

# Investment in Air Transport Infrastructure

Guidance for developing  
private participation

Mustafa Zakir Hussain, Editor

With case studies prepared by  
Booz Allen Hamilton



THE WORLD BANK



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**PPIAF**

PUBLIC-PRIVATE INFRASTRUCTURE ADVISORY FACILITY

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# CONTENTS

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<b>ACKNOWLEDGMENTS</b>	<b>i</b>
<b>ABBREVIATIONS AND ACRONYMS</b>	<b>iii</b>
<b>1. PREFACE</b>	<b>1</b>
Details of the Study	2
Structure of this Paper	3
<b>2. OVERVIEW</b>	<b>5</b>
<b>A. SECTOR BACKGROUND</b>	<b>17</b>
<b>3. AIR TRANSPORT INFRASTRUCTURE SUPPLY AND DEMAND</b>	<b>19</b>
The Nature of Air Transport Infrastructure	19
Supply of Airport and Air Navigation Services	21
Air Transport Demand	28
Other Developments in the Nature of ATI Demand	35
<b>4. THE CHANGING ROLE OF GOVERNMENT</b>	<b>51</b>
Introduction	51
Motivation for Government Provision of Air Transport Infrastructure	51

Constraints Faced By Governments	53
Literature Treatment of Government Failings	54
A New Allocation of Responsibilities	55
<b>B. POLICY DESIGN FOR PRIVATE SECTOR PARTICIPATION</b>	<b>59</b>
<b>5. MOTIVATIONS, VISION, OBJECTIVES, AND PROCESS</b>	<b>61</b>
Motivations for Reform and Vision for the Sector	61
Objectives of PSP Policies	63
Process, Planning, and Consultation	67
Analysis Required to Support Decision Making	70
<b>6. ALTERNATIVE FORMS OF PSP</b>	<b>75</b>
Introduction	75
A Detailed Spectrum of PSP	76
Relative Merits of Different Levels of PSP	82
Contemporary Models of Public Provision	83
Expected Gains from Ownership By Private Firms	85
Political Economy and the Assessment of Policy Sustainability	92
<b>7. ECONOMIC ANALYSIS OF PSP POLICIES</b>	<b>95</b>
Introduction	95
Project Finance	95
Responsibilities and Risks	99
Management Incentives	108
Transaction Advisory Support	115
<b>8. MARKET, INSTITUTIONAL, AND REGULATORY REFORM</b>	<b>117</b>
Market Structure	117
Institutional and Regulatory Reform	122
Other Institutional Arrangements	129
Optimal Regulatory Contracts	131

<b>C. PERFORMANCE ASSESSMENTS, DIAGNOSTIC TOOL FOR POLICY MAKING, AND SUMMARY OF KEY MESSAGES</b>	<b>139</b>
<b>9. PERFORMANCE ASSESSMENTS</b>	<b>141</b>
Introduction	141
Performance Assessments	152
<b>10. DIAGNOSTIC TOOL FOR EARLY DECISION MAKING:     SELECTING THE APPROPRIATE FORM OF PSP MODEL</b>	<b>153</b>
<b>11. SUMMARY OF KEY MESSAGES</b>	<b>157</b>
<b>APPENDIXES</b>	
I. Case studies	163
II. Lessons from Case studies	219
<b>BIBLIOGRAPHY</b>	<b>239</b>





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## ACKNOWLEDGMENTS

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This study was produced by a task team led by Mustafa Zakir Hussain of the Finance Economics and Urban Development Department of the World Bank. Other principal team members included Oliver Hogan, Edward Clayton, and (during an earlier stage) Mike Fairbanks, all of Booz Allen Hamilton.

This study was conceived by a group that included Ellis Juan and Douglas Andrew (initial task team leader) of the Finance, Economics and Urban Development Department of the World Bank, together with Jyoti Shukla and Michael Schur of the Public-Private Infrastructure Advisory Facility (PPIAF).

Tomas Serebrisky and Charles Schlumberger of the World Bank and Clemencia Torres de Mästle and Paul Reddel of PPIAF provided extensive peer review. Claire Markgraf worked tirelessly to support delivery of the final product.



## ABBREVIATIONS AND ACRONYMS

ACSA	Airport Company of South Africa
ADC	Aéroports de Cameroun (Cameroon Airports)
AdP	Aéroports de Paris (Paris Airports)
AdR	Aeroporti di Roma (Rome Airports)
AFD	Agence Française de Développement (French Development Agency)
AG	The Airline Group
AIA	Athens International Airport
ANS	air navigation service
ANSP	air navigation service provider
AOT	Airports of Thailand
APEC	Asian Pacific Economic Cooperation
ASA	air services agreements
ASECNA	Agency for the Safety of Aerial Navigation in Africa
ATC	air traffic control
ATCO	air traffic control officer
ATI	air transport infrastructure
ATM	air traffic movements
ATNS	Air Traffic and Navigation Services Ltd.
BA	British Airways
BAA	British Airports Authority
BICIC	[a bank]
bn	billion
BOOT	build own operate transfer
BOT	build-operate-transfer
CAA	Civil Aviation Authority
CEO	chief executive officer

CFA	Cameroon Francs
CPI	consumer price index
CP1	control period 1
CP2	control period 2
DBF	design build finance
DBFM	design build finance maintain
DBFOM	design build finance operate maintain
DBOO	design build own operate
DBOOT	design build own operate transfer
DFS	Deutsche Flugsicherung
DfT	Department for Transport
EBIT	earnings before interest and taxes
EBITDA	earnings before interest, taxes, depreciation, and amortization
EIB	European Investment Bank
FSC	full-service carrier
FY	fiscal year
GA	general aviation
GDP	gross domestic product
ICAO	International Civil Aviation Organization
IATA	International Air Transport Association
IPO	initial public offering
ISO	International Standards Organization
JAL	Japan Airlines
LAA	Loa Airport Authority
LCC	low-cost carrier
m	million
MALIAT	Multilateral Agreement on the Liberalization of Air Transport Navigation
NATS	National Air Traffic Services
NBV	net book value
OAA	Open Aviation Area
ORSNA	Organismo Regulador del Sistema Nacional de Aeropuertos (Regulatory Agency of the National System of Airports)
PPI	Public-Private Infrastructure
PPIAF	Public-Private Infrastructure Advisory Facility
PPP	public-private partnership
PSP	private sector participation
RPI	retail price index
SAA	Shanghai Airport Authority

SACL	Sydney Airport Corporation Ltd.
SCACHL	Southern Cross Airports Corporation Holdings Ltd.
SIA	Shanghai International Airport Co., Ltd.
SOE	state-owned enterprise
Stg	sterling
WLU	workload unit



1.

## PREFACE

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This paper discusses the development of appropriate private sector participation (PSP) to optimize the provision of air transport infrastructure (ATI). It is aimed primarily at government policy makers in low- and middle-income countries and their advisors. This paper answers a number of questions, including the following: When is it appropriate to allocate the responsibilities involved in ATI provision to private firms rather than continue to allocate them to governments and their agencies? If policy makers decide to vest certain responsibilities with private firms, what considerations are important during this allocation process? How is it best to achieve the transition, and what kinds of private firms should be involved?

Given the characteristics of an airport and the institutions supporting it, this paper goes on to answer a question often posed by policy makers: What forms of PSP can be considered? The paper offers a diagnostic tool to support initial decision making regarding the most appropriate PSP options in a given situation. The paper discusses the successes and failures of PSP to date and reviews their relation to the institutional and regulatory framework, the impact of the political climate, the form of privatization contract, project economics, market conditions, the interests of the international investment community, and the financial structuring of the transaction.

The analysis attempts to remedy the lack of information sharing that has afflicted policy makers and to contribute important lessons by establishing a knowledge base. Experience of PSP has been influenced heavily by local conditions that make it difficult to generalize and apply findings. Many of the advances in PSP have taken place in the developed world, and therefore, the body of evidence from which we can learn genuine good practice is driven by these nations. Nevertheless, the aim of this report is to col-



lect this information in one paper that then can be used to develop policies for middle- and lower-income countries. This study will point to effective formulations that should result in better allocations of resources, more efficient use and development of infrastructure, and the derived consequence of a more competitive environment, which, in turn, enriches countries and reduces poverty.

## Details of the Study

The paper uses a combination of theory (referring to concepts and literature) and case evidence (findings of the application of PSP in a number of real cases across developed and developing countries) to piece together a set of guidelines for PSP in the provision of ATI. **The Overview (section 2)** provides a summary guide to these issues and findings, example outputs from the diagnostic tool, and a focused set of key messages.

The paper distills this information to develop a diagnostic tool that policy makers can use to determine the most appropriate menu of options for PSP in a given situation (see section 10). It summarizes key messages (see section 11) and compiles a list of 40 lessons learned (see appendix II).

### Box 1.1

#### Use of Case Study Evidence

**Booz Allen Hamilton** compiled and assessed the case study evidence included in this paper. Most of this information is contained in part C (the performance assessment), appendix I (the case studies), and appendix II (lessons learned). Findings from this analysis, along with Booz Allen Hamilton's wider experience, illustrate a number of points made throughout the paper. In many cases, these points are highlighted in grey boxes.

The case studies represent a variety of different sizes of airports (and navigation systems) and different types of PSP experience. Of the 14 detailed case studies compiled, three were taken from Sub-Saharan Africa, five from East Asia and Pacific, two from Latin America, and four from Europe and North America. The sample included a mix of PSP types. Three types could be characterized as corporatization, management contracts, and leases; three were airport concessions; one was a greenfield airport concession; six were trade sales and partial divestitures; and one was a stock market flotation.

## Structure of this Paper

The remainder of this paper is organized in three parts, which are structured as follows. Part A (sections 3 and 4) considers the sector background. Section 3 provides an overview of ATI demand and supply, incorporating a review of developments in and the outlook for the air transport sector. It concentrates on developments in and the outlook for downstream aviation markets, which directly shape the demand for ATI. Section 4 addresses the changing role of governments, namely, from providing ATI to ensuring the optimal provision of ATI.

Part B (sections 5–8) focuses on the policy-making process and the options available for PSP. It begins with a high-level checklist for policy makers. Section 5 considers motivations for reform, the vision for the sector, and the objectives for reform. Section 6 considers the different types of PSP, ownership models, and measures to ensure the sustainability of PSP policies. Section 7 deals with the economic aspects of reforms that are necessary to complement a policy of introducing PSP, namely, project finance, the allocation of responsibilities, and risks and management incentives. Section 8 looks at the issues of market structure, regulatory and institutional reforms, and optimal regulatory contracts.

Part C (sections 9–11) focuses on outputs from the available evidence. Section 9 begins with a high-level performance assessment of the case studies of PSP in ATI. These cases are assessed against investment, output growth, prices, financial performance, operational efficiency, and service levels and quality. Section 10 sets out the diagnostic tool developed by Booz Allen Hamilton based on the case studies and wider experience across the sector. This tool provides early guidance for determining the appropriate form of PSP for a given level of institutional development, demand, and consumer willingness to pay. Section 11 summarizes the paper's key messages.

The pertinent characteristics of the case studies and lessons learned are presented in appendix I and appendix II. The bibliography is included at the end of the paper.



## 2.

# OVERVIEW

Air transport infrastructure (ATI)<sup>1</sup> comprises airports, air traffic control (ATC) centers, and the organizations involved in coordinating their provision and use. Airport operators allocate space and resources between airlines, their handling agents, and commercial concessionaires. They determine how airport ground-handling services are provided. Responsibility for security, fire, and rescue generally are vested with the airport operator. Provision of air navigation services (ANS) involves airport and en route ATC and is normally managed separately from airports.

Traditionally, ATI was exclusively under government ownership and management, and capital investment funding was, in general, a responsibility assumed by governments. Airline ownership of terminals at major airports in the United States was a notable exception. Airports have always had a wide range of private businesses operating within their boundaries, from ground handlers to retail concession operators. Governments' desire to focus limited fiscal resources on social sectors and growing demands for investment in ATI, however, has led to a wide-scale private sector role in financing airport and ATC investment. This increased role is leading to significantly more cases of private sector participation (PSP) in ATI.

To date, the private sector has played a number of different roles in delivering ATI. According to the World Bank's Private Participation in Infrastructure Projects (PPI) database,<sup>2</sup> by 2008, there were 132 instances of significant PSP across low- and middle-income countries. These projects

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1. The airports and broader infrastructure required to facilitate air travel.

2. The Private Participation in Infrastructure Projects or PPI database holds data on more than 3,800 projects and is a joint product of the World Bank and the Public-Private Infrastructure Advisory Facility (PPIAF).

have attracted more than US\$32.8 billion from the private sector.<sup>3</sup> During 2005–2006 alone, 18 low- and middle-income countries signed airport contracts. The dominant forms of PSP have remained concessions and greenfield build-operate-transfers (BOTs). In the first half of 2007, new airport contracts were awarded in Jordan, Kazakhstan, Senegal, Tunisia, and Turkey (Schwartz and Izaguirre 2007).

This paper was developed to bring together the key information required by policy makers to (1) determine whether PSP is appropriate, (2) identify the forms of PSP to be considered, and (3) understand the use of different forms of PSP in different situations, and to provide case study information on pitfalls to date.

The applicable theory is vast, and the experience of PSP has been influenced heavily by local conditions that make it difficult to generalize and apply findings. Many advances in PSP have taken place in the developed world, and the body of evidence from which we can learn genuine good practice is driven by these nations. Nevertheless, this paper provides guidance on these issues that then can be applied to develop policies for lower- and middle-income countries.

This paper is divided into three parts. Part A covers ATI sector background, Part B provides policy advice, and Part C focuses on some of the case study evidence to date.

**Part A** discusses the nature of ATI, describes the key characteristics relating to its supply, and discusses several aspects determining the character of demand for ATI going forward. A number of characteristics should be taken into account when developing policy for ATI:

1. The main gateway airport into a country is often seen as emblematic of a nation and where it sees itself. Policy therefore needs to take account of wider national interests.
2. Use of ATI is not consumed directly but, rather, in combination with staff and other resources, as a service. Although the physical structures are important, policies should focus on the end (service provision) rather than the means.
3. Required expenditure is large and long-lasting, which has major implications for types of financing and maintenance costs.
4. ATI is space specific and immobile, which, combined with the third characteristic, means that investments will shape the regional policy of a country for a long time.
5. ATI services can be priced and are chargeable and, consequently, have the potential to be financially self-sustaining.

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3. All amounts are U.S. dollars unless otherwise indicated.

6. Demand is “derived” from the market for airline services. In turn, demand for airline services has a domestic and international dimension that varies according to a country’s circumstances, such as the wealth of the population, the quality of surface transport links, the openness of the economy, and the geography of the country.

Fundamentally, reliable ATI requires the delivery of adequate transport capacity and the services required to deliver this capacity. Increased competition and demand-driven services (such as retail space) add to the complexity of the business model and have to be factored into policy making.

In recent years, the airline industry has undergone dramatic changes, including mergers, bankruptcies, alliances, and the spread of new business models like that of the low-cost carrier (LCC). Fuel price volatility, the U.S. Open Skies Initiative, and the expansion of the European Union (EU), along with other actions, have led to liberalization of traffic rights and ownership and control restrictions. In many but not all situations, these actions have removed substantial government-imposed economic barriers to entry, thereby increasing competitive opportunities and threats.

After addressing the nature of ATI supply and demand, Part A discusses the changing role of government in the provision of ATI. Governments often face constraints in funding ATI. Large upfront payments required for ATI often compete in the national budget with the provision of social services such as education and health, as well as other transport investments. More atomized forms of expenditure required for such services can be committed more easily under tight budgetary constraints. These constraints often manifest themselves in what is termed the “infrastructure gap”—in which infrastructure important to economic growth is underfunded and underprovided.

In countries where a lack of public finance is not the main constraint, the lack of incentives to be efficient has manifested itself in overdesign or “gold plating.” Public sector management has also been considered to be less customer oriented.

Governments have seen increased PSP as the solution to these issues, with the role of government changing to that of ensuring that the policy is in place to deliver appropriate PSP.

**Part B** discusses policy for developing PSP in ATI and the PSP options to be considered. A spectrum of different forms of PSP is possible—in terms of both scope and scale. Policy makers need to think carefully about the form of PSP that would be viable in a given context. Considerations include the following: Is the business potentially profitable? Who would be taking each of the risks? Are the incentives right? Do the firms have the ability to invest?

The simple view of PSP focuses on the transfer of ownership of state-owned assets to private interests. It is often assumed that ownership defines

control, but control actually depends on management and strategic direction of the operation, as well as on its ownership. A more accurate view of PSP is that it involves the transfer of some control from government to the private sector, which can happen through the transfer of ownership or the transfer of contractual rights, or a combination of both. Governments therefore must consider the degree of their involvement in the broad range of elements of management and strategic direction when considering PSP.

ATI provision can be characterized by two sets of responsibilities: the first for the optimal provision of the physical (ATI) structures, and the second for the optimal allocation of the organizational responsibilities that complement them. These two sets of responsibilities can be further decomposed. Optimal provision of the physical structures requires allocation of responsibilities for (1) asset design, “build,” and acquisition; (2) finance for asset delivery; and (3) asset ownership. The organizational responsibilities that complement the assets include (4) operations and maintenance; (5) revenue collection; and (6) management of the organization(s) vested with responsibilities one through five.

Experience shows that the motivations for and objectives of introducing PSP in ATI have been dominated by the need to facilitate investment in large-scale rehabilitation and improvement programs for airports (mainly developing countries with several small-scale airports), in capacity expansions (mainly developed countries with large major-city airports), in new (not-so-major) airport construction (also mainly industrial countries), or in ANS. In these cases, the optimal allocation of the first three responsibilities is vital. The need to improve responsiveness to customers and to get away from public-sector operational restrictions that may impede the ability to operate and employ skills resourcefully, however, often is perceived as part of the problem. In these respects, the optimal allocation of the last three responsibilities is vital.

A selection of the spectrum of PSP options facing the policy maker is outlined:

Corporatization can introduce desirable degrees of management and financial autonomy to a sector owned and operated by the public sector. The choice between a state-owned enterprise (SOE) with commercial objectives (in which case the government retains ownership of the assets) and private profit-maximizing firms for ATI provision likely will depend on the extent to which effective regulation of quality of service is in place. Increased private sector provision puts the onus on effective regulation of quality of services. The state will need to ensure that it establishes effective regulation of quality. Otherwise, the government may wish to retain ownership and control. This is probably the most logical explanation for the more rapid shift toward the introduction of PSP in the airport sector than in air navigation and communications (where prior achievement of certain levels of quality of supply is critically important).

