalising African airspace, affording foreign airlines rights to operate freely in the region (InterVISTAS, 2014). According to this study benefits of 'open skies' policies include increased air

transport activity, which leads to an uptick in tourism, trade, investment and productivity, and ultimately generates employment and economic output. Furthermore, growth in air traffic can only be realised if there is sufficient capacity and adequate quality of infrastructure. According to Hussain (2010), air transport infrastructure consists of "airports, air traffic control (ATC) centers, and the organizations involved in coordinating their provision and use" (p. 5).

This research focuses on financing the development of airport infrastructure that is required to facilitate growth of air transport in Africa. In order to motivate the study we take a further look into the state of airport infrastructure in Africa, means of financing necessary investment and the role of Public Private Partnerships.

1.1. Airports in Africa

As mentioned earlier, the level of air transportation in Africa is low compared to other regions of the world. Globally, airports generated an income of US$ 117 billion, of which African airports raked in a mere US$ 2.8 billion or 2.4% (ACI, 2013). Typically, only airports that handled more than 1 million annual passengers (MAP) are considered viable (Foster & Briceño-Garmendia, 2010; ICAO, 2013b), although some argue the more than 3 to 5 MAP are required to generate acceptable returns (Aviation Economics, 2013). Smaller airports do not generate sufficient income to cover the relatively high fixed costs associated with operating an airport. The Airports Council International (ACI), an international industry body, estimates that over two-thirds of the world's airports are loss-making (ICAO, 2013b). According to research by the Centre for Aviation (2014a) African airports perform relatively well in terms of gross profit, income per passenger and liquidity (current ratio) compared to other regions. However, they are lacking in terms of revenue generated from sources other than landing fees and passenger charges, the so-called non-aeronautical revenues.

According to Foster & Briceño-Garmendia (2010) and Gwilliam (2011), there are almost 3000 airports in Africa, of which around 260 received scheduled services in 2007. According to airport traffic statistics published by the ACI, in 2014 there were 36 airports in Africa with over 1 MAP, 21 of which are located in SSA (ACI, 2015); these airports are listed in Table 1-2. Broadly speaking they can be divided into the following categories:

- **Mega airports: >10 MAP**

  There are only two mega airports in Africa, located on either end of the continent (North/South), in Cairo, Egypt and in Johannesburg, South Africa.
- **Large airports: >5 MAP**

  Nine airports in Africa can be classed as medium size based on passenger traffic between 5 and 10 MAP. Five of these airports are located in North Africa (Morocco, Egypt, Algeria and Tunisia) and the others are spread across SSA.
- **Medium airports: >1 MAP**

  Twenty-one airports in Africa handled between 1 and 5 MAP in 2014, fourteen of which are located in SSA.
- **Small airports: <1 MAP** (not listed in Table 1-2)

  The majority of airports are small airports, often only handling domestic flights. Typically, they are considered non-viable and their operations have to be subsidised.

According to Foster & Briceño-Garmendia (2010) and Gwilliam (2011) the number of airports in Africa is stable and there is generally sufficient runway capacity available. One runway can provide a capacity of over 10 MAP, and those airports that currently handle more than 10 MAP already have two runways. However, the runways are not always in good condition, due to lacking maintenance. Less than half of all runways in SSA are in excellent or very good condition, compared to over 95 percent in North Africa (Foster & Briceño-Garmendia, 2010). This is problematic because under-maintenance of infrastructure causes African countries to spend more than they should on maintaining a stable level of infrastructure (Briceño-Garmendia, Smits & Foster, 2008). The cost of preventive maintenance is lower than the net present outflows of major rehabilitations.

The number of runways is currently not a limiting factor for growth of air transport in Africa. Where needed, runway capacity can be increased by lengthening and widening runways, by improvements in operational procedures, or by constructing (partial) parallel taxiways that allow runways to be used more efficiently (Gwilliam, 2011). Furthermore, Foster & Briceño-Garmendia (2010) state that many Sub-Saharan African terminal buildings handle traffic volumes at or above their stated capacity. New terminal buildings, or expansions of existing terminal buildings, are required to facilitate growth in air transport, although data on

terminal buildings is not readily available. Moreover, as anyone who has flown to several African countries can confirm, many terminal buildings could do with upgrades to improve the quality of service.

According to the World Bank (CBC, 2013) increasing urbanisation and economic growth in Africa require the transport sector to invest in order to provide strong international connections that ensure effective supply chains and provide domestic industries with a competitive advantage. Given the low levels of air traffic and airport activity in Sub-Saharan Africa there are significant opportunities for growth, provided the enabling infrastructure is available in sufficient capacity and adequate quality. According to ICAO (2013b) current and forecast air traffic will necessitate increasing levels of investment in order "to maintain and enhance airport capacity and service quality" (p. 3).

Research by Banerjee, Oetzel & Ranganathan (2006), shows that in most emerging market economies the government is not able to finance the growing need for infrastructure. Foster and Briceño-Garmendia (2010) argue that income generated from airports and air traffic should be sufficient to finance the necessary investments, but that the sector does not capture this income due to political and organisational issues.

This then begs the question of how the necessary investments in airport infrastructure can be financed.

Table 1-2: Passenger traffic at the largest airports in Africa in 2014 (from: ACI, 2015)

Rank	City	Country	IATA Code	Million Annual Passengers (MAP)	% change 2013 – 2014
1	Johannesburg	South Africa	JNB	19.2	+1.3%
2	Cairo	Egypt	CAI	14.7	+6.6%
3	Cape Town	South Africa	CPT	8.6	+3.4%
4	Casablanca	Morocco	CMN	8.0	+5.4%
5	Lagos	Nigeria	LOS	7.5	+7.2%
6	Hurghada	Egypt	HRG	7.2	+24.9%
7	Addis Ababa	Ethiopia	ADD	6.9	+5.6%
8	Algiers	Algeria	ALG	6.5	+9.1%
9	Nairobi	Kenya	NBO	6.4	+7.4%
10	Sharm El Sheikh	Egypt	SSH	6.2	+4.8%
11	Tunis	Tunisia	TUN	5.1	-5.1%
12	Abuja	Nigeria	ABV	4.6	+18.2%
13	Durban	South Africa	DUR	4.5	-0.2%
14	Marrakech	Morocco	RAK	4.0	+5.4%

15	Khartoum	Sudan	KRT	2.8	+9.4%
16	Plaine Magnien	Mauritius	MRU	2.8	+1.3%
17	Accra	Ghana	ACC	2.5	-2.2%
18	Borg El Arab	Egypt	HBE	2.5	+11.1%
19	Dar Es Salaam	Tanzania	DAR	2.5	+5.5%
20	Enfidha	Tunisia	NBE	2.2	-2.6%
21	Saint-Denis	La Reunion	RUN	2.0	+0.6%
22	Djerba	Tunisia	DJE	2.0	+4.0%
23	Tripoli	Libya	TIP	1.9	-46.3%
24	Dakar	Senegal	DKR	1.8	-1.6%
25	Oran	Algeria	ORN	1.6	+14.2%
26	Agadir	Morocco	AGA	1.5	-0.8%
27	Entebbe	Uganda	EBB	1.4	-1.0%
28	Mombasa	Kenya	MBA	1.4	+6.8%
29	Port Harcourt	Nigeria	PHC	1.3	+13.4%
30	Brazzaville	Congo	BZV	1.3	+15.2%
31	Port Elizabeth	South Africa	PLZ	1.3	+1.1%
32	Abidjan	Cote D'Ivoire	ABJ	1.3	+7.6%
33	Marsa Alam	Egypt	RMF	1.2	+26.9%
34	Monastir	Tunisia	MIR	1.1	-4.3%
35	Lusaka	Zambia	LUN	1.1	+1.5%
36	Pointe Noire	Congo	PNR	1.1	+14.7%

2. Problem Statement

It is clear that airport infrastructure and airport business activity in Sub-Saharan Africa is lagging behind the rest of the world, and with it the air transport activity it enables. Air transport has been shown to have a positive relation with economic development, both in Africa and other regions of the world, and therefore a lack of availability and quality of airport infrastructure may hurt economic development (Button & Taylor, 2000; Brueckner, 2003; Cooper & Smith, 2005; Green, 2007; Ishutkina & Hansman, 2009; Khadaroo & Seetanah, 2008; Bilotkach, 2015). It is thus in the interest of governments in Sub-Saharan Africa to further the development of airports.

However, many governments are not able to finance the required investments in airport infrastructure from fiscal revenues alone and it has been recognised that private participation is required. Project finance, and public private partnerships (PPP) in particular, may offer valuable opportunities for the private sector to become involved in the development of airport infrastructure. There are limited examples of airport PPPs in emerging markets and only very few in Africa. Most of these examples are relatively recent and have not been studied extensively in an effort to draw valuable and reliable insights from them.

The literature on the topic is focused very much on the European, Australasian and (Southeast) Asian markets, where airport PPP activity has been greater. Research conducted does not address the specific issues that may be encountered in emerging and low-income countries. Such issues include relatively low levels of GDP, and corresponding low demand for air travel, high airport landing charges (Gwilliam, 2011) and limited competition amongst airports in certain regions. Consequently, research to date does not offer insights into the particular set of challenges faced in airport PPPs in SSA, let alone propose solutions to deal with them.

Developing airports in Africa is a large and complex undertaking that will require the mobilisation of different sources of capital and expertise through a variety of project structures, and financial instruments and markets. More guidance would be welcome to

assist African governments in developing airport infrastructure, and to private investors in realizing the opportunities available.

3. Research Objectives and Questions

The objective of this study is to provide insight into the opportunities and limitations of PPPs for airport developments in Sub-Saharan Africa. It aims to provide guidance on the challenges and possible avenues for solutions that exist.

We aim to achieve this objective by answering the main research question:

Can Public Private Partnerships support the development of airports in SSA?

This main research question has been broken down into three key questions, each supported by a number of sub-questions as follows:

1. **How can PPPs be used for airport development in emerging markets?**
   1.1. Who are the key stakeholders in airport PPPs and what are their interests?
   1.2. What are possible PPP structures for airports? What are the key characteristics of airport PPP structures?
   1.3. What are the key benefits and risks associated with airport PPPs?

2. **What are the requirements for successful airport PPPs in SSA?**
   2.1. What lessons can be learnt from past PPPs in emerging markets?
   2.2. What PPP structures are most suitable for airport development in SSA?
   2.3. What are the necessary preconditions for airports PPPs in SSA, and do those exist?
   2.4. What are the limitations to the use of PPPs for airports in SSA?

3. **Do governments in SSA consider PPPs as suitable options for airport development?**
   3.1. What are governments' motivations for using, or not using PPPs for airports?
   3.2. What are the objectives for governments in considering PPPs for airports?
   3.3. What are the challenges faced by governments in using PPPs for airports?

4. Benefits of the Research

This study will provide African airport authorities/owners with the following benefits:

- Lessons learnt from past airport PPPs, providing insight into the risks to governments, airlines and consumers.
- Identification of financial considerations that determine the success of airport PPPs.
- Guidance on the structuring of airport PPPs in various situations, dealing with challenges specific to emerging markets.
- Ability to approach or engage with potential investors around a common understanding of risks and rewards.

Private airport investors will find this study useful as it provides them with information on the opportunities that exist for airport PPPs in Sub-Saharan Africa. Furthermore, they will gain an understanding of the concerns and considerations of the public airport owners. This will be advantageous to them when identifying and structuring airport PPP deals.

This study will provide both public and private parties with insights that are currently not available in the literature. It will enhance the understanding of both parties, which should contribute to increased chances of successful airport PPPs. This study will therefore further the interest of airport investment, which should enable growth in air traffic, along with the associated benefits to local and regional economies.

5. Literature Review

5.1. Contribution of airports to economic development

In order to fully appreciate the importance of investment in airport infrastructure in Africa, it is essential to understand the relationship between air transportation and economic growth, and more specifically between (air) transportation infrastructure and economic growth.

There are several studies that evaluate the effects of infrastructure, which typically includes transportation, energy, telecommunications, water and sanitation, on various measures of economic output and growth. For instance, a time series analysis by Egert, Kozluk, & Sutherland (2009) found a positive impact of investment in infrastructure on economic growth in OECD countries. Mbekeani (2010) argues that the availability of infrastructure with sufficient capacity and of adequate quality, reduces the cost of doing business, which leads to increased competitiveness in international trade.

When considering the positive effects found in various studies, it is important to note that such results are neither consistent, nor entirely certain. Ajakaiye & Ncube (2010) argue that the causal relationship between infrastructure and economic development is inconclusive. Calderon and Serven (2010) describe that much of the literature on the topic finds positive long-run effects of infrastructure on measures of economic development such as output and productivity, or their growth. However, they point out that inferences should be made with caution, due to the three common issues of measurement, heterogeneity and identification. Issues of measurement of infrastructure as a single variable, either physical or monetary, relate to the difficulty of capturing the multi-dimensional concept of infrastructure. Similarly, research on the topic often falls short in capturing the heterogeneity of infrastructure across time periods and countries, in terms of quality and productivity for instance, mostly due to a lack of data. Most importantly however, Calderon & Serven (2010) point out that research evaluating the linkages between infrastructure and economic development is problematic in terms of identification; there is a two-way causality between them. Countries with a higher or faster growing output may spend more on infrastructure and empirical research that does not control for this could display a simultaneity bias.

Research by Kumo (2012) using data from South Africa confirms there is a strong two-way causality between infrastructure investment and long term economic growth. Ajakaiye & Ncube (2010) conclude that sustained economic growth often occurs in the presence of "meaningful infrastructure development" (p. i4), but that it remains ambiguous which causes the other.

Looking at transport infrastructure specifically, econometric research by Khadaroo & Seetanah (2008) has found a positive relationship between foreign direct investment and transport infrastructure, inclusive of air, land and water transport, for a panel of 20 African countries over the time period 1986-2000. Moreover, their results indicate that foreign investors are more sensitive to transport infrastructure than to other forms of infrastructure, such as communication, energy, wastewater and defence.

A significant body of research has been developed that demonstrates the links between air transportation and economic growth (Button & Taylor, 2000; Brueckner, 2003; Cooper & Smith, 2005; Green, 2007; Ishutkina & Hansman, 2009; Bilotkach, 2015). Air transport activity generates income and jobs, in the aviation industry directly, and indirectly in supporting industries such as manufacturing, engineering and services, as well as in sectors that are supported by it, such as tourism. A case study of Amsterdam Schiphol Airport by Hakfoort, Poot & Rietveld (2001) estimated that one job on the airport generated approximately one job in "indirect or induced employment" (p. 595). Thus, airports generate substantial catalytic impacts, or wider economic benefits, which according to InterVISTAS (2014) manifest mainly through the following channels:

- **Trade** – air transport enables and facilitates trade by increasing connections between places and reducing travel times, which brings new customers of goods and services within reach. Cargo transported by air often consists of high value products, including time-sensitive goods and perishables. This is illustrated by the fact that while air cargo only accounts for 0.5% of global trade volumes, it accounts for 35% by value (ATAG, 2015). Research by Nordas & Piermartini (2004) affirms that the quality of infrastructure is a key factor influencing bilateral trade flows.
- **Investment** – location decisions by companies tend to take into account proximity to transport nodes, as they provide competitive benefits. The connectivity provided by

an airport can attract new businesses to its area. For instance, Bel & Fageda (2008) found that the availability of direct flights from a nearby airport is an important factor in determining a company's headquarter location.

- **Productivity** – Cooper & Smit (2005) found that the catalytic impact of air transport in Europe "has been to raise both investment and underlying productivity significantly" (p. vi). Underlying productivity is a measure of the increase in GDP over and above the increase caused by changes in inputs of labour and capital. They argue that improved air transport provides firms with access to new markets (improving supply side performance) and to a larger labour pool, allowing them to attract and retain high quality employees. These effects, combined with greater exposure to international competition, have encouraged firms' innovation and efficiency.

Research clearly demonstrates that transportation infrastructure, specifically airports, and the air transportation they enable, contribute to economic growth and development. This means it is in the interest of African governments to ensure sufficient investment in airport infrastructure in order to enable and support growth.

5.2. Investment in infrastructure and project finance

Briceño-Garmendia et al (2008) state that the public sector is responsible for the majority of investments in infrastructure in Africa. Their research shows that African governments typically make budgetary provisions for investment in infrastructure equivalent to between 6 and 12 per cent of their gross domestic product (GDP). However, because most African economies are small, this level of spending is not big in absolute terms. Governments' budgetary provisions are funded through fiscal revenues, government borrowings or grants. Governments can borrow from national or international capital markets, directly from other governments or from international institutions.

It has been recognised that governments of low-income countries and emerging markets have not been able to address the need for investments in infrastructure utilising the traditional forms of budget finance (Banerjee, Oetzel & Ranganathan, 2006; Brixiova, Mutambatsere, Ambert & Etienne, 2011). Several studies suggest that due to public sector budget constraints and low savings levels in Africa, foreign private capital is required to fund

the necessary infrastructure development (Ramamurtia & Doh, 2004; Orr & Kennedy, 2008; Ajakaiye & Ncube, 2010). Mezui & Hundal (2013) suggest broad initiatives for cooperation between the public and private sectors as the way forward. Brealey, Cooper & Habib (1996) describe various ways for governments to involve the private sector in the financing and management of infrastructure projects, which are summarised in Table 5-1. They define privatization as the provision by private parties of "capital and management services to an entire industry, rather than to individual projects" (p. 27). Private funding and management of individual projects are achieved through project finance. It should be noted that others define privatization more generically as the transfer of governmental functions, responsibilities, control or ownership to the private sector (TRB, 2012).

Orr & Kennedy (2008) argue that risk reduction through project finance, securitization of project loans and consortium finance were drivers of the boom in foreign direct investment (FDI) in infrastructure in developing countries in the 1990s. Esty (2003) states that project finance is one of the most important means of funding infrastructure projects and its application in developing countries is likely to increase.

Table 5-1: Ways that infrastructure projects can be funded and managed (from: Brealey, Cooper and Habib, 1996)

Arrangement	**Finance**	**Management**
Project finance	Private	Private
Privatization	Private	Private
Service contracts	Government	Private
Leases	Private	Government
Nationalization	Government	Government

Project finance is a financing structure that is often used to finance large, capital intensive projects, "characterized by a system of support and risk mitigation mechanisms that address certain key risks that otherwise could not be financed on a stand-alone basis" (Mezui & Hundal, 2013, p.45). It involves the creation of a legally independent special purpose vehicle (SPV), financed with non-recourse debt, that is used to invest in an asset, or assets, with a single purpose and limited life (Esty, 2003). Brealey et al (1996, p. 25) give the following principal features of large infrastructure projects funded through project finance:

- A project is established as a separate company, which operates under a concession obtained from the host government.
- A major proportion of the equity of the project company is provided by the project manager or sponsor, thereby tying the provision of finance to the management of the project.
- The project company enters into comprehensive contractual arrangements with suppliers and customers.
- The project company operates with a high ratio of debt to equity, with lenders having only limited recourse to the government or to the equity-holders in the event of default.

Just like other companies, the performance of the project company is dependent on its ability to attract paying customers. However, infrastructure projects are often supported by government-linked off-take guarantees or minimum revenue guarantees (Mezui & Hundal, 2013). This form of risk management and the use of limited- or non-recourse debt mean that for (foreign) equity investors a small amount of capital can go a long way, without exposing them to unacceptably high levels of risk. This leads to the observation by Brealey et al (1996) that project finance is more likely in capital-intensive projects in riskier-than-average countries, such as the emerging markets of Africa. Indeed, Esty (2003) argues that by isolating the project in a separate company, project finance reduces the possibility that a risky asset has a negative impact on the equity investor, or sponsoring firm. Further, he argues that using project finance can reduce agency costs associated with capital projects with large free cash flows, and "solves leverage-induced underinvestment by allocating project returns to new capital providers in a way that cannot be replicated using corporate debt" (p. 4).

The structuring of a typical project financing arrangement for infrastructure involves numerous parties, as shown in Figure 5-1, chief of which are the following:

- **Government** provides the SPV with a (long-term) concession to build and operate the infrastructure involved. The SPV may retain ownership of the asset, or transfer it to the government at the end of the concession. Government may hold equity in the SPV, provide debt guarantees to lenders, or provide off-take guarantees and

subsidies. Government also provides the necessary regulatory framework, licensing and permitting.

- **Sponsors or equity investors** provide the capital required for establishment of the SPV and the construction of the asset. According to Mezui & Hundal (2013), this amounts to 20 – 40% of the capital required. Typically, a single sponsor owns a controlling stake in the SPV and is involved with the construction and/or management of the project.
- **Debt investors** typically provide 60 – 80% of the capital required for the project (Menzui & Hundal, 2013). Often this debt is provided by a syndicate of lenders, such as banks, specialised institutions or the bond market. As the risk profile of the project changes throughout the duration of the concession agreement the debt may be renegotiated.
- **Contractors and suppliers** are involved in the construction of the project and provision of the necessary inputs. The main contractor often holds a controlling stake as (one of) the sponsor(s) of the SPV (Brealey et al, 1996).
- **Customers or off-takers** can be one or more government agencies, corporate firms or individual end users.

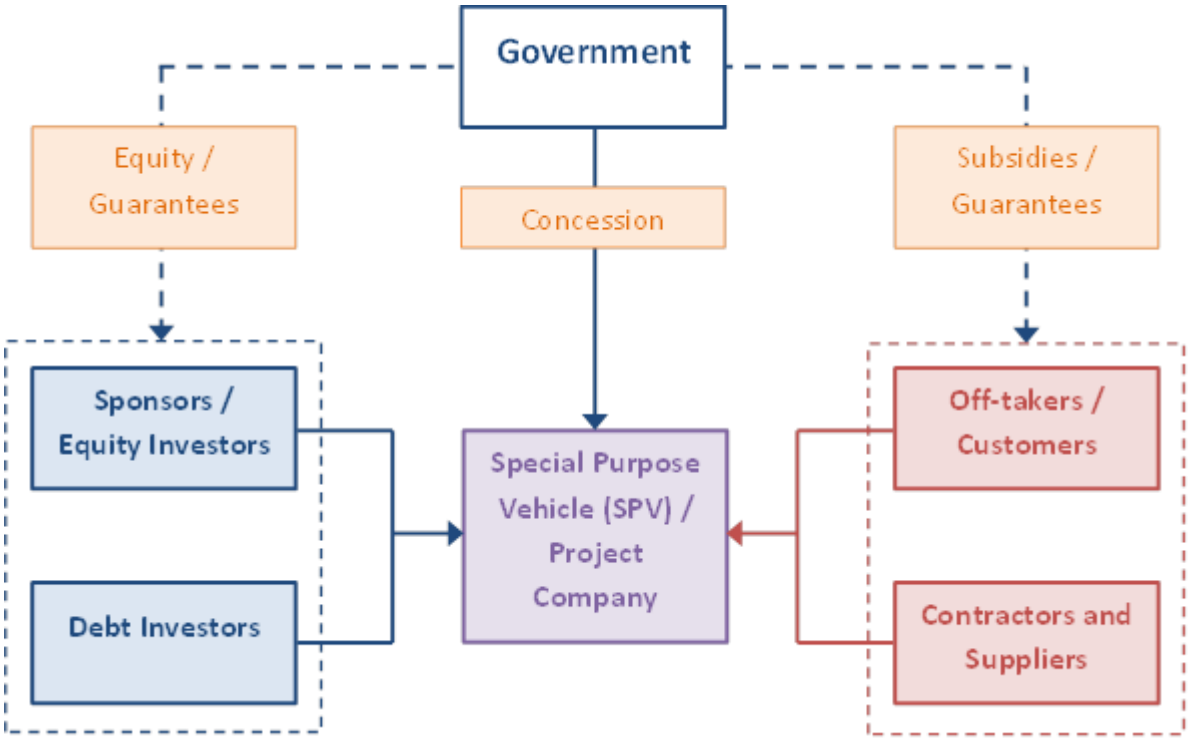


Figure 5-1: Typical project finance structure (adapted from: Mezui & Hundal, 2013 and Brealey et al, 1996)

Possible sources of private (debt) capital for project financing include following:

- Commercial banks
- Export Credit Agencies
- International Financing Institutions (including grants)
- International capital markets (including project bonds)
- Domestic capital markets (including project bonds)

Brealey et al (1996) describe the multitude of contracts between the various parties involved in a project finance arrangement as means of risk management, intended to allocate the risks to those parties best able to evaluate and manage them. Ramamurtia & Doh (2004) note that a key incentive for equity investors backing infrastructure projects was the possibility for them or their sister companies to sell products and services to the project under beneficial contractual terms.