Regional airports often are owned and funded by the regional government or city government because these airports would not be commercially attractive to private sector participants, but they are seen as essential to the local economy. Governments that retain ownership should seek an appropriate balance between providing incentives for managers to pursue profit objectives and ensuring efficiency maximization, within the constraints imposed by appropriate service and investment requirements. State-owned enterprises usually will have a lower cost of capital because of the ability of the government to guarantee its debt. Risk remains with the state (creating contingent liabilities that have to be managed), however, and it could encourage overinvestment. Having said this, a number of city governments that own airports provide successful examples.

PSP can take many forms. Some of these forms are referred to as public-private partnerships (PPPs). These include management contracts, concessions, and partial trade sales. Choosing the right form of PSP for a situation is often critical. Part B describes the various PSP options and provides examples of their operation. Table 2.1 summarizes the concepts of PSP, starting from the most conservative (management contract) and moving through to full privatization. The nature of responsibility held by the private sector changes with the different forms.

**Table 2.1 PSP Types: Summary of Private Sector Responsibilities for Each Form of PSP**

		Management contract	Terminal BOT	Terminal concession	Airport concession	Greenfield airport concession	Trade sale & privatization
Source of revenue		Service payment	Service payment	Performance payment	Performance payment	Performance payment	Risk transfer & profits
Responsibility							
Asset operation and maintenance	Ownership			✓	✓	✓	✓
	Finance		✓	✓	✓	✓	✓
	Operation	✓	✓	✓	✓	✓	✓
	Maintain	✓		✓	✓	✓	✓
Investment in asset	Finance		✓			✓	✓
	Build		✓			✓	✓
	Design		✓			✓	✓

*Source:* Based on work by Booz Allen Hamilton.

*Note:* BOT = build-operate-transfer; PSP = private sector participation.



Full privatization has taken place in few cases. This is largely because of governments' reluctance to cede control over what, at least in the case of major capital city airports, is widely regarded as a national asset. It also has been attributed to the failure to balance the interests of consumers and investors (short- and long-term), given the highly immobile and long-lived character of ATI assets. Kay (1999) forwarded the view that the terms of (full) privatizations in the United Kingdom were too favorable to firms and shareholders and that insufficient attention was paid to the interests of consumers. The lack of adequate explicit mechanisms meant that customers had no chance to secure a fair share of the expected efficiency gains from privatizing. The design of the contracts under which private sector participants operate is vital to achieving these gains. Also vital is the framework for economic regulation and regulatory governance, and the strength of the institutions vested with contract and regulatory enforcement.

Part B discusses the merits of the different approaches from the perspective of public policy objectives and regulatory and institutional requirements. It also discusses requirements on the part of the public sector bringing in PSP and supports the discussion with a number of real cases.

**Part C** reviews the performance of case studies, discusses a diagnostic model developed for this paper, and summarizes the paper's key messages. Part C brings together case study evidence from a broad range of geographies and PSP types with concepts from the literature to assess successes and failures to date. It analyzes 15 cases in 13 countries and evaluates performance according to levels of investment, output, prices, financial performance, operating costs, service level, and quality. It draws out lessons and key guidance for policy makers. A particular focus of the study is to improve policy making for PSP in lower- and middle-income countries (generally including smaller airports).

One of the key messages is that the choice of PSP type (including scale of PSP) is critical to the general likelihood of success or failure. For examples that failed, the evidence suggests that the principal reason was the inappropriate choice of the form or scale of PSP. This includes not only the type of PSP, but also the risk allocation created by the transaction and the policy framework around it. The complication is that governments rely on the PSP process to deliver both the required physical structures and the management to organize these structures. Such a twofold requirement is complex—especially if carried out on an airport- or sector-wide scale.

In low-income countries, success relied on the concessionaire making substantial investments in rehabilitation. If returns on the deal as a whole to the private sector were not sufficient, the vital investment program suffered, creating a vicious circle of downward-spiraling revenues. A less ambitious scale of concession might have better shielded the concessionaire from the risks.

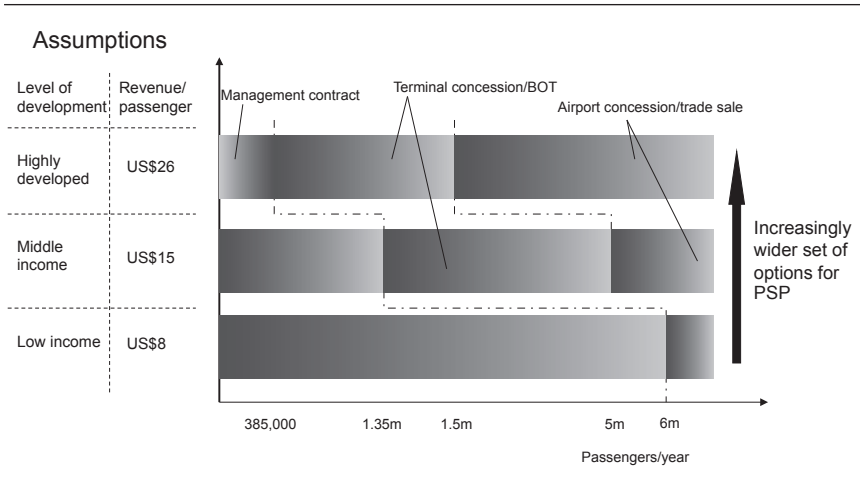
In these cases, the introduction of PSP should have been more gradual and risks should have been better shared with the consumers and the government. This is a particularly important lesson for low-income country policy makers. PSP can be introduced at several different levels, and further potential exists for unbundling and introducing PSP at a number of these levels. This is particularly important in instances in which more ambitious forms of PSP would be difficult to pursue. Opportunities for limited forms of PSP exist. Airport companies can play a key role in running competitive procurement for such services. For example, aircraft ground-handling provision is still vested with commercial airlines or with airport companies. These services could be bid out to a broader set of firms. Other services include retail sales, baggage handling, and passenger services.

Providing early guidance on the selection of PSP type was identified as a key output for this study. This is particularly true in the case of small airports in low- and middle-income countries. Part C compiles evidence from the case studies and wider experience to offer a diagnostic tool that allows policy makers to quickly assess the types of PSP to pursue (and the types to avoid) for the given conditions. This tool requires the following simple inputs:

- Level of development (national sophistication of institutions/prior experience with PSP)
- Revenue per passenger (incorporates effect of competition and consumer willingness to pay)
- Amount of traffic (current and likely)

The output is the average number of passengers per year required to make successively more ambitious PSP types viable. Outputs will vary depending on the assumptions (see the left-hand panel in figure 2.1).

**Figure 2.1 Indicative Outputs of Diagnostic Tool**



Source: Based on outputs from diagnostic tool developed by Booz Allen Hamilton.

Note: BOT = build-operate-transfer; PSP = private sector participation; Revenue/passenger in U.S. dollars

As shown in figure 2.1, as levels of institutional development and revenue per passenger increase, the threshold number of passengers per year at which more ambitious forms of PSP can be introduced decreases. A low-income country with low willingness to pay per passenger would require consistent demand of several million passengers per year before a sustainable transition could be made from a management contract to a concession contract. In contrast, in the most developed countries, the policy maker can transition to a limited concession for significantly fewer than half a million passengers a year. Most cases will fall between these two extremes.

Box 2.1 includes specific examples. Policy makers can use the diagnostic tool for a host of different combinations of assumptions. Details are provided in the body of the report.

## Box 2.1

### Sample Outputs from Diagnostic Tool

Assume a **highly developed market** with **well-developed institutions**, a track record of private sector participation (PSP) through successful stock market flotations, and an average revenue per passenger of US\$26. In these circumstances, as few as 385,000 passengers would be required to transition successfully from a management contract or the like to a terminal concession, a build-operate-transfer (BOT), or small-scale greenfield airport. More than 1.5 million passengers a year would be required to consider an airport concession or trade sale funded by operations.

Assume a **middle-income country** with **moderately well-developed institutions**. The country has experience with several management contracts and some experience with infrastructure developed by the private sector. Average revenue per passenger is assumed to be US\$15. In these circumstances, more than 1.35 million passengers would be required to transition successfully from a management contract or the like to a terminal concession, a BOT, or small-scale greenfield airport. More than 5 million passengers a year would be required to consider an airport concession or trade sale funded by operations.

Assume a **low-income country** with **limited institutions**. Some simple infrastructure PSP is present, such as management contracts. If we assume that the average revenue per passenger is US\$8, then the diagnostic tool suggests that about 6 million passengers per year would be required to shift from considering a simple management contract or trade sale supported by commercial property to a more ambitious form of PSP, such as a terminal concession or terminal BOT.

*Source:* Outputs from Booz Allen Hamilton diagnostic tool.

Part C summarizes key messages (see section 11) covering the following:

- Motivation, vision, and objectives
- Reform process
- Types of PSP and ownership
- Policy sustainability
- Project finance and risk allocation
- Management incentives

- Market structure
- Regulatory and institutional reforms
- Regulatory contracts

Having a process in place to attract the most appropriate bid for the circumstances is as important as attracting the highest possible offer. The process for attracting PSP and subsequent management and regulation should be adapted to the country and the sophistication of its institutions. Quality of process relies on consultation, transparency, and bid robustness (through sound financial and technical analysis and advice). Techniques such as requiring bidders to have debt financing agreements in place before submitting their final bid help to ensure that the winner is able to take the project forward. Where debt financing proves difficult, this is often an indication of future problems with the business case.

It is important for the sustainability of the deal that the terms do not unduly favor one party. Project revenues to the private sector are mostly driven by ability to pay (low-income countries) and the tariff rules determining airside revenues (transition countries). Whether prices can change in response to changes in costs is the key determinant of who bears the risk. Tariff rules such as pass-through costs, reset rules, indexation, and termination payments are critical for determining how robust the PSP is to changes in conditions.

Regarding the structuring of the financing, it is of particular importance to ensure that the project has a serviceable capital structure. Timing of debt servicing is not flexible, and highly leveraged projects stand a higher chance of getting into difficulty if the projected revenue numbers are in doubt.

The following measures can improve robustness of the transaction:

- In feasibility assessments and while determining contract terms, allow for price (tariff) adjustments to catch up with prevailing international market levels in cases in which tariffs have been held artificially low and are not able to recover costs. Many cases listed in the International Air Transport Association (IATA) Charges Manual have not been revised since the 1970s or 1980s. A new private sector operator would need to institute significant increases in such cases.
- Avoid incentives for investment that exceed consumers' willingness to pay.
- Use regulatory instruments that take full account of realistic quality of information (financial and performance) available in the country.

The government can improve the sustainability of the deal in the following ways:

- Ensuring adequate levels of asset transfer and accuracy in asset valuation. The government should do what it can to ensure that bids are based on accurate information on likely financing costs and requirements.
- Agreeing to a timetable of investments so that private sector participants can arrange financing that is sustainable.
- Providing performance-based subsidies to compensate firms for inadequate ability/willingness to pay.

A lack of adequate contract enforcement or regulation might lead to the winning bidder trying to recover a disproportionate amount of costs through higher prices at a later stage. In general, the airport sector has seen few cases of contract cancellation (4 out of 104, representing less than 4 percent of investment commitments during 1990–2005). The sector, however, has seen a number of high-profile instances of contract renegotiation, including the Lima airport concession in Peru and the 32-airport concession in Argentina (Andrew and Dochia 2006).

In terms of approaches to regulate private sector pricing, price caps appear to have performed well in situations in which prices were initially too low (the South African ANS), the initial period of large-scale investment has passed or is only now starting to pick up again (BAA plc of the U.K. and Athens Airport), or initial problems with risk have been ironed out (National Air Traffic Services Holdings Ltd. [NATS], the U.K. ANS). In cases in which the regulatory contract is still driven by investment requirements (South African airports), price caps appear to be performing less well. Commercial negotiations (New Zealand ANS, Sydney Airport) and cost-plus regimes (Mexico and Thailand) are more appropriate.

Managers of service provision should be responsible for delivering performance improvements. In the United Kingdom, the NATS PPP had a contractual agreement between its board of directors and the company management team specifying key performance and operating targets for the coming year. This provided strong incentives. In contrast, in South Africa, Aeroporti di Roma (AdR, the management service provider) held a number of seats on the board and received payments for consultancy services. This arrangement, combined with a small stake in the company (20 percent), likely reduced the potential strength of the incentives to perform.

Section 11 includes a significant discussion of the key messages (also see the 40 lessons learned in appendix II).



**A.**

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## SECTOR BACKGROUND

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This part covers the following:

- Air transport infrastructure supply and demand (section 3)
- The changing role of government (section 4)





### 3.

## AIR TRANSPORT INFRASTRUCTURE SUPPLY AND DEMAND

### **The Nature of Air Transport Infrastructure**

The English-language definition of *infrastructure* is the basic physical and organizational structures needed for the operation of a society. Infrastructure is vital to economic growth and development and, therefore, to improving a country's general living standards, alleviating poverty, and enhancing social cohesion. Its contribution was aptly described by Prud'homme (2004) as a "space shrinker," enlarging markets and lowering trade barriers. Infrastructure is generally thought to include a nation's housing, hospitals, schools, and buildings. Infrastructure also includes the networks required to remove sewerage; deliver water, electricity, and communications; and provide the roads and railways that facilitate the connection of people to places.

Air transport infrastructure (ATI) provides nodes in a network of domestic and international air links that is vital for the delivery of air transport. It includes the physical structures, namely, airports and air traffic control (ATC) centers, and the organizations involved in coordinating their provision and use. Without ATI, air transport cannot function, and without a well-functioning air transport system and the international linkages it provides, national markets will be smaller and some markets may not even exist, particularly for landlocked, isolated, and low-population-density countries (World Bank 2005). Air transport epitomizes the economic and sociopolitical aspects of

globalization, which is defined by Shariff (2003) as the worldwide process of homogenizing prices, products, wages, interest rates, and profits.<sup>4</sup>

While air transport plays an important role in terms of generating economic activity,<sup>5</sup> its main role in the increasingly global environment is to facilitate economic activity. Air transport is central to the transportation of manufactured goods, as well as to the ability of companies to trade more effectively by enabling face-to-face meetings.<sup>6</sup> International trade enriches countries and often constitutes a significant share of a nation's gross domestic product (GDP), the most common measure of the size of a nation's economy.<sup>7</sup> Whether domestic or foreign, good air transport plays a crucial role in companies' investment decisions, especially in manufacturing and services, where face-to-face contact is important.<sup>8</sup> Investment enriches countries by introducing new production capacity and jobs. While the profits of domestic industry flow back into the economy, thereby furthering growth, foreign direct investment results in transfers of technology and know-how, as well as linkages to the global marketplace. Air transport is vital to tourism, which also is a source of enrichment for countries. Tourists consume goods and services, and residents of the country are given the opportunity to work and advance in the tourism industry.

Given society's demand for well-functioning air transport systems and the increasingly important roles these systems play in the global economy, demands are growing on the infrastructure needed to facilitate air travel. Optimal provision of ATI is critical to an economy's competitiveness because it provides the necessary inputs in the provision of air transport. Optimal provision of ATI requires, on the one hand, optimal provision of the physical structures

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4. Globalization refers to the process of liberalizing the forces of human migration, international trade, the rapid movement of capital, and the integration of financial markets. In theory, as goods, capital, and labor flow more freely between nations, inequality falls and developing countries experience greater prosperity.

5. In 2004, for instance, the air transport industry employed 0.5 million people in Africa and contributed US\$11 billion to the continent's GDP (ComMark Trust 2006). The IATA, for example, predicted that a 10 percent increase in air transport would increase GDP by 1.6 percent in the long run, resulting from increases in trade, investment, and tourism.

6. Aviation recently has been deemed responsible for bestowing national comparative advantage in the production of high-value goods when it was observed that well over 20 percent of Chinese exports to the United States are air freighted. Neighboring countries (such as Mexico), on the other hand, may have a comparative advantage in lower-value goods by using cheaper land transport.

7. GDP is measured as the market value of all final goods and services produced within a country. The expenditure method is the most common approach to measuring GDP, which gives the identity  $GDP = consumption + investment + government\ spending + (exports - imports)$ . Exports increase GDP and consequently, the wealth of the nation. Imports provide healthy competition to domestic producers and increase choice for consumers.

8. Healey and Baker's (2003) annual survey of attitudes toward business location, for instance, found that 56 percent of European companies regard air transport links as crucial to deciding where to locate new business.

and, on the other, optimal allocation of the organizational responsibilities that complement these structures. Both sets of responsibilities traditionally have been vested with governments; however, for a number of reasons, they increasingly are being vested with private firms.

In the current global marketplace, ATI is critical to development. Airports and ATC constitute an essential component of a nation's infrastructure by providing domestic and international links that are vital to economic development through flows of human capital, commerce, and tourism. Air links enlarge markets, and the development of new tourism trade-driven markets is especially dependent on efficient and effective ATI.

ATI, like all infrastructure, is a capital good. It is not consumed directly but rather, in combination with labor and other inputs, it provides services. According to Prud'homme (2004), what matters is the service, much more than the infrastructure needed or used to produce it. Policies, therefore, should focus on the end (service provision) rather than the means (infrastructure). This is consistent with the idea that infrastructure includes the physical structures, namely, airports and ATC centers, and the organizations involved in coordinating their provision and use. ATI is lumpy and long lasting, which has major implications for financing and maintenance. ATI also is space specific and immobile, which, combined with the lumpy and long-lasting characteristics, means that investments will shape the economic geography or regional policy of a country. ATI is not a pure public good, and therefore, it is capable of being priced and is chargeable. Consequently, ATI has the potential to be financially self-sustaining.

## **Supply of Airport and Air Navigation Services**

### *Basic Description*

Airports provide the infrastructure and facilities necessary to facilitate air transport. The essential elements of an airport include runways, taxiways and airfield lighting, aprons and ramp facilities (to park and process aircraft), terminal buildings (for passenger processing through check-in and security, baggage sorting and freight), and gate lounges (where passengers congregate to board aircraft). Airport operation involves the activities required to coordinate the use of the capacity and facilities that provide these essential elements, including maintenance and provision of essential services such as security, firefighting, and cleaning. Airport operators allocate space and resources between, on the one hand, airlines and their handling agents and, on the other, commercial concessionaires. Terminals are provided as common user facilities in most countries, but in some countries (for example, Australia and the United States), they may be owned and operated by airlines, either as exclusive or common user facilities.

Ground-handling services are provided within airports. They require expensive equipment, such as check-in desks, aircraft tugs, baggage transport vehicles, and buses to transport passengers to remote aircraft parking stands. Responsibility varies for the provision of this equipment and the services it facilitates in combination with labor. In many countries, airport operators retain the exclusive rights, while in other countries, the dominant (home or “flag”) carrier assumes the responsibility. In Europe, established conditions facilitate competition in the provision of ground handling within airports. Airlines with operations at these European airports are offered choices of providers. In some situations, the airport operator or flag carrier assumes responsibility for the provision of ground-handling equipment and allows independent specialist service providers to use the equipment.

Responsibility for ensuring the provision of security and fire and rescue generally has been vested with the airport operator. Increasingly, however, airport operators are providing the necessary equipment and divesting responsibility for the labor function that is combined to provide the service. Policing, immigration, and customs generally are provided by the government departments or agencies responsible for these services in a national context.

Doganis (1992) stated that “airports . . . facilitate, for both passengers and freight, the interchange between air travel and surface transport.” Surface transport requires the necessary infrastructure (roads and railways) and vehicles (taxis, buses, and trains). Local councils generally are responsible for the airport infrastructure, although the involvement of airport operators in the financing of such infrastructure is an increasing trend.

Airports also provide or facilitate the provision of a range of ancillary services, such as car parking, car rental, local information, and retail. These services increasingly are being provided by private concerns that lease space at the airport for their business. Car parking, however, often is provided by airport operators, who assume responsibilities for the provision of the physical car parks and the labor function required to coordinate their use and transport passengers between car parks and terminal buildings.

The provision of ANS involves airport and en route ATC. Airport ATC involves the control of landings and takeoffs and of surface aircraft movements within the airport, and it usually is carried out from a control tower at the airport. En route ATC involves the control of aircraft passing through a nation’s airspace at higher altitudes. As aircraft approach or take off from an airport, control passes between airport ATC and en route ATC, requiring the two systems to be integrated for operational purposes. Government departments or agencies, such as a civil aviation authority (which often are responsible for the enforcement of safety standards), typically have been made

responsible for ANS. An increasing acceptance of the feasibility of providing air navigation on a commercial basis, however, has led to an evolution toward vesting the responsibility with state-owned enterprises (SOEs).

### *Recovering Costs of Supply*

The principle recommended by the International Civil Aviation Organization (ICAO) and adopted in statements to contracting states is that users may be required to pay their share of the properly allocated costs (ICAO 2004). Under this recommendation, costs of providing services should be borne by the users of the infrastructure, that is, by airlines and aircraft operators, and eventually by the airlines' customers.

Airport operators receive revenues from charges for facilities and services deemed to be "essential" to accommodate aircraft movements and to process passengers. These usually include takeoff and landing charges (typically based on aircraft weight), aircraft parking charges (typically based on aircraft size and duration of stay), and passenger handling charges (usually expressed as a rate per departing or arriving passenger and sometimes differentiated based on domestic and international departure or arrival). Some airports (for example, Dublin) charge separately (on a per passenger basis) to handle passenger security.

Facilities that are viewed as supplementary, such as departures, baggage systems, check-in desks, and cargo and maintenance sheds, are subject to separate charges because different airlines have different requirements in these areas.<sup>9</sup>

The ICAO guidelines for airport operators set out broad principles on the costs to be recovered through airport charges and on the structure of those charges. Such guidelines are not mandatory and often are not followed by airport operators. For instance, although the ICAO guidelines recommend that passenger charges be levied on airlines and passed through to airline tickets, many airports levy these charges directly on international passengers. Airport charges, however, are constrained by paragraph 15 of the Chicago Convention, which requires nondiscrimination on airport access and charges. Further constraints may be imposed in bilateral air services agreements.

Charges paid by airlines for these "essential" services typically are set according to a type of sharing rule known as the single till. Under this rule, revenues from ancillary commercial activities (such as property rentals, car parks, and retail and concession outlets) are netted off the total airport cost

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9. The Office of Fair Trading in the United Kingdom recently sought, in the context of a proposed airport acquisition and merger, to define the relevant product market as the provision of airport infrastructure services to airlines and left open the question of whether a further segmentation of the market according to the type of airline should be made (European Commission 2005).

base to calculate the residual to be recovered through airport charges. The cost of the essential facilities can be subsidized by commercial activities. The idea of single till prices resulted from the fact that commercial activities would not exist without the airlines that bring passengers to the airport. Although single till airport charges stimulate demand in the presence of spare capacity, a main drawback is the artificial constraint on prices at congested airports, where it may be necessary to ration excess demand through higher charges.

Airports (particularly major ones) have the potential to earn various forms of economic rent, namely, location and monopoly rents. Location rents exist because users of the airport for economic activity are prepared to pay a premium for preferred locations. Central to this notion is the scarcity value of land. Monopoly rents arise from airport market power and discretion over price; however, more often than not, they are difficult to distinguish from location rents (Forsyth 2004).

In setting charges for en route ANS, air navigation service providers (ANSPs) (typically a statutory monopoly) calculate cost based on the total facilities and labor used to provide services, which may include military equipment used to provide services to commercial air traffic. Combined with the projected workload, the cost base is used to calculate a rate per unit of service. ICAO requires, where possible, a “single charge per flight,” which is achieved through a formula that incorporates the unit rate, distance flown, and aircraft weight. All ANSPs in states that are contracted to the European Organisation for the Safety of Air Navigation (EUROCONTROL) are obliged to apply ICAO principles, and recent legislation introducing the Single European Sky within the European Union mandates the adoption of this approach by EU member states.

The application of ICAO principles envisages that ANSPs should earn a reasonable return on capital employed to contribute toward future investment and, thus, implicitly accepts the concept of “prefunding” projects through charges. ANSPs, however, are at risk of revenues being lower than costs, if traffic forecasts are incorrect or if shocks occur that reduce demand or increase costs beyond those that were expected. In these circumstances, unrecovered costs can be included in the cost base of future years.

Although the ICAO recommendations are simply recommendations, a considerable number of states, airports, and ANSPs follow them—including a significant bloc in Europe made up of members of EUROCONTROL. In some important aviation markets, this approach is not adopted.

Some nations support ATI through subsidies out of general taxation or other government income (for example, privatization income or cross-subsidy from other SOE activity), taxes on aviation-related activities, loans,

equity injections, accepting low returns on past investments, or preferred tax treatment. In the United States, for example, the costs of the Federal Aviation Administration (FAA), including responsibilities for the support of ANS infrastructure and operations, are covered partly by national government funds and partly by taxation on aviation activities.<sup>10</sup>

Efficient pricing of ATI should discourage use of the airport during congested periods. Allocative efficiency is achieved by setting prices to ensure that scarce capacity is allocated to those airlines that value it most. During congested periods, each extra user imposes delays on all following users until the end of the busy period (sometimes the end of the day). A valuation of these delays will provide estimates of marginal congestion costs and the basis for efficient marginal cost prices. Peak pricing can test the true valuation of proposed capacity expansions. Airlines willing to pay peak surcharges send a signal that they are willing to pay for investment in new capacity. Airline organizations, such as the International Air Transport Association (IATA), however, have vehemently opposed peak pricing of airports and ANS, claiming that such price would be unlikely to affect airline behavior because charges for ATI constitute only a small proportion of airline costs, and also that the benefits of scheduling in peak periods would dwarf any surcharges. In the absence of peak pricing, spare capacity at European airports has been rationed using the administrative system of airport slots, while at many U.S. airports, queuing is imposed.

### *Cost Conditions*

ATI, and airports in particular, typically are characterized by the fact that capacity can be increased (or, indeed, initially built) only in large chunks. In other words, enhancements to existing (or new) infrastructure required to meet demand are indivisible and entail lumpy investment at considerable intervals. New airport terminals or runways are classic examples of lumpy investments.

Lumpy investments, by their nature, require heavy finance and are inherently risky because construction and maintenance costs may rise significantly during the period between design of the facility and acquisition of finance and its construction (maintenance), because of changes in project design, and because of demand uncertainty. If demand does not quickly reach the levels required to fill the capacity, the company may not achieve the scale necessary to recover the investment.<sup>11</sup> Demand forecasts are a function of the macroeconomic cycle—that is, estimates of microeconomic

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10. Tax revenues can be affected by airline strategies. For example, in the United States, an ad valorem tax of 7.5 percent is levied on tickets for domestic flights. While flights have increased dramatically, much of the increase is in low-cost operations, which have driven down yields. The overall reduction in prices can mean reduced tax revenues.

11. An example of excess capacity resulting from overinvestment is Montreal's Mirabel Airport.



conditions that reflect local demand fluctuations, income, and price elasticities of demand. Forecasts tend to be inaccurate in the short term (three to five years) and are all but useless in the long term. Lumpy ATI investments are subject to policy risk as well. Governments and their agencies can take actions that affect the profitability of such investments. For example, a tightening of monetary policy by the Central Bank might cause a recession, which would significantly affect demand growth.

The ability of airport infrastructure providers to deliver increased capacity and improved services at reasonable cost to users will be a substantial determinant of whether the air transport industry will be able to respond to anticipated demand growth (Holt, Horncastle, and Phillips 2006). The basic choice is between investing now and avoiding a deterioration of quality in the event of a surge in the demand for air transport, or delaying investments and avoiding (in the short term at least) large fixed investments that come with varying levels of financing costs (which increase with the levels of private sector participation [PSP]).

ANS are highly manual in nature and labor costs are not as flexible as in other industries. In particular, the amount of labor resources required is established and largely fixed for the whole year according to projected summer peaks. Moreover, an average three-year lead time for air traffic controller (ATCO) training adds to the relative inflexibility in responding to short-term demand fluctuations. In addition, control personnel usually are required to exercise their license for a minimum amount of time each year at prescribed maximum intervals, and labor union and legal restrictions often apply to the use of overtime.

The Civil Aviation Authority (CAA) and EUROCONTROL both have recognized the poor relationship between ANS charging structures and costs. Typically, ANSPs have been able to raise prices to allocate fixed costs over smaller volumes during a traffic downturn, which causes airlines' costs to rise when their position has deteriorated as a direct result of the same downturn. Given the highly competitive nature of the airline industry and the general desirability of encouraging air transport, the relevant agencies should work harder to find a more optimal allocation of risk and incentives. Although airport and ANS costs are a relatively small proportion of airline costs (for example, for British Airways, these costs accounted for £556 million of a total operating cost base of £7,273 million in fiscal year [FY] 2004/5), increases in this share of costs could have a detrimental effect on airline operations in times of falling revenues.

### *Evolution of ATI Provision*

In many developing and developed economies, the perception of ATI as a strategic asset requiring government provision for political and social rea-

sons, such as its role in general economic development and prosperity or in sustaining employment, prevails. It can be perceived as a source of economic rent to be extracted from the users and suppliers of air transport. For these reasons, high levels of political ownership and control persist in the industry.

The recent drive toward PSP, particularly in airports, has, as in many other sectors, arisen from the wider recognition that government provision can be inefficient by prioritizing the objectives of politicians rather than striving toward greater efficiency for the benefit of the growth and development of air transport. Consequently, governments have sought to divest themselves of assets that are underperforming or that are now viewed as noncore government services. Likewise, governments have faced constraints on resources, precluding the infrastructure investment required to deal with significant growth in air transport. Moreover, many state-owned companies were not meeting cost-recovery targets. The process commenced in the United Kingdom with the 1987 privatization of the British Airports Authority plc (BAA), which was accompanied by privatizations in several sectors, including communications and energy. Other countries have begun to follow suit, such as Australia with the privatization of Sydney Airport in 2001.

Large airport operating companies (such as BAA, Copenhagen, and Schiphol) have been heavily involved in PSP initiatives as “cornerstone” investors, while others, such as New Zealand’s Auckland International Airport, have involved share registers incorporating individual and institutional investors with no specific airport management expertise among them. Certain privatized or soon-to-be-privatized airports will benefit from the introduction of the airport management expertise that a cornerstone investor can bring, such as in India. For others, general public offerings will be more suitable—for example, Hong Kong International Airport (whose privatization is widely expected in the near future) is relatively well run and has a good understanding of contemporary airport management “best practice.” Of course, there are ways of drawing on specialist knowledge other than from the ownership group (such as by employing specialist advisors).

There has also been an emergence of what might be termed airport public-private partnership (PPP) vehicles, such as Macquarie Airports and HOCHTIEF AirPort, which each have interests in airports on several continents. These PPPs have tended to result in highly leveraged airport companies, as they structure their investments with high levels of debt. The future of such organizations remains to be seen, but those with good in-house expertise and market presence in airport management are likely to feature more prominently in future privatizations, as either minority or majority investors.

In addition, low airspace user satisfaction with the cost and responsiveness of ANS provision has increased the pressure and demand for greater

commercial, customer-oriented management skills within the service providers. Both of these factors (and others) have led to the growth of corporatization within the state sector to provide ANSPs with access to the necessary capital and commercial skills.

### **Air Transport Demand**

Demand for ATI is a “derived demand” from the market for airline services. In other words, the demand for air services determines the demand for ATI. Therefore, to understand the nature of demand for ATI, it is necessary to understand the evolution of and demand for air transport. Demand for air transport has a domestic and international dimension that varies according to a country’s circumstances. Demand for domestic air travel depends (to a greater or lesser extent) on the quality of other transport infrastructure links, namely, road and rail. International travel depends on the openness of the economy (including for people). The greater the extent of liberalization, the more demand that needs to be accommodated, and the greater the amount of competition, the more complex ATI provision becomes because of several different (and new) types of customers, namely, airlines operating small and large aircraft, operating quick-turnaround low-cost operations versus traditional full-cost operations. The demand for international travel also depends on the geography of the country. For example, in Europe, an island nation such as Iceland is far more dependent on international air travel than continental countries that have access to continent-wide railways and highways.

#### *The Institutional Framework That Characterizes Demand for ATI*

The conditions under which demand for air transport manifests have been controlled carefully through the Convention of International Civil Aviation (commonly known as the Chicago Convention).<sup>12</sup> It was signed by 52 states in Chicago on December 7, 1944. It came into force on April 4, 1947, with the 26th ratification, and even today, with its 188 signatory states, remains the basis for the governance of international civil aviation. The Convention’s preamble declares that the signatories have agreed “on certain principles and arrangements in order that international civil aviation may be

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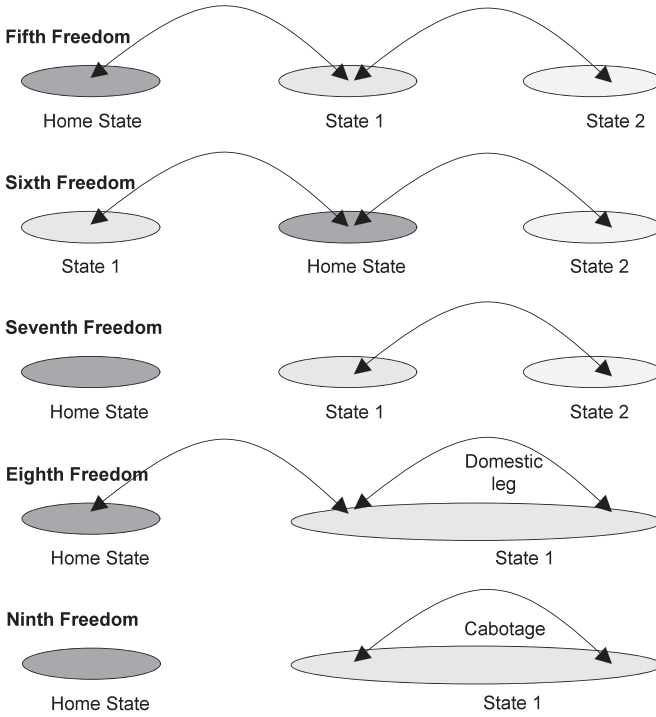
12. This is because governments immediately recognized commercial air transport as a strategic industry requiring close involvement. There were, arguably, three main reasons for this view. The first concerned national security. Aircraft flying through a nation’s airspace and landing at its airports could be used for hostile purposes. The second concerned the safety-critical nature of aviation and the need to protect passengers and crews from collisions arising from traffic in the airspace and on the ground, but also from commercial operators who might be tempted to skimp on aircraft maintenance to increase profits. The third reason is economic. Air transport comes with a high level of risk because of the high costs associated with its provision, and governments tended toward a policy of protecting their nations’ providers.

developed in a safe and orderly manner and that international air transport services may be established on the basis of equality of opportunity and operated soundly and economically.”

The Chicago Convention sets out the rights and obligations of states, as agreed by the signatories. First among these is the recognition of the sovereignty of states on their airspace, reflected in Article 1 of the convention, which states that “The contracting States recognize that every State has complete and exclusive sovereignty over the airspace above its territory.” This introduced the necessity for specific arrangements governing (1) the passage of aircraft involved in international flights through the sovereign airspace of other contracting states; and (2) the transport of passengers and freight to and from other contracting states. The convention provides the foundation for agreements between states to deal with these situations. Article 6, dealing with scheduled air services, states that “No scheduled international air service may be operated over or into the territory of a contracting State, except with the special permission or other authorization of that State, and in accordance with the terms of such permission or authorization.” These authorizations and permissions are framed in terms of “freedoms of the air.” Of the nine freedoms, only the first five are formally recognized by the ICAO. The five formally recognized freedoms are described in the following paragraphs. Figure 3.1 provides a diagrammatic representation of the sixth to ninth freedoms, as well as the fifth freedom for the sake of comparison.

- First freedom: The right to fly across the territory of a state without landing in that state.
- Second freedom: The right to land in the territory of a state without embarking or disembarking revenue traffic (passengers, freight, mail); for example, for refueling or technical reasons.
- Third freedom: The right to disembark revenue traffic taken on in the state of the nationality of the aircraft operator.
- Fourth freedom: The right to embark revenue traffic whose destination is the state of the nationality of the aircraft operator.
- Fifth freedom: The right to embark revenue traffic whose destination is the territory of any other contracting state and to disembark traffic originating in any such territory. The overall journey must begin or terminate in the state of the nationality of the aircraft operator. Fifth freedoms are also known as beyond rights.

**Figure 3.1 Sixth to Ninth “Freedoms of the Air”**



*Note:* Arrows refer to picking up and setting down revenue-generating traffic, and home state refers to the state of registration or ownership of the carrier.