As governments seek to involve the private sector more in infrastructure development using project finance, the procurement model known as public private partnership (PPP) is often

mentioned. The World Bank (2014) and European Investment Bank (2015a) state that most PPP projects are financed using project finance.

5.3. Public Private Partnerships

A number of definitions of public private partnerships (PPPs) are being used in the literature and practice and variations depend on the academic or regulatory context in which they are used. Broadly speaking PPP refers to private sector involvement in realising public works and PPPs generally fill a gap between traditional procurement of government projects and full privatization (Grimsey & Lewis, 2005). Grimsey & Lewis (2005) argue that PPPs differ from privatization in the sense that the government no longer has a direct role in the operation of a privatized asset, but maintains ultimate responsibility in the case of a PPP.

Most definitions of public private partnerships refer to collaboration between public and private sector parties on a medium- to long-term basis, involving the provision of services and capital for the design, construction, management, operation and/or ownership of physical assets, and utilizing contractual methods of sharing risks and rewards between the various parties (Grimsey & Lewis, 2005; Yescombe, 2007; Chan et al, 2009; World Bank, 2009; TRB, 2012).

PPPs can involve a wide range of contracts from short-term to long-term, from provision of limited services, to complete financing, construction and operation of major (infrastructure) assets. According to the World Bank report Attracting Investors to African Public-Private Partnerships (2009, p. 8), the provision of public infrastructure by a private party under a long-term PPP arrangement typically involves the following:

- Design and build or upgrade the public sector infrastructure
- Assume substantial financial, technical, and operational risks
- Receive a financial return through payments over the life of the contract from users, from the public sector, or from a combination of the two
- Return the infrastructure to public sector ownership at the end of the contract (in some cases the private party may retain ownership of the asset).

Chan et al (2009) and the World Bank (2009) state that PPP schemes often use contract types such as the following, or variations thereof:

- Design Build (D&B)
- Operate Maintain (O&M)
- Design Build Operate (DBO)
- Build Own Operate Transfer (BOOT)
- Build Own Operate (BOO)
- Lease Own Operate (LOO)

While PPPs are used in a wide range of industries, each with their own particular issues, the basic concepts and contract forms are applicable to a variety of infrastructure projects. Projects can involve the provision of infrastructure products/services directly to a government agency, or to the general public.

According to Grimsey & Lewis (2005) the key objective of the public sector for using PPP arrangements is to achieve greater value for money. This would suggest the private sector may be more efficient at delivering the range of "infrastructure services" (p. 174) bundled together in a PPP, than the public sector is at procuring them separately. They argue that this is mainly due to "economic signals" (p. 172) that affect the private sector, but the public sector is removed from (Grimsey & Lewis, 2007). For instance, the use of project finance creates an incentive to ensure the PPP project is delivered on time as the cash flows generated from operating the project are the main, or only, source for repaying debt (Grimsey & Lewis, 2005). However, Chan et al (2009) argue that the extent to which PPPs provide value for money is not conclusive, as the outcomes under alternative arrangements are always unknown.

Yescombe (2007) and Chan et al (2009) argue that the main motive for governments using PPPs for infrastructure development is that it can support increased investment without raising government borrowing. This is important for low income and emerging countries as PPPs can advance infrastructure projects "when governments face fiscal constraints that would prevent the use of traditional government procurement methods" (Chan et al, 2009, p. 173). Estache (2001) supports this by arguing that fiscal crisis was the main reason for

governments in the 1990s to turn to the private sector for infrastructure development. Yescombe (2007) points out that PPPs are additional to other forms of public sector investment and not in substitution for it, effectively enabling the public sector to make (or bring forward) investments in infrastructure that otherwise would not have been possible (or would have to be carried out later).

Besides the greater efficiency and access to private capital, the World Bank (2009) argues that PPPs also create long-term mutuality of interests of public and private parties, moving away from short-term "claims culture" (p. 3) sometimes associated with traditional public procurement. Yescombe (2007) supports this by arguing the capital at risk provides a financial incentive to the private parties to ensure the project operates as required. Finally, the long-term nature of PPP projects requires thorough evaluation in project selection, which leads to more efficient use of resources (World Bank, 2009). This last motivation of PPPs is supported by Orr & Kennedy (2008), who implore private parties to "maintain commercial discipline in the selection of projects and ensure that marginal projects not go forward in times of booming economic activity" (p. 121).

Grimsey & Lewis (2007), Yescombe (2007) and Chan et al (2009) describe several contentious issues raised by opponents of the use of PPP procurement methods, including the following:

- The cost of finance for private parties can be expected to be higher than for governments. However, the cost of finance raised by private parties for a particular PPP infrastructure project reflects the level of risk of that project. The cost of finance for government often does not include this specific risk premium and can therefore not be compared on a like-for-like basis.
- There may be concerns that the returns the private sector expects to earn for bearing the project risks are excessive, thus increasing the costs of provision of the infrastructure. However, it has been shown that the excess return to investors, compared to a competitive bidding market, is at most around 0.7 per cent. Further excess returns may be achieved by refinancing debt following good performance or risk reduction. It is suggested that such excess returns may be shared with governments through revenue-sharing agreements.

- Concerns are expressed about community access and user charges for the infrastructure provided under the PPP arrangement. User charges and tariffs can be addressed in the PPP contract and in regulation of the particular industry or type of infrastructure.

As we move on to look at the use of PPPs for airport projects some of the issues, motivations and concerns mentioned above will be addressed more specifically.

5.4. Airport Business

In order to evaluate the role of public private partnerships in airport development it is important to understand the business of airports and typical ownership and operation models.

Historically, most airports around the world were owned and managed by the state or a local government. However, in the 1990s the role of government in the provision of public infrastructure, including airports, started to shift from owner to regulator and policymaker (Juan, 1996; Tretheway, 2001; Oum, Zhang & Zhang, 2004; Czerny & Zhang, 2015). Several countries started to privatize or corporatize their airports, transferring complete or partial ownership, as well as management responsibilities to private firms. In Africa, most airports are still government owned and operated (Gwilliam, 2011).

Several models of airport operation and ownership are used around the world, ranging from state owned and operated, to fully private. Broadly speaking the models can be divided into the following four distinct groupings: (i) public ownership and operation, (ii) regional ownership and operation, (iii) public ownership and private operation, and (iv) private ownership and operation (Tretheway, 2001; Gwilliam, 2011). Airport companies, whether publicly or privately owned, or a combination thereof, can own and/or manage one or more airports. Several large airports companies (e.g. British Airports Authority, Schiphol Group, Fraport and Airports Company South Africa) have stakes in airports in several countries, ranging from full airport ownership and operation in their home countries, to minority equity stakes, or limited management contracts at airports abroad.

The privatization and commercialization of airports, along with growing air traffic and general deregulation of air transport, has led to airports gradually evolving from simple providers of an infrastructure service, to complex, multifaceted businesses (Juan, 1996; Tretheway, 2001; Akwei, Tsamenyi & Sa'id, 2012). The core activities of an airport business are the provision of runways, taxiways, aircraft stands and security areas. These activities generate the so-called aeronautical revenues, through the collection of landing charges from aircraft operators (airlines) and passenger service charges. Non-core activities include ventures such as retail, property development, parking and other concessions. Income generated through these commercial activities is referred to as non-aeronautical revenue. The importance of non-aeronautical revenue for airport business is growing and already represents more than half of the total income, in most regions of the world (ACI, 2013). In this regard, African airports are lagging behind with non-core activities accounting for approximately one-third of total income. Non-aeronautical activities also tend to be more profitable than aeronautical operations (Oum, Zhang & Zhang, 2004).

5.5. Airport PPPs

As businesses with substantial fixed assets and multiple revenue streams, airports can be attractive to private investors. Given the multifaceted character of airport business, there are numerous ways of structuring airport PPPs. Private sector participation can range from service and management contracts, to long-term leases or even outright sale (see Table 5-2). Airport PPPs can involve new 'greenfield' airport developments, or existing 'brownfield' airports where the private party may be expected to carry out upgrades or expansions. Performance contracts are often used, specifying levels of performance that the private party must meet, including measures such as customer service, on-time flight departures, and environmental noise generation. PPP deals can cover a particular service or part of airport operations; they can be limited to a specific facility such as a terminal building, or cover the entire airport with all its facilities and services.

Table 5-2: Airport privatization continuum, generic models (from: TRB, 2012)

Partial privatization	*Least privatization* Service contracts ↓ Management contracts ↓ Developer financing and operation
Full privatization	↓ Long-term lease or sale ↓
Private development	Private airport ownership or development *Most privatization*

Each of the models of privatization, or PPP structures, comes with different roles and responsibilities for the public sector and different arrangements for sharing of risks and rewards. According to Tretheway (2001) two key considerations for choosing airport PPP structures are the means by which the airport is expected to meet its financial requirements, and the degree of freedom in setting prices. As some airport services are inherently natural monopolies, economic regulation is particularly important in order to protect customers (i.e. the general public) from excessive prices (Tretheway, 2001; Oum, Zhang & Zhang, 2004; Czerny & Zhang, 2015). For instance, O'Donnell, Glennie, O'Keefe & Kwon (2011) argue that the lack of strict price regulation has allowed the privatized Sydney Airport in Australia "to use its market power to charge monopoly rents" (p. 176), leading to complaints by airlines, passengers and other airport users.

There are four main types of regulation: (i) rate of return regulation, (ii) cost of services regulation, (iii) price cap regulation, and (iv) intervention regulation. The most direct and widely used way of regulating airport charges, for both aeronautical and non-aeronautical services, is price cap regulation (Tretheway 2001; Czerny & Zhang, 2015). Price cap regulation is very important to the structure and details of airport PPP deals, and is subject to intensive debate. The type of regulation chosen, and the price caps set, greatly affect an airport's ability to generate financial returns, affects the costs of air travel to the general public, and may provide airports with incentives for innovation and development. According to Tretheway (2001), in most countries only aeronautical services are subject to price cap

regulation, as commercial non-aeronautical services are perceived to be offered in a more competitive market and therefore regulation is not required. The following three main versions of price cap regulation are in use at various airports around the world:

- **Single-till price cap** – In this version of regulation both aeronautical revenues and non-aeronautical profits are used to cover the fixed costs of the airport's aeronautical infrastructure, such as runways, taxiways and terminal buildings. The price cap for the airport's aeronautical charges, i.e. the landing and passenger fees, is calculated by subtracting total operational costs, both aeronautical and non-aeronautical, from the non-aeronautical revenues. The difference, or residual cost, is then covered by the aeronautical fees.
- **Dual-till (or multi-till) price cap** – Under the dual- or multi-till approach the aeronautical costs are to be covered only by the aeronautical revenues. This may lead to higher landing and passenger fees, but can also incentivise airports to develop their commercial activities.
- **Hybrid-till price cap** – This model is a combination of single- and dual-till approaches and allows for the price cap to be set such that the aeronautical costs are covered by aeronautical revenues plus a portion of non-aeronautical profits.

Czerny & Zhang (2015) point out that airport market power, airline market power, airport congestion and the type of airport concession used are key factors to be considered in the evaluation of the various forms of price regulation for airports. Research has focused on determining the optimal pricing structure in order to maximize welfare for society as a whole, considering both the airports, airlines and their customers, i.e. the general public (Oum, Zhang & Zhang, 2004; Czerny, 2006; Czerny & Zhang, 2015). Their research has found that single-till regulation is beneficial when airports are not congested, by controlling airport market power. In the case of capacity-constrained airports dual-till regulation is preferred in order to control excessive congestion, which may lead to delays and lower levels of service. In addition, the extent of under-investment is lower under dual-till regulation, while total factor productivity is greater than under single-till regulation. Furthermore, they mention the auctioning and trading of slots, i.e. landing rights at the airport, can be used to control

the detrimental effect of too low aeronautical charges set under single-till regulation at congested airports.

In order for airport PPPs to be successful and beneficial to all stakeholders, each airport must be considered in its own competitive landscape. Different forms of privatization, coupled with appropriate price regulation, are required for every different situation. Governments may have various reasons for considering airport PPPs, which typically include some of the following key motives (Tomová, 2009; Stiller, 2010; TRB, 2012, Rikhy, Roberts & Cheung, 2014, Özdemir, 2015):

- Access to private capital for development
- Extract an upfront or ongoing payment for the airport asset (monetize the asset)
- Stimulate air service and airline competition, and meeting increased traffic demand
- Introduce more innovation and creativity, including entrepreneurial ideas in the development of non-aeronautical revenue
- Secure long-term efficiencies in operation and maintenance and enhance customer services
- Transfer of technology and operational expertise
- Internationalise airport business and involve global players
- Shift the risk of debt, capital development and/or operations to the private sector
- Accelerate project delivery and reduce construction costs
- Reduce reliance on general tax levies
- De-politicise airport decision making

Airport PPPs are typically established through a competitive international bidding process, whereby the government invites bids from eligible and interested parties and awards a concession to the winning party. The winning party (the concessionaire) is then allowed by the government (the grantor) to operate the airport for a certain period of time and under certain conditions. These conditions often include required investments in capacity upgrades and financial structures under the applicable regulatory model.

According to Rikhy et al (2014, p. 301) the majority of airport investors or operators have, until recently, been one of the following:

- Infrastructure fund investors with airports as part of a broader portfolio of infrastructure assets;
- Concession companies with core construction businesses that have recently diversified into airports with limited airport operating experience, seeking to complement their core business;
- Airport operators tied to a large, state-owned airport with limited flexibility and often limited resources (both financial and staff) spent on projects outside their home airports; or
- Pure construction or development companies seeking to be the engineering, procurement and construction (EPC) contractor while remaining a shareholder during the development phase and exiting once the construction is finished.

They point out that the involvement of EPC contractors has been more prevalent in the developing world due to the often large-scale developments of airport infrastructure and facilities tied to the airport PPPs. In recent years the following three new models for airport investment or ownership have emerged (Rikhy et al, 2014, p. 302):

- Direct investment from institutions such as pension and sovereign wealth funds;
- Cross-holdings or partnerships between existing airport operators; and
- Investor-operator airport platforms.

Due to the various objectives that may drive the grantor to embark on an airport PPP, and the complexity of the airport business, airport investors and operators with a wide range of capabilities and active involvement in the airport management are desirable (Feldman, 2008; Rikhy et al, 2014). Feldman (2008) argues it is necessary to create a consortium or joint venture that brings together the right mix of operational expertise, local experience and capital.

Governments around the world, including those in emerging markets, have decided that they can successfully involve the private sector in the financing and operation of airport infrastructure using PPPs (Magagi, 2011; ICAO, 2013b). For instance, there are 25 airport companies worldwide that are listed on stock exchanges; five being Chinese, three Mexican, two from Southeast Asia, and the remaining fifteen from Australasia and Europe (ICAO,

2013b). According to Magagi (2011) global investment in airport projects with private participation amounted to more than US$ 7 billion in 2006, and this reduced to just over US$ 2 billion in 2008. In the following years the investment activity remained around or below this level, until it shot up dramatically to around US$ 15 billion in 2012 mainly due to the closure of three large airport projects in Brazil (World Bank, 2013). The Private Participation in Infrastructure Database (World Bank, 2015a) shows total airport investment with private participation in Sub-Saharan Africa between 2004 and 2014 worth only US$ 210m. Rikhy et al (2014) argue that airport privatization is a trend that is supported by an abundance of capital and investors having an increased understanding of value drivers for airports, having become more comfortable with demand risk and increasingly being able to adjust their returns for asset types and geographies.

From the perspective of emerging markets Brazil and India are particularly interesting cases. Between 2011 and 2014, Brazil has privatized six of its major airports, under 20 to 30 year concession. The auctions of these PPP concessions were oversubscribed, including bids by local and global players, and prices were invariably higher than forecast. The Brazilian state airport operator Infraero retained a 49% equity stake in each of the concessions.

India has also concluded PPP deals at six major airports since 2006, and further concessions are currently being considered. In its report on airport investments in Africa, the Centre for Aviation (2014a) argues that the Indian airport privatizations have become “a sort of role model for the developing world” (p. 3) and private investment in airport infrastructure in Africa is expected to follow this model. This model is characterised by the national government remaining the major investor in the PPP development, with a stake up to 50%, while private investors and operators take up stakes of around 10% each.

In a description of the state of airport privatization around the world Tomová (2009) mentions there are thirteen PPP airports in Sub-Saharan Africa. The article, which may be slightly outdated by now, lists 4 airport PPPs in South Africa, and one each in the following countries: Cameroon, Côte d’Ivoire, Gabon, Kenya, Madagascar, Mauritius, Nigeria, Tanzania and Togo.

5.6. Bankability of Airport PPPs in Sub-Saharan Africa

The literature reviewed shows there are clear drivers for governments, particularly in emerging markets, to consider PPPs for airport development. There are numerous successful examples and plenty investor activity worldwide. However, airport PPP activity to date in Sub-Saharan Africa is very limited. One of the main reasons for this may be that airport PPP projects are often not considered bankable.

A project is considered bankable if debt financiers, who typically provide the majority of capital, are willing to finance it (European Investment Bank, 2015b). In general terms, debt financiers will consider a project bankable if they believe the revenues generated by the project will be sufficient to pay back the loans and the risks involved with the project are acceptable. The concession grantor (i.e. the government) has various methods for enhancing a project's bankability, which include the setting and structuring of concession fees and the protection of investors against specific risks (Stiller, 2010).

Risks associated with PPP projects are numerous and Yescombe (2007, p. 242) divides them according to the project phases as follows:

- general political risks
- site-related risks
- construction risks
- completion risks
- operation-phase risks

He further describes that political risk is particularly important in PPP projects, as the one party in such a project, the government, "may be able to use its power to change the law, or take executive action, to the detriment of the Project Company" (p. 247). According to the report Attracting Investors to African public-private partnerships (World Bank, 2009) some of the major concerns of PPP equity and debt investors relate to the "effectiveness and enforceability of the PPP contract and related agreements" (p. 58-59). Research by Ojah, Gwatidzo and Kaniki (2010) indicated that support for property rights has a positive impact on the decisions to invest in fixed capital of firms in SSA, specifically in the East African Community. This shows that the rule of law in the project country, specifically the quality

and enforcement of property rights, can be a major determinant in the bankability of a project. More generally, the limited investability of emerging markets, due to what Ladekarl and Zervos have termed “housekeeping and plumbing” issues (Ladekarl & Zervos, 2004), is a factor that contributes to the low number of airport PPPs in SSA.

Another factor that negatively affects the bankability of PPP projects in SSA is the limited availability of (long-term) debt funding. This, along with the opportunities to refinance debt, is also described as one of the major concerns of investors in African PPPs (World Bank, 2009). Domestic financial markets in most SSA countries are relatively underdeveloped, in particular (long-term) bond markets (Andrianaivo & Yartey, 2010; Mezui & Hundal, 2013). The limited capacity of long-term domestic bond markets creates a reliance on the banking sector for finance (Özdemir, 2015). Unfortunately, in many SSA countries the banking sector is not able to support large infrastructure investments with the appropriate terms. Banking credit to the private sector is less than 15% of GDP in emerging markets, while it is more than 100% in developed countries (Andrianaivo & Yartey, 2010). A lack of (affordable) domestic funding for airport PPPs creates a reliance on foreign investment, which brings with it currency risks. In order to mitigate this, the denominating currencies of cash inflows and outflows of an airport PPP should be matched (Özdemir, 2015), which is not always feasible.

Finally, a key aspect of the bankability of airport PPPs in SSA is the ability of the airport to generate sufficient income to cover costs and repay financiers. This is linked directly to the air traffic at the airport, as that is the key driver for aeronautical revenues directly, and non-aeronautical revenues indirectly. As highlighted earlier, in 2013 there were only 32 airports in Africa with more than 1 MAP, which is often considered the minimum level of traffic for an airport to be profitable. This means the pool of prospective airport PPPs in SSA is limited from the perspective of revenue potential. Rikhy et al (2014) point out that many of the airports in the world that have not yet been privatised are in small markets or are regional airports with relatively low levels of air traffic. Moreover, they point out that “politically and economically unstable emerging markets” (p. 303) provide a challenging environment for investors to ensure recovery of their investments and compensation for risks. Long-term traffic growth rate forecasts of around 4 to 7% per annum for Africa can make for bankable

projects. However, Coombs (2011) urges caution in using the link between GDP growth and passenger traffic growth in forecasting, as pressure on airline profitability may put pressure on aeronautical revenues for airports. Important to note here is that the growth of air traffic in Africa is limited due to the highly regulated aviation markets that are subject to restrictive bilateral agreements (InterVISTAS, 2014). It is argued that liberalisation of aviation markets (i.e. airspace) leads to lower prices and increased levels of air traffic, which in turn supports the bankability of airport PPPs.

5.7. Discussion

The contributions of transportation infrastructure, including airports, to economic development have been studied extensively and positive linkages have been established. As many developing countries struggle to mobilise sufficient funds from their budgets for the development of transportation infrastructure, project finance, and PPPs in particular, offer a way to involve the private sector in funding of infrastructure development. It has been argued that this can bring several benefits including greater efficiency in operations and maintenance of the infrastructure.

PPPs have been applied to the development of airport infrastructure worldwide, although not as widely in emerging markets. Past examples of airport PPPs in SSA are limited and peer-reviewed literature on the topic is scarce. This means governments in SSA who are considering their options for financing airport developments face a lack of insight into the possibilities and challenges associated with PPPs.

This research aims to address this gap in literature by exploring the benefits, risks, opportunities and challenges associated with airport PPPs in SSA. It aims to identify pertinent issues that are faced by governments and their perceptions of the applicability of the various PPPs models available to further much-needed airport developments in the region.

6. Research Design and Methodology

6.1. Introduction

The research questions posed in this study relate to a subject, airport PPPs in SSA, on which limited research literature is available. Very little is known about the views on the topic of the stakeholder of interest to this study, governments in SSA. According to Creswell (2009) this type of research warrants a qualitative approach that is exploratory in nature, as opposed to a quantitative approach that seeks to test an objective hypothesis. Creswell (2009) argues that the qualitative research process is focused on the formation of an understanding, by the researcher, of the view that the participants in the study hold on the topic. It typically involves multiple forms of data, including (publicly available) documents and interviews with participants. Mack, Woodsong, MacQueen, Guest & Namey (2005) argue that qualitative research enables rich and explanatory views on the topic to be developed and intangible and unexpected factors to be identified.

This study is exploratory and practice-oriented in nature, as it aims to identify motivations, limitations, concerns and challenges that are faced by governments in SSA in relation to airport PPPs. The lack of information available on this topic presents the need to obtain first-hand information (i.e. primary data) from these governments. The chosen research method for this is in-depth interviews.

However, in order to inform the interview process, it is important to be aware of the latest developments on the topic of airport PPPs in emerging markets. The most important airport PPPs in emerging markets in the last few years have occurred in Brazil in India. As these developments have been reported on widely (in popular press rather than peer-reviewed literature) it is likely that they will have influenced the view of SSA governments on the topic. Therefore, document-based case studies have been conducted to explore these recent developments.

6.2. Case Studies

6.2.1. Methodology

According to Creswell (2009) and Dul & Hak (2008), in a case study a researcher explores one or a small number of cases, bounded by time and activity, in their real life context and findings from the case(s) are analysed in a qualitative manner. Dul & Hak (2008) argue that case studies are particularly suited for descriptive practice-oriented research that aims to contribute to the knowledge of practitioners. According to Yin (2003) and Hancock & Algozinne (2006) a descriptive case study describes an event (a case) and the real-life context in which it took place.

One of the research sub-questions relates to drawing insights from past airport PPPs in emerging markets. In order to address this aspect of the research, the case studies conducted aim to grow the knowledge on the recent airport PPPs in the emerging markets of Brazil and India. The knowledge gained from these case studies informed the interviews with SSA governments conducted in this study and can benefit practitioners in the field of airport PPPs.