The allocation of these freedoms, in general, is agreed on through a system of bilateral air services agreements (ASAs). In formulating agreements, emphasis was placed on the balance of “benefits” between the airlines of the contracting states. Aviation rights were deemed “national property” and the driving view was that national carriers required protection to exercise those rights to ensure reciprocal benefits. Exclusive concessions or franchises were granted, or national carriers were directly owned and operated by the states. Analysts have argued that a driving political factor was the concern of European states that their airlines might be vulnerable to larger, more efficient U.S. carriers in an open regime in the immediate post–World War II period.

This producer-oriented nature of aviation policy is further emphasized by the fact that bilateral ASAs typically have included restrictions on some or all of the following: (1) flight frequency, (2) capacity (number of seats offered), (3) routes (city pairs) to be served, (4) carriers that can operate, and (5) fares. In this respect, policy and regulation of international trade between states differs in aviation compared with most other industries, including other forms of transport such as ocean shipping. The bilateral regime governing a state's air services thus controls access to its air transport markets. Market access, however, may in some cases be affected by factors such as airport or air navigation services capacity. In Europe, this has manifested itself in the form of landing and takeoff slot allocations.

Several countries have agreed to govern air transport through agreements between blocs of states. Two examples are the Intra-Arab Freedom of the Air Program and the Multilateral Agreement on the Liberalization of International Air Transportation (MALIAT). In 2000, through the Council of Arab Transport Ministers, 16 Arab countries from Morocco to the Republic of Yemen, but excluding Algeria, became party to the Intra-Arab Freedom of the Air Program. The agreement came in four stages: (1) liberalization of freedoms of the air for cargo and nonscheduled services; (2) liberalized third and fourth freedom services, while retaining 60/40 capacity share requirements between the airlines of the different states; (3) removal of the 60/40 capacity share requirements; and (4) total liberalization of fifth freedom traffic in November 2006.<sup>13</sup> The program retained certain safeguards related to regulatory convergence. In particular, the progressive elimination of capacity restrictions is subject to the application of a "mechanism for combating unfair anticompetitive practices." Measures to ensure minimum participation by airlines are prevented, and parties to the agreement are committed to the progressive abolition of state aid. Amendments required to achieve the four stages were made in bilateral agreements during renewal, but the principles and content of the revised agreements are in line with the trend toward regional cooperation.

In the Pacific region, seven states (Brunei, Chile, New Zealand, Samoa, Singapore, Tonga, and the United States) have acceded to MALIAT,<sup>14</sup> which establishes generalized, open international market access among states. In addition, Brunei, Chile, New Zealand, and Singapore signed the MALIAT

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13. Ministère de l'Équipement et du Transport du Royaume de Maroc, référentiel de la régulation du transport aérien au Maroc 6 (2004).

14. Agreement drawn up under the auspices of the Asian Pacific Economic Cooperation (APEC) in November 2000, originally between the five APEC countries. Non-APEC members Peru, Samoa, and Tonga subsequently joined, although Peru left in 2005.

Protocol,<sup>15</sup> which, in addition to the freedoms granted in MALIAT, allows seventh freedom rights for passenger flights and cabotage rights when continuing an international flight.

This system of restrictive air services agreements and the freedoms of the air that they grant is the most significant result of the view that aviation is a strategic industry requiring close government involvement because of national security, safety, and economic issues. This view remains the driving force in many parts of the world. The overall trading and economic considerations have outweighed the strategic and political interests driving the restrictive system of air services agreements only where states decide to liberalize in a common market, such as the European Union, or where states wish to promote greater access to markets because the home airline is not strong enough to support the growth of a particular industry, such as Thailand tourism. The deregulation of the U.S. domestic market in the late 1970s greatly stimulated air traffic, but this stimulation was not extended to the admission of non-U.S. carriers, again to protect U.S. airlines and their employees. Even in the European Union, where aviation interests largely have been subsumed into the overall interest of creating an internal market with no government subsidies, national interests have arisen—for example, the continued investigation by the European Community into Greece’s financial support of Olympic Airlines or Italy’s recent attempt to enforce tariff restrictions on flights to non-EU states.

When negotiating changes to existing agreements, such as the introduction of competition, states take into account the diverse range of effects on the relevant economic agents. These might include (as in the case of Greece) positive impacts for the home airport or region in the form of additional services and lower fares; direct and indirect economic benefits associated with increases in traffic, such as increased employment and incomes; negative impacts for the dominant home carrier with lower fares and direct challenges to its market share; positive impacts for the home carrier in the form of access to newly opened markets; and negative impacts for airports if aggressive competition forces airline bankruptcy (as in the case of Sabena in Belgium).

### *Liberalization*

Increasing liberalization is creating new opportunities for the industry in response to a growing recognition that more open relationships between states can benefit air transport and the economy. For example, if ASAs limit the number of operators or the amount of capacity on a route, removal of such restrictions can facilitate increases in the supply of capacity as well as

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15. This entered into force between the first three states in December 2001, with Chile joining two years later in December 2003.

new market entrants. Demand is stimulated by price reductions, as are the direct and indirect economic benefits that the industry generates. Naturally, increased demand for air services will have a direct impact on airports and ANS providers. It may create demand at previously undeveloped airports and on new routes that require ANS cover, or it may require additional or different forms of infrastructure at existing locations. Air transport liberalization encompasses the idea of removing nationality constraints on airline ownership and permitting cross-border investment, which would contribute to needed industry restructuring and enhanced efficiency.

The United States has initiated the process of international liberalization by adopting less restrictive “open skies” agreements with some of its trading partners. The first open skies agreement was signed with the Netherlands. Although less restrictive than the typical bilateral ASA, the detail in open skies agreements has not completely swept away restrictions on market access. The typical agreement promoted by the United States is, in fact, restricted to unlimited open third and fourth freedoms, to unlimited designation (that is, any number of carriers from either side), and unlimited capacity offerings. In some cases, the agreements have included fifth and sometimes seventh freedoms, but usually cargo carriers benefit from these. The agreements do not incorporate cabotage (that is, access to domestic markets by trading partners’ airlines) and, in some cases, there are limitations on the points in the United States that the other side can serve. Anecdotal evidence shows limitations on the points served by nondomestic airlines operating in a number of EU states. Moreover, these limitations do not include rights of establishment. In other words, foreigners cannot own more than 25 percent of the voting equity in U.S. airlines. To date, the United States has signed more than 70 open skies agreements, with Thailand and India being recent partner signatories.

A more radical step toward more complete liberalization is currently under active consideration by the United States and Europe—that is, an Open Aviation Area (OAA). The concept of an OAA encompasses a wider range of market issues. The approach to competition and regulation would be more systematic; in particular, tackling the issue of state aid to airlines and the potential for it to distort market conditions. Although the evolution of privately owned U.S. airlines is different from that of the state-owned EU flag carriers, the issue of state aid is not addressed in the current U.S. model. An OAA would allow for cross-border investment, thereby stimulating new entry and beneficial competition, while at the same time relaxing the rules on airline ownership, allowing requisite industry consolidation.



An OAA is oriented toward consumers, with a focus on competition that achieves a better balance between consumer and producer interests, enhances economic development and growth, and safeguards the overall public interest. It should place the industry on a stable, long-term growth path characterized by fewer insolvencies and smoothed-down cycles and should engender a commitment from states toward regulatory convergence and harmonization of quality controls in such areas as safety, security, environmental protection, work rules, competition and regulatory policy, and provision and administration of public infrastructure.

Air transport in the European Union operates under what is, in effect, an OAA among the member states that is part of the overall creation of a common market. The European Union actively looks to extend these principles beyond its borders and, accordingly, has reached agreement with Morocco on a so-called Euro-Mediterranean air transport agreement that will deliver a much less restrictive regime, including consecutive fifth freedom rights for Moroccan airlines in the European Union. A number of nations have promoted more liberal attitudes toward air services. In particular, Dubai and Singapore have led the way in terms of granting market access to foreign airlines, while seeking reciprocal benefits for their own airlines in states where they otherwise would have been restricted and where the domestic markets are larger. This, combined with the alignment of their airlines' strategies with national policy and the successful building of sophisticated airport facilities as regional hubs, has led to successful, competitive, and high-quality airlines.

The concept creates a holistic framework that will deepen and widen markets. Because an OAA involves social, technical, security, and economic issues, it is important to consider them in the context of wider trade relationships. The World Trade Organization (WTO) is becoming increasingly involved in the aviation sector. For example, the General Agreement on Trade in Services (GATS) covers aircraft repair and maintenance, selling and marketing of air transport services, and computer reservation systems and may be extended to cover multilateral liberalization in air cargo. On cargo, states often view such operations as less of a threat to their home carriers and routinely grant (with the support of ICAO) more liberal freedoms, often to support other industries. For example, airlines from several countries have been granted seventh freedoms for cargo operations in China to allay fears that a lack of air transport capacity could hamper China's boom in the export of manufactured goods.

### *Implications for ATI Demand*

With increased competition in the recently liberalized air transport industry, airlines have sought areas in which to cut costs. This has placed pressure on ATI providers to increase efficiency and reduce costs so that they can reduce

air transport input costs (airport and ANS charges). Such pressures have been heightened by the perception that ATI providers appear to face relatively little overall financial risk and have continued to be profitable while airlines struggle to survive.

Air transport liberalization and, in particular, the success of the low-cost airline concept have made competition between airports a reality. Dedicated low-cost airports have positioned themselves as quite serious competitors to the traditional hub airports—for example, Hahn Airport in Germany. The combination of these two factors has resulted in a constantly expanding number of route alternatives becoming available to passengers, and competition for passenger flows, both at the regional level in point-to-point travel and at the intercontinental level, is now a reality (Booz Allen Hamilton 2005).

Success will be defined not only by efficiency gains with measurable associated cost reductions but also by quality improvements (that is, improving the processes and flows that are valued by passengers).<sup>16</sup> Established airports can no longer rely on guaranteed volumes of business from their regional catchment areas, but must compete for them. All airports need to examine their strategic alignment in response to the pressures for clear product differentiation.

Understanding the requirements of airline customers and effective communication between airports and airlines to facilitate mutual understandings of forward strategies will be crucial to success. Information disclosure and consultation on quality of service and capacity expansion issues will be vital.

## **Other Developments in the Nature of ATI Demand**

### *Growth, Privatization, and Competition*

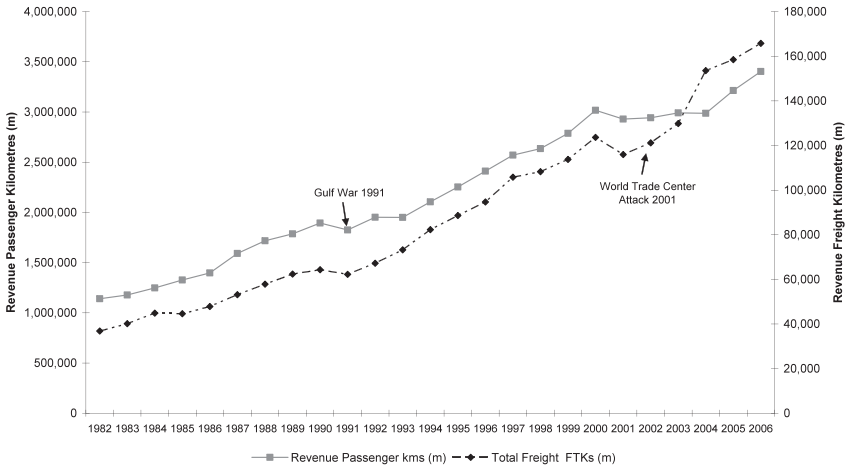
The trend in global air transport operations from the early 1980s to 2006 is illustrated in figure 3.2. Overall, the industry has enjoyed steady growth despite its vulnerability to shocks, such as air accidents, security breaches, fuel price fluctuations, and military and political conflicts. One of the effects of the 9/11 attacks on the World Trade Center and the Pentagon was to expose the fragile commercial basis of many airlines, especially when challenged by new entrants with lower cost bases.<sup>17</sup> Although shocks have led to major airline restructuring and even bankruptcies, increasing liberalization has created (and continues to create) new opportunities for the industry.

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16. Every airport faces a trade-off between maximum use of capacity and a high level of service (including minimum connecting times).

17. IATA predictions for 2004 indicated total losses for the industry of circa US\$4.8 billion, of which IATA members' share was around US\$2 billion. In May 2005, IATA Director-General Giovanni Bisignani predicted losses 25 percent higher than in 2004 because of rising fuel prices.

**Figure 3.2 World Air Transport Operations Outputs, 1982–2006**



Source: ICAO/IATA

New markets, such as China and India, offer the potential for significant development, and new entrants are mooted regularly. India’s civil aviation ministry reported traffic growth of 24 percent at the country’s airports in 2004, and more than 750 new aircraft are on order from Indian airlines. Although growth rates fell in intermediate years, it is reported to be back up to 22 percent in the first five months of 2010.<sup>18</sup> Domestic growth in the second-most populous country is expected to remain rapid in the medium term. In other markets, growth is relatively strong, but the beneficiaries are changing as new entrants appear.

The historical development of the air transport industry shows that the first advances toward commercialization and privatization were made in the airline industry. These advances included (1) moves from state to private commercial ownership and control (albeit with restrictions on nationality); (2) liberalization of the system of restrictive bilateral ASAs, permitting new entry in previously protected duopoly markets; and (3) removal of barriers to entry in domestic markets (in particular, the European Union and the United States), resulting in entry by new airlines with innovative business and operating models (namely, low-cost carriers [LCCs]), thereby widening access to air travel and imposing pricing discipline on the entire industry.

Given a sufficiently liberal environment and adequate access to infra-

18. Information sourced from Press Trust of India and accessed at <http://www.business-standard.com/results/storypage.php?autono=98026&tp=on> on 23 June 2010

structure, the airline industry is potentially competitive because the sunk costs of entry are relatively low.<sup>19</sup> The fact that many markets are not sufficiently liberalized, however, means that the legal barriers to entry are significant. There is also a strong culture of protecting unprofitable carriers. U.S. full-service carriers (FSCs) have had large financial losses in recent years.<sup>20</sup> Many FSCs have used the system of protection from creditors while restructuring takes place, the so-called Chapter 11 bankruptcy procedures. Indeed, many carriers have entered, exited, and reentered the process, imposing high costs on shareholders and employees. In Europe, numerous governments have protected their flag carriers through state aid or through the protection of competitive positions—for example, by denying new entry on existing routes. High barriers to exit also are evident either because airline exit costs are high or governments grant specific favors to keep them in business. In Switzerland, the restructuring of Swissair involved government support of investment by banks. In other EU countries, alternative structures have been adopted to secure the solvency of some flag carriers.

The continued existence of bankrupt carriers, whether protected by Chapter 11 or state aid, slows or eliminates exit from the industry and potentially prevents entry by more efficient carriers.<sup>21</sup>

In the early twenty-first century, commercial airlines carrying passengers can be divided into two types: traditional FSCs and LCCs.<sup>22</sup> The following discussion deals with each type, along with developments in their segment of the industry, in turn.

### *Meeting the Demands of Full-Service Carriers*

With the introduction of high-capacity, long-haul aircraft in the 1960s and 1970s, air transport came to be dominated by large operators offering networks of air links. Until recently, these have been the most significant operators, with a half-dozen “major” U.S. carriers and the same number of “flag” carriers from the largest EU states dominating the market. Their strong, recognizable brands are universally familiar to most travelers, and

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19. This is because aircraft can be rapidly sold and redeployed.

20. FSC losses totaled US\$7.5 billion in 2004.

21. Counter to the perception that Chapter 11 represents a “subsidy” to U.S.-based airlines, thereby incentivizing them to operate unprofitable routes at lower load factors than their non-U.S. counterparts, data suggest that load factors actually improve and prices, which then remain slightly depressed over the subsequent two or three quarters, decline after an airline files for bankruptcy protection (Booz Allen Hamilton 2007). Moreover, no evidence suggests that competitors of the bankrupt airlines lower their prices, that they lose passengers to their bankrupt rival, or that capacity dumping occurs (Borenstein and Rose 1995).

22. Other types of carriers include charter and cargo carriers. Charter carriers typically operate on a nonscheduled basis between urban conurbations and holiday destinations and are akin to point-to-point LCCs. Although they existed before LCCs, they have had to reposition themselves (essentially as LCCs) to compete on point-to-point routes.

they have contributed significantly to the development of traffic around the globe. FSCs are not strictly defined, but they do have a number of common characteristics, including the following: (1) multiple-class service offerings on the same aircraft, (2) a higher-quality service reflected in airside lounges and the use of air bridges at airports, (3) the use of principal airports, (4) in-flight catering included in ticket prices, (5) the use of traditional distribution channels, (6) multi-aircraft fleets tailored to specific routes managed in flexible and efficient ways, and (7) high levels of network connectivity and frequency through the hub-and-spoke system.

The hub-and-spoke system, however, suffers from two shortcomings:

- The required airport infrastructure is complex (and, therefore, expensive) because of the need to connect baggage facilities to facilitate short connecting times, low asset-utilization rates, process complexity, and high staffing levels needed to guide passengers.
- Airport congestion at peak times is caused by the confluence of inbound and outbound waves of traffic, which cause costly delays in terms of airline operations and underutilization of airport assets between the peaks (or, alternatively, wasteful overprovision of airport infrastructure).

To counter these shortcomings, network carriers have modified their behavior at hub airports, including depeaking schedules. A strong requirement for hub-and-spoke operations, however, is exemplified by the number of connecting passengers at major hub airports. For example, in 2007, almost 54 percent of the 53 million or so passengers passing through Frankfurt Airport were connecting passengers (CAA 2008).<sup>23</sup>

In the FSC segment, the tendency is toward consolidation through alliances. Park (1997) found alliances involving no network overlap to be welfare enhancing, while those with overlap were welfare reducing because of reduced competition on (the overlapping) routes. Brueckner (2001) tested airline alliances with network overlap for an allowance of “antitrust immunity” (which permits the partner airlines to cooperate on fares). Although fares for interline passengers<sup>24</sup> decreased because of the alliance, fares between the partners’ hubs increased. Alliances are likely to increase the market power of members at their hubs, but potential cost savings could reduce fares for departures from those hubs. Although regulatory authorities care about price-fixing, they also understand the need for cooperation. Indeed, Doganis (2001) states that “it is the existing regulatory regime that

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23. Thirty-five percent at London Heathrow, 42 percent at Amsterdam Schiphol, and 32 percent at Paris Charles De Gaulle for the same year.

24. Interlining occurs when a passenger trip requires the use of two or more airlines.

has forced . . . concentration to be achieved through alliances of various kinds rather than cross-border mergers or acquisitions.” Airlines can gain from significant economies of utilization of aircraft in an alliance, while joint marketing and seat-selling may be attractive in terms of reducing expenditure on marketing, an arguably wasteful endogenous sunk cost that can increase barriers to entry to the market.

Doganis (2001) recorded 500 airline alliances. Now, three major alliances exist, each with the common feature of cooperation between a major European and U.S. carrier. Those alliances involve (1) Lufthansa/United (the Star Alliance), (2) British Airways/American Airlines (the One World Alliance), and (3) Delta/Air France/KLM/Northwest (the Skyteam Alliance).

Several major airports have established themselves as international hubs in support of the hub-and-spoke model operated by the FSCs. In Europe, Paris Charles de Gaulle Airport supports the operations of Air France, Frankfurt am Main the operations of Lufthansa, Amsterdam Schiphol the operations of KLM, and London Heathrow the operations of British Airways. In the United States, Atlanta’s Hartsfield airport is a unique example of a hub airport with a relatively small catchment area that supports Delta’s operations. Dubai is positioned as an alternative to many European hubs and provides an example in which coherent development of the airport and the home airline’s (Emirates) route network has led to high growth and a high proportion of connecting rather than originating and terminating traffic. Hub airports facilitate a concentration of services at a transfer point and make a wider range of destinations available to passengers and feasible for the operating airlines.

FSCs generally are characterized by multiple-class service offerings; higher service quality, including airside lounges and air bridge usage; high levels of network connectivity and frequency; and multi-aircraft fleets. Airports serving FSCs, therefore, generally are required to include comfortable and spacious terminal buildings; in-terminal facilities such as lounges and air bridges; the infrastructure to facilitate seamless, rapid flight and baggage connectivity for transfer passengers; and the ability to handle various aircraft types of different gauges.

According to Booz Allen Hamilton (2005), the future challenge for major hub airports lies in redefining their relationships with their main FSC customers, which includes a focus on making processes more flexible and using resources optimally. This can be achieved by giving the concept of “system partnership” new, content focused on practice and by reorganizing the commercial framework through the targeted development of new hub systems (for example, Paris-Amsterdam for Air France-KLM). European hubs need to be mindful of external factors, such as competition from new hubs in Eastern Europe and the Middle East, and all hub airports need to consider politically

influenced factors, such as the stability of the investment environment.

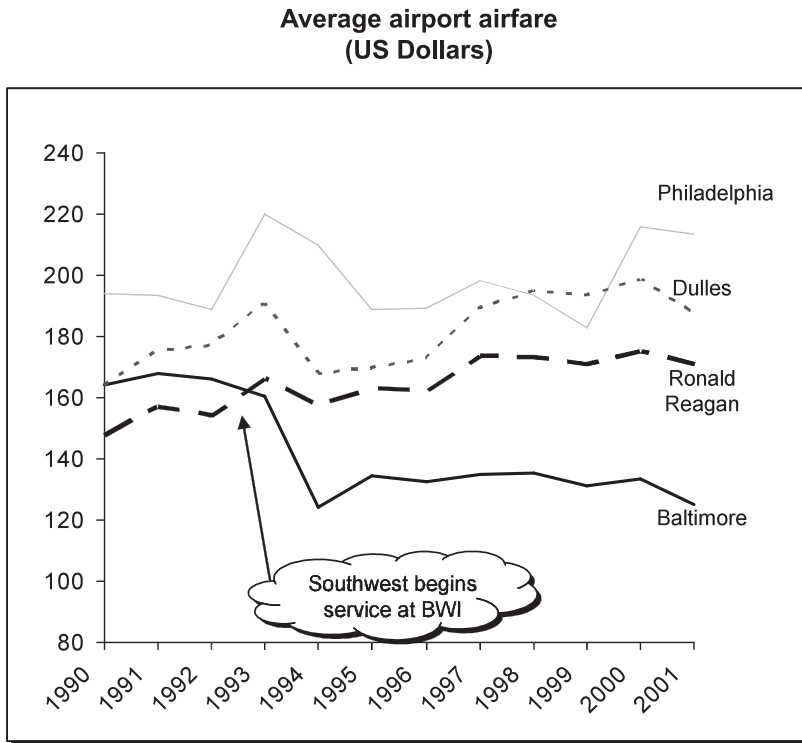
### *Meeting the Demands of Low-Cost Carriers*

LCCs typically offer point-to-point networks with a business model that is fundamentally different from FSCs. The LCC model focuses on minimizing costs by maximizing operational efficiency in all aspects of the business, such as (1) maximizing aircraft utilization and minimizing fuel burn, (2) standardizing fleets to reduce operational and maintenance costs, (3) offering only point-to-point services with connections requiring individual tickets for each flight leg, (4) using secondary airports, and (5) providing a single-class “no frills” service.

One constant is the key operational aim of all LCCs (and increasingly is pursued by FSCs): the requirement for rapid turnaround times, which provide optimal aircraft utilization, reliable performance levels, and improved customer satisfaction. The discipline, however, also reduces costs throughout the business. For example, ground staff is utilized only for a limited time, thereby preventing the additional costs associated with a more lax approach to staffing the gap between arrivals and departures.

LCCs have been successful in engendering intense price competition to FSCs at hub airports by offering cheaper direct services or by links between secondary airports that are adjacent to leading cities, tourism, or migrant workers’ destinations. Figure 3.3 shows the evolution of airfares at a number of U.S. airports following the entry of Southwest into the market at Baltimore/Washington International (BWI). Average ticket prices fell by around 25 percent and remained at this level, while at other nearby airports with no LCC presence, average ticket prices fell initially but later recovered to their initial levels.

Figure 3.3 Evolution of Airfares Following the Introduction of LCC Services



Source: Booz Allen Hamilton.

Note: BWI = Baltimore/Washington International; LCC = low-cost carrier.

The success of LCCs can be attributed to their ability to add new destinations quickly and to adjust schedules and prices in response to market conditions, as well as their cost advantage.

Globally, LCCs have experienced rapid growth in their direct service networks. Figure 3.4 shows the expansion of Southwest's network in the United States between 1991 and 2002.





out of 54 LCCs served more than 1 million passengers per year.<sup>25</sup> LCCs have experienced high levels of entry and exit, with many failed start-ups and a high degree of consolidation (which was not observed in the traditional carrier environment) between LCCs—for example, easyJet’s acquisition of Go, Ryanair’s acquisition of Buzz—and between a mix of carriers—for example, Virgin Express and SN Brussels. In fact, financial analysts and industry commentators believe that a small number of carriers eventually will dominate each continent, serving price-conscious business travelers and nonbusiness travelers on short-haul routes. This already may be the case, with easyJet and Ryanair dominating the European LCC market and Southwest and Jet Blue dominating the U.S. LCC market. Under this scenario, regional carriers may be expected to provide feeds for a limited number of hubs and point-to-point flying in higher-yielding business and smaller, niche markets.

A key element of the LCCs’ cost mitigation strategy is to reduce airport costs by using secondary airports. The most profound effect of the LCCs’ low investments in airport locations is their relatively low exit costs and consequent bargaining power. They negotiate heavy discounts on airport charges in return for the promise of passenger volumes that, in turn, increase demand for the airport’s commercial activities.<sup>26</sup> Airports should not expect to receive much (if any) revenue from ground-handling activities, as LCCs tend to maximize the extent to which their own staff carry out these tasks. Airports also must accept competition from LCCs in their traditional commercial areas of food and beverage sales and duty free.

LCCs have, however, stimulated and built new markets for airports, and many secondary airports have been “put on the map” through powerful marketing of destinations by LCCs. The challenges for these airports include the minimization of check-in, baggage-handling and turnaround times, risk sharing, and the ability to handle limited numbers of similar midsize aircraft types. The main challenge for ANS is to keep capacity in line with the explosion in demand that LCCs have caused.

The challenge for smaller secondary airports lies in balancing the growth opportunities offered by LCCs with the risks of dependency. Innovative commercial revenue-earning concepts need to be explored, including targeting specific groups through innovative catering approaches and discounted products. Low-cost airports need to predicate their futures on continuous passenger growth, while recognizing markets in which LCCs are reaching saturation limits.

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25. Surveys indicate that only 13 of the 54 carriers served more than 1 million passengers in the year (*Airline Business*).

26. In essence, a version of single-till airport pricing, heavily weighted in favor of the airline.

Several midsize airports operate as “hybrid” models, striving to balance the needs of midsize flag carriers and LCCs. A mix of diverse users with differing requirements presents challenges in terms of consensus building and nondiscrimination.

*Analysis: FSC and LCC Impact on Demand*

Demand for ATI and associated airport services and ANS is derived from the demands of passengers and freight shippers for air transportation. In the context of passenger transportation, airports have a dual role in satisfying the demands of commercial airlines (which bring passengers to the airport) and the passengers themselves, who generate nonaeronautical income from ancillary activities such as car parking and retailing. Passengers can substitute modes of transport but find it less straightforward to switch between origin and destination locations. This limits the extent to which commercial passenger airlines can substitute airports, even in response to price differentials for essential services. Conversely, it may be easier for freight-forwarders to substitute modes of transport and origin and destination locations.

The geographic distribution of passengers between airports remains uneven. Of the 1,192 airports with international scheduled services, the top 25 serve 32 percent of the traffic (ICAO 1999). The operation of hub-and-spoke networks by FSCs resulted in a few well-developed dominant facilities, with smaller neighboring facilities often struggling to meet critical mass (Francis, Fidato, and Humphreys 2003). Airline liberalization in the United States during the 1980s and in the European Union during the 1990s, however, has resulted in the entry of LCCs, which offered a competitive alternative to passengers seeking ways “to avoid paying the high prices demanded by FSCs to maintain their complex hub-and-spoke systems” (Franke 2004). LCCs, which do not require the level or range of airport services FSCs demand, have sought out secondary and regional airports, whose new commercial focus (often following privatization) has led them to offer substantial discounts on landing charges.

For the newly growing secondary airports, doing business with LCCs can be risky. LCCs seek substantial discounts on published landing charges as well as various subsidies to assist in route development. Aeronautical charges generally constitute a greater proportion of total revenues than they do for hub airports. The increased traffic volumes, however, should result in compensating increases in commercial revenues for the airports.

Consequently, established airports have seen their shares of point-to-point traffic dwindle (Barrett 2004). The combination of LCCs and low-cost airports offers a differentiated bundle of attributes of the air travel product, related to geographic location and distances from travelers’ origins and destinations. As well as lower airfares because of competition, passengers can gain from shorter waiting times and walking times and less confusion at

secondary airports. Although this might be outweighed by longer surface journey times to city centers, the disutility of delays for baggage, difficulties in transfer connections, and congestion in terminals and access routes associated with hub airports is avoided (Barrett 2004).

The LCC/low-cost airport combination has been significant in terms of expanding the size of the overall market, extending it to those who previously did not travel or, at least, traveled relatively infrequently. Franke (2004) points out that FSCs initially perceived LCCs as restricted to a niche sector, “luring low-yield passengers who would not have flown otherwise.” This perception has proven incorrect, however, as demonstrated during the downturn in the aviation market after September 11, 2001, during which LCCs thrived largely by taking passengers from FSCs. In the United States, LCCs offer competition on 70 percent of internal routes, and Franke (2004) asserts that the LCC business model can operate viably at 40 to 50 percent of the unit cost of the average FSC. The LCC strategy of effective capacity utilization is directly related to the efficiency with which aircraft and passengers can be processed (or turned around) at an airport, which, in turn, goes to the heart of the efficiency of airport service and ANS.

The majority of major hub destinations in the European Union are now served by a low-cost alternative. In general, this new entry has come from the decommissioning of former military facilities or the revival of previously underutilized regional airports. In rare cases—for example, Ciudad Real outside Madrid—entirely new airports have been developed.<sup>27</sup> LCCs generally have favored secondary airports because they require fundamentally different airport services than those offered by hubs. Using cheaper and less-congested secondary airports enables LCCs to achieve the operational efficiencies that underpin their lower-unit costs, particularly minimizing turnaround time. Quicker turnarounds enable LCCs to achieve better fleet utilization and staff productivity.

Often, competition will not exist between different LCCs on a route from a particular secondary airport. These airports, however, will introduce competition with hub airports for “route alternatives.” According to Barrett (2000), one study indicated that a service from Stansted to a minor airport in Europe is likely to be seen as a good alternative to a comparable route from Heathrow by more than one-fifth and as much as one-third of passengers. Therefore, the competitive pressure on hub airports from secondary airports will likely increase, and they will have to react by developing low-cost facilities to supplement their full-service offering or else risk losing market share and even particular routes to secondary airports.

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27. Ciudad Real Airport is the first privately run airport in Spain.

The dramatic increases in air services in the light of liberalization also places pressure on ANS capacity, and LCCs, in particular, putting pressure on ANSPs (and governments) for more direct routings and efficient flight profiles.

### *The Implications of Emerging Technologies for ATI Demand*

Airbus and Boeing, the largest commercial aircraft manufacturers, have presented two notably different outlooks for the future of air travel. While Airbus envisages demand growth being served by large aircraft operating between major world hubs, Boeing projects increased demand for direct, point-to-point flights from all airfields. In other words, Boeing believes that passengers increasingly prefer to fly direct routes from local airports rather than transferring through hubs.

These different views have led to markedly different aircraft manufacturing projects. Airbus has concentrated resources on developing the A380, the world's largest commercial aircraft, with two decks and a capacity of 500 to 800 passengers. The aircraft is expected to deliver costs per seat kilometer that are 15 percent lower than a Boeing 747. Boeing has focused its energies on small long-range aircraft, namely the B787, which has a capacity of 219 to 289 passengers. Like the A380, it was developed from modern composite materials that produce a light, strong airframe that delivers superior economics of operation, enabling airlines to run direct point-to-point services more profitably between almost any pair of airports around the world.

Competition between the two manufacturers is fierce, and both have been successful in attracting customers for their new products. Both views of the future have merit. This is confirmed by the fact that Airbus has been seeking launch funding for the A350, a derivative of the A330 twin-engine aircraft. The A350 is aimed squarely at the B787's target market. An increasing number of large hub airports, however, would be necessary for the A380 to dominate. Moreover, while a number of major hubs in the European Union and United States are slot constrained, the depth of the impact of LCC competition from secondary airports, network carrier consolidation, and the ability of airports to add new capacity will be crucial in determining whether this situation persists.

Airports anticipating the beginning of A380 flight operations have significant work completed, under way, or planned, revolving around essential civil engineering of the airfield, stands, and terminal buildings. The greater mass, weight, and wingspan of the A380 requires the strengthening of runways, taxiways, taxiway bridges, and the apron area; the widening of some runways and taxiways; relocation of fixed obstacles close to taxiways; and reductions in the number of stands to accommodate the greater areas required for the A380.

In addition to the airfield civil engineering implications, the design of the A380 requires upgrades to the terminal buildings. The current plans for the aircraft foresee boarding and disembarkation on two levels, which would expedite the transfer of passengers as well as allow the airlines to better differentiate their services to premium and economy passengers. Greater seating areas in departure lounges are anticipated, possibly with segregated premium and economy passengers on split levels. Boarding gates will require multiple-level air bridges (already installed at London Heathrow).

These investments will have significant cost implications for airports and the attendant risks associated with the uncertain take-up of the new A380. Airports that are subject to performance targets for runway utilization imposed by regulation or agreements with airlines will need to be mindful of the impact of A380 operations. The airports may need to consider surcharges for A380 operators to compensate for any revenue reductions resulting from a failure to meet the runway utilization targets.

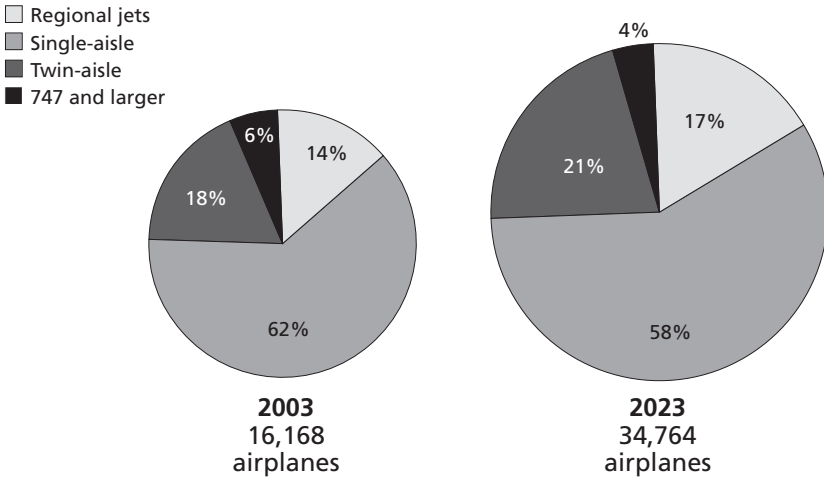
The A380 will place additional demands on the air traffic management system in a number of ways. At many airports, specific taxiways have been allocated for the A380, which will restrict the flexibility of ATC to route traffic around the airport. Airport capacity will be further reduced because of the A380's maximum taxi speed of 15 knots (around half the speed limit for other aircraft), and greater aircraft separations will be required to allow for the A380's wake turbulence. Such effects will require innovative and expeditious handling of other aircraft to mitigate these capacity reductions and consequent delays.

Regional jets have gained prominence in recent years, completely replacing turboprops in many markets. The importance of regional jets stems from the fact that they (1) provide essential feeder services between small regional airfields and larger hubs for connecting passengers; (2) allow routes to be served where demand may not be sufficient to justify larger jet aircraft and where cost-efficient point-to-point services are required; (3) can operate in airstrips where, for reasons of terrain or location, larger jet aircraft cannot operate; and (4) allow short routes to be operated with the high service levels expected by business passengers. In the United States, nearly all regional jet operations are part of wider hub-and-spoke operations.

Boeing and Airbus agree on the growing demand for regional jets, as evidenced by the forecasts in figures 3.5 and 3.6. Boeing, however, which projects that 76 percent of future aircraft deliveries will be regional jets, does not have a product that serves the market, its smallest aircraft being the B717 with a capacity of 106 passengers, of which it has ceased production. Airbus produced the A318, which seats up to 120 passengers. While it would appear to have been developed with the distance and payload characteristics of the A320 series, it is competing against the larger regional jets of the niche manufacturers.