In line with Dul & Hak (2008) the methodology followed for the document-based case studies includes the following steps, which are described in more detail in the following sections:

- Case selection
- Data collection
- Analysis

6.2.2. Case selection

In order to draw insights from airport PPPs in emerging markets, the population of eligible cases to be studied contains all past airport PPPs in all emerging markets. From this population we selected cases, through purposive sampling, that are of particular interest to this study (Mack et al, 2005; Dul & Hak, 2008; Creswell, 2009). According to Mack et al (2005) purposive sampling is one of the most widely used methods of choosing study subjects based on pre-selected criteria that are applicable to the research question at hand.

As the thinking on airport PPPs continues to evolve, due to changes in the competitive environment (e.g. the global economy, industry regulation, etc.), it is important to look at recent cases, certainly no more than 10 years old. Furthermore, due to limited availability of data on airport PPP transactions, it is imperative to choose cases on which sufficient information is available.

From the emerging market perspective, two countries immediately come to the fore: Brazil and India. Both countries have implemented several airport PPPs in the last decade, which have all been widely publicised and debated (in popular media).

According to World Bank (2015b) classifications Brazil is an upper middle income country (with a GDP per capita in 2014 of US$ 11,384 and a population of 206 million) and India is a lower middle income country (with a GDP per capita in 2014 of US$ 1,582 and a population of 1.295 billion). Most of SSA is classified as lower middle to low income, with the exceptions of Gabon, Namibia, Botswana, Mauritius and South Africa which are upper middle income. The average GDP per capita of SSA is US$ 1,777 and the total population is 973 million.

Looking at these indicators it seems that Brazil provides a reference point for the upper middle income countries in SSA, and those aspiring to move into that category. India provides a closer reference to the lower middle income countries in SSA, and those low income countries that are hoping to grow to that level. As part of the so-called BRICS (Brazil, Russia, India, China and South Africa) group of leading emerging markets, these two countries certainly seem to be relevant cases for this study.

6.2.3. Data collection

According to Baxter & Jack (2008) case study research typically uses multiple data sources, which are analysed jointly, rather than separately. As phenomena can be viewed from different perspectives, using various data sources increases the validity of the research findings (Baxter & Jack, 2008; Dul & Hak, 2008; Creswell, 2009). This process of cross-checking different data sources, data types or researchers is known as triangulation and is used to enhance the strength of these case studies.

The document-based case studies of airport PPPs in Brazil and India made use of publicly available information, mainly from the following sources:

- Scientific, peer-reviewed, publications
- Media publications (popular/commercial)
- Company information

According to Creswell (2009) the limitations of document-based case studies are that some of the information may not be publicly available, may be hard to find or may be incomplete. Further, he points out that authenticity and accuracy of documents may be an area of concern. On the other hand, he asserts the advantages being that documents are unobtrusive (i.e. no direct interaction with participants is required), represent data that have been put together thoughtfully and are more time- and cost-effective than other information sources (i.e. observations or interviews).

Due to time, geography and cost limitations no interviews or other participant interactions have been conducted for these case studies. This is considered acceptable as the purpose of these case studies is to provide context, understanding and background to the further research that is conducted in SSA through interviews.

6.2.4. Analysis framework

According to Baxter & Jack (2008), at the stage where the gathered data is analysed, a "conceptual framework serves as an anchor for the study" (p. 553). They argue that such a framework can support the researcher in determining what to include in the analysis, what likely relationships are based on logic and theory, and in grouping or classifying certain elements.

The analysis framework used in the case studies of airport PPPs in Brazil and India is based on the theory of airport PPPs outlined in the literature review. The following elements are of key importance to the understanding of the airport PPPs that took place in the countries, and the insights that may be drawn from them:

- **Deal structure**; the various parties involved in the concession arrangements for the various airports. Of particular interest is the role the government plays in these

deals, through participation, support and regulation. Further, the type of private parties involved, and their origins, have been identified.

- **Regulatory environment**; the particular regulatory regime applied to govern the various airport privatizations (i.e. the till structure). As noted in the literature review the till structure is of key importance to airport PPPs as it influences the revenue generated.
- **Investments**; the investments required to obtain the concession and the prescribed infrastructure upgrades. These capital outlays are crucial to the bankability of the airport PPPs.
- **Air traffic**; the level of air traffic at the various airports and the growth thereof. As outlined in the literature review the air traffic determines, directly and indirectly, the revenues generated by an airport and is therefore of paramount importance in airport PPP deals.
- **Possible results of PPP deals**; the possible positive or negative effects observed by stakeholders in the PPP deals. For example, these results may be financial performance by the concessionaire, or service levels experienced by airport users.

Each of the above elements have been analysed for the airport PPPs in Brazil and India in order to gain a deeper understanding and draw insights. Subsequently, the findings from each of the two countries have been compared in order to identify possible trends, or significant differences.

6.3. Interviews

6.3.1. Methodology

Interviews enable a researcher to gain new and vivid insights into a specific topic, expressed in the words of the respondents (Mack et al, 2005; Folkestad, 2008). According to Mack et al (2005) the interviewee is considered an expert and the interviewer intends to learn as much as possible about the topic from the expert. Inherent to the interview methodology is that the information gathered is indirect and filtered through the interpretation and expression of the interviewees (Creswell, 2009).

Interviewers should pose questions in a neutral manner and not lead the interviewee according to preconceived ideas or (dis)approval. Creswell (2009) argues that open-ended questions allow interviewees to express their views freely and in their own words, thus reducing the influence of the interviewer's past experience and opinions. Interviews allow for a measure of flexibility that enables the researcher to ask follow-up questions and probes based on the participant's responses. Probes can be used to stimulate the interview, clarify responses, or delve deeper into a response (Harrell & Bradley, 2009).

Mack et al (2005) describe that one major advantage of using interviews as part of exploratory research is that open-ended questions and probing allow respondents to answer in their own words, which enables responses that are (p. 4):

- meaningful and culturally salient to the participant
- unanticipated by the researcher
- rich and explanatory in nature

Furthermore, Folkestad (2008) and Nohl (2009) claim that results from multiple interviews can be compared, as the respondents are asked for their views on the same topics. This does require the interviews to be somewhat standardised. In terms of standardisation Harrell & Bradley (2009) and Baumgartner & Pahl-Wostl (2013) describe a spectrum of interview approaches, ranging from improvisation to determination, highlighting that a common factor amongst all is the freedom of participants in answering the interview questions. Two common categories of interviews on this spectrum are structured and semi-structured interviews (Harrell & Bradley, 2009; Woods, 2011).

Structured interviews are characterised by the pre-planning of all the questions asked, which allows for exact replication of the interview with numerous respondents. Questionnaires and surveys are structured interview techniques that are often used in research. The main advantages of structured interviews are the possibilities for replication with many respondents, the high level of comparison or generalisation that is possible and the reliability of results due to internal consistency. However, the main disadvantage is the restrictive nature of questioning yielding restricted answers (Woods, 2011).

Due to the exploratory nature of this study and the limited number of respondents, semi-structured interviews were deemed a more suitable method. In semi-structured interviews the questions asked are partially pre-planned, allowing for a degree of flexibility in probing and follow-up. This allows for much richer and more detailed information to be obtained and a deeper understanding to be developed than is possible with other research methods (Harrell & Bradley, 2009; Nohl, 2009). However, results from semi-structured interviews are more difficult to compare and generalise than those of structured interviews (Woods, 2011).

6.3.2. Respondent selection

In order to learn about the views on airport PPPs of the governments in SSA, the total population of possible participants in the interviews for this study consists of the relevant persons in the governments of all countries in SSA. Using the commonly applied method of purposive sampling those participants that are of interest to this study were selected (Mack et al, 2005; Creswell, 2009). As the objective of these interviews is to explore and gain an understanding of the views of SSA governments on airport PPPs, a random sampling strategy would be inappropriate (Baumgartner & Pahl-Wostl, 2013). The purpose is not to generate a representative sample and generalise results, but rather to gain a rich and deep understanding of the topic by interviewing people who are well-informed. The criteria that were used to select the possible participants in the interviews are the following:

- **Air traffic**; as discussed in the literature review, the level of air traffic at an airport is an important factor in airport PPPs. The generally accepted minimum level of air traffic for an airport to be profitable is 1 million annual passengers (MAP). This means that only those airports with more than 1 MAP, or those that are expected to reach 1 MAP in the foreseeable future, are interesting candidates for PPPs. Therefore, only governments of countries with such airports are selected for this study.
- **Geographical spread**; in order to gain a broad view of the topic throughout SSA, the selected respondents should represent a reasonable geographical spread. For this reason respondents were selected from countries in Southern, East and West Africa.
- **Access by researcher**; for the researcher to establish contact and set up interviews with the relevant respondents within the limited time frame of this study, access to

the appropriate persons in the countries of interest was needed. The selection of respondents was thus limited to those countries where the researcher has access to the relevant networks.

- **Knowledge and authority**; within the selected SSA governments the appropriate respondents would be those people with sufficient knowledge on the topic (i.e. subject matter experts) and an authority to share the views of the governments they represent. Therefore, it was imperative to ensure the right respondent in each government was approached.
- **Willingness and availability**; as the topic of the interviews relates to government policies and considerations regarding the privatisation of airports, this could be considered sensitive or confidential information. It is crucial that respondents are willing to share their views on this topic and allow for it to be published in this study. Moreover, availability to participate in the interviews within the limited timeframe of this study was essential.

Whether a country has had experience with airport PPPs in the past was not considered a criterion for respondent selection. The views of governments both with and without experience are valuable when looking ahead to future airport developments.

Based on the abovementioned selection criteria, respondents from the following countries were approached with a request for participation in this study (i.e. to determine their willingness and availability):

1. Botswana
2. Ethiopia
3. Ghana
4. Kenya
5. Mozambique
6. Namibia
7. Nigeria
8. Rwanda
9. South Africa

10. Tanzania
11. Zambia

6.3.3. Data collection

Interviews can be conducted face-to-face, via the telephone, via e-mail, or using other digital communication methods such as (video) chat programs (Opdenakker, 2006; Creswell, 2009). Opdenakker (2006) states that the advantages and disadvantages of the various interview methods can be characterised according to the dimensions of time and space, or according to technology used. He relates the main differences between the methods to synchronous or asynchronous "communication in time and/or space" (p. 2), as outlined in Table 6-1.

Table 6-1: Four interview methods divided according to synchronous or asynchronous communication in time and/or space (adapted from: Opdenakker, 2006)

	Time	**Place**
Synchronous communication	Face-to-face Telephone Video / chat	Face-to-face
Asynchronous communication	E-mail	E-mail Telephone Video / chat

According to Opdenakker (2006) face-to-face interviewing is the only method that is synchronous in both time and space and therefore provides the full advantages of social cues, spontaneity and direct interaction without time delay. However, he points out that these advantages bring with them additional complexity on the part of the interviewer, who has to manage the use of social cues and direct interaction so as to not bias or influence the results of the interview. The face-to-face interviews were recorded, with the permission of the respondents, to enable accurate analysis and reporting. In addition, notes were taken by the researcher during the interviews.

Face-to-face interviews were considered the preferred method for this study as they would provide the richest and most detailed results on the complex topic of the study. However, due to the geographical spread of the respondents, time and costs meant it was not feasible

to carry out all interviews in person. Some of the interviews, therefore, were conducted via telephone.

Opdenakker (2006) notes that telephone interviews are synchronous in time, but asynchronous in space, thereby extending access to participants. He points out that the visual social cues are not available, but the language- and voice-based social cues can still be used. According to Creswell (2009) the limited contact between interviewee and interviewer in telephone interviews can be outweighed by the greater flexibility in scheduling and access to participants. The telephone interviews were recorded using the speaker-phone functionality, and notes were taken by the researcher.

It should be noted that video chat programs (e.g. Skype) were considered for the interviews that could not be carried out face-to-face, because they provide the visual social cues that telephone interviews do not. However, the high quality internet connections required for this were not available in all places and therefore it was decided not to use this method, but opt for telephone interviews instead.

All the selected respondents were approached with a personalised e-mail request for an interview, with a short description of the study topic and objectives. Suitable dates and times were then arranged for both the face-to-face and telephone interviews. All of the interviews started with an introduction of the study, description of the research objective and questions, discussion on practical matters, such as terms of confidentiality, copyright, recording and the expected length of the interview, and an opportunity for interviewees to ask questions before the start. A list of guiding questions, or interview guideline, provided in Appendix A, was used by the researcher to provide a frame for the discussion and to ensure the relevant questions were asked and topics were addressed (Harrell & Bradley, 2009).

As described by Creswell (2009) the interview script contains a number of fact-based, or ice-breaker, questions to start off with. Following, there are several open-ended questions, with various sub-questions that can be used for probing. Questions focus on the present first, before moving on to the future.

6.3.4. Analysis framework

The analysis and interpretation of narrative data, obtained through interviews, is often referred to as content analysis (Taylor-Powell & Renner, 2003). The process of data analysis is considered to be continuous and iterative, and lines between data collection, analysis and interpretation can be blurred (Folkestad, 2008; Creswell, 2009).

The content analysis process followed for this study is based on the descriptions by Taylor-Powell & Renner (2003), Piercy (2004) and Creswell (2009) and is shown in Figure 6-1. Each of the steps is briefly described below.

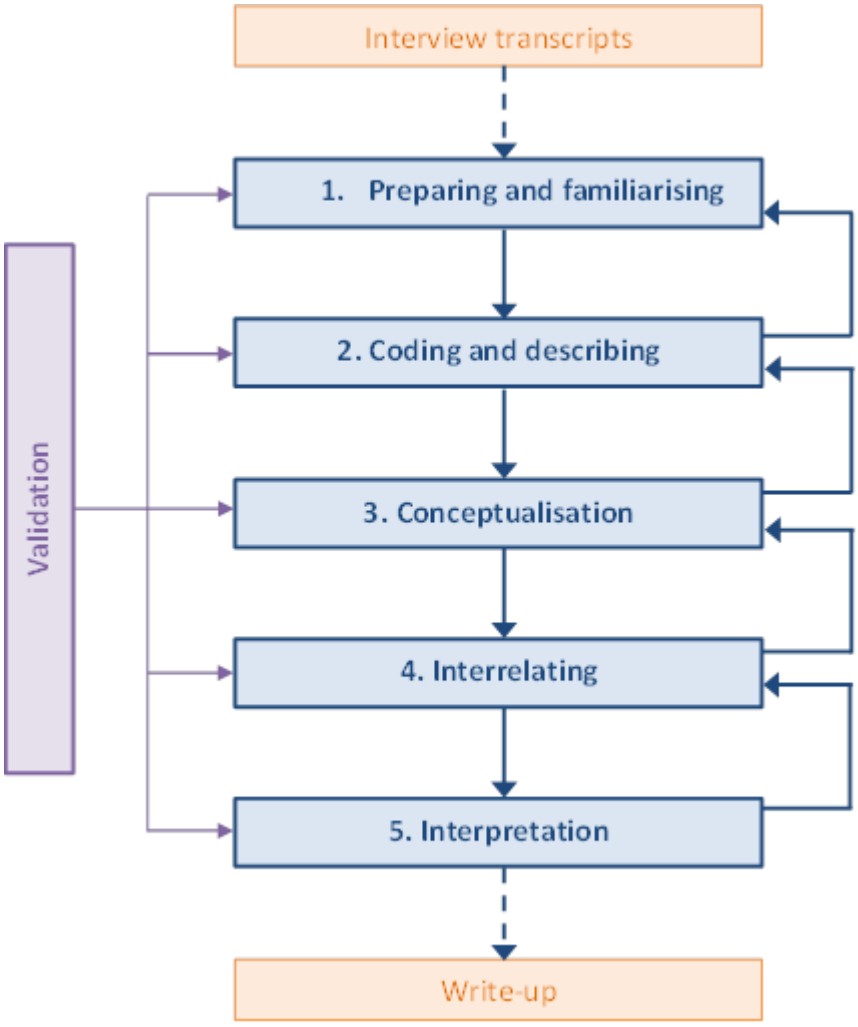


Figure 6-1: Content analysis process (adapted from: Taylor-Powell & Renner, 2003; Piercy, 2004; Creswell, 2009)

1. **Preparing and familiarising**; in the first step of the analysis the interview are transcribed and notes taken are typed up. The transcripts were then read through and notes made in the margin to record early observations.

2. **Coding and describing**; the second step of the content analysis involved the development of preliminary descriptive and interpretive categories, or codes. These codes are developed based on the actual contents of the interviews, on the knowledge gained from the document-based case studies and from the literature review. Both substantive (i.e. about the content) and attribute(i.e. about the respondent's characteristics) coding trees were developed, in a deductive and iterative manner, based around the research questions and knowledge of the respondents.

3. **Conceptualisation**; in this step of the analysis the preliminary categories are analysed further, with the aim of identifying connections between the various codes. The coding tree was expanded further with sub-codes where relevant.

4. **Interrelating**; in the fourth step of the analysis themes within and between the codes are identified. A theme is considered a meaning that is common across various instances within the interview data. Themes were described in a narrative to convey the findings of the study.

5. **Interpretation**; this final step of the analysis brings it all together and aims to elicit answers to the research questions from the data. The themes identified in the various interviews are compared across various groupings (e.g. between countries or regions, according to level of air traffic in the country, experience with airport PPPs, etc.) and related to the document-based case studies and literature review.

Throughout the content analysis process the validity of the findings has been checked using triangulation. The accuracy of statements by interviewees, as well as themes emerging from the interviews, was examined by cross-checking against the findings from the literature, and

other documentation that may be available on the specific topic. Any discrepant information that does not converge with the findings from the interviews has been presented in order to enhance the realism of the findings and highlight the complex and disparate views that exist (Creswell, 2009).

The conceptual framework used in the content analysis corresponded to the research questions posed in this study. It was founded on the key aspects of airport PPPs analysed in the document-based case studies, and on the topical theory outlined in the literature review.

7. Case Study Brazil

7.1. Background

Brazil, a vast country in Latin America, stretches more than 4000km from north to south and from east to west, and covers almost half of Latin America's total land area. According to the World Bank (2015b), in 2014 Brazil had a population of 206 million and a total GDP of US$ 2.346 trillion at market prices. With a GDP per capita of US$ 11,384 it is classified as an upper middle income country.

The country is a federation consisting of 26 states and one federal district, which contains the capital Brasília. It is generally divided into 5 geographical regions: Northern, Northeast, Central-West, Southeast and Southern.

The Brazilian Airport Infrastructure Enterprise (Empresa Brasileira de Infraestrutura Aeroportuária or Infraero) was established in 1972 as a government corporation (ICAO, 2013c). It was responsible for managing the country's main commercial airports and those in the federal district. In 2011 it managed 66 airports, which represented 97% of Brazil's air traffic (Switzerland Global Enterprise, 2013). According to ICAO (2013c) the various State Governments manage the 121 secondary airports in their territory and various cities manage another 131 secondary airports and airfields. The Brazilian Air Force and Navy manage their own military airports. Pinto (2012) states that there are 129 airports in 127 cities that receive regular flights and the main network is made up of the 26 State capitals, the national capital, two additional airports in São Paulo and one in Belo Horizonte.

The Switzerland Global Enterprise (2013) describes how a rising middle class, strong growth in tourism and the hosting of the 2014 FIFA World Cup and 2016 Summer Olympics caused (and may cause) substantial growth in air traffic. Furthermore, neglected transport infrastructure in the country and, in particular, underinvestment by Infraero, have led to most important airports in Brazil reaching critical occupation levels, prompting the urgent need for airport capacity upgrades and modernisations. According to Pinto (2012), a study conducted in 2010 indicated that nineteen of the twenty largest airports in the country were severely constrained in terms of terminal building and aircraft parking capacity. The

Switzerland Global Enterprise (2013) quotes a figure of R$ 7.3 billion (approximately US$ 1.8 billion) estimated by the Federal Government to be required to upgrade 13 airports for the 2014 FIFA World Cup. Given the amount of capital estimated to be required for the necessary upgrades, the government decided to introduce private investor participation in the airport developments.

7.2. Concessions

The first of the airports to be developed using a PPP model by the Federal Government was the Governador Aluízio Alves International Airport in São Gonçalo do Amarante near Natal, the capital of Rio Grande do Norte state. The greenfield airport, known as Aeroporto de Natal (IATA code: NAT), was opened in May 2014 and is operated by the Inframérica consortium on a 25-year concession (with the possibility of a 5-year extension). This concession was purchased in 2011 through an international competitive bidding process for US$ 106 million, giving the consortium a 100% equity ownership of the airport (Leigh Fisher, 2012; Airline Leader, 2014). This concession has been both referred to as a "benchmark for what might eventually become the norm" (Airline Leader, 2014) and a "trial privatization" (Centre for Aviation, 2013).

The second round of airport PPPs in Brazil was completed in early 2012 and involved three major airports, two in São Paulo and one in Brasília. According to the Centre for Aviation (2013) the concessions were concluded quickly as the 2014 FIFA World Cup was imminent and the government faced criticism "as to its tardiness in resolving infrastructure issues".

The concession for the Presidente Juscelino Kubitschek International Airport in Brasília (IATA code: BSB) was awarded to the Inframérica consortium that had also won the earlier NAT concession. The 25-year concession was sold for approximately US$ 2.6 billion. A 20-year concession for the country's busiest airport, São Paulo–Guarulhos (IATA code: GRU), was won by the Invepar-ACSA consortium for approximately US$ 9 billion. For Campinas-Viracopos (IATA code: VCP), in São Paulo, the 30-year concession was awarded to the Brazil Airports Consortium for around US$ 2.2 billion.

According to the Centre for Aviation (2013) the second round of airport PPPs was followed by a "lengthy period of introspection in the government", considering the lessons learnt and

changes to be made for the next round. The main points of contention were the minimum level of experience that the airport operator parties in the consortia should have, the limitations on previous winners to bid for new concessions and the role of Infraero in the privatised airports.

Round three of the airport PPPs in Brazil was concluded in 2014, involving the main airports of Rio de Janeiro and Belo Horizonte. The 25-year concession for Rio de Janeiro–Galeão International Airport (IATA code: GIG) was awarded to the RIOgaleão consortium for an amount of US$ 7.9 billion. For the Tancredo Neves International Airport (IATA code: CNF) in Confins near Belo Horizonte, the concession was won by a consortium known as BH Airport for approximately US$ 812 million.

In early 2015 the Brazilian Government announced the fourth round of airport PPPs will take place in the second quarter of 2016 (Ramalho, 2015). This round will involve the following four airports:

- Salgado Filho International Airport in Porto Alegre (IATA code: POA)
- Deputado Luís Eduardo Magalhães International Airport in Salvador de Bahia (IATA code: SSA)
- Pinto Martins International Airport in Fortaleza (IATA code: FOR)
- Hercílio Luz International Airport in Florianópolis (IATA code: FLN)

7.3. Role of government

In airport PPPs governments play various different roles. Firstly, the government, through Infraero, was the operator of the airports that were privatised. This means Infraero transferred the airport operation tasks to the private concessionaires, usually over a transition period of 6 to 12 months (Switzerland Global Enterprise, 2013). However, Infraero retained an equity ownership stake in the concessions of 49% (except for the first NAT concession, where 100% equity is owned by the private consortium), thus maintaining a veto right on strategic decisions (ICAO, 2013c). Furthermore, this ownership stake of Infraero ensures it does not lose all the income from the privatised airports, but is still entitled to dividends (Pinto, 2012).

Secondly, the government provides the regulatory framework for the airport PPPs, mainly through the National Civil Aviation Agency (Agência Nacional de Aviação Civil, ANAC). ANAC was established in 2006 to take over from the former civil aviation authority, the Air Force's Department of Civil Aviation (DAC). ANAC falls under the Presidency, and is linked to the Civil Aviation Secretariat (SAC) and the Ministry of Defence. In conjunction with the Federal Audit Court, ANAC sets the terms of the various airport PPP concessions and manages the bidding processes (Centre for Aviation, 2013).

Moreover, ANAC is responsible for the economic regulation of the airport concessions. This means it establishes and controls the aeronautical charges the airports are allowed to charge their customers, which may be different for each airport. These charges include boarding fees, landing fees, parking fees, storage fees and cargo handling fees (ICAO, 2013c). ANAC is an independent regulatory agency (IRA) that uses price cap regulation to ensure airport concessionaires do not charge monopolistic charges and fees regarding airport infrastructure services and operations (Serebrisky, 2012). Specifically, the Brazilian airport concessions operate on a hybrid-till model, whereby a part of the non-aeronautical revenues are directed to cover the aeronautical expenses (ICAO, 2013c). However, Serebrisky (2012) reports that ANAC indicated it uses a single-till model, whereby all non-aeronautical revenues are directed towards aeronautical expenses. He does indicate that there seems to be conflicting information on this topic in his research. According to Pinto (2012), ANAC uses the price-setting rule called $RPI - X - Q$, where RPI is the retail price index, X represents productivity gains made by the concessionaire and Q is a quality of service index (Alexander & Irwin, 1997). Under this price-setting rule the tariffs for aeronautical charges are adjusted annually to allow them to rise with inflation (or the retail price index), but ensure the productivity gains made are shared between the concessionaire and the tariff-paying public, and the concessionaire is penalised if quality standards are not maintained. The quality of service index Q is determined through a technical report that uses objective measures of service quality (such as queuing times and equipment availability) and a user satisfaction survey (Pinto, 2012). Pinto (2012) states that the concession parameters (X and Q) are revised every 5 years and that the economic regulation allows for extraordinary revision aimed at recovery of the financial balance of the contract, at the request of ANAC or the concessionaire.

Thirdly, the SAC established the Fund for National Civil Aviation (Fundo Nacional de Aviação Civil, FNAC) to foster the development of civil aviation in Brazil, through the maintenance and modernisation of public airport infrastructure (Civil Aviation Secretariat, 2015). Each of the airport concessionaires is obliged to contribute a certain percentage (2 to 10%) of gross revenue to the FNAC on an annual basis (Pinto, 2012; Leigh Fisher, 2013).

Beyond these three main roles, the government plays additional roles in (financing) the various consortia, as is described in the following sections.

7.4. Concession parties

The concession for each of the airports were awarded through an international competitive bidding process, with the winning bid defined as the one that maximised the total fixed fee for each airport (Pinto, 2012; Leigh Fisher, 2013).The bidding process consisted of three stages:

- Each interested party was required to submit its bid for one or more of the airports being auctioned at the time, in writing in a sealed envelope. The highest bidders for each airport were then selected to participate in the following round.
- A live, verbal bidding round took place at São Paulo's Stock Exchange allowing the selected bidders to bid against each other. This round was concluded and a winner selected at the point where there were no new higher bids for each airport.
- The highest bidder for each airport was invited for contract negotiations to iron out the details of the concession agreements.

For the first two rounds of privatisations there was a minimum requirement for the concessionaires to have at least 5 years' experience in operating airports and to have operated an airport with at least 5 MAP within the last 10 years (Pinto, 2012). However, after these two rounds President Rousseff and several bankers expressed their concerns over the lack of operational experience of the winning concessionaires (Rumsey, 2012; Centre for Aviation, 2013). For the next round, this lead to the requirement for Galeão (GIG) airport being raised to having an operator partner with experience operating an airport with at least 22 MAP, while for Confins (CNF) the requirement was 12 MAP (Leigh Fisher, 2013). Furthermore, the minimum equity share of the operator(s) in the consortia was raised from

10% to 25%. All these requirements were meant to ensure sufficient international experience was brought on board to ensure successful operation of the privatised airports.

Further to operational experience, the concessionaires were expected to bring sufficient capital to pay for the concession fees and the required airport infrastructure upgrades, as well as the construction capabilities to implement these upgrades. As described by Feldman (2008) consortia had to be formed in order to bring together the necessary expertise, experience and capital.

A multitude of international firms from all over the world were involved in the first three rounds of airport privatisations. As many as 11 consortia were qualified and submitted bids for one, two or all three of the airports in round 2. The following sections describe how each of the winning consortia for the first three rounds is constituted.

7.4.1. Natal (NAT) and Brasília (BSB)

The Inframérica consortium that won the first airport privatisation of Natal (NAT) and the second round concession for Brasília (BSB) was made up of Brazilian construction firm Engevix and Argentine conglomerate Corporación América. Engevix is a large engineering, procurement and construction (EPC) contractor active in the power, infrastructure and heavy industry sectors in Brazil and Latin America, Africa and Asia. In 2011 it employed more than 3500 people and had a turnover of over R$ 1.5 billion, which is equivalent to approximately US$ 375 million in today's terms (Engevix, 2011).

Corporación América has a wide range of activities, including construction and operation of road and airport infrastructure, hydrocarbon exploration and production, agriculture and banking. It operates passenger and cargo terminals at 53 airports in Latin America and Europe (Corporación América, 2016). The privately held firm was reported to have revenues of US$ 1.2 billion in 2014 and finances its activities through retained earnings, bond issues and financial support from the Brazilian Development Bank (Banco Nacional de Desenvolvimento Econômico e Social, BNDES) (GR Reporter, 2014).

In May 2015 Engevix agreed to sell its stake in the Inframérica consortium to Corporación América as it struggled with low liquidity, due to its involvement in a large corruption

scandal (Agencia EFE, 2015). This on-sale deal, which made Corporación América the sole owner of the consortium, was reported to be worth US$ 131 million (Centre for Aviation, 2015a).

7.4.2. Guarulhos (GRU)

The 20-year concession for Guarulhos airport (GRU) in São Paulo was awarded to the Invepar-ACSA consortium. The consortium is led by Brazilian infrastructure concession firm Invepar (Investimentos e Participações em Infraestrutura S.A.), which holds 90% of the equity. Invepar operates concessions for airports, highways and rapid transit systems in Brazil and Peru. The company is owned in equal portions by engineering and construction firm OAS and Brazil's three largest pension funds: PREVI, the pension fund of state-owned bank Banco do Brasil, FUNCEF, the pension fund of state-owned Bank CAIXA, and Petros, the pension fund of state-owned petrochemicals firm Petrobras (The Economist, 2012; Leigh Fisher, 2013; BM&F Bovespa, 2015).

Airports Company South Africa Limited (ACSA) is the airport operating partner in the consortium. ACSA is a state-owned company that operates nine of South Africa's largest international airports and holds a stake in Mumbai Chhatrapati Shivaji Airport, India.

7.4.3. Viracopos (VCP)

The Brazil Airports Consortium that was awarded the 30-year concession for Viracopos (VCP) consists of Brazilian infrastructure firm Triunfo Participações e Investimentos (45%), Brazilian conglomerate UTC Participações (45%) and French airport operator and investor Egis Airport Operation (10%).

Triunfo is a listed firm with revenues of approximately US$ 1 billion and employment of approximately 4500 professionals in 2014 (Triunfo, 2016). It is involved with toll road concessions, port administration, airports and energy infrastructure.

UTC is a holding firm that controls various companies in heavy industry, civil construction, real estate, defence, hydrocarbons and investment. In 2013 the company had revenues of approximately R$ 4.4 billion, equivalent to US$ 1.1 billion in today's terms (UTC, 2013).

Egis is an engineering and infrastructure firm that is active in the transport, building, energy, water and building sectors. Egis operates 14 airports around Europe, Latin America, Africa and Oceania (Egis, 2016). According to its website the firm had revenues of EUR 854 million in 2014, equivalent to US$ 927 in today's terms. The firm is 75% owned by the French state-owned financial institution Caisse des Dépôts and the remaining 25% is owned by the partners and employees. According to the Centre for Aviation (2013) Egis is well known for its activities in emerging markets and has a reputation for its ability to enhance existing airport infrastructure and service levels.

7.4.4. Galeão (GIG)

The third round concession for Galeão (GIG) was won by the RIOgaleão consortium, which is composed of the giant Brazilian conglomerate Odebrecht (60%) and Singaporean airport operator and investor Changi Airports International (40%). The consortium also bid on all three of the airports in round 2 but was not successful at that time (Pinto, 2012).

Odebrecht is active in the fields of engineering and construction, industry, infrastructure and energy in 21 countries. According to its website the firm had revenues of R$ 108 billion in 2014, which is close to US$ 27 billion in today's terms. The firm's construction subsidiary Construtora Norberto Odebrecht S.A. is Latin America's largest construction firm and focuses on large-scale infrastructure projects, including airports (BNamericas, 2016).

Changi Airports International (CAI) is a subsidiary of the state-owned Changi Airport Group, which has operated Changi International Airport in Singapore since 1981. CAI is active as an investor and consultant at 11 airports in China, India, the Middle East and Europe (RIOgaleão, 2016).

7.4.5. Confins (CNF)

The consortium BH Airport (previously known as AeroBrasil) won the concession for Confins (CNF) airport. This consortium is led by Brazilian concession company CCR (75%), who joined forces with Swiss airport operator Flughafen Zürich (24%) and German airport operator Flughafen Munich (1%). CCR and Flughafen Zürich also bid for two of the airport concessions in round 2 but were not successful in those bids (Pinto, 2012).

With revenues of approximately US$ 2.5 billion, CCR is one of the largest infrastructure concession companies in Brazil (CCR, 2016). It operates highways and metro lines and hold stakes in various infrastructure-related companies. The firm was listed on the São Paulo Stock Exchange in 2009 and its two largest shareholders are the Brazilian conglomerates Andrade Gutierrez (holding 17%) and Camargo Corrêa (holding 15%) (BM&F Bovespa, 2016).

Taking part in the consortium was the first time Flughafen Munich owned a stake in an airport outside Germany (Flughafen Munich, 2014). The company later sold its stake in the consortium to Flughafen Zürich, which increased its holding to 25% (Centre for Aviation, 2015a).

Besides being the operator of Zürich International Airport in Switzerland since 2000, Flughafen Zürich is active at 10 airports in 7 countries in Latin America and Asia (Flughafen Zürich, 2016).

7.4.6. Overview of concession parties

The six airport PPP deals concluded so far have involved airport operators from Argentina (Corporación América), South Africa (ACSA), France (Egis), Singapore (Changi) and Switzerland (Flughafen Zürich). Each of these parties is expected to bring experience of managing large international airports to the Brazilian airports.

Further to the operators, each of the winning consortia contains a large Brazilian conglomerate or infrastructure concession firm. These firms typically have access to substantial amounts of capital and have experience in operating infrastructure concessions in Brazil.

Finally, the consortia all contain (either directly or through the conglomerates) large construction firms. These firms provide the expertise in large-scale infrastructure construction projects that is required for the necessary airport upgrades.

Further, it should be noted that governments play a significant role in (the financing of) these consortia. The infrastructure concession company Invepar that was part of the consortium that won the GRU concession is majority owned by Brazilian state pension funds. The airport operator party in this consortium is ACSA, which is owned by the South

African state. Other international airport operators, Egis and Changi, are also state-owned in France and Singapore respectively.

Moreover, the BNDES is responsible for most of the financing of the round 2 deals, providing subsidised (6% interest rate) local currency loans with a 15-year tenor for the BSB and GRU concessions and a 20-year tenor for the VCP deal (Rumsey, 2012). It reportedly finances 60% of construction works and 80% of the acquisition of national equipment (Winterstein, 2012; Switzerland Global Enterprise, 2013). These arrangements have led to comments by some commercial banks about a missed opportunity for bond financing (Rumsey, 2012).

7.5. Concession financials

The concessions were awarded to the highest bidder in terms of the fixed concession fee. ANAC had set minimum values for the fixed fees, which were all exceeded by the bidders. The fixed concession fee is due in annual payments that are adjusted for inflation (Pinto, 2012). In the case of GRU the winning bid was more than 4 times higher than the minimum and according to The Economist (2012) this raised concerns amongst commentators who argued that the government (through BNDES and the state pension funds that own Invepar) was dealing with the government (ANAC). The fixed concession fees give the winning bidders a 51% stake in the airport concessions, with the remaining 49% being owned by Infraero (except for NAT where the private concessionaire owns 100%).

In addition to the fixed fee, the concessionaires are required to contribute annually to the FNAC fund a percentage of gross revenue. These percentages range from 2% to 10% and in the round 2 deals subject to a higher percentage for revenues above an upper bracket (Pinto, 2012; Leigh Fisher, 2013).

As part of the concession deals, each concessionaire is required to make certain investments in expansion and upgrade of the airport infrastructure. Investments in airside infrastructure (e.g. runways, taxiways and aprons) are linked to air traffic movements (i.e. landings and take-offs) and terminal building upgrades are linked to peak passenger numbers, in order maintain a certain level of services, specified by IATA as Level C (Pinto, 2012).

An overview of the fixed concession fees, the minimum auction prices, variable FNAC contributions and required investments for each of the airport PPP deals are provided in Table 7-1.

Table 7-1: Financial details of Brazilian airport PPPs (from: Pinto, 2012 and BMI Research, 2014)

Round	Airport	Concession Duration (years)	Concession Fee (R$ million)	Minimum fee (R$ million)	Investments required (R$ million)	FNAC contribution (% of revenue)
1	NAT	25	170	52	650	N/A
2	GRU	20	16 210	3 400	4 600	10% (15%)
	BSB	25	4 510	582	2 800	2% (4.5%)
	VCP	30	3 800	1 500	8 700	5% (7.5%)
3	GIG	25	19 000	4 830	5 700	5%
	CNF	30	1 800	1 090	3 500	5%

7.6. GDP and air traffic

From the literature review we know that air traffic is a major factor in the bankability of airport PPPs as it is a driver for both aeronautical and non-aeronautical revenues. According to Bhadra (2008) GDP and per capita income are the two main drivers of air traffic demand in both developed and developing countries.

A minimum of 1 MAP is often cited as the boundary for profitability for airports (Foster & Briceño-Garmendia, 2010; ICAO, 2013b). Private investors in airport infrastructure will consider the level of air traffic at an airport, as well as the historic and forecast growth thereof.

As shown in Figure 7-1 passenger air traffic in Brazil has grown substantially over the last decade, reaching a compound annual growth rate (CAGR) of more than 8%. Ramalho (2015) presents a forecast of 6% CAGR for the next 20 years. According to Leigh Fisher (2013) GDP growth has been a major driver for air traffic growth, along with economic deregulation of the airline industry and the entrance of low cost carriers (LCCs), leading to a reduction in air fares. Figure 7-2 shows how growth in GDP and air traffic have largely moved together, reaching a peak in 2010. Since then GDP growth has slumped to 0.14% in 2014 (Centre for Aviation, 2015a).

As NAT was a greenfield airport opened in 2014 there was no historic traffic data available for investors to consider. However, at the time of the concession award in 2011, the Augusto Severo International Airport from which the new NAT was to take over handled approximately 2.7 million passengers. ACI (2015) traffic figures from 2014 show that since its opening in May 2014 the new NAT airport handled just over 1 million passengers in the remainder of the year.

All the round 2 airports handle well over 1 MAP and showed strong growth in the years before and after privatisation in 2012 (see Figure 7-3). In the years from 2005 up to privatisation GRU achieved a CAGR of 8.8%, BSB achieved 6.5% and VCP a staggering 33.0%.

Figure 7-4 shows that the round 3 airports also showed high levels of passenger air traffic and strong growth. In the years leading up to privatisation GIG achieved a CAGR of 7.3% and CNF achieved 14.5%. Even though GDP growth had slowed down considerably from the height of 2010, these airport PPP deals still attracted investments substantially above their set minimum values. This shows that investors remain confident that in the long-term traffic levels and growth will be sufficient to achieve the required return on investments. The Centre for Aviation (2015a) raised some question marks relating to a possible effect of the recent low GDP growth (or even contraction) on the upcoming round 4 concessions.

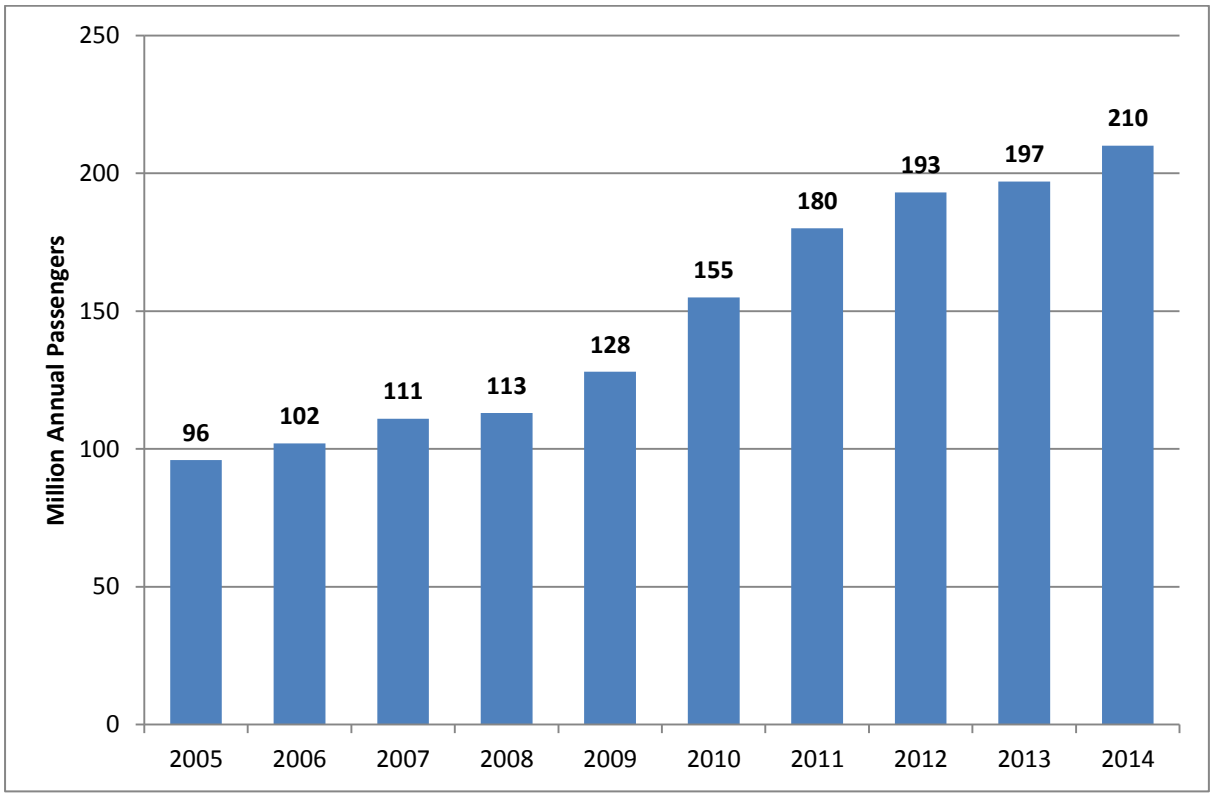


Figure 7-1: Total passenger air traffic in Brazil (from: Ramalho, 2015)

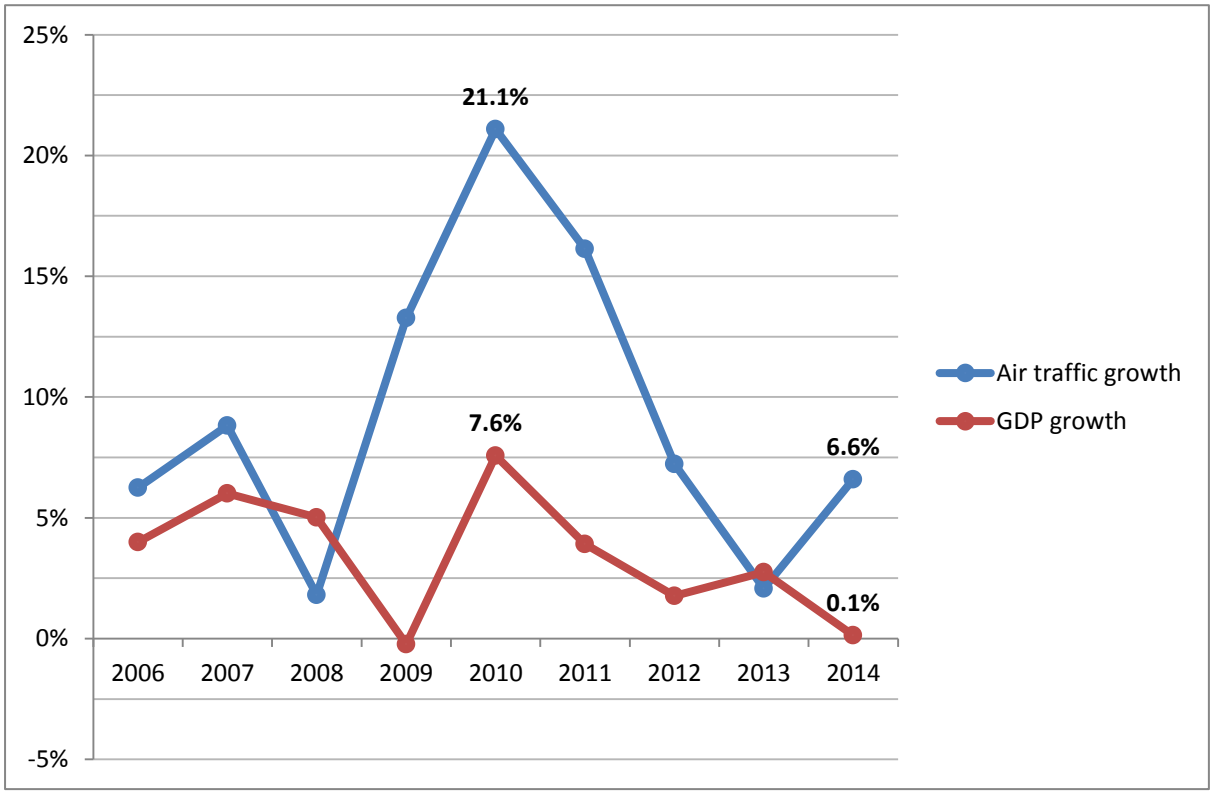


Figure 7-2: Change in GDP and air traffic in Brazil (from: World Bank, 2015b and ACI, 2015)

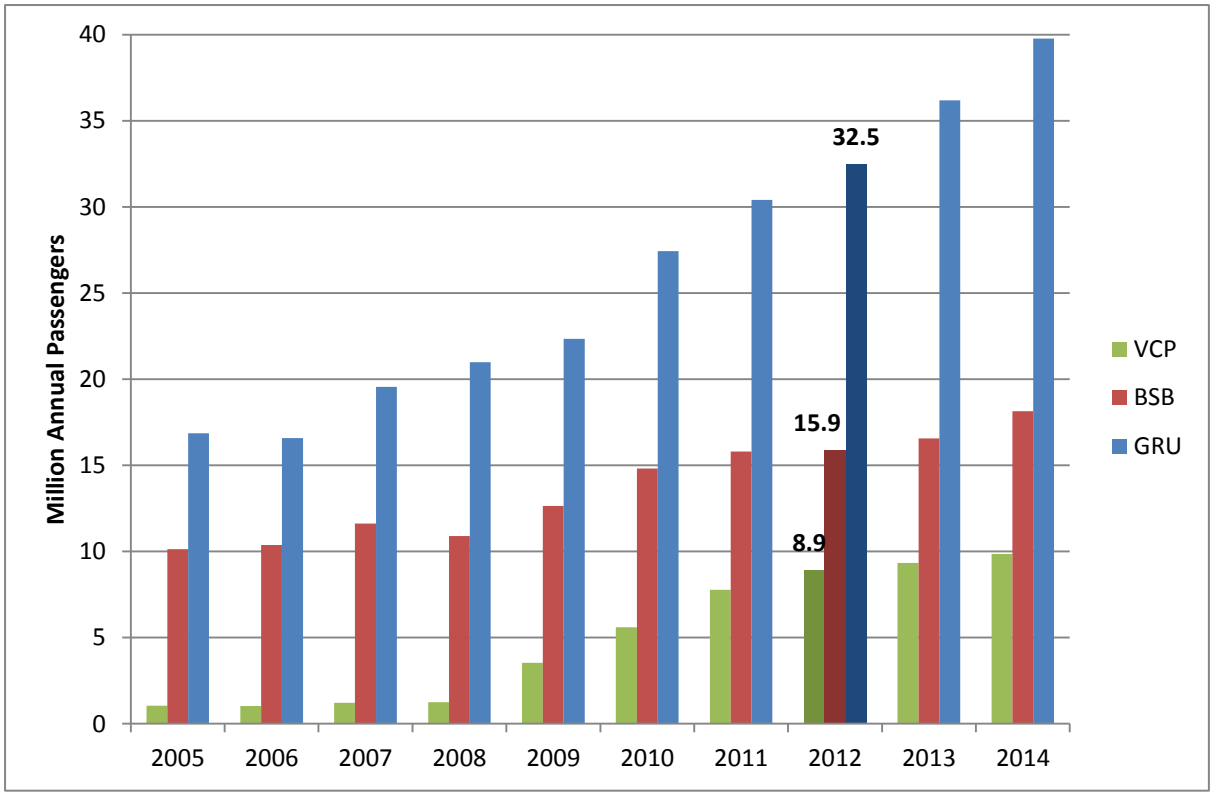


Figure 7-3: Passenger air traffic at GRU, BSB and VCP airports (from: ACI, 2015)