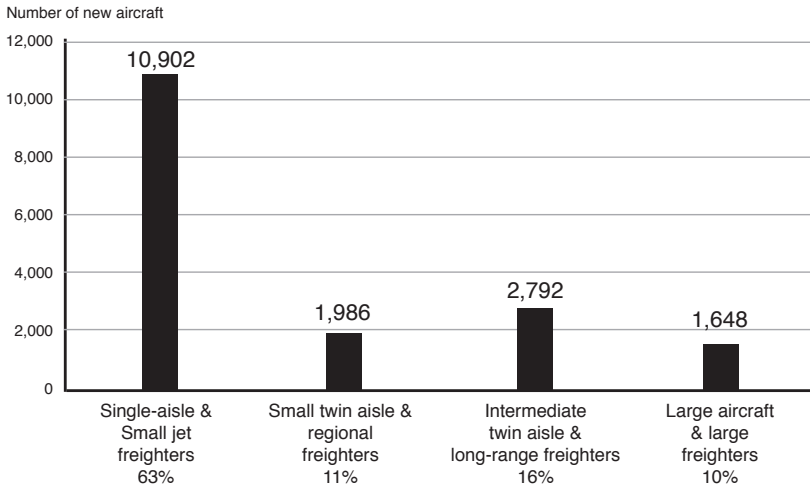
**Figure 3.5 Estimate of World Aircraft Fleet Composition**

**The World Fleet Will More Than Double Over the Next 20 Years**



Source: Booz Allen Hamilton using information from Boeing Commercial Airplane Group 2004.

**Figure 3.6 Estimate of Aircraft Fleet Deliveries, 2004–2023**



Source: Booz Allen Hamilton using information from Airbus.

Embraer (a Brazilian aircraft manufacturer) has further subdivided and analyzed the regional jet market and asserts that the predominant market exists for aircraft in the 70- to 110-seat category, which it believes is not adequately served by the product offerings of the two major players. Fur-

ther, Embraer argues that this has led either to unfulfilled demand, in which case airlines operate smaller aircraft with insufficient capacity, or to poor utilization, where larger jets are used with empty seats. The company anticipates strong growth over the next 20 years, with demand for 6,750 jets in the 30- to 120-seat range.<sup>28</sup>

A large number of regional jet construction programs are ongoing around the world. Other than the major players (Embraer and Bombardier), projects are under way in China (ARJ21) and the Russian Federation (varied, but including the TU334).

The recent and projected significant growth in this sector, combined with the new larger aircraft, will lead to more complex aircraft mixes at airports, which will impose constraining effects on ATC and runway capacities. ATIS providers will face challenges in terms of expanding capacity and managing demand.

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28. According to a report by *Aviation Today* ([www.aviationtoday.com](http://www.aviationtoday.com)) dated November 10, 2008.





## 4.

# THE CHANGING ROLE OF GOVERNMENT

### **Introduction**

Reform processes must begin with an understanding of the existing problems. This chapter begins with some background on the original motivations for government provision of ATI and reviews how some of the constraints and failings of governments have led to problems. This provides the basis for reviewing the underlying problems that afflict the provision of ATI and should help governments to diagnose the underlying causes of those problems and determine whether PSP is likely to help address them.

### **Motivation for Government Provision of Air Transport Infrastructure**

Governments' role in the provision of ATI has its origin in the association of market failure with the industry. During the postwar period, suspicions of market inequities (such as monopoly power) and imperfections (such as externalities) automatically led to the advocacy of government provision (Shleifer 1998). Such views were part of a wider debate during the 1930s and 1940s about capitalism, socialism, and the role of central planning in a market economy. As Shleifer (1998) aptly points out, an interesting aspect of the debate was that *laissez-faire* economists of the time focused overwhelmingly on the goal of achieving competitive prices even at the cost of accepting government ownership in noncompetitive industries. Libertarian economist Henry Simons (1934) wrote that "the state should face the necessity of actually taking over, owning, and managing directly, both the railroads and the utilities, and all other industries in which it is impossible

to maintain effectively competitive conditions.”<sup>29</sup> Simons’ advice is attributable, in part at least, to the apparent failures of regulation during the Depression (Shleifer 1998).

The market failure that has long been associated with ATI is that of natural monopoly, which, in simple terms, describes the case in which single-firm supply of the market costs less than two or more firms.<sup>30</sup> This naturally led to a presumption that provision by private firms would bestow monopoly power, resulting in inequities and inefficiencies. If regulation was viewed as likely to be ineffective, then, following Simons’ (1934) line of argument, the difficulty in maintaining effectively competitive conditions justified government provision.<sup>31</sup> Recent evidence shows, however, that airports are not naturally monopolistic and that competition between them is possible to the extent that they are close enough to provide viable route (door-to-door) alternatives to passengers and freight providers. (These issues are explored in section 8—Market Structure.) Some of the developing country cases suggest, however, that it is still necessary to have single-firm provision of several airports. Market power is, therefore, still (although perhaps to a slightly lesser degree) a pervasive feature of ATI provision.

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29. Competitive conditions and prices achieve economic efficiency. There are three aspects to this. Allocative efficiency denotes the optimum allocation of scarce resources between end uses, to produce that combination of goods and services that best accords with the pattern of consumer demand. This is achieved when all market prices and profit levels are consistent with the real resource cost of supply. Optimal consumer welfare is achieved because the price of each good and service is equal to the real resource cost of supplying them, including a normal profit (being the reward for risk-taking by entrepreneurs). Competitive conditions ensure allocative efficiency because firms attempt to bid business away from their rivals, leading to prices that converge to these real resource costs. Productive efficiency is concerned with the combination of factor inputs that minimizes the cost of producing a given level of output. Competitive conditions ensure productive efficiency because firms, in seeking further price reductions to outdo their rivals, will seek to minimize production costs. Prices, thereby, will converge to the lowest real resource cost of supply. Dynamic efficiency is concerned with optimal long-term investments in growth and innovation. Specifically, investment projects should proceed only when they are expected to yield a net positive outcome. In other words, the expected net present value should exceed zero. Competitive conditions ensure dynamic efficiency because the discipline of sustaining prices that equal the lowest real resource cost of supply ensures that unprofitable investments will not occur.

30. In economic terms, high fixed costs and low marginal costs mean average total costs are falling over the relevant output range, resulting in significant increasing returns to scale. Increasing returns to scale (also known as economies of scale) describe the long-run reduction in average (or unit) costs that occurs as the scale of the firm’s output increases. In ATI provision, the cause of increasing returns to scale can be thought of as indivisibilities in the physical structures, such as runways or ATC centers. Entire runways are required regardless of whether the intention is to provide for one or thousands of flights.

31. Note, however, that there is a strong political dimension in motivating government provision of ATI (and air transport itself), namely the strategic nature of aviation, a view that was most poignant in the postwar period. This view and the consequent role of governments were enshrined in the Chicago Convention.

## Constraints Faced By Governments

Government is the primary decision-making body in a nation-state, primarily responsible for defense and maintaining internal law and order. The economic role of government depends on the sociopolitical system the country has adopted, the two extremes being the centrally planned economy and the private enterprise economy. In the former, the government plays an all-encompassing role, often owning most economic resources and determining what products and how much of each are to be produced. In the latter, economic resources are held privately, and markets provide the mechanism to allocate them, except to the extent that government plays a restricted role in redistributing income and wealth and influencing the general level of economic activity.

Governments are funded through taxation and influence the workings of the economy through their spending and investment decisions (public expenditure) and through their control (via monetary and fiscal policy) of the spending and investment decisions of other sectors of the economy. Public expenditure is used to provide social (or public) goods and services (such as health, education, defense, and roads), certain marketed goods and services (when they are associated with market failures), and transfer payments (such as unemployment benefits and state pensions) that effectively redistribute wealth in the economy.<sup>32</sup>

Government's role as an economic agent, therefore, is to determine and implement policies that maximize the welfare of society.<sup>33</sup> Governments face, however, a number of constraints in carrying out this role. Specifically, governments face pressure to keep taxation as low as possible, which restricts the funds available for public expenditure as well as the ability of governments to borrow against future tax returns. In other words, society competes for limited government funds. Therefore, governments that decide to use these funds for the provision of ATI forego their use for other purposes, such as the provision of certain public goods and services, other marketed goods and services for which market failures are perceived as equally or more severe, transfer payments designed to redistribute income, or some other policy that requires government spending.

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32. Public goods and services are provided by government for the benefit of all or most of society. They are funded through general taxation and, consequently, there is no specific direct link between the consumption of public goods and payment for them. Marketed goods and services can be defined loosely as goods and services that can be purchased and paid for by individual consumers (including firms when purchasing inputs) for their own benefit. Consumers are assumed to behave rationally in the sense that, for a given level of quality, they will choose the lowest price. Rationality, however, also incorporates the idea that consumers appreciate choice.

33. As well as policies involving taxation, public expenditure, and monetary and fiscal controls, some policies prevent social exclusion of those occupying remote regions, and others protect the environment.

These constraints have led to the most common problem associated with ATI (as with all infrastructure) provision—the so-called infrastructure gap, which typically is characterized by inadequate maintenance and capacity expansion of airports and air navigation and communications systems. The gap occurs because governments have limited financial resources to devote to increased capital expenditure for improving and expanding ATI.

### **Literature Treatment of Government Failings**

Pigou (1938) was one of the first economists to recognize most clearly the dangers of bureaucratic control (Shleifer 1998). It was only during the 20 to 30 years before the turn of the millennium, however, that the evidence in the literature on the failures of state provision of many types of infrastructure (including ATI) began to accumulate. This evidence suggests that most, if not all, governments do not always determine and implement policies that maximize the welfare of society. The theories that have been formulated as a result suggest that the goal of politicians is to remain in power and enjoy the perquisites of their office. This requires political support in the form of votes (in the case of democracies) or loyalists to suppress the opposition (in the case of dictatorships). Governments consequently have directed benefits to political supporters by, among other things, using their ownership and control of assets to, for example, force excess employment or create projects that transfer wealth to supporters (Bennedsen 1998; Shleifer and Vishny 1994, 1999). Patronage systems, for example, may mean that managerial positions are given to well-connected applicants who are not necessarily the best qualified for the job. These patrons in turn may expect contracts to be awarded to friends. Government provision of goods, services, and infrastructure therefore has come to be viewed as inefficient because it addresses the objectives of politicians rather than maximizes efficiency and the welfare of society.

Governments have been motivated politically not to levy or increase fees and charges for the use of ATI and associated services, because the social (and political) pain is felt immediately, whereas it may take several years before higher revenues translate into better services. A closely related issue is the misallocation of scarce ATI capacity through government restrictions on (and failures to implement) economic pricing. As mentioned in section 3—Recovering Costs of Supply, scarce capacity should be allocated to those airlines that value it most. At Heathrow Airport, however, regulated maximum

airport charges are determined according to a single till, so that the price users pay does not in any way reflect their willingness to pay. Therefore, scarce capacity is not allocated to the airlines that value it most and that can provide the types of services that generate the greatest benefit to society.

Also relevant is the increasing realization of the failures and apparent limited capacity of the public sector in delivering large-scale infrastructure projects efficiently and cost-effectively, which has resulted in cost overruns, “gold-plated” facilities, and “white elephants.” Such an assumption, however, might in certain cases be misleading. Good public managers may be operating under conditions and constraints that prevent them from being effective, or governments may be constrained in their efforts to replace ineffective managers.

Many governments have attempted to reform utilities without PSP through restructuring, technical assistance, the appointment of new board members and managers, or development agency assistance. The inability, however, to change systems of patronage and the kinds of short-termism at the heart of many problems is commonly considered to have led to many failures. Consequently, governments throughout the world have embarked on massive privatization programs, including in ATI. By engaging a private firm and giving it defined responsibilities for the provision of ATI, governments widen their reform options. Governments must approach the manner in which they divest responsibilities to these privately held profit-motivated firms carefully.

### **A New Allocation of Responsibilities**

The role of governments was articulated by the signatory states in Article 28 of the Chicago Convention, in which, to support the development of ATI, each contracting state undertakes “so far as it may find practicable, to . . . provide, in its territory, airports, radio services and other air navigation facilities to facilitate international air navigation in accordance with the standards and practices recommended or established from time to time” (see note 31). The signatory states, however, are responsible for upholding these standards and

practices through the enforcement of safety and security standards.<sup>34</sup> States also play an increasing role in the area of environmental standards.<sup>35</sup>

Given the strategic nature of the industry in the postwar era, it is not surprising that governments combined these vital roles with the provision of ATI, through operating departments within a ministry or a representative civil aviation authority. These institutions have acted as providers, managers, and operators of airports and ANS, while ensuring safety and security in aviation, as well as a fair deal for consumers. To reduce the number of conflicting roles, corporatized and commercialized SOEs increasingly have been vested with responsibilities on ATI, a strong trend through the 1980s and 1990s and continuing through the 2000s. The shift toward the involvement of private firms is, however, especially prevalent in airport provision. The reform leader in this respect was the United Kingdom, with the full divestiture of the BAA in 1986. Many countries, including the Republic of Ireland, have commercialized airport and ANS operators. Others have introduced varying degrees and types of private participation. A reasonable interpretation of these shifts is that governments have redefined their role to ensure the optimal provision (that is, amount, standard, and price) of ATI by firms.

When governments divest to firms, there are many questions, such as the following: Should the firm be private or public? What will the firm's responsibilities be? What kinds of firms are required to undertake them? How should the risks associated with these responsibilities be allocated among taxpayers (through government as the contracting agent), customers, man-

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34. The purpose of safety regulation is to prevent flight failures, and the basic principles are articulated in documents produced by the ICAO. It is the responsibility of national governments to interpret, implement, and enforce the appropriate rules, regulations, and standards. Safety regulation includes aircraft and pilot certification; directions on repair, maintenance, and operation (such that aircraft continue to meet design standards); accident investigation; protection from attack; minimum standards for airports; and air navigation aids. Responsibility for safety is usually vested at the national level with civil aviation authorities. The U.S. Federal Aviation Administration and the European Aviation Safety Agency, however, are primarily responsible for certifying aircraft from the two largest manufacturers, Boeing and Airbus, respectively.

35. Air transport has several environmental impacts, including noise and engine emissions. ATI shares many of the impacts of any major industry, including visual impact, land-take, contamination of land and water from fuel and industrial waste, and impacts on wildlife. Air quality standards are increasingly being defined and enforced, for example, the European Community directive on ambient air quality standards. Many major European airports are noncompliant because they constitute large concentrations of emitters of air pollutants (from aircraft, land vehicles, and buildings), which means that airports are likely to become increasingly affected by the legislation. Clearly, developments in environmental policy on aviation will have serious implications for the amount of air services that will be permitted in any one location. Consequently, the size and location of airports and ANS will be affected, which, in turn, may affect intentions on privatization. For example, if privatization is motivated by the funding required to expand a large airport, but environmental restrictions will preclude that expansion, little may be achieved by privatizing, all else being well.

agers and employees, and shareholders? What institutional reforms are necessary to manage the relationship? Is independent regulation required? In making decisions, it is important to consider the motivations, the vision for the sector (in the context of the nation), the objectives for reform, and the robustness of the process to deliver them. These issues have important implications for the success of outcomes (the subject of sections B and 6).

In vesting responsibilities for investment, maintenance, and operations in ATI with firms, governments impose more of the risks of provision on these firms. In return, governments exchange rights to revenues and profits (to owners of private firms) or rights to determine the short-term use of revenues and profits (to managers of SOEs).<sup>36</sup> They also provide assurances against risks that arise on costs, demand, and government policy. These firms, however, also receive market power. SOEs show tendencies toward “empire building,” which suggests that, in these cases, the government-appointed public managers of these firms hold market power. Private firms are motivated by profits. Their owners can exert varying levels of discipline, usually depending on the organizational capability of the share ownership structure. In these cases, the owners and managers of these firms hold market power in varying proportions. Either way, the key to success is controlling the market power bestowed on (the owners or managers of) firms in a way that does minimal damage to the incentives to perform efficiently, especially in the area of investment. This should be achieved through competition where possible, which requires decisions on market structure. Where competition is lacking, however, governments need to give firms the ability and incentives to make good investment and operating decisions by granting discretion and by exposing them to the related business risks, so that they are rewarded for good and punished for bad decisions. Governments should not automatically facilitate renegotiations of agreements when profits decline as a result of the normal business risks that the firm has agreed to bear.

The two distinct traditions or schools of thought on how to perform these regulatory functions and achieve this objective are contract based and independent regulation:<sup>37</sup>

- *Contract based.* This is based on long-standing French practice, in which tariff and service standard adjustments are seen as adjustments to the terms of a contract between the operator and the contracting authority.

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36. These rights are defined in economic theory as residual income rights and residual control rights. Residual control rights can be thought of as short- to medium-term residual income rights.

37. Attempts to combine the two can create risks. For example, if the regulator can effectively override the contract, the operator may be exposed to too much policy risk. A better way of blending might be to ensure that independent regulators' decisions are governed by the contract and subject to arbitration, and that contracts and arbitration are public.



Changes are agreed or settled by courts or arbitration if agreement cannot be reached. More sophisticated forms of these contracts, however, include panels of experts who recommend changes and other institutions to help the parties reach a balanced decision.

- *Independent regulation.* This tradition derives from the United States. Decisions are entrusted to competition authorities and regulatory agencies, which take the form of neutral, technocratic bodies, empowered by statute to make binding decisions on operators in the form of regulatory contracts.

As with government provision, the performance of these regulatory functions by government has lacked sufficient depth and transparency, has tended to become muddled by the same conflicting objectives associated with government provision, or has simply become captured by the provider (the exception would appear to be France). Independent regulators can afford to be more single-minded. In reality, however, the institutional arrangement of contracting and regulation varies across countries, in recognition of the fact that, for various reasons, some may be more likely to break down or perform poorly (see section 8—Institutional and Regulatory Reform).

## B.

# POLICY DESIGN FOR PRIVATE SECTOR PARTICIPATION

Following is a high-level checklist of issues that governments need to ensure they have considered before embarking on a policy of introducing private sector participation (PSP) in air transport infrastructure (ATI). This list provides the basis for this part:

- Motivation, vision, and objectives of reform (section 5)
- The reform process (section 5)
- Type of PSP arrangement (section 6)
- Policy sustainability (section 6)
- Project finance (section 7)
- Responsibilities and risks (section 7)
- Management incentives (section 7)
- Market reform (section 8)
- Institutional and regulatory reform (section 8)



## 5.

# MOTIVATIONS, VISION, OBJECTIVES, AND PROCESS

### **Motivations for Reform and Vision for the Sector**

The drivers of reform include the need for funding for ATI investments in development, expansion, and improvement; budgetary and fiscal pressures on governments; economy-wide policies on the role of governments; the appetite for private involvement; and the need for increased performance on investment, maintenance, operations, and management. Understanding these motivations has vital implications for the type of reform undertaken. If finance and government budgetary constraints are the main issue, reform is more likely to necessitate the attraction and involvement of private firms. If, however, poor performance is the issue, it may be necessary only to improve governance and regulation. If this improvement can be achieved through better government contracting or the establishment of an independent regulatory agency, this may provide a less costly solution for countries where the risks of sustainable commercial operations by private firms are high or the appetite for privatization is low. Likewise, if performance is poor only in certain specific areas, it may be necessary to involve the private sector or to address governance and regulation only in those areas. While targeting policy, staggering reforms might provide a useful testing ground and learning experience for governments wishing to further extend the role of the private sector in the future.