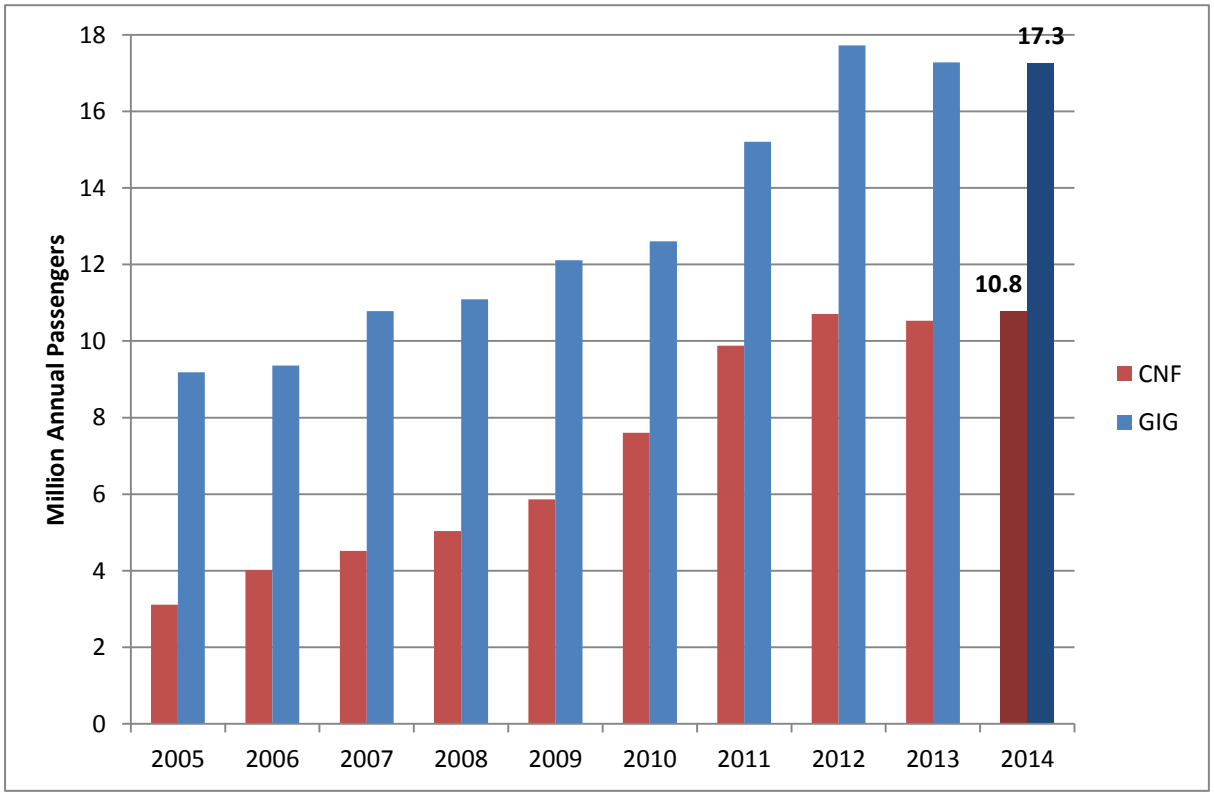


Figure 7-4: Passenger air traffic at GIG and CNF airports (from: ACI, 2015)

7.7. Outcomes and findings

The fact that the airport concessions auctioned so far have all been sold for prices far above the minimum has raised concerns amongst commentators that in order to recover their investments the private concessionaires will pass on costs to airlines and passengers by raising aeronautical fees (de Sainte Croix, 2012; The Economist, 2012). The aeronautical charges are of course subject to price cap regulation, which should prevent concessionaires from charging unreasonable amounts. It was reported that in 2014 the aeronautical charges at the privatised airports were increased (Alves, 2015). However, the relative lack of publicity or protests around this increase would suggest it was not considered excessive. A special report by IATA (2015, p. 3) suggested that the privatization process was clear, and agreed rules are in place to regulate them, but that "some essential areas are not yet covered by contractual limitations".

This is in contrast to the increase in taxes at the airports that are still managed by Infraero. The "airport taxes" at these airports were raised by 14.21%, which is well above inflation (Alves, 2015). As reported by Alves (2015), Brazil's Consumer Defence Institute (IDEC) considered the increase to be "unjustifiable" and "abusive" to passengers. Since the privatisation of some of Brazil's major airports, Infraero has seen its income reduce drastically and it ran a US$ 187 million deficit in 2014 (Centre for Aviation, 2013; Alves, 2015; Centre for Aviation, 2015a). This is believed to be the main reason behind the significant increase in charges at the airports Infraero still controls. The role and structure of Infraero are being reviewed by the Brazilian government and it has already spun-off its services business into a separate company (Centre for Aviation, 2015a; Soto, 2015).

In 2013 it was reported (Centre for Aviation, 2013) that upgrade works at airports managed by Infraero (GIG and CNF, at that time) were proceeding considerably slower than those at the privatised airports (GRU, BSB and VCP). From the sole perspective of airport upgrade works, the privatisations were considered a success (Centre for Aviation, 2013).

More generally, the Brazilian government considers the privatizations so far to have been "very successful" (Pearson, 2013) and "positive" (Centre for Aviation, 2015a).

7.8. Discussion

The recent airport PPP deals in Brazil show that the government plays a significant role in the privatisation process, both on the regulatory side and in the financing of the private parties participating in the PPPs.

The concessions have provided the government with large revenues in the form of the fixed concession fees. Moreover, they provide a steady source of income to support the publicly controlled airports in the country, through the FNAC. Nevertheless, the process has caused major disruptions to the funding and role of state operator Infraero, which will have to be reorganised to suit the change in landscape.

It is clear that large traffic volumes and strong traffic (and GDP) growth have played a role in driving up the prices paid by investors in the airport concessions. This signals investors' confidence in the long term stability and growth in the Brazilian aviation sector. However, the role of government in financing the private consortia should not be neglected.

Concerns have been raised about the aeronautical charges at the privatised airports. So far, these concerns do not seem to be warranted with effective economic regulation in place, although it is still early days in the duration of the concessions.

7.9. Lessons learnt for financing airport developments in SSA

The experiences with airport PPPs in Brazil show the importance of domestic sources of finance and the role of development finance. Governments in SSA would be wise to take these aspects into account when considering airport PPPs. Foreign sources of finance could introduce currency exchange rate risks that need to be factored into investment decisions. In case domestic finance would not be available, governments in SSA could consider measures to mitigate the currency exchange rate risk for investors. Development finance, or Official Development Assistance (ODA), could play a role in improving the bankability of airport PPP projects.

Another key takeaway from the Brazilian case study is the importance of the impact of privatising profitable airports on the funding of unprofitable ones. The Brazilian Government implemented an airport infrastructure fund (FNAC) that ensures the privatised airports

contribute to the development of unprofitable airport infrastructure in the country. The fixed concession fees paid by the concessionaires and the dividends received by government-owned airport operator Infraero should also contribute to this cause. However, the changes in the industry caused by the privatisations means the role of government in developing, owning and operating airport infrastructure has to be redefined.

8. Case Study India

8.1. Background

India is a very large country in South Asia that spans almost 3000km from north to south and from east to west. With a population of approximately 1.295 billion in 2014, it is the world's second most populous (World Bank, 2015b). According to the World Bank (2015b) India is a lower middle income country with a GDP per capita of US$ 1,582 in 2014.

The country is made up of 29 states and 7 union territories, which are governed by the Central (or Union) Government, and the capital New Delhi is located in the state of Delhi.

The Airports Authority of India (AAI) was formed in 1995 by a merger of the National Airport Authority and the International Airports Authority of India (Bhadra, 2008). Its mandate is to build, manage and develop civil aviation infrastructure in the country and to provide air navigation services. The AAI manages 125 airports (including 18 international, 78 domestic and 26 civil enclaves at Defence airfields) and has a strong track record of upgrading airport infrastructure (Centre for Aviation, 2014b). According to Jain, Raghuram & Gangwar (2007) only 60 of the AAI airports received regular scheduled flights and only 11 operated profitably. It has been argued that the AAI's "lack of commercial orientation" means commercial opportunities at its airports are not being leveraged to the fullest (Kachwaha, 2012; Centre for Aviation, 2014c, p. 3).

Due to a strong growth in India's middle class, increasing tourism activity and liberalisation of the aviation industry passenger air traffic in the country has grown at an remarkable CAGR of more than 10% over the past decade (Bhadra, 2008; Raghunath, 2010; Open Government Data Platform India, 2014). Bhadra (2008) states that in 2006 it was estimated that the capital required to address airport infrastructure backlogs, with an eye on the Commonwealth Games that were hosted in New Delhi in 2010, was US$ 9 billion over the following 5 years. According to Mukherjee (2015) investments of US$ 40 to 50 billion are required to provide sufficient airport capacity for the projected growth in air traffic up to 2025. The government has decided to turn to the private sector as a source of necessary

funding, as well as for the introduction of much needed efficiency improvements (Ohri, 2006; Bhadra, 2008; Kachwaha, 2012; Centre for Aviation, 2014b).

8.2. Concessions

The very first airport PPP in India took place in 1994, where the concession to build, operate and transfer (BOT) a new greenfield airport near Kochi in the state of Kerala was awarded to Cochin International Airport Limited (CIAL) (ICAO, 2013d). CIAL is a public limited company that was set up by the State Government of Kerala and this project is considered a "pioneer of the Indian airport" PPP model (ICAO, 2015). The airport (IATA code: COK) was opened for commercial traffic in 1999. Following this project, the government amended its legislation in 2003 to allow for up to 100% foreign direct investment into greenfield airports.

In July 2004 the government awarded a 30-year concession (with the option to extend by another 30 years) to design, build, own and operate (DBOO) a new greenfield airport near Bangalore in Karnataka State to the Bangalore International Airport Limited (BIAL) (ICAO, 2015). The airport, known as Kempegowda International Airport (IATA code: BLR), was opened in May 2008.

The 30-year DBOO concession (with the option to extend by another 30 years) for a new greenfield airport near Hyderabad was awarded in December 2004 to Hyderabad International Airport Limited (HIAL) (ICAO, 2015). The airport opened in March 2008 and is known as Rajiv Gandhi International Airport (IATA code: HYD).

In 2006 two brownfield concessions for the country's two largest airports at Delhi (IATA code: DEL) and Mumbai (IATA code: BOM) were awarded following an international competitive bidding process (ICAO, 2013d). These 30-year concessions (with the option to extend by another 30 years) were awarded to the New Delhi International Airport Limited (DIAL) and the Mumbai International Airport Limited (MIAL) respectively.

The following year a concession for an "aerotropolis" development near Durgapur in the state of West Bengal was awarded to the Bengal Aerotropolis Projects Limited (BAPL). The greenfield airport known as Kazi Nazrul Islam International Airport (IATA code: RDP) was opened in May 2015 (ICAO, 2015).

The election of a new government in 2014 ushered in a delay in the award of further PPP deals for airports in the country. In September 2013 the AAI had announced six more airports were to be privatised, namely Ahmedabad, Chennai, Guwahati, Jaipur, Kolkata and Lucknow, and that a further 9 were to follow (Centre for Aviation, 2014c; Poole, 2015). However, this proposal was shelved by the new government, as it reconsidered the lessons learnt from past privatisations (Centre for Aviation, 2014c; Firstpost, 2014; Mukherjee, 2015; Poole, 2015). It was announced in December 2015 that instead of awarding long-term concessions on a PPP basis, operations and maintenance (O&M) contracts were awarded to Singapore's Changi Airports International for the airports at Ahmedabad and Jaipur (Bhattacharya, 2015). The procurement process for two major greenfield developments, Navi Mumbai and Goa Mopa, have experienced delays. It is not expected that these PPP deals will be concluded during the course of 2016 (Centre for Aviation, 2015b).

8.3. Role of government

The government plays various roles in the Indian airport PPPs, ranging from airport operator and owner, to concessionaire partner and economic regulator.

As an operator at DEL and BOM airports, the AAI has transferred operations to the concessionaires after 2006, over a period of 3 to 6 months (Jain et al, 2007). The concessionaires for these airports, DIAL and MIAL, each have an international airport operator on board, Fraport and ACSA respectively, who provide the necessary operational expertise. Since the other concessions are all related to greenfield airports, AAI has not been involved as an operator there.

However, from an ownership perspective the AAI plays a role in three of the concessions completed so far. The AAI owns a stake of 26% in the DIAL and MIAL consortia, providing it with the right to veto certain important decisions (Kachwaha, 2008). Moreover, it holds 13% of the equity in the BIAL consortium that operates the BLR greenfield airport in Bangalore. These ownership stakes entitle AAI to a flow of dividends from the operations. Further government ownership of the successful airport PPP consortia is effected through various Union and State government entities:

- The Union Government of India owns a 13% stake in HIAL, which operates the HYD greenfield airport in Hyderabad;
- The State Government of Karala is a major shareholder in CIAL and played an important role in setting up the innovative financing structure of the Cochin airport concession. This will be elaborated on in the section on financing of the various airport PPPs.
- Karnataka State Industrial Investment & Development Corporation Limited (KSIIDC) holds a 13% share in BIAL; together with the AAI this brings the government ownership of this consortium to 26%.
- The government has a small stake in the latest greenfield PPP in Durgapur, operated by the BAPL consortium. The 1.2% equity stake is owned by the West Bengal Industrial Development Corporation, a nodal agency owned by the State Government of West Bengal.

Besides the role of the AAI as airport operator, and the ownership role played by various government entities, the government of India plays a key role in the award and regulation of the airport PPPs. According to Jain et al (2007) cabinet decided in 2003 to utilise a PPP model for the development of DEL and BOM airports and it constituted an Empowered Group of Ministers (EGoM) to implement this decision. Further, the Ministry of Civil Aviation (MoCA) constituted an Inter-Ministerial Group (IMG) to support the EGoM in the process.

The MoCA is responsible for policies and programmes relating to the development and regulation of civil aviation in India, including overseeing the provision of airport infrastructure (Jain et al, 2007). As such, the MoCA with the support of the EGoM and IMG developed the bidding documents, the concession agreement (Operation Management and Development Agreement, OMDA) and managed the competitive bidding process (Pandey et al, 2010). The bidding process was subject to several delays and some controversy relating to the evaluation of the technical and financial bids received (Jain et al, 2007). Eventually, in January 2006 the GMR-Fraport consortium was allowed to choose which airport concession it wanted, and it chose DEL. The concession for BOM was awarded to the GVK-ACSA consortium.

Interestingly, these concessions were awarded in the absence of a clear regulatory framework, which has led to continued debates and disputes between the government and the concessionaires (Centre for Aviation, 2014b). The designated economic regulator, the Airports Economic Regulatory Authority (AERA) was only constituted in 2009 (Raghunat, 2010). AERA's mandate includes the determination of tariffs for aeronautical service fees and monitoring of performance of the major airports in the country, with the aim of creating a level playing field for all major airports and protecting the interests of airport users (AERA, 2015; Singh et al, 2015). Major airports in India are considered those with annual passenger traffic of more than 1.5 million (Kachwaha, 2012).

AERA has adopted price cap regulation, regulating aeronautical service fees such as landing, aircraft parking and passenger fees, while leaving non-aeronautical charges such as rent unregulated. This is meant to create an incentive for concessionaires to develop strong non-aeronautical revenues (Pandey, Morris & Raghuram, 2010). AERA uses a single-till approach whereby both aeronautical and non-aeronautical revenues are directed to cover aeronautical costs (Singh et al, 2015). However, the OMDAs for DEL and BOM that were signed before AERA was active stipulate a hybrid-till approach. Singh et al (2015) state that under this hybrid-till approach only 30% of non-aeronautical revenues are considered in the determination of the aeronautical service tariffs. The remaining 70% of non-aeronautical revenues are retained by the concessionaire.

Representations by various other concessionaires were made to the government, in order to have the single-till approach changed to their preferred dual-till approach (Centre for Aviation, 2014c). Singh et al (2015) report that AERA reached a compromise with the BIAL concessionaire at Bangalore and settled on a hybrid-till approach whereby 40% of non-aeronautical revenues are directed towards aeronautical costs. It remains to be seen whether AERA will shift its approach to price cap regulation and implement hybrid-till systems across the board. The Centre for Aviation (2014b) argues that India's weak institutional framework, lack of domain expertise and uncertainty about the future role of the AAI contribute to the lack of a predictable and transparent policy environment that is required to attract investors to the industry.

8.4. Concession parties

8.4.1. Cochin (COK)

The first airport PPP in India at Cochin (COK) airport was developed in a somewhat unusual manner. Due to budgetary constraints and a desire to improve upon the inefficient public operations at the airport, the local government was tasked to redevelop the airport using alternative sources of funding. In 1994, the local Cochin administrator, backed by the Keralan State government, set up the Cochin International Airport Limited (CIAL) to construct, own, operate and maintain the airport (Hooper & Walder, 2001). This company then sourced funding from various sources over the next few years, which has resulted in a diverse ownership structure.

The government owns 36% of the equity of CIAL, the majority of which was contributed by the Government of Kerala State, a chunk by the Kerala State Industrial Development Corporation and minor stakes by various government-supported institutions (Hooper & Walder, 2001; Rameshan & Jeyavelu, 2007). Airport service providers, including Air India and Bharat Petroleum, own approximately 24% of CIAL's equity. The majority of the firm's equity is owned by a large group of non-resident Indians from over 25 countries.

Unsecured debt, guaranteed by the Government of Kerala State, is a major source of finance for CIAL. Its total debt burden peaked in FY 2001-2 at Rs 2509 million and has since been reduced to Rs 838 million in FY 2004-5 (Rameshan & Jeyavelu, 2007). Several of the airport's service providers have also provided interest free deposits in return for the rights to provide certain services at the airport.

8.4.2. Bangalore (BLR)

The 30 year concession for the greenfield airport at Bangalore (BLR) was awarded in 2004, after the competition attracted 17 bidders and completion of the process took more than 10 years (Hooper & Walder, 2001). The Bangalore International Airport Limited (BIAL) that won the concession is 26% owned by the government, with equal portions being held by the Karnataka State Industrial & Infrastructure Development Corporation and the AAI (ICAO,

2015). The remaining 74% is owned by the following private parties: GVK Group India (43%), Siemens Project Ventures GmbH (26%) and Flughafen Zürich AG Ltd (5%).

According to Raghunath (2010) early shareholders Larsen & Toubro (an Indian construction and technology conglomerate) and Flughafen Zürich sold stakes in BIAL totalling 29% to GVK, valuing the company at over US$ 1 billion.

GVK is a large Indian conglomerate which is active in the energy, resources, infrastructure and hospitality sectors. In FY 2014-15 it recorded revenues of over Rs 30 billion (approximately US$ 442 million), more than 80% of which was generated by its airport activities (GVK, 2015). In addition to BIAL, GVK is active at Mumbai (BOM) and two airports in Indonesia.

Siemens Project Ventures GmbH is a subsidiary of the giant German technology conglomerate Siemens AG. The subsidiary invests in the energy, healthcare, industry and infrastructure markets, focusing on projects where its parent company can play a major role in construction or supply of technology and equipment (Siemens, 2016).

Besides being the operator of Zürich International Airport in Switzerland since 2000 and its stake in the Confins Airport concession in Brazil, Flughafen Zürich is active at 10 airports in 7 countries in Latin America and Asia (Flughafen Zürich, 2016).

8.4.3. Hyderabad (HYD)

Following an international competitive bidding process, the concession for the greenfield airport at Hyderabad (HYD) was awarded to the Hyderabad International Airports Limited (HIAL), which is 26% owned by the government, through the AAI and the State Government of Telangana (or Andra Pradesh) in equal parts. The private parties in the consortium are Indian conglomerate GMR (63%) and Malaysia Airports Holding Berhard.

GMR is a listed Indian conglomerate with activities in energy, transportation and urban infrastructure. In FY 2014-15 it had revenues worth over Rs 110 billion (approximately US$ 1.6 billion) and its airport activites (Hyderabad, Delhi and Mactan–Cebu International Airport in the Philippines) accounted for almost half of that.

Malaysia Airports Holding Berhard (MAHB) is a listed company, incorporated by the Malaysian Government in 1991, that manages 39 airports in Malaysia, one in Turkey and one in India. According to its website it also provides airport management services to two airports in Cambodia.

8.4.4. Delhi (DEL)

The concessions for both Delhi (DEL) and Mumbai (BOM) airports were awarded through an international competitive bidding process, initiated by the government in 2004. Nine consortia were pre-qualified, five submitted bids for DEL and six for BOM.

According to Jain et al (2007) the conditions of the bidding process stipulated that foreign shareholding of the consortia was limited to 49% and restrictions were placed on shareholding by airlines. For both airports the AAI would hold 26% of the equity in the concession companies. Participation of an experienced airport operator with at least 10% stake in the consortium was a requirement in stipulated in the Operation Management and Development Agreement (OMDA). In addition to the OMDA a State Government Support Agreement was to be put in place, providing a commitment of support by the respective State Governments for the concessionaires in terms of land development, surface access, utilities, safety and security (Jain et al, 2007). This obligation of the government to support the airport PPPs is considered a unique feature that is not seen in other countries and in other industries' PPP deals (Kachwaha, 2012).

The concessions would be awarded to the bidders, meeting the minimum requirements stipulated, with the highest percentage of revenue offered as a concession fee. After errors in the bid evaluation and several disputes the concession for DEL was awarded to the GMR-Fraport consortium in January 2006 (Jain et al, 2007). The lead partner GMR holds 64% in the concession company Delhi International Airport Limited (DIAL) and German airport operator Fraport holds 10%. At the time of the award 10% of the concession company was held by Malaysia Airports (Niaga) Sdn Bhd, a subsidiary of MAHB, but this stake was sold to GMR in 2015 for an amount of US$ 80 million (ICAO, 2015).

Fraport has managed Germany's largest airport, Frankfurt Main, since its opening in 1936 and manages nine additional airports in Europe, Asia and South America. Fraport was listed

on the Frankfurt Stock Exchange in 2001 and is majority owned by the Government of the State of Hesse (31%) and the City of Frankfurt (20%) (Fraport, 2016).

8.4.5. Mumbai (BOM)

The concession for Mumbai (BOM) was awarded to a consortium led by GVK (50.5%) and two South African parties, namely airport operator ACSA (10%) and investment company Bidvest (13.5%). The remaining 26% of equity in Mumbai International Airport Limited (MIAL) is held by the AAI.

ACSA is a state-owned company that operates nine of South Africa's largest international airports and holds a stake in Guarulhos airport in São Paulo, Brazil.

Bidvest is listed on the Johannesburg Stock Exchange and reported revenues of more than ZAR 200 billion (approximately US$ 12.5 billion) in 2015 (Bidvest, 2016). The South African Public Investment Corporation (PIC), which manages the pension funds of government employees, holds substantial stakes in both Bidvest (approximately 15%) and ACSA (20%).

8.4.6. Durgapur (RDP)

The concession for the greenfield Durgapur (RDP) airport was awarded to Bengal Aerotropolis Projects Limited (BAPL), a private consortium with no AAI ownership, in 2007. The only government involvement in this consortium is a 1.2% ownership stake by the West Bengal Industrial Development Corporation. The majority shareholder in BAPL is Changi Airports India, a subsidiary of Singaporean airport operator Changi Airports.

The Indian infrastructure, construction and finance firm IL&FS holds a 12.7% equity stake in BAPL. The firm was incorporated by three Indian government entities, the Central Bank of India, the Unit Trust of India and the Housing Development Finance Corporation in 1987, and has since diversified its ownership structure. In 2014 IL&FS generated revenues of over Rs 15 billion (approximately US$ 220 million).

The remaining 53.9% equity of BAPL is held in equal parts by four companies linked to three main promoters of the project, each with experience in related fields such as infrastructure and financial services (IACO, 2015).

8.4.7. Overview of concession parties

The PPP for COK came about in somewhat unusual manner, whereby the government set up and promoted the concession company and then sourced funds from a variety of sources. Most interestingly, it was able to tap into the savings of diaspora as a major source of finance – a method akin to diaspora bonds.

The major greenfield and brownfield PPPs that took place between 2004 and 2007 all attracted international airport operations expertise, in the form of large, foreign airport operators (Flughafen Zürich, Malaysia Airports, Fraport, ACSA and Changi).

As was observed in the case of Brazil, large domestic conglomerates and infrastructure firms also play a key role in each of the PPPs (GVK, GMR, and IL&FS). These firms bring experience in managing infrastructure concessions, dealing with governments and financial acumen to the developments.

Finally, the government, through AAI and various (State) development agencies holds stakes in each of the airport PPPs. The main modus is 26% government ownership of the concession company, either through AAI alone, or in combination with the local state government.

8.5. Concession financials

Unlike the other concessions, the COK concession does not require CIAL to pay a concession fee to the government. The government (AAI) does receive dividends from the company proportional to its equity ownership. It is not clear whether the concessionaire for this airport is entitled to impose any additional charges, over and above the standard (regulated) aeronautical service fees.

For the other airport PPPs in India, the concessionaires pay a concession fee to the AAI based on a specified percentage of gross revenue (Centre for Aviation, 2014c). At the two greenfield airports at Bangalore and Hyderabad the concessionaires pay 4% of gross revenue to AAI (Nayar, 2012). At the two brownfield PPPs in Delhi and Mumbai the concessionaires won the bidding process by offering 45.99% and 38.7% of gross revenue respectively (Jain et al, 2007; Kachwaha, 2012). The concession fee for the greenfield PPP at

Durgapur is not known. The Centre for Aviation (2014c) reports that the AAI has received US$ 1.7 billion in revenue share from the airport PPPs since FY 2007.

The concessionaires at the latest airport PPPs are entitled to charge a User Development Fee (UDF), which is set by AERA (Sinha, 2013). This UDF provides an additional source of revenue for the airports and is also subject to the revenue sharing arrangement with the AAI. However, in light of the high level of revenue sharing at DEL and BOM airports, the concessionaires appealed this. The government conceded in favour of the concessionaires and changed the UDF to an Airport Development Fee (ADF), which is not subject to revenue sharing (Pandey et al, 2010). It was later reported that the government would not entertain such changes in future, arguing that the airport users "should not be burdened by high charges" (Sinha, 2013).

For each of the airports the concessionaires are required to carry out certain upgrade and expansion projects, with specified deadlines and penalties for late completion (Jain et al, 2007; Pandey et al, 2010). Beyond the immediate mandatory investments, the development of the airports will be based on a master plan with clearly defined triggers for expansions. Table 8-1 provides an overview of the estimated costs of the first phase of upgrades and expansions at each of the airports (besides Durgapur on which no information is available).

Table 8-1: Overview of concession fees and first phase capital expenditures (from: Raghunath, 2010)

Airport	**Location**	**Type**	**Passenger traffic 2014** (MAP)	**Concession Fee** (% of revenue)	**Investments required** (US$ million)
COK	Cochin	Greenfield	6.1	N/A	60
BLR	Bangalore	Greenfield	14.5	4%	695
HYD	Hyderabad	Greenfield	9.8	4%	500
DEL	Delhi	Brownfield	39.8	45.99%	3800
BOM	Mumbai	Brownfield	35.0	38.7%	3500

Given the considerable mandatory capital outlays, concessionaires have had to provide evidence of their ability to raise sufficient capital, through parent companies and commercial debt (Jain et al, 2007). This was considered particularly important as external funding cannot be secured against the airport land and aeronautical assets (e.g. runways, taxiways and terminal buildings). Securitisation of the land and aeronautical assets is not allowed as it can provide unwanted encumbrances to takeover of the assets by the

government upon expiry of the concession agreements (Pandey et al, 2010; Raghunath, 2010).

According to Kachwaha (2008; 2012) the “commercial backbone” of the latest airport PPPs (i.e. excluding Cochin) is a considerable piece of airport land that is made available to the concessionaire for development, free of charge. These land areas, for example 5% of the total in Delhi and 10% in Mumbai, represent significant value as the airports are located within the highly congested city areas (Pandey et al, 2010). The concessionaires are expected to develop this land for commercial (non-aeronautical) activities such as hotels, business parks, malls and the like, which would be transferred to the AAI upon expiry of the concession. Concessionaires will be reimbursed for the transfer of these assets at their fair market value at the time, minus the value of the land (Pandey et al, 2010).

8.6. GDP and air traffic

From the literature review we know that air traffic is a major factor in the bankability of airport PPPs and that GDP is an important driver for air traffic. A minimum of 1 MAP is often cited as the boundary for profitability for airports (Foster & Briceño-Garmendia, 2010; ICAO, 2013b). Private investors in airport infrastructure will consider the level of air traffic at an airport, as well as the historic and forecast growth thereof.

As shown in Figure 8-1 passenger air traffic in India has grown substantially over the last decade, reaching a compound annual growth rate (CAGR) of 10%. Bhadra (2008) and Raghunath (2010) argue that a growing Indian middle class, increasing tourism activity and liberalisation of the aviation industry have been important drivers for the growth in air traffic. Figure 8-2 shows how growth in GDP and air traffic have largely moved together, reaching a post-financial crisis peak in FY 2011.

The three greenfield airport concessions (COK, BLR and HYD) all took over from existing airports in the vicinity and therefore did not start operations with zero passenger traffic. Figure 8-3 shows that each of these airports has reported passenger traffic well over 1 million and consistently strong growth. COK achieved an impressive CAGR of more than 13% over the last decade, while BLR and HYD have both grown at approximately 6% CAGR since

the start of operations in 2008. Unfortunately, no traffic data on the greenfield RDP airport is available.

The two brownfield airport concessions involve India's two busiest airports, DEL and BOM. Both of these airports have seen their passenger traffic decrease in only two of the last 10 years. In that same period BOM achieved a CAGR of more than 7% while DEL has overtaken it with a CAGR of more than 10%.

High traffic figures and strong growth have contributed to the keen interest shown by the private sector in the airport PPPs in India. According to the Centre for Aviation (2014b) passenger traffic in India is expected to continue its growth, reaching a total of 472 million passengers in FY 2032, making it the third largest aviation market in the world, behind the USA and China. However, it notes that improvements in the regulatory and policy environment are necessary preconditions to achieving this.

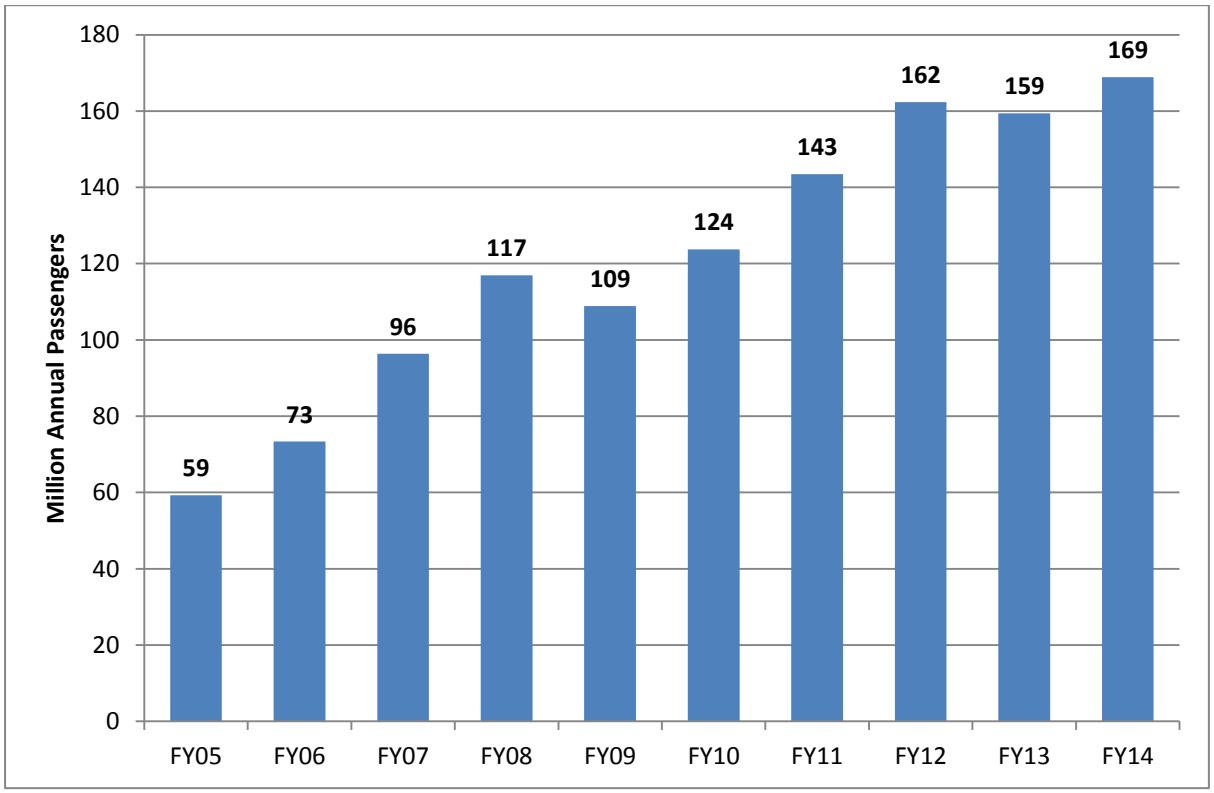


Figure 8-1: Total passenger air traffic in India (from: Open Government Data Platform India, 2014 and DGCA, 2015)

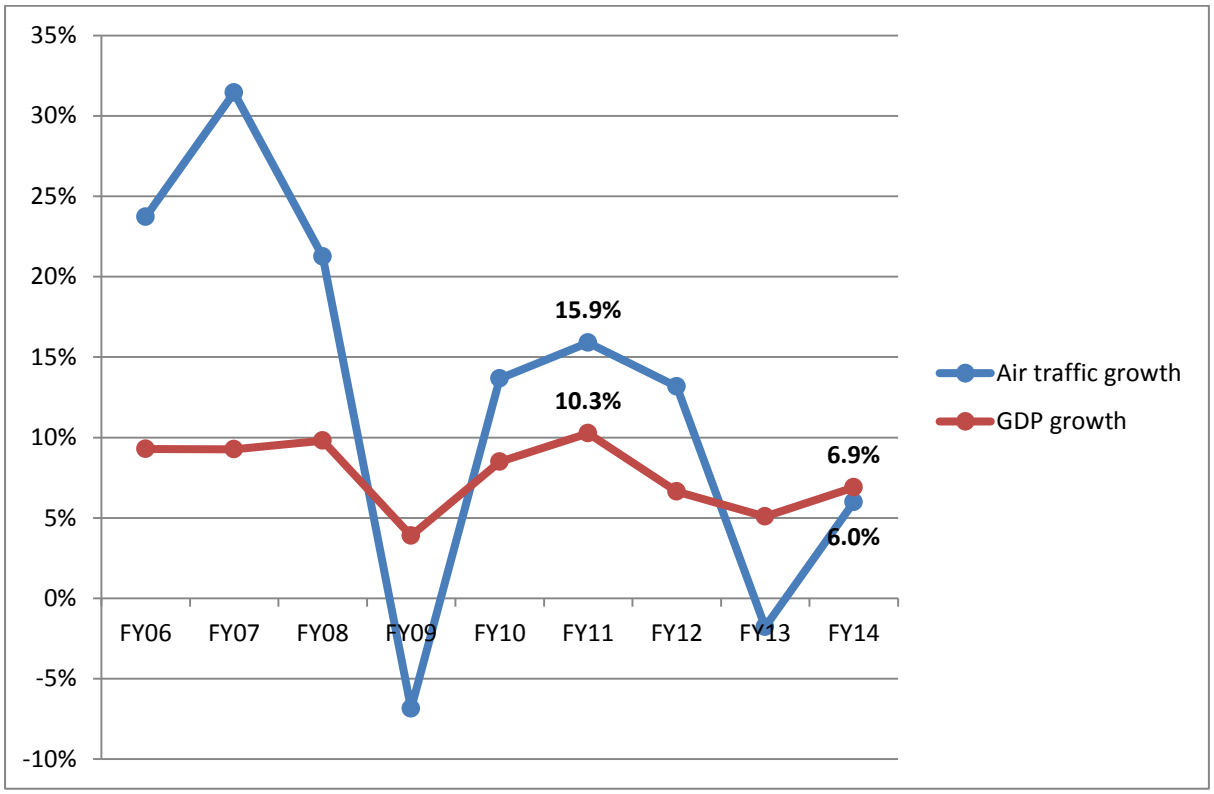


Figure 8-2: Change in GDP and air traffic in India (from: World Bank, 2015b; Open Government Data Platform India, 2014 and DGCA, 2015)

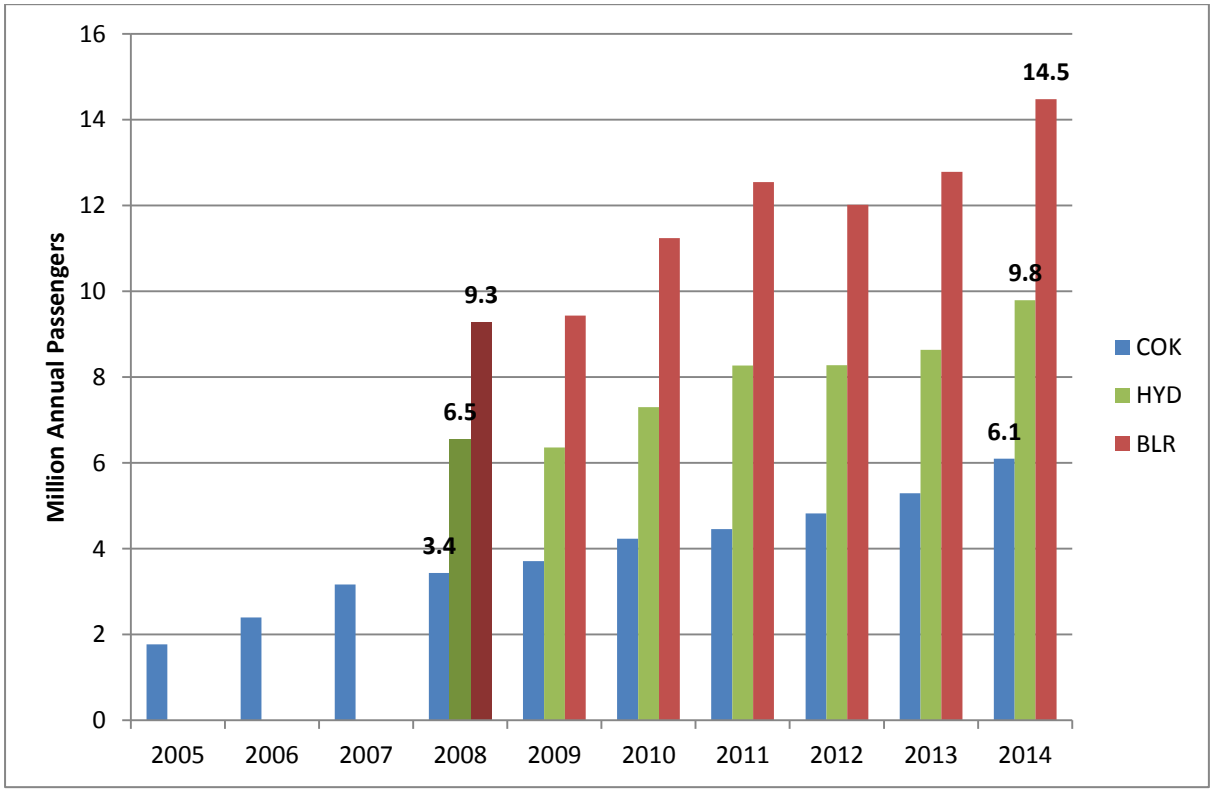


Figure 8-3: Passenger air traffic at greenfield airports (from: ACI, 2015)

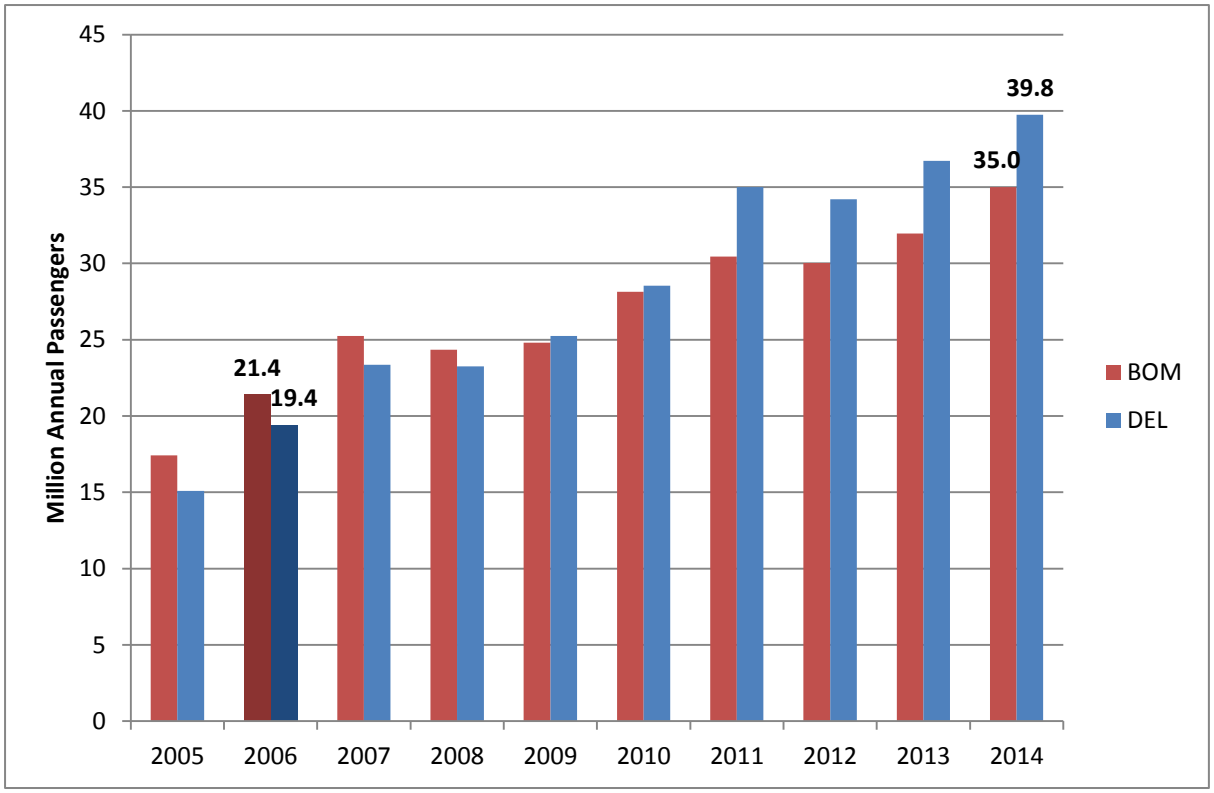


Figure 8-4: Passenger air traffic at brownfield airports (from: ACI, 2015)

8.7. Outcomes and findings

The Indian airport PPPs are generally hailed as a success, citing the significant infrastructure improvements, awards won by the various airports and continued appetite from the private sector for further privatisations (Nayar, 2012; Singh et al, 2015). However, the privatisation process has not been faultless and several issues have been raised.

According to Somaia (2015) most of the aviation value chain in India has been struggling for profitability in recent years, due to the weak regulatory framework, high fuel prices and over capacity in the airline sector. Indeed, Pandey et al (2010) reported already in 2010 that the heads of concessionaire partners GVK and GMR have asked the government for an increase in tariffs, citing a drop in domestic passenger traffic and a struggling real estate market as reasons for their requests. However, these requests were denied at the time in order to avoid putting further pressure on the airlines. Nevertheless, Firstpost (2014) and Mukherjee (2015) report that airlines and governments are unhappy with tariff increases that have occurred at DEL (increase of 346%) and BOM (increase of 164%) in recent years.

Some consider the charges levied by the concessionaires on the airport users to be excessive and have claimed the privatised Indian airports are amongst the world's most expensive (Sinha, 2013; Singh et al, 2015; The Indian Express, 2015). According to the Centre for Aviation (2015b) AREA is now intending to reduce the aeronautical charges at DEL by 78%. These issues show that the economic regulation the airport PPPs operate under has not been entirely effective in protecting stakeholders from monopolistic behaviour by airports.

Jain et al (2007) describe how all AAI staff employed at the brownfield airports would be retained by the concessionaire for at least three years. Employees would have to be made offers by the concessionaires that are "no less beneficial than the current arrangement" (Jain et al, 2007, p. 7). However, it seems that the transition of employment from AAI to private sector has not been completely successful. The Airports Authority of India Employees' Union (AAIEU) has claimed that the terms offered by the private concessionaires were not acceptable and that many AAI employees were "displaced" (Sharma, 2015). Moreover, the report claims that staff have had to vacate houses on airport land as they were demolished to make way for new developments. These labour issues have led to the AAIEU threatening to strike in order to stop the government from moving ahead with further privatisations (The Indian Express, 2015; Sharma, 2015).

The AAI manages 125 airports, 90% of which are not profitable and require substantial investments in upgrades and expansions (Centre for Aviation, 2015b). According to Jha (2015) the revenue share from PPP airports accounts for a third of the AAI's income. This income enables the AAI to support its loss-making operations and necessary capital outlays. However, AERA's intention to reduce the aeronautical fees charged at the PPP airports could see the AAI's income from revenue sharing decline substantially (Centre for Aviation, 2015b). In addition, if more of the AAI's large, profitable airports are privatised (such as Chennai and Kolkata) the revenue share levels are likely to be lower than those at Delhi and Mumbai, putting further pressure on the AAI's income. One of the AAI's other sources of income, the provision of air traffic management services, is also at risk as the government considers spinning off this part of its operations into a separate entity (Centre for Aviation, 2015b). It is clear that the significant changes in the airport sector in India impact the AAI

and its revenue model. For the purpose of the development of the sector, including both the international PPP airports and the loss-making domestic airports, the AAI's role and strategy will have to be reconsidered.

8.8. Discussion

The recent airport PPPs in India have demonstrated the importance of effective government regulation and policies. The PPP procurement process encountered several irregularities and the economic regulation of the airport PPPs was implemented late, which has led to uncertainty and turmoil in the airports sector.

The weakness in regulatory framework has also led to criticism of the fees charged by the private airport operators. Further, the privatisation process has given rise to labour disputes. These are signs that the government has gone through a steep learning curve during this process. It is hoped that lessons are learnt, institutional capacity has grown and airport development in the country will be see improvements. A rethink of the role and business model of the AAI is required, as its operating environment has changed drastically.

On the bright side, the privatisation process has led to significant increases in capacity and improvements in quality at some of the country's major airports. The two brownfield and three greenfield concessions have brought in significant private capital and expertise, including the involvement of internationally experienced airport operators. Two large Indian conglomerates, GVK and GMR, have emerged as dominant players in the sector.

Strong economic performance and growth in passenger traffic have been key to enabling the private sector investment in airports. For these reasons it is likely that investor confidence will remain, provided the government implements lessons learnt and moves forward with airport development in a suitable modus.

8.9. Lessons learnt for financing airport developments in SSA

As was the case in Brazil, the Indian airport privatisations have relied heavily on domestic finance. This confirms the importance for SSA governments in considering the availability of various sources of finance to the private sectors.