Air transport plays a vital role in generating economic activity and, more importantly, in facilitating it. Air transport is critical to the development of international trade, to attracting foreign direct investment, and to the development of a country's tourist industry. ATI is critical to the competitiveness

of an economy and provides the necessary inputs for the provision of air transport. Optimal provision of ATI, and the development and growth of the air transport that it facilitates, is consistent with the overall development and poverty alleviation objectives of most, if not all, countries. Consideration of whether, and to what extent, to reform ATI provision and introduce PSP should be with a view to furthering this overarching objective.

This consideration may require choosing between expansion and quality of service improvements (which delay the necessity for expansion), choosing between keeping fees and charges low and removing the burden of subsidies from government. Governments need to consider whether PSP is likely to be effective in furthering the vision for the sector and must determine priorities accordingly. For example, the market might be able to tolerate higher prices better than it can tolerate poor quality and delayed capacity expansions, in which case the delivery of expansions and quality improvements will be more important than keeping prices low.<sup>38</sup> Consensus building on what the reforms are intended to achieve and on the overall vision may be required.

One of the most important motivations for the introduction of PSP is a need to obtain better value for money for the required infrastructure and services. Normally, a private provider's profit motive (along with its expertise and professionalism) may motivate it to operate and invest more efficiently than its public sector counterpart. For example, it may provide services with fewer staff, miss fewer profitable opportunities to expand the business, build fewer "white elephants" or projects with more costs than benefits, or undertake rehabilitation or capacity expansion at a lower cost. Private providers are likely to retain as profits some of the benefits of improved performance, and this improved performance can also allow lower tariffs for customers, reduced subsidies from taxpayers, or higher-quality services for the same level of tariffs and subsidies. Whether a private operator can provide ATI more efficiently than a public sector comparator is likely to depend on the details of the arrangement and the extent to which the operator is restricted from implementing the kinds of measures that would deliver greater efficiency and value for money. In that regard, governments must carefully assess the advantages and disadvantages of private provision relative to a public sector comparator and weigh them against other successful PSP schemes. Part of the planning of the PSP scheme should include, where possible, the financial benchmarking of the scheme against a theoretical public sector alternative as well as against comparable PSP schemes in equivalent countries. Care should be taken when carrying out such benchmarking to factor in the cost of providing the

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38. This is normally the case with ATI because its demand is derived and its costs constitute only a small proportion of the cost of air transport, meaning it typically has a rather low price elasticity of demand.

specified quality of service, as well as the cost borne by the project sponsor as a result of assuming risks that otherwise might fall to the government. The expected gains from the involvement of private firms are explored in section 6—Institutional and Regulatory Reform.

### **Objectives of PSP Policies**

In considering the introduction of PSP, policy makers will have a variety of objectives in mind, arising largely from the constraints faced by government and the failings associated with government provision outlined in section 4. Clearly articulating and agreeing on objectives at the start of the process allows everyone to work toward a similar end and provides a solid framework for choosing between options and resolving disputes during the design process. Like other factors considered in this section, clear objectives go a long way toward determining the success of the policy. Policy makers' objectives for introducing PSP and complementary reforms are most likely to include the following:

1. Facilitating investment by removing public sector financial constraints
2. Improving responsiveness to customers
3. Improving performance in ATI provision, management, and operation through
  - a. increased efficiency,
  - b. relief from public sector financial constraints and engendering self-reliance,
  - c. avoidance of constraints on the public sector's capacity to implement efficiently and cost-effectively large-scale infrastructure projects, and
  - d. introduction of active participation by the private sector in all phases of the project life cycle, thereby securing better value for money than the traditional design-build model, in which the private sector's role was limited to the project construction phase.
4. Improving the government's financial position through
  - a. proceeds from the sale of assets or of the rights on their use,
  - b. dividends where a degree of state ownership is retained,
  - c. reduced dependence of ATI provision on limited government tax revenues and borrowing, and
  - d. reduced size of the public sector and burden on public administration.
5. Creating private sector capabilities in activities that have been run publicly to enhance the competitiveness of markets
6. Promoting wider share ownership among the general public and among employees of the newly privatized firm (to increase the popularity and achieve political sustainability of the PSP policy)
7. Assisting in the development of domestic capital markets

In most countries, facilitating investment by removing public sector financial constraints is likely to be the objective that receives the greatest priority. Given that demand for ATI is derived from the market for air transport and that it represents only a small proportion of airline ticket prices, a degree of management and operational inefficiency may be tolerable if that is the price of ensuring that investment takes place. Performance issues might be a priority in developing countries with severe corruption and patronage problems, and in developed and developing countries where the public sector has a reputation for the inefficient delivery of large infrastructure projects, resulting in cost overruns, gold plating, and white elephants. Improving responsiveness to customers is vital for effective investment and is likely to receive high priority in most countries.

Motivation, vision, and objectives are clearly articulated in some, but not all, of the case study airports and air navigation services (ANS) selected for this report. Box 5.1 includes examples of the motivations for bringing the private sector into some projects.

#### Box 5.1

##### **Case Study Focus 1: Motivation, Vision, and Objectives**

###### **Cameroon:**

Its objectives were articulated as the introduction of better airport management (with a commercial approach) and the attraction of finance for investment in airport rehabilitation and improvement.

###### **South African (Airports and ANS):**

Booz Allen Hamilton did not identify clearly articulated objectives, but it determined that the government's objectives included providing for major investment in airports and ANS without recourse to government funds, taking advantage of the expertise of a technically and commercially experienced foreign airport operator, advancing the government's policy of empowerment of historically disadvantaged communities, and taking advantage of South Africa's business leadership in the region to exploit international commercial opportunities in the airports' management.

###### **United Kingdom:**

The initial impetus for privatization was the high priority given by government to reduce the Public Sector Borrowing Requirement. The initial emphasis was on the divestiture of profitable state-owned companies that could be

*continued*

### **Case Study Focus 1: Motivation, Vision, and Objectives (continued)**

sold easily, quickly, and at a good price. By the time of the flotation of British-Telecom in 1984, however, the government had other objectives, including promoting efficiency and widening and deepening share ownership to reinforce the popularity of privatization and to make it more difficult for opposing forces to reverse the trend. The government's specific objectives on airports were perceived to be to raise income for government at a time of a large public sector, to ensure that future investment needs were provided by the private sector (thus freeing the business from constraints on government borrowing), to encourage greater efficiency in operation and investment, to promote commercial management, and to promote wider share ownership. The government's specific objectives on ANS were articulated in a 2002 National Audit Office report. They were to maintain standards of safety and national security by separating service provision from safety regulation, to attract an injection of private sector money and improved project management skills, and to free National Air Traffic Services Holdings Ltd. (NATS) from public sector constraints, giving the company greater freedom to invest in and improve its services and to safeguard the interests of taxpayers in achieving these prime objectives.

#### **Greece:**

The government was motivated by the need to construct a new Athens airport as part of the modernization of the country's economy and as a necessity for the 2004 Olympic Games. Its objectives were to avoid financing the airport from public funds, to build and commission the airport on time and on budget, to introduce efficient commercial operations and management, and to accelerate the modernization of the economy.

#### **China:**

The government was motivated by raising low-cost funds to build Shanghai Pudong Airport and promoting the sustained development of Shanghai and the Yangzi River Delta region. Other objectives (articulated in the June 2002 Regulation on Foreign Investment in the Civil Aviation Industry) included encouraging foreign participation in the ownership, development, and financing of China's airports; encouraging airports to go public in overseas markets; breaking new ground for the restructuring of large state-owned companies; and exposing Chinese partners to advanced management and mature business models.

*continued*



## **Case Study Focus 1: Motivation, Vision, and Objectives (continued)**

### **Thailand:**

The government had adopted a general policy toward state-operated enterprises (SOEs) of corporatization and encouraging private sector participation. It needed to raise money to finance the completion of the new Bangkok international airport, Suvarnabhumi, which was delayed, over-running on cost, and experiencing construction problems. The objectives of introducing PSP were to enhance the competitiveness of the SOE, give Airports of Thailand (AOT) the flexibility to meet rising demand, promote travel, contribute to Thai economic growth, and boost the potential of Thai capital markets.

### **Lao People's Democratic Republic:**

The government was motivated by the need to facilitate growth in tourism. The government's principal objective was to attract finance for investment in a new passenger terminal and ATC tower, renovate and extend the runway to handle wide-body aircraft, and introduce a commercial approach to the ongoing operation of the airport and its new facilities.

### **Australia:**

Having successfully privatized in several sectors, the government was motivated to introduce PSP in airports by fiscal constraints, the need for greater efficiency and performance, and the need for enhanced customer focus to facilitate the further development of air transport. Its main objectives were to reshape management and ensure sufficient management capabilities for the airports, to improve their productivity and profitability, and to remove bureaucratic control. More detailed objectives included (1) upgrading the airports (including aeronautical and nonaeronautical); (2) attracting, planning, and realizing airport investments that are timely and environmentally sound; and (3) optimizing sales proceeds and minimizing government's exposure to residual risk.

### **New Zealand:**

The government was motivated by the need for major investment in ANS that it was unable to fund. At the time, the government was determined to cut the size of the public sector through privatization and other PSPs, having inherited economic stagnation and large deficits from the previous government. In commercializing the SOE responsible for ANS, its objectives were to remove the burden of finance from government's budget, improve efficiency, move to a more commercial charging structure, and establish a system whereby it covered its operational and financial costs.

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### **Case Study Focus 1: Motivation, Vision, and Objectives (continued)**

#### **Argentina:**

When President Carlos Menem assumed power in 1989, he initiated a series of economic and structural reforms, including the privatization of public enterprises. His objective for Argentina's airports was to transfer responsibility for operating and investing in airport infrastructure to a more competitive private sector and to end the government's operational and managerial control of the system.

#### **Mexico:**

The government was motivated by the fact that the economy was being held up by poor infrastructure and inefficient state provision, with corruption and little investment. Moreover, it had few funds following an earlier economic crisis. While Booz Allen Hamilton has not seen an explicit statement of objectives, it believes the intentions were to raise money for the government, to improve efficiency and effectiveness in the operation of the airports, and to secure adequate investment to satisfy demand without government contribution.

#### **Canada:**

The government was motivated by cumulative underinvestment in ANS, which was constrained by public sector cash constraints, by staff resource misalignment because of a restrictive civil service hiring policy, and by a large investment program that appeared likely to overrun. While Booz Allen Hamilton has not seen an explicit exposition of objectives, they appear to have been to move to commercial finance and remove it from government books, to move to commercial operation to resolve staff misalignment, to move to a more transparent charging regime, and to cover costs with charges, while smoothing charges over the air transport cycle and managing commercial risks.

*Source: Booz Allen Hamilton.*

### **Process, Planning, and Consultation**

The quality of the process can determine the success of the arrangement. Consulting widely and expending resources for good advice usually goes a long way toward achieving the required political sustainability of the chosen policy. Developing the best arrangement for local needs and circumstances and finding suitable advisers for the arrangement are as important as obtaining the best possible offer from a bidder. It is extremely important to engage advisers with sufficient expertise and knowledge of ATI PSP. This usually requires the

involvement of international advisers. The technical aspects of the transaction should be developed to a level of detail that gives governments a high degree of certainty about the costs and feasibility of the proposed arrangements. Advisers with vested interests (for example, links to equipment suppliers) should not be relied on, because doing so tends to result in solutions that are technically rather than service requirement driven.

Governments face a trade-off between improvements in the arrangement and the costs of extra refinements in terms of time and money. Governments should consider the size of the transaction and recognize that an in-depth analysis that is justified for a long-term arrangement in a major city may be too expensive for a short-term arrangement in a small town. A good process produces a satisfactory outcome without unnecessary delays and costs, and without results that are biased because of advice based on vested interests.

Countries with laws that are supportive of PSP and with good-quality information can proceed more rapidly through the preparatory stages. The time required to complete the preparatory stages will vary according to prevailing conditions and the arrangement being pursued. For instance, while a management contract can be designed and implemented within 12 months, a concession may take two to three years. Likewise, a management contract to operate and maintain a single airport will take less time than a concession to operate, maintain, and develop more than one airport. Governments may choose to proceed at a slower pace to allow more time for consideration of the issues and the management of social and political concerns. The issue of finance may need to be addressed separately from the selection of the operator, especially in cases in which finance and operational responsibilities are split. Whether or not they are split, they may depend on each other, through cross-effectiveness requirements. In the particular case of finance being sought from an international development bank, it may take two or three years to prepare a project that meets all safeguards and fiduciary requirements.

The required preparations involve an iterative process with new information continually emerging. The various stages may require different levels of detail and precision. Early financial modeling will be based on limited data and approximations and can be quite crude; however, by the time the bidders are asked to prepare bids, governments need to have the best information available and to have thought through the arrangements in detail.

Consultation and communication is important at all stages of the process. Governments need to know what stakeholders want from the reforms and let them contribute to the discussion. Involving prospective participants early in the process is likely to increase the chances of encouraging interest. This will make successful, sustainable reform more likely. It will be helpful for governments to identify key stakeholders (including outreach to potentially marginalized groups), to develop effective ways of interacting with

stakeholders, and to identify the most politically sensitive issues that may require specific policy decisions (especially those involving the distribution of benefits among stakeholders). Gathering information, communicating decisions, engaging in dialogue, and harnessing the knowledge and creativity of consumers and stakeholders and involving them in decision making are key to developing a successful and sustainable policy.

Before taking final decisions, governments must take an independent and unbiased view of how the whole transaction will play out, including the long-term effects. ATI developments affect the community for a generation or more, so unexpected side effects can have a significant negative effect on the overall success of the transaction.

Early on, governments may wish to choose a “reform leader” (a government entity that has appropriate skills, capacity, and responsibilities) to champion and coordinate the overall process. The government should be clear about which level of government is responsible. In establishing this clarity, it is necessary to recognize that the institution(s) appointed to manage the process is not just a transaction manager, but also a key decision maker and political champion for the PSP policy. This position requires the ability to make major decisions and consult stakeholders. The options include local government, central government, or local government with support from central government, depending on the importance, scale, and complexity of the transaction.

Factors influencing the choice include determining who holds legal responsibility for the particular piece of ATI and has the capacity to analyze and decide policies and financial considerations. For example, central government may have more power and resources at its disposal. Local government may still be weak because, for example, decentralization is recent or incomplete. Involving local or city government may be unavoidable in situations if they play key roles in airport development, finance, and operation, or if they are responsible for job creation in their area. Cities in the United States play a key role in the operation and development of airports through airport authorities. That role often can extend beyond the boundaries of the airport. For example, the Metropolitan Washington Airports Authority recently assumed responsibility for the extension of the city’s Metro line to Dulles Airport.<sup>39</sup>

Appropriate reporting structures can bring powerful decision makers into the process in an effective way. In addition, the team’s delegated powers should allow the process to proceed in a timely, efficient, and transparent manner with appropriate checks and balances.

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39. It follows that, in these cases, an intermediary step might involve the transformation of the airport authority into a corporatized state-owned company (see section 6—Contemporary Models of Public Provision).

## Analysis Required to Support Decision Making

Selection of the operator requires the reform leader to make the opportunity attractive to prospective PSPs and to use sound processes to determine the best participant. The leader needs to consider the types of participants he or she wants and can expect to attract. Potential PSPs might include large global airport-operating companies, individual or institutional investors that have no specific airport management expertise, or airport privatization vehicles such as Macquarie Airports and HOCHTIEF AirPort. The reform leader should minimize the risks of any operator being given an unfair advantage or an opportunity to affect competition for the arrangement. If direct or competitive negotiations are chosen instead of competitive tendering, or are simply unavoidable, the reform leader must ensure that incentives are in place for the participant to produce the best possible bid. This requires a process for selecting the PSP that is robust, transparent, and fair. If transparency and fairness are absent, the policy may be open to significant challenge and could be threatened. Integral to the arrangement is the requirement for clearly articulated intentions on the level and quality of services that are expected, prices to be charged to customers, and subsidies to be provided to the PSP.

The formulation of such intentions, as well as the attraction and choice of appropriate participants, will require significant consultation and technical and financial analysis, involving an iterative process that takes account of views on cost, willingness to pay, and information on consumer preferences. High levels and quality of service will require greater investment, and either customers or taxpayers must pay for this investment. Consequently, an appropriate balance between the service consumers would like and their willingness and ability to pay for it is essential. This requires engineering and financial studies to come up with various consistent cost-quality options and consultation to establish the preferred option.

If below-cost tariffs on users are preferred and complementary subsidies are required, governments should engage in cost-benefit analysis to decide whether it is worth spending money to obtain nonpecuniary benefits. While private firms have higher financing costs than governments (section 6—Contemporary Models of Public Provision), public funds are scarce. Consequently, they may have a high opportunity cost.<sup>40</sup> In other words, if public funds are used for ATI, governments forego the use of those funds for other purposes, such as the provision of certain public goods and services,

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40. The French economists Jean-Jacques Laffont and Jean Tirole describe this in terms of a shadow price of public funds, which, they suggest, might be as high as 40 percent in France.

other marketed goods and services for which market failures are perceived as equal or more severe, transfer payments designed to redistribute income, or some other policy that requires government spending.

Governments should use cost-benefit analysis, where possible, to assess choices of the type of PSP, the supporting ownership and incentive structures, and the institutional measures needed to ensure optimal governance and economic regulation of market power. If policies are projected to generate positive net benefits (from discounted cash flow analyses of intertemporal projections), they are likely to operate in the public interest and should be implemented. If they are projected to generate greater costs than benefits, they should be weighed against alternative policies that achieve the same or similar objectives.

### Box 5.2

#### Case Study Focus 2: Reform Processes

##### Cameroon:

The Cameroon government commissioned a feasibility study by Caisse Francaise de Developpement (now Agence Francaise de Developpement, or AFD). Having considered the recommended approach and made the decision, government mandated Aéroports de Paris (AdP) to create a mixed ownership and management company for the country's airports. In December 1993, Aéroports du Cameroun (ADC) was incorporated as a private limited liability company.