The role of the government in developing, owning and operating airport infrastructure in the post-privatisation industry is also a key lesson to be learnt from the Indian airport PPPs. The AAI has seen both its sources of income and its investment needs change drastically. It would be sensible for SSA governments to consider the implications of airport PPPs on the funding of unprofitable infrastructure in the country when implementing airport PPPs.

Finally, an interesting takeaway for SSA governments from the Indian case study is the possibility of accessing diaspora funds for airport developments. Since the privatisation of COK airport in the mid-nineties there have been considerable developments in the use diaspora funds that may provide opportunities to financing airport developments in SSA.

9. Interview Results and Analysis

9.1. Introduction

In order to obtain primary data on the views of SSA governments towards using PPPs for airport developments, in-depth interviews with government representatives were conducted. These interviews were informed by the case studies of Brazil and India presented in the previous chapter.

This chapter describes the data collection and content analysis, and presents the findings from this research.

9.2. Data Collection and Respondents

Suitable respondents were sought from the countries selected in the Research Design and Methodology and approached with a request to participate in this study. Only two respondents were found to be willing and available to participate. The respondents are introduced in the following sections.

Interviews with these respondents were conducted by the researcher and took place via telephone (Respondent 1 in Kenya) and face-to-face (Respondent 2 in South Africa). The interview guideline in Appendix A was used to inform the topics that were addressed in the interviews. The interviews were recorded in full and transcribed for the purpose of analysis.

9.2.1. Respondent 1: Kenya

The first respondent in this research is an Independent Director of the KAA who has been in this position since April 2015. He chairs the Finance and Investment, Private Investment and Strategy Committees of the Board of the KAA. His background is in finance, having worked as a banker and being involved in several PPP projects in the social infrastructure sector in Kenya.

9.2.2. Respondent 2: South Africa

The second respondent is the Director of Aviation Economic Analysis and Regulation at the National Department of Transport. He has worked in the aviation sector for more than 10 years and was previously in charge of airport infrastructure at the Department of Transport.

9.3. Background

In order to provide context to the interview results, the following sections provide an overview of the airports industry in Kenya and South Africa. This overview addresses the organisational and legislative state of affairs in the industry, any past experiences with airport PPPs in the country and the situation around air traffic and GDP.

9.3.1. Kenya

Kenya is located on the equator in East Africa and is a founding member of the East African Community (EAC). According to the World Bank (2015b) in 2014 it had a population of approximately 45 million and a GDP per capita of US$ 1,358 classifying it as a lower middle income country.

Oversight and regulation of the civil aviation industry, including the provision of air traffic navigation services as well as economic regulation of air services, is provided by the Kenya Civil Aviation Authority (KCAA), which was established in 2002 (KCAA, 2016a).

The airports system in the country is managed and developed by the Kenya Airports Authority (KAA), which was established as an autonomous body in 1991. KAA manages four international airports, four domestic airports and two airstrips (KAA, 2016a). The two main international airports are Jomo Kenyatta International Airport (IATA code: NBO) in Nairobi and Moi International Airport (IATA code: MBA) in Mombasa, which together account for approximately 90% of all passenger traffic in Kenya. There are several other airports and airstrips in Kenya that are owned and operated by local governments but these receive no scheduled flights and very little passenger traffic.

As shown in Figure 9-1 total air passenger traffic at the KAA airports and airstrips has grown from almost 6 MAP in 2005 to more than 8.5 MAP in 2014, which represents a CAGR of

approximately 4% (KAA, 2012; KCAA, 2014). Figure 9-2 illustrates the movement of GDP growth and passenger air traffic growth. The contraction of passenger traffic in 2012 and 2013 has been attributed by commentators to the upsurge in violent terrorist attacks in the country.

The KAA reported revenues of KES 3.2 billion (approximately US$ 32 million) in 2014, which was split into 78% aeronautical and 22% non-aeronautical.

PPP projects in the country are assessed and approved by a dedicated PPP Committee, which is supported in its functions by the PPP Unit (PPP Unit, 2016). The PPP Unit (2016) quotes a capital requirement of US$ 4 billion per year over the next decade for the development of the country's infrastructure as an important reason for prioritising PPPs in infrastructure.

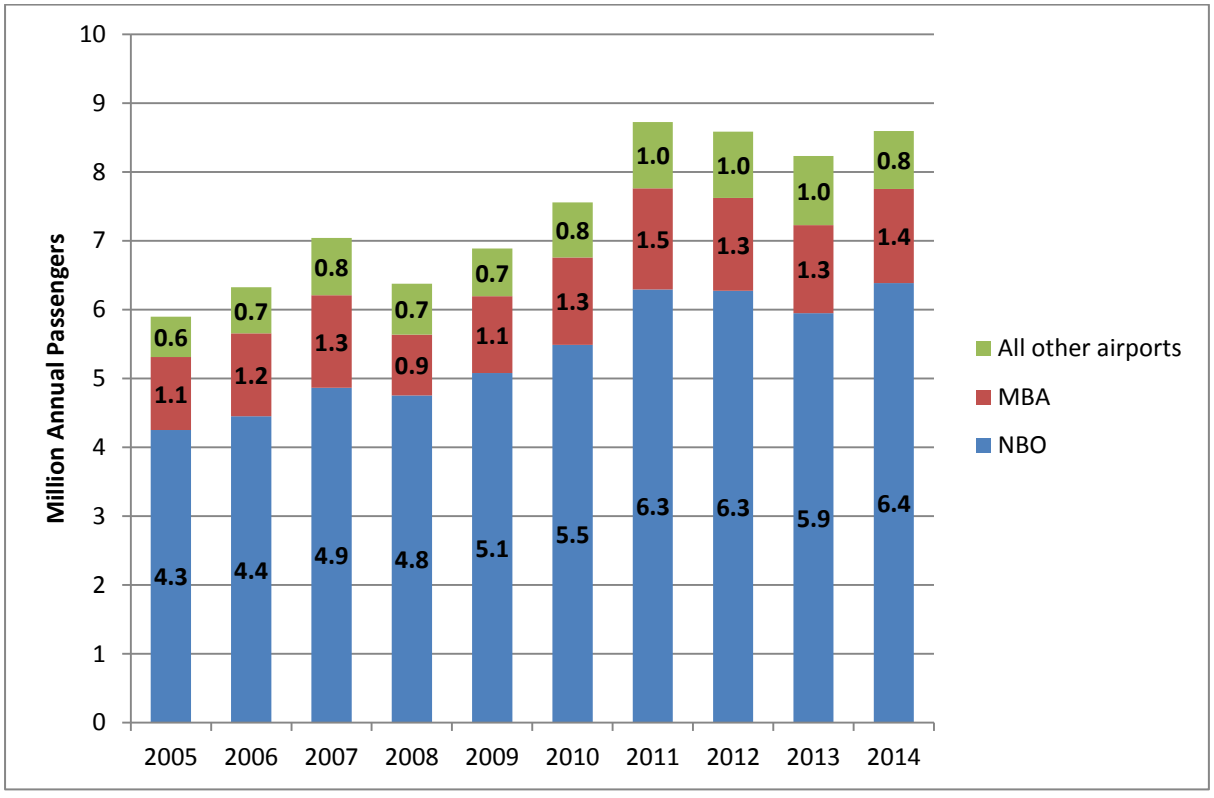


Figure 9-1: Total passenger air traffic at KAA airports (from: KAA, 2012 and KCAA, 2014)

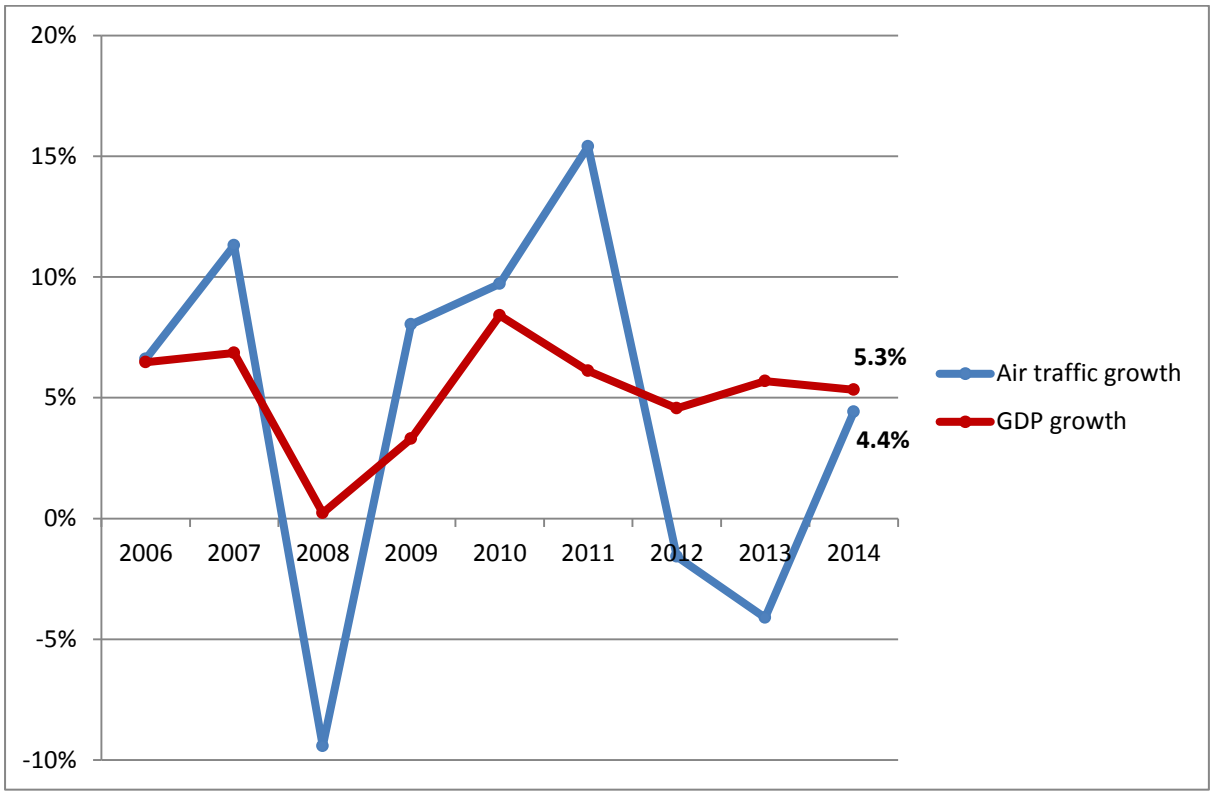


Figure 9-2: Change in GDP and air traffic in Kenya (from: KAA, 2012; KCAA, 2014 and World Bank, 2015b)

9.3.2. South Africa

South Africa is located at the southernmost end of the African continent and is a member of the Southern African Development Community (SADC). In 2014 it had a population of 54 million and a GDP per capita of US$ 6,483 classifying it as an upper middle income country (World Bank, 2015b).

Aviation in the country is regulated by the National Department of Transport and one of its agencies, the South African Civil Aviation Authority (SACAA). The SACAA is responsible for safety and security oversight for the civil aviation sector. Economic regulation is provided by the Regulatory Committee within the National Department of Transport.

In 1993 the Airports Company South Africa (ACSA) was established to own and operate the country's nine major airports (ACSA, 2016). ACSA is majority owned by the South African Government, through the National Department of Transport, while the Public Investment Corporation (PIC), which manages the pension funds of government employees, holds a 20% stake. According to ICAO (2013e, p. 1) ACSA is a financially independent commercial entity, operating "at arm's length" from the government. The nine ACSA airports and their 2014

passenger traffic are listed in Table 9-1. Figure 9-3 shows the total passenger traffic at the ACSA airports over the last decade and Figure 9-4 shows the change in passenger traffic in relation to the country's GDP growth. From 2005 to 2014 the passenger traffic at the nine ACSA airports achieved a modest CAGR of 2%.

In 2014 ACSA reported ZAR 7.1 billion in revenues, 64% of which was attributed to aeronautical activities and 36% to non-aeronautical activities.

Table 9-1: Passenger traffic in 2014 at ACSA airports (source: ACI, 2015)

Airport	Location	IATA Code	Million Annual Passengers (MAP)
O.R. Tambo International Airport	Johannesburg	JNB	19.2
Cape Town International Airport	Cape Town	CPT	8.6
King Shaka International Airport	Durban	DUR	4.5
Port Elizabeth International Airport	Port Elizabeth	PLZ	1.3
Bram Fischer International Airport	Bloemfontein	BFN	0.4
Upington International Airport	Upington	UTN	0.07
East London Airport	East London	ELS	0.6
George Airport	George	GRJ	0.6
Kimberley Airport	Kimberley	KIM	0.2

According to the Department of Transport (2015a) there are 135 licensed and approximately 1600 unlicensed airports in South Africa. Out of the licensed airports, 9 are owned by ACSA, 5 by provincial governments, 75 by local (municipal) governments and 46 are privately owned. The vast majority of these privately owned airports are small airstrips, mainly used for flight schools and leisure activities such as micro-lights and skydiving. Approximately 86% of passenger traffic is facilitated through the ACSA airports. Outside these nine airports the majority of passenger traffic takes place at the privately owned Lanseria International Airport and Kruger Mpumalanga International Airport (Department of Transport, 2015a).

Lanseria International Airport was established in 1974 as a municipal airport and was privatised in 1991 (Venter, 2016). Passenger traffic at the airport reportedly grew from 150,000 in 2005 to more than 1 million in 2010. The airport is owned by a consortium consisting of the PIC, infrastructure investment firm Pan African Investment Corporation and local investment firm Nozala (LACDC, 2016).

Kruger Mpumalanga International Airport was established as a privately-owned airport in 2002 by Primkop Airport Management (Pty) Ltd. The airport handled approximately 250,000 passengers in 2014 (ACI, 2015).

The third significant private airport in South Africa is the Hendrik Van Eck Airport in Phalaborwa. This airport was originally owned by resources firm Foskor, who sold it to (privately owned) local airline SA Airlink (SA Airlink, 2016). It is the only airline operating flights to this airport, which mainly serves tourists visiting the Kruger National Park.

According to the White Paper on National Civil Aviation Policy (Department of Transport, 2015b) the funding of provincial airports is perceived to be a challenge for the government. Nevertheless, it states there are presently "no specific incentives for investing in airports" (p. 38) and that "financial viability is a prerequisite for private-sector involvement" (p. 39).

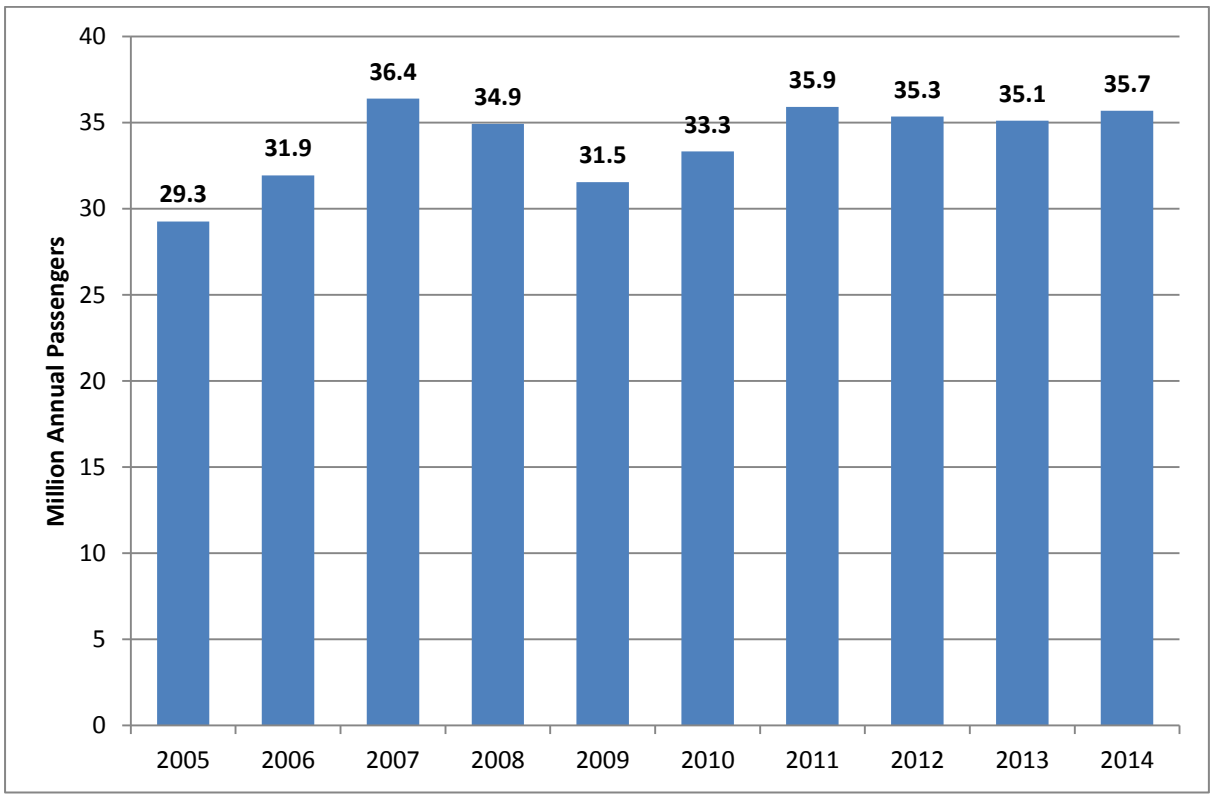


Figure 9-3: Total passenger air traffic at ACSA airports (from: ACI, 2015)

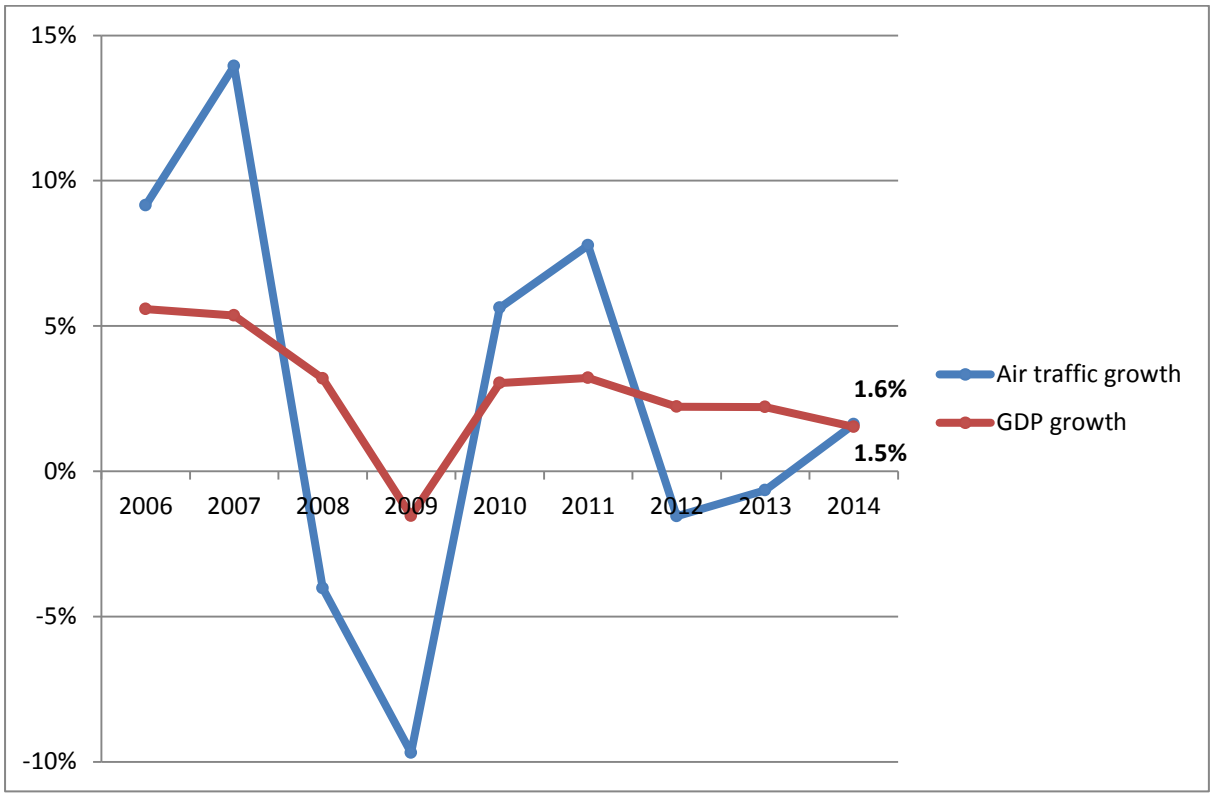


Figure 9-4: Change in GDP and air traffic in South Africa (from: ACI, 2015 and World Bank, 2015b)

9.4. Content Analysis

The interviews were analysed in accordance with the process outline in the Research Design and Methodology chapter. After transcribing and familiarising the interviews were coded to provide an insight into the contents. The coding tree used for this contains attribute codes and substantive codes and is included in Appendix B. Through conceptualisation and interrelation several themes were identified that related to the theoretical basis of this research and the case studies conducted. Interpretation of the themes and the viewpoints within them expressed by the respondents resulted in the findings that are presented in the following section.

9.5. Findings

The findings presented in this section relate the interview content to the theoretical background established in the literature review and the emerging market context outlined in the case studies. They highlight similarities and differences between the countries of the two respondents, Kenya and South Africa. The following results of the content analysis of the interviews and are organised according to the themes identified.

9.5.1. Financing of airport developments: budget finance and the funding gap

Respondent 1 indicated that the KAA receives US$ 20 million in budget allocation from the government for the development of infrastructure at the country's small air strips. Developments at its main airports (NBO and MBA) are financed through loans from Development Finance Institutions (DFIs). The KAA is able to borrow from some of the DFIs without a sovereign guarantee, as one of the few parastatal organisations in Kenya, because it has significant revenues. For example, in 2010 it borrowed US$ 93 million from the French Development Agency (Agence Française de Développement, AFD) for terminal building works at NBO, and in 2014 it borrowed US$ 66 million for upgrades at MBA (KAA, 2016b). Respondent 1 indicated KAA is currently in discussions with AFD about financing the development of the "Original Ring" at NBO, which includes Terminal 1A, 1B and a new arrivals terminal. The respondent said the infrastructure gap in Kenya was estimated at KES 130 to 200 billion (approximately US$ 1.3 to 2.0 billion) per annum and argued that PPPs could be utilised to plug this gap.

In South Africa, ACSA is able to access a variety of sources of finance for capital expenditures, including loans from DFIs and the issuance of bonds. Respondent 2 indicated that within the ACSA network, income from the large, profitable airports is used to subsidise loss-making operations at the smaller airports. The Provincial and Municipal airports in the country rely on budget finance from their owners and incidental support from other government entities for capital expenditures. The Provincial and Municipal Governments are mostly able to allocate sufficient funds to these airports in order to support the role they play in providing connectivity in the region. Respondent 2 indicated that many of these airports rely on government budget allocations for 70% up to 100% of their financing needs, excluding major capital expenditures. The funding gap for airport infrastructure in South Africa exists outside of the profitable segment of the market, which is dominated by ACSA and the private Lanseria International Airport. This means private participation in the financing of developments of these airports is not likely, which echoes the government's position expressed in the White Paper on National Civil Aviation Policy (Department of Transport, 2015b).

9.5.2. Role of government: legislation, institutional capacity, and investability issues

In Kenya the process of procuring PPP deals is driven by the State Government, through the PPP Unit. This PPP Unit organises the procurement of PPP projects according to a list of priority projects set up by various government agencies and approved by Cabinet. Respondent 1 indicated that the PPP legislation in the country has been criticised as cumbersome and impractical, noting that all PPP deals over US$ 10 million have to be approved by Cabinet. Unsolicited proposals for PPPs can only be entertained by the PPP Unit under very specific circumstances. However, it was highlighted that a successful airport PPP deal for a number of small airstrips in the Masai Mara region had been concluded by the Narok County Government.

In South Africa, unsolicited proposals for airport PPPs can be entertained by the National Department of Transport and will be considered on a case by case basis by the Airport Coordinating Committee. Several of such proposals, for greenfield airports, have been received but to date none have been concluded. Similarly to Kenya, Provincial and Municipal governments have the authority to conclude airport PPP deals by themselves, subject to compliance with applicable legislation. For example, airport management concessions (a "light" form of airport PPPs that does not involve private financing) have been granted at three municipally owned airports that operate domestic flights only.

Both Respondents noted that a lack of capacity and understanding of airport PPPs within governments is a limiting factor for their implementation. Many governments in SSA do not have sufficient knowledge of the complicated risk sharing and financing arrangements for airport PPPs and are therefore not able to develop and utilise legislation to support private participation. Respondent 1 was of the opinion that support from government, in the form of sovereign guarantees, would be required for the successful implementation of airport PPPs in Kenya, but was sceptical whether such support would be forthcoming. He stated that the government has many competing needs and cannot simply "plug the gap in the financial model for a private entity". Respondent 2 argued that many SSA governments do not apply "commercial thinking" when it comes to infrastructure development. This corresponds to the comments by the Centre for Aviation (2014c) about the AAI's lack of

ability to develop non-aeronautical revenues, and the absence of “economic signals” in government highlighted by Grimsey & Lewis (2007).

According to Respondent 1 valuable lessons can be learnt from the energy sector in Kenya, which has been highly successful and has seen “several independent power producers come on stream with significant capacity”. He describes how policy certainty, a simplified regulatory framework, an established feed-in tariff and strong expertise (in both public and private sector) on financing energy PPPs have contributed to this success.

Respondent 2 further argued that “thinking is more politically inclined” in SSA and that “political cycles” (i.e. elections) provide obstacles to private participation in airport development. This relates to the broader issue of low investability in emerging markets, which can be considered an impairment to (foreign) investment. Respondent 1 lists “uncertainty on aviation policy”, macro-economic issues, questionable legal protection for investors and vulnerability of the Kenyan economy to external shocks (such as the recent Ebola virus disease outbreak and violent terrorist attacks) as risk factors for investors in airport infrastructure. Investability may be more of a concern for Kenya, a lower middle income country, than it is for South Africa, an upper middle income country with a larger economy and more developed capital markets. The issues of policy certainty, institutional framework and domain expertise were also cited as concerns in India (Centre for Aviation, 2014b).

9.5.3. Air traffic: limitations and risks

Respondent 1 argued that any investor in airport PPPs in the country (referring mainly to NBO) would require the level of traffic at the airport to be guaranteed by the government. In essence, he believed private investors would not be willing to accept the demand risk associated with passenger traffic and would insist on a minimum traffic guarantee from the government (i.e. a sovereign guarantee). The respondent considered it highly unlikely that such a guarantee would be provided by the government, as it presents a major downside risk that the government would want to offload to the private sector in the PPP structure.

A concessionaire taking on an airport PPP relies on sufficient passenger traffic to generate revenues, which will enable it to repay its investors. The confidence of debt providers in

particular that the level of air traffic can be sustained and grown over time is believed, by Respondent 1, to be insufficient to make airport PPPs in Kenya bankable. Air traffic in the country is exposed to various risks, including the reliance on the national airline Kenya Airways (which is responsible for more than 70% of traffic in the country), the threat of terrorist activity and the Ebola virus disease. Respondent 2 adds that (changes to) visa regulations also present a risk to air traffic.

The situation in South Africa is quite different from that in Kenya. Respondent 2 believes that its more diverse economy and the hub role that the country plays for air traffic in Africa provide it with a higher level of surety. Even if the situation in South Africa itself were to suppress air traffic demand, the demand created by links with neighbouring countries and the rest of the continent would mitigate the impact for its airports. It should be noted here that air traffic growth in South Africa has been rather lacklustre in the past decade, with a CAGR of approximately 2%. Meanwhile, other hub airports in the continent, particularly in East Africa, have grown faster than South Africa's main international hub O.R. Tambo International Airport (JNB) in Johannesburg. Nevertheless, JNB is still by far the largest airport in the continent and South Africa still the largest aviation market. Respondent 2 points to recent proposals by private parties to set up greenfield airports, serving as secondary airports in the vicinity of JNB and Cape Town International Airport, as a sign of investor confidence. He points out that the fact no such PPP deals have been concluded to date owes more to risks associated with foreign investment in airports operating international flights, than to traffic risks perceived by the investors.

The fact that the majority of air traffic in South Africa occurs at the ACSA airports means that there is very limited air traffic demand left outside of that network. Referring to this situation, respondent 2 asked "who will come and invest in anything outside of our current airport network"? Moreover, the respondent stated that ACSA would be the government's first point of call if the need for a new airport would arise. This shows that the corporatisation of the country's main airports network, in a state-owned entity, means that there is very little opportunity left for private participation in the development of (other) airports.

9.5.4. PPP structures, private concession parties and foreign investment

When asked about the private parties that could play a role in airport PPPs in Kenya, Respondent 1 referred to a number of international airport operators. This indicates that bringing in operational expertise is seen as one of the objectives of airport PPPs, as was the case in Brazil and India. In South Africa however, the presence of ACSA, the largest airport operator on the continent, means there is no need to bring in operational expertise from outside. In fact, ACSA has exported its expertise to airport PPPs in Brazil and India. In addition, three of South Africa's municipally owned airports have awarded management contracts to a private airport operator, which is considered a "light" form of PPPs that does not involved private financing. Respondent 1 indicated that such lighter forms of PPPs could be considered in Kenya, as they limit the risk exposure of the private sector party. There can also be a role for (private) airlines to play in airport PPPs (as in the case of Phalaborwa Airport), although there are risks associated with vertical integration in a monopolistic environment.

Besides operational expertise, other areas such as non-aeronautical revenue development may benefit from private sector involvement. However, there are other ways, besides PPPs, of brining in necessary (private sector) expertise for the development of airport revenues. Consultants can fill gaps in expertise in airport organisations, and joint ventures in commercial activities (such as real estate development) can be effective in growing non-aeronautical revenues of airports.

In addition to airport operational and commercial expertise, airport PPPs require parties with capabilities in construction and the management of government concession agreements. In both Brazil and India it was seen that large domestic conglomerates played an important role in airport PPPs. The South African conglomerate Bidvest was also involved in the airport concession for DEL in India. These type and scale of conglomerates may not be present in the smaller economies in SSA, which could limit the possibilities for domestic involvement in airport PPPs.

From the financing point of view, Respondent 1 would look towards foreign investors, while Respondent 2 also mentioned domestic sources. This may be due to the fact that Kenya is a

lower middle income country with a small economy and capital market, while South Africa is an upper middle income country with a much larger economy. It is worth noting that the GDP (at market prices) of Brazil is almost 7 times larger than that of South Africa, which itself is almost 6 times larger than that of Kenya (World Bank, 2015b).

In Brazil, also an upper middle income country, most of the financing of the airport PPPs came from domestic sources, including (government) pension funds. In South Africa the PIC has invested in both ACSA and the private Lanseria International Airport, which shows the benefits of mobilising (government) pension funds for infrastructure investment. The COK airport concession in India (initiated in 1994) was able to mobilise funds from non-resident Indians, which is an innovative way of attracting foreign investment that could be considered by low or lower middle income countries in SSA.

Further to the discussion about whether there is a need for foreign investment, Respondent 2 highlighted that there are security risks involved in foreign investment in airports. This may be particularly important for airports with international flights, as they provide a gateway into and out of the country. This was cited as one of the reasons a proposed greenfield airport PPP did not materialise.

In addition to security concerns, Respondent 2 indicated that an over-reliance on (foreign) private parties in the industry presents a risk to governments. As private sector wages are often higher than those in the public sector, a transfer of knowledge and skills from public to private sector could take place. This would put the public sector in a disadvantaged position in terms of regulation and oversight of the private parties operating in the industry.

Finally, Respondent 2 described private investors as “profit maximisers”, highlighting the need for regulation and oversight of airport PPPs. He described how the objectives of the private sector (maximising profit) do not align with those of the public sector (providing effective connectivity at reasonable prices). This issue relates to the concerns that have been expressed in India about excessive aeronautical fees and labour issues at the privatised airports. In essence, the issues arises as some airport services are inherently natural monopolies, which require economic regulation to protect airport users and the general public (Tretheway, 2001; Oum, Zhang & Zhang, 2004; Czerny & Zhang, 2015).

10. Conclusions

From the research conducted several conclusions can be drawn that provide answers to the research questions. In short, it was found that PPPs can certainly play a role in supporting airport developments in SSA. However, from a review of the literature, in-depth case studies of Brazil and India and interviews with government representatives in two SSA countries, a richer view on the opportunities for airport PPPs in SSA has emerged.

Twelve airport PPPs in Brazil and India have been implemented in recent years, with mostly positive outcomes in terms of improvements in airport infrastructure and service levels. Also in South Africa, PPPs have successfully been used to develop airport infrastructure and improve connectivity in the country and the region, albeit on a much smaller scale. Airport PPPs offer, amongst other benefits, the possibility of utilising private sector financing and expertise for the purpose of airport development.

However, the opportunities for using airport PPPs in SSA countries are beset by several challenges. If these challenges were to be addressed by the governments in these countries, the risks for private parties to become involved in long-term airport concessions could be reduced and substantial benefits may be realised. In the interim, PPP models that allocate less risk to the private sector, and limit financial exposure of private parties, could also prove beneficial to airport development in the region.

The following sections provide a summary of the research findings, structured along the research sub-questions.

10.1. How can PPPs be used for airport development in emerging markets?

This research has shown that PPPs can be used to develop airport infrastructure in emerging markets by bringing in private sector capital and expertise. In order to achieve this governments play a key role.

First and foremost, governments are expected to provide an enabling environment for investors in airport infrastructure. This relates to a wide range of aspects collectively referred to as investability. Macro-economic stability that supports economic growth is

crucial, as GDP is considered an important driver of the air traffic from which the income of airports is derived. More specifically, stable, predictable and practical aviation policies and PPP legislation are key aspects of such an enabling environment. For successful airport PPPs in particular a strong and clear economic regulatory framework is required in order to protect airport users from monopolistic behaviour and to provide clarity and certainty around revenues to private participants.

Further, if governments want to utilise PPPs for the development of their airports, they are expected to drive the process of procuring PPPs by setting up a realistic procurement process with attractive conditions and actively pursuing interested private parties.

Airport PPPs in emerging markets can be highly lucrative investments, which is evidenced by substantial investor interest and high prices being offered for concessions in Brazil and India. Private sector parties that are interested in the potential returns offered by investments in airports are expected to bring a wide range of experience and expertise to the table. Successful airport PPPs usually require a consortium of firms to be formed. Such a consortium should include investors with access to sufficient capital at suitably low rates. Large capital outlays may be required to fund airport infrastructure upgrades and expansions associated with airport PPPs in emerging markets. This points towards the need for construction expertise in the airport PPP consortium. As airport upgrades and expansions can be large and complex, relevant experience is required to complete them cost-effectively within set timeframes.

Successful airport concessionaires in Brazil and India have relied on a wealth of experience in infrastructure development and the management of complex concession agreements with governments. The recent airport PPP transactions in these countries have been dominated by large, domestic conglomerates with strong track records in infrastructure development and large construction projects.

Essential to the success of airport PPPs is a consortium’s ability to operate airports efficiently and achieve revenue growth. The development of non-aeronautical revenue streams is of particular importance to growth in income and profitability. International airport operational experience and commercial acumen are considered vital. Airport PPPs in

emerging markets offer an opportunity for established international airport operators to expand their business beyond their home markets and diversify their sources of income.

PPP structures used for large airports, both greenfield and brownfield, in Brazil and India have involved long-term concessions with required investments in infrastructure. As these have involved the selling off of profitable assets by governments, mechanisms have been included to compensate these governments. Concession fees (either fixed or revenue-based), dividends to public shareholders in the concessionaires and contributions to airport infrastructure development funds (such as the FNAC in Brazil) have been used. These mechanisms ensure that the governments are still capable of funding unprofitable airport infrastructure that may serve an important role in providing connectivity. Some have argued that these airport PPPs have provided governments with increased revenues, as well as improved airport infrastructure and service levels. Furthermore, where governments are not able to fund the necessary improvements in airport infrastructures, airport PPPs have provided a way of accessing private capital. Project delivery by private sector is believed to be faster and more cost-effective than by public sector.

On the other hand, there are several risks associated with private sector involvement in airport development. Security concerns have been expressed, relating to foreign control of key infrastructure and border posts. More frequently, the escalation of costs to airport users has been cited as a drawback of airport PPPs. This highlights the importance of economic regulation in the monopolistic airport environment. Other risks include over-reliance on private sector, skills drain from public sector and labour disputes relating to the transfer of operations from government to private sector.

10.2. What are the requirements for successful airport PPPs in SSA?

As in other emerging markets, key to successful airport PPPs in SSA are an attractive investor environment, stable aviation policies, effective PPP legislation and strong economic regulation of air services. Beyond these issues, sufficient air traffic and access to the necessary capital and skills are crucial.

The level of air traffic activity in SSA countries is much lower than in the large emerging markets of Brazil and India, who have recently implemented a number of airport PPPs and

may implement more in the near the future. In 2014 there were only 21 airports in SSA that handled more than one million passengers, which is considered a minimum threshold for profitability. Further, a substantial share of the SSA air traffic is captured by South Africa, where the profitable airports sector is dominated by the corporatized, state-owned airports company ACSA. The majority of the remaining air traffic takes place in low and lower middle income countries with less favourable investment climates and less robust air traffic. There is a strong link between national (state-owned) airlines and the level of air traffic in many SSA countries. This poses a risk to air traffic and, therefore, the airport and airline markets have to be considered in unison when evaluating opportunities for airport PPPs. Strong GDP growth in SSA, and with it air traffic, do provide encouraging signs.

Airport PPPs in emerging markets typically require substantial investments in upgrades and expansions of airport infrastructure. Therefore, access to capital at suitable rates is a requirement for successful airport PPPs. Such capital is preferably sourced domestically, in order to avoid exchange rate risks and unnecessary foreign influence over key national infrastructure. However, capital markets and the banking sector in many SSA countries are not able to support the level of investment required. As seen in Brazil and South Africa, (government) pension funds can play a role in financing airport PPPs. DFIs (such as the BNDES in Brazil) can also play a major role in providing affordable finance and supporting private sector investment in airports. Where foreign investment is required, the example of COK in India shows that innovative arrangements involving diaspora populations could present opportunities for countries in SSA.

In SSA governments will have to look into ways of supporting the bankability of airport PPPs or utilising PPP structures that are less risky to the private sector. In some cases, private sector parties may require revenue guarantees and other support from government in order to reduce their risk exposure in long-term concessions. Alternatively, lighter forms of PPPs can be considered, whereby the private sector is brought in more for airport operational expertise and commercial acumen, than for its financial contributions. Lighter forms of PPP may be more suitable for the development of airports in SSA with low levels of air traffic. Even after implementing a number of long-term concessions, the Indian government has also turned to more limited airport management contracts. In general, PPP structures are

considered suitable when there is an appropriate sharing of risks and rewards between public and private sector, which is different in each country and for each airport.

10.3. Do governments in SSA consider PPPs as suitable options for airport development?

For SSA governments the main objective of using PPPs for airport development is to access private sector finance to fill the infrastructure funding gap that exists. Currently, government budget allocations are the main source of finance, but these are often not sufficient to realise the potential benefits of air transportation on the economy. The access to loans from DFIs may be limited due to the need for sovereign guarantees or due to prevailing government debt levels.

However, as discussed above, the investor climate and level of air traffic in SSA may not be supportive of large capital investments by private sector. Long-term concession agreements that involve major airport upgrades and expansions could expose private sector parties to unacceptable levels of risk.

In South Africa several successful airport PPPs have been implemented. However, due to the fact that the majority of air traffic in the country is handled at ACSA airports, there is very little opportunity for profitable PPPs outside that network. Proposals for greenfield airport PPPs have been received but none have been concluded to date. The Provincial and Municipal airports that currently depend on government budget allocations are not profitable and, therefore, unattractive to private investors. Lighter types of PPPs involving management concessions have been successfully implemented at a number of airports in the country. The government does not actively pursue airport PPPs in the country.

Private sector finance would be welcome in Kenya to support airport developments, which currently rely on government budget allocations (for smaller unprofitable airports) and DFI loans for the two main international airports NBO and MBA. Even though the level of air traffic at these airports in 2014 was 6.4 MAP and 1.4 MAP respectively, airport PPPs are not considered bankable due to several challenges. The level of air traffic is highly dependent on the national airline Kenya Airways and is vulnerable to economic and external shocks.

Furthermore, the investor climate is such that investors would require the government to take on a substantial share of the risk in the PPP arrangement.

Common challenges that are being faced by governments in SSA looking to implement PPPs for airport development include the investor climate, the level and growth of air traffic, the regulatory and policy frameworks and institutional capacity and domain expertise within government.

11. Discussion

11.1. Relevance of the research

The research findings clearly highlight the potential benefits of using PPPs for airport developments, the factors that contributed to the success of airport PPPs in other emerging markets and the multitude of related requirements, risks and challenges that are specific to the situation in SSA. These aspects provide guidance to SSA governments looking to develop their airport infrastructure for the benefit of connectivity and economic growth. Key areas for policy improvement include the quality of PPP legislation and regulation of the aviation industry.

The research provides SSA governments with an understanding of the various parties involved in airport PPPs and their possible roles. This will enable them to target specific investors and ensure they acquire the experience and expertise necessary for maximising the benefits extracted from airport PPP deals.

Airport investors can draw insights from this research into the aspects that affect the opportunities for airport PPPs in emerging markets. It allows them to better evaluate risks and propose mitigation measures. It also enables them to engage with host country governments on specific issues that affect the bankability of airport PPPs, including traffic risk and the regulatory system.

11.2. Opportunities for further research

This research is exploratory in nature and has identified a wide range of issues that are of importance in the development of airports in SSA and the use of PPPs specifically. Several of these issues require further investigation in order to develop a deeper understanding and arrive at valuable (policy) recommendations.

In order for governments to set priorities and take appropriate actions, in an effort to utilise airport PPPs, it is important to gain a more detailed insight into the valuation and risk assessment methods used by airport investors. The valuation methods used can show where investors perceive risk, how they rate it and how they mitigate it. This insight can

enable governments to identify the policies and actions that can have the greatest impact on improving the bankability of proposed PPP structures and ultimately maximising the benefits derived from the PPP for all parties.

Coupled with valuation and risk assessment are the possible sources of funding utilised by airport investors. More knowledge on the funds available, their costs, terms and conditions can enable governments to improve the bankability of airport PPPs. For example, they could provide benefits (such as tax breaks) in specific cases so as to increase the available funds or reduce their costs. Of particular interest are blended finance (i.e. utilising public funds to 'catalyse' private funds), mobilising pension funds for infrastructure investment and diaspora finance (i.e. through instruments such as diaspora bonds).

This leads to the wider topic of what governments can do to improve bankability of airport PPPs. Stiller (2010) highlights several possible options that could be explored by governments. The applicability of these, and other methods, may differ per country as the risks faced by investors will also be country-specific. A thorough comprehension of ways to mitigate risks and improve bankability can be beneficial to both governments and investors.

Considering the challenges to bankability of long-term airport concessions in SSA, it would be worth investigating how lighter forms of PPPs can benefit airport developments. A multitude of PPP models is available, each with their own benefits and ways of distributing risk and reward between public and private sectors. It could be very beneficial to SSA governments to find out which models are most suitable to the low-traffic and high-risk environment in low and lower middle income countries. As many airports in SSA still rely heavily on aeronautical revenues, governments could benefit from knowledge on the different ways of utilising private sector expertise in the growth of non-aeronautical revenues.

The privatisation of a substantial number of the countries' largest airports in Brazil and India has left the government-owned airport authorities (Infraero and AAI respectively) in need of reorganisation. Of particular interest is the question of how governments can ensure sufficient funds are available to support and expand unprofitable airports, when the profitable ones are privatised. As described, concession fees, dividends, cross-subsidisation

within an airport network and mandatory contributions to infrastructure development funds are possibilities. However, more research is required to find the right balance between these, and any other possible, mechanisms.

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Appendix A: Interview Guideline

1. Introduction

Course description:

- Master of Management in Finance & Investment
- 1-year programme at Wits Business School
- Research thesis

Research objective:

The objective of this study is to provide insight into the opportunities and limitations of PPPs for airport developments in Sub-Saharan Africa. It aims to provide guidance on the challenges and possible avenues for solutions that exist.

Research questions:

Can Public Private Partnerships support the development of airports in SSA?

1. How can PPPs be used for airport development in emerging markets?
2. What are the requirements for successful airport PPPs in SSA?
3. Do governments in SSA consider PPPs as suitable options for airport development?

Purpose of interviews:

Gain insight into the views of SSA governments on PPPs for airport development:

- Motivations and objectives
- Objections and concerns
- Challenges

Practical matters:

- One-hour interview (approximately)
- Will be recorded and (partly) transcribed

- Will be included in thesis report (including position)
- Any questions?

2. Background

- What are currently the sources of funding for airport developments? Budget, Offical Development Assistance (ODA) or private?
- Are they considered sufficient to provide in the country's need for airport infrastructure development?
- What is the past experience with airport PPPs in the country?
- Legislation and policy in place that deals with airport PPPs and economic regulation of aeronautical charges?
- Would you consider airport privatization? Why or why not? Currently plans for airport PPPs in the country?
- What are the objectives of airport privatization?
- What would you hope to achieve with airport privatizations?

3. Role of government

- If you were to privatise an airport(s), what would be the preferred role of the government (airport authority/company) in daily operations? And in strategic decisions?
- Do you consider regulation of airport (aeronautical) charges to be necessary? What type of regulation would be preferred or likely? Do you have particular views on single till versus dual or hybrid till regulations?

4. Concession parties

- Who would be suitable parties to participate in airport PPPs in the country?
- What are your views on participation by foreign companies?
- What competencies, skills or experience should private parties bring to the table?
- Is airport operations experience an important factor?

5. Concession financials

- How should the government be reimbursed for awarding a concession? Fixed fee, revenue/profit sharing, dividends?
- Besides paying a fixed concession fee, what should concessionaires further contribute financially?
- What are likely sources of (debt and equity) capital for private parties to fund concession fees and airport upgrades? Are domestic sources (local currency) available? Or is foreign capital required?
- What role can multilateral development finance institutions play?
- Do you believe that airport PPPs in the country could be bankable for the private sector?
- What can the government do to improve bankability?
- If (large) profitable airports are privatised, would that impact the government (airport authority/company) revenue stream? How would that affect the maintenance and upgrade of (small) non-profitable airports?

6. GDP and air traffic

- What is the outlook for growth in GDP and air traffic in the country?
- Is the level of air traffic at airport(s) in the country sufficient for private investors to be interested in PPPs? Is air traffic growth sufficient?
- Do you see the level of air traffic, and its growth, as an opportunity or a limiting factor?

7. Closing

- What do you see as obstacles/challenges/limitations in the implementation of airport PPPs in the country?
- Do you see a role for PPPs in airport development in the country? In other countries in the region? In Sub-Saharan Africa?
- Any other comments or thoughts on the matter?
- Word of thanks.

Appendix B: Content Analysis Coding Tree

1. Attribute codes

No.	Code	Sub-code
1	Income level	Upper middle income (UMI)
		Lower middle income (LMI)
2	Region	Southern Africa
		East Africa
3	GDP Growth (CAGR last decade)	≈ 3%
		≈ 5%
4	Traffic Growth (CAGR last decade)	≈ 2%
		≈ 4%
5	Medium airports (>1 MAP)	2
		5
6	Experience with PPP	National
		Regional

2. Substantive codes

No.	Code	Sub-code
1	Financing	Budget
		ODA
		Private
		Sufficient
		Gap
2	Role of government	Regulator
		Financier
		Initiator
		Policy
		Capacity
3	Concession parties	Foreign
		Domestic
		Operator
		Investor
4	PPP Structure	Light
		Long-term concession
5	Precedent	In airports
		In other sectors
6	Investability	Policy
		Macro-economic
		Legal protection

7	Risk	Traffic
		Economic
		To government
8	Challenge	Institutional capacity
		Bureaucracy
9	Benefits	Efficiency
		Non-aeronautical
		Funding