##### South Africa:

Morgan Grenfell advised the South African government on its airports strategy. A competition was held to find a strategic partner. Twenty-nine airport operators expressed interest and a short list of four was chosen for a second (main) round of bidding. The short-listed candidates were Aeroporti di Roma (AdR), BAA, Schiphol Airport, and a consortium between Flughafen Frankfurt and Aéroports de Montréal. AdR was the chosen participant.

##### United Kingdom:

Studies on the feasibility of airport privatization and on the mechanisms for introducing it were followed by public consultation. The issues of economic regulation and sector structure were considered in detail—namely, and most important, whether the three London airports would be privatized separately. The incorporation of the British Airports Authority plc (BAA) as a private limited liability company was accompanied by share placements, involving the public and institutional investors.

*continued*

## **Case Study Focus 2: Reform Processes (continued)**

On ANS, the U.K. government (Department for Transport, or DfT) was advised by Credit Suisse First Boston to implement a public-private partnership (PPP) following its announcement in 1999. The U.K. Transport Bill, which established the PPP, passed through Parliament in 2000, after almost 10 years of public consultation and two years of parliamentary process. The bidding process ran in parallel with the parliamentary process and involved seven interested parties. A 46 percent stake in National Air Traffic Services Holdings Ltd. (NATS) was sold to a consortium of private U.K. airlines (the "Airline Group") and a 5 percent stake was held in trust for employees. The DfT's advisors carried out detailed financial modeling.

### **Greece:**

The decision to develop the new airport that was the subject of PSP was made in 1975. An airport departure tax was collected in a development fund to assist in financing it. An international tender for a strategic partner was launched in 1991. Two candidates were short-listed, and the HOCHTIEF-led consortium provisionally selected in 1993. Following a change in government, agreements were renegotiated and signed in 1995.

### **China:**

Before restructuring, Hongqiao International Airport operated as a commercial state-owned company, with 19 functional departments and 22 business units. A number of structural changes commenced in February 1998, including the following: (1) Shanghai Airport Authority (SAA) was established in February 1998 to satisfy the needs of the operation of "One City, Two Airports"; (2) Shanghai Hongqiao International Airport Co., Ltd., was listed as a joint-stock limited company on the Shanghai Securities Exchange; (3) Shanghai Airport (Group) Co., Ltd., was established in May 1998 as a state-owned organization; and (4) Shanghai Hongqiao International Airport Co., Ltd., was renamed Shanghai International Airport Co., Ltd. (SIA) on June 28, 2000.

### **Thailand:**

The Airports Authority of Thailand was corporatized as AOT plc in 2002 and vested with running the country's five main airports. Another SOE, (New) Bangkok International Airport (NBIA), was established to deliver Suvarnabhumi, Bangkok's new international airport. A consortium of financial companies was sold a 30 percent stake in AOT plc in March 2004. Upon completion of construction of the new airport in 2006, NBIA was taken over by AOT plc. The first step followed five years of advice to the Thai government and the exploration, negotiation, and renegotiation of several complex proposals.

*continued*

## Case Study Focus 2: Reform Processes (continued)

### Lao People's Democratic Republic:

Lao Airport Authority (LAA) was created to own and operate Vientiane Airport. A 49 percent stake was sold to a Japanese consortium. This followed the upgrade of the airport in 1998. Donor funds of approximately US\$15 million were raised by the Asian Development Bank (from sources including the Japanese Overseas Development Assistance Program, Thailand, France, and the Nordic Development Fund) to finance investment in a new passenger terminal and ATC tower, renovation, and extension of the runway to handle wide-body aircraft.

### Australia:

The Department of Finance and Administration was appointed to manage the sale process, with advice from the Department of Transport and Regional Services. Between them, they were responsible for ensuring that the sale outcome was consistent with regulatory, environmental, foreign investment, competition, access, and pricing policies. They were required to ensure demonstration by the lessee of its commitment to the effective development of Sydney Airport, consistent with Australia's international obligations. A three-stage tendering process was initiated to find bidders for a trade sale of the shares in Sydney Airport Corporation Ltd. (SACL) and, consequently, the rights to the lease on Sydney Airport, as well as to test the financial capabilities of the bidders. This included the requirement to submit the following: (1) a 10-year business plan, including a financial model; (2) the proposed management structure; (3) the proposed approach to managing the airport business; (4) proposed business strategies to enhance value; (5) strategy implementation plans; and (6) a finance plan for the acquisition of SACL, including types, terms, and levels of debt, equity, and hybrid financing. Southern Cross Airports Corporation Holdings Ltd. (SCACHL) was, as a result, appointed to purchase the shares of SACL and, consequently, the rights to a 50-year lease on Sydney Airport (with the option to renew for a further 49 years) on June 28, 2002. The purchase price of the lease was monitored throughout the process for the effects of interest rate changes, and the government and SCACHL engaged in detailed negotiations about the allocation of risk. The bidding process was well designed and took account of the impact of bid structures on future tax revenues, the extent of compliance with thin capitalization regulations, the effect on bid prices arising from the risk effects of any proposed amendments to the terms by the bidders, and the effect on bid prices of movements in interest rates during the process.

*continued*



## **Case Study Focus 2: Reform Processes (continued)**

### **New Zealand:**

The relevant section of the government department was converted to a commercial company wholly owned by the government.

### **Argentina:**

Following the announcement of the creation of two concessions to run the country's 58 airports, the government hired consultants to develop a regulatory framework that guaranteed a level playing field and selected investment banks to assist on the financial side. This resulted in the decision to create a single concession to run 32 airports. A competitive bidding process for interested consortia commenced in winter 1997, but no list of bidders, or restrictions on them, were published. An interministry selection and preadjudication commission was formed from the Cabinet Secretariat, the Ministry of Defense, the Ministry of Economy and Public Works and Services, and the Tourism Secretariat.

### **Mexico:**

Competitive bidding processes were initiated for strategic partners to take a 15 percent stake in three majority state-owned companies, each holding concessions to run groups of the country's 34 main airports (Mexico City excluded). This was followed by a flotation on the New York Stock Exchange and the Mexican Bourse.

### **Canada:**

NavCanada was transformed from a government department to an SOE operating on commercial principles (except as regards to finance) in 1994. Its final transformation took place in 1996, when existing employees were transferred to this company, with their terms and conditions of employment protected. The government arranged for the purchase by NavCanada (financed by debt) of the assets and incomplete investment projects from the government. There was no competitive process.

*Source:* Booz Allen Hamilton.

## 6.

# ALTERNATIVE FORMS OF PSP

### **Introduction**

The simple view of PSP focuses on the transfer of ownership of state-owned assets to private interests. It incorporates an assumption that ownership defines control, which depends on management and strategic direction of the operation, as well as on its ownership. A more accurate view of PSP is that it involves the transfer of some control from government to the private sector. The government can transfer this control through the transfer of ownership or the transfer of contractual rights, or a little or a lot of both. It was Kay (1999) who stated that the U.K. government's practice of assuming that a change in ownership alone would deliver the desired result of successful flotations might have been misguided. It can be useful, therefore, for governments to think about the degree of involvement they wish to retain in the broad range of elements of management and strategic direction, not just the rather straightforward issue of ownership. This section addresses the third and fourth items from the high-level checklist for policy makers: types of PSP arrangement and policy sustainability.

PPPs can be used to describe a range of activities on the path to privatization, including commercialization and corporatization of government provision. Reforms in the area of ANS have been focused on such measures. Therefore, governments must consider different models of public ownership, as well as the establishment of nonprofit organizations.

Governments that wish to retain no involvement likely will undertake full privatization, in the form of a public flotation, a private sale, or a management buyout. Long-term leases are a means to achieve temporary full privatizations. Governments that wish to retain some level of involvement

likely will enter into agreements with private sector partners, including strategic partnerships, partial divestiture or public flotation, concessions, and management contracts. Each of these options is explored in this section.

### **A Detailed Spectrum of PSP**

ATI has been described in terms of two sets of responsibilities—the first for the optimal provision of the physical (ATI) structures and the second for the optimal allocation of the organizational responsibilities that complement them. These two sets of responsibilities can be further decomposed.

Optimal provision of the physical structures requires allocation of responsibilities for the following:

1. Asset design and “build”
2. Finance for asset delivery
3. Asset ownership

The following organizational responsibilities complement the assets:

4. Operations and maintenance
5. Revenue collection
6. Management of the organizations vested with items 1–5

As presented in section 5—Objectives of PSP Policies, the motivations for and objectives of introducing PSP in ATI have been dominated by the need to facilitate investment in large-scale rehabilitation and improvement programs for airports (mainly developing countries and several small airports), in capacity expansions (mainly developed countries and large major-city airports), not-so-major new airports (also mainly developed countries) or in ANS. In these cases, the optimal allocation of responsibilities 1 to 3 is vital. The need to improve responsiveness to customers and to get away from public-sector operational restrictions that may impede the ability to operate in a sensible way and to employ skills resourcefully is often perceived as part of the problem. In these respects, the optimal allocation of responsibilities 4 to 6 is vital.

In table 6.1, the horizontal axis labeled “PSP Type” represents the extent of PSP, which increases when a greater portion of responsibilities 1 to 6 are allocated above the line to a single (or multiple) private sector firm(s). The various PSP models are outlined in table 6.1 and are described as follows.

- *Design and Build (D&B)*. Traditionally, infrastructure was financed mainly by taxpayers (through subsidies and other types of financial support), rather than users (through charges). Governments had their own building departments, and construction workers were government employees. Slowly, governments decided to subcontract “build” and, increasingly, design of infrastructure to specialist private firms. Governments and their employees retained all other responsibilities.
- *Design Build Finance (DBF)*. Pressure on government revenues from taxation has required them to borrow for infrastructure investments from quasi-private lending institutions (for example, development banks). Other than the design and build functions, all other responsibilities remained vested with governments.
- *Design Build Finance Maintain (DBFM)*. In this model, responsibility for asset maintenance is subcontracted to specialist private firms, for which they typically receive fixed payments. Performance payments for maintenance may be implemented to provide the incentives to the private firm to keep equipment in operation for rapid maintenance.
- *Design Build Finance Operate Maintain (DBFOM)*. In this model, the role of private firms is further extended to include operation of the infrastructure, typically in the same manner as the maintenance function.

Table 6.1 PSP Type options in ATI

Private sector	Asset revenues	Service payment	Service payment	Performance payment	Performance payment	Performance payment	Risk transfer & profits	Risk transfer & profits
Asset operations and maintenance					Ownership (t) Finance	Ownership (t) Finance	Ownership Finance	Ownership Finance
				Operation	Operation	Operation	Operation	Operation
Asset delivery			Finance	Maintain	Maintain	Maintain	Maintain	Maintain
		Build	Build	Finance	Finance	Finance	Finance	Finance
		Design	Design	Build	Build	Build	Build	Build
PSP type	D&B Design & build	DBF Design build & finance	DBFM Design build, finance & maintain	DBFOM Design build finance operate & maintain	DBOOT Design build own operate & transfer	DBOOT Design build own operate & transfer	DBOO Design build own operate	Privatization
	<b>Extent of risk transfer to private sector</b>							
Public sector	Public funding	Direct budget	Future budget	Future budget	Future budget	Future budget	—	—
	Contingent S.	No	No	Maintenance	O&M	O&M&F	—	—
Role	Ownership operation	Ownership operation	Ownership operation	Ownership operation	Ownership operation	Revert to government	—	—
Revenue	Retain revenues	Retain revenues	Retain revenues	Retain revenues	Retain revenues	Taxes	Taxes	Taxes

Source: Booz Allen Hamilton.

Note: — = not relevant; ATI = air transport infrastructure; D&B = Design and Build; DBF = Design Build Finance; DBFM = Design Build Finance Maintain; DBFOM = Design Build Finance Operate Maintain; DBOOT = Design Build Own Operate Transfer; DBOO = Design Build Own Operate; O&M = operation and maintenance; O&M&F = Operate & Maintain & Finance; PPP = public-private partnerships; PSP = private sector participation.

The DBFM and DBFOM options usually involve contracting out, incorporating the provision of specific operational and maintenance functions by the private sector in return for a fixed (or pro rata) fee(s). The provider of these functions is not required to invest and no returns from the infrastructure accrue to the provider. The contract, however, could be performance based, in which case the provider might depend on the revenues and profitability of the airport (or of the activities for which the contracted party is responsible if they can be isolated). Contracts are often structured such that the contracted party receives a share of airport revenues, while paying a lease or rental charge to the airport owners, in which case they bear some of the revenue risk. Maintenance and cleaning functions usually involve short-term contracts (one year or less) that may or may not be performance based.

Operations management contracts generally assume longer terms. Examples include the six-year management contract from the Cuban Government to Aeropuertos Españoles y Navegación Aéreas (AENA) to run the new airport at Cayo Coco and the 15-year management contract to operate facilities at Guangzhou Baiyun airport granted to Guangzhou Baiyun Airport Facilities Management and Operation Company. Management contracts allow the private sector contractor to transfer best practice across a range of airport activities, which might include elements of investment, thereby reducing costs and enhancing revenues and improving standards of services. These contracts have been applied almost exclusively by public airport authorities in member countries of the Organisation for Economic Co-operation and Development (OECD) to improve service quality and the financial performance of the airport. In developing countries, the stimulus to engage the private sector is more frequently related to securing additional funding for investment projects and for gaining the benefit of private sector skills in project management.

- *Design Build Own Operate Transfer (DBOOT)*. In this model, private contractors are hired to design and construct the project, obtain finance, and operate and maintain the facilities. Ownership of the facilities is later transferred to government. The recently operational greenfield concession at Hyderabad, India, is an example of this type of contract (currently, transfer is set for after 30 years of operation, although the option exists for a further 30 years).
- *Design Build Own Operate (DBOO)*. This contract is the same as DBOOT, but without transfer to the government.

The DBOOT and DBOO models are common concession formats. Under these contracts, the contractor controls project design, construction, operation, and maintenance of facilities. They usually involve a combination of

equity investment and debt finance. The extent and scope of the private sector operator's responsibilities can vary. For example, they may cover financing and operation of all airport assets, or they may only cover a particular facility, such as a terminal. They can include commitments to investment programs aimed at expanding capacity and can involve different levels of revenue risk-sharing through, for example, different concession fee structures. Examples of relatively long-term contracts for managing and operating facilities include Argentinean airports, Mexican airports, Tirana Mother Teresa Airport, and Athens International Airport. Concessions for terminal management and operations exist at Budapest Ferihegy Airport and Terminal 3 at Toronto Airport, while El Dorado Airport in Bogota operates a unique concession for runway management and operations.

Concessions often are awarded to a consortium of companies. Their makeup might depend on such factors as the nature of the project and the extent of any constraints imposed by the government. For example, many governments require a significant or majority stakeholding by indigenous business. Projects involving construction and operation of passenger terminals usually involve an airport operator such as BAA alongside local construction companies and investment banks. Shareholders take limited equity stakes (perhaps 5 to 10 percent of funding) in a vehicle for the consortium (typically a firm with a new name), with the bulk of finance coming from debt or development bank funding. According to the concession agreement between the Airports Authority of India and the joint-venture company (JVC) known as Delhi International Airport Private Limited dated April 4, 2006, the ownership structure for the JVC includes a 26 percent stake for the government (Airports Authority of India). Airport operators Fraport AG Frankfurt Airport Services Worldwide and Malaysia Airports (Mauritius) Private Limited each own 10 percent. Two infrastructure developers—GMR Infrastructure Limited and GMR Energy—own 31.1 percent and 10 percent, respectively. GVL Investments Private Limited has a 9 percent stake and India Development Fund has a 3.9 percent stake.

Other forms of PPP include the joint venture–strategic partnership model. These PPPs usually involve a private sector firm acquiring a stake (often a minority shareholding) in an SOE, which, in turn, provides a vehicle for private sector finance and operational expertise to directly relieve public financing constraints and to improve operational and financial performance. For example, two-thirds of Osaka Kansai Airport, constructed by Kansai International Airport Company, is owned by central government. Partial divestiture models expose the business to at least some external capital market discipline. Examples include Fraport in Frankfurt, Flughafen Wien in Austria, Zurich Airport, and the international airports in Thailand.

Following are various further models for PSP:

*Privatization.* Full privatization transfers the ownership of assets and control of the business from a public corporation to private investors through a flotation or a trade sale. The privatized entity becomes responsible for operating the facilities and financing investments, either internally through retained earnings or externally through the issue of new equity or debt. Public flotations involve the sale of equity to institutions and the public (generally through initial public offerings, or IPOs). Divestiture to the private sector may be complete or incomplete and may take place in more than one stage. Public flotations reach the widest possible range of private investors and institutions. Privatization is the most costly, however, in terms of marketing and preparation. A feature of U.K. privatizations is the government's retention of the so-called golden share, enabling it to intervene on decisions with long-term strategic importance or issues affecting the public interest.<sup>41</sup> This feature requires that certain provisions of the privatized company's Articles of Association (dealing with the relationships between shareholders) cannot be changed without the specific consent of the golden shareholder. These provisions typically involve measures to prevent concentrated shareholdings.

*Private sales.* Private sales generally take two forms: private placements and trade sales. Private placements usually involve a sale to a consortium of commercial companies, one of which manages the enterprise. A trade sale usually involves a competitive tendering process. Selection criteria usually focus on the price that the tenderer is willing to pay and assurances on meeting public service obligations. Trade sales, however, may entail a negotiated sale with a single potential buyer.

*Management buyouts.* Management buyouts involve the managers acquiring ownership and control of the assets of the business. Such privatizations invariably lead to highly leveraged companies, with the assets acquired used as security to borrow a large part of the purchase price. They tend not to remain leveraged for long. Managers become either very rich or bankrupt. If the buyout poses high risk, it may be wise for governments to investigate prepared backup options to pick up the pieces.

*Long-term leases.* Long-term leases involve payment of a periodic fee for rights to control, manage, and operate the infrastructure. In some cases, ownership of the infrastructure is transferred in the future to the lessee for a nominal charge. The lease may be tradable and the lessee retains rights to all revenues earned. Examples include the Canadian and Australian airports.

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41. The retention by the U.K. government of a golden share in the BAA was subsequently ruled in contravention of European Union law by the European Court of Justice.



The Australian model has been interpreted as the transfer of management control from the government to the private sector. The Australian federal government has entered into long-term 50-year leases with consortia of private businesses. The government cedes control over day-to-day and year-to-year operations, while maintaining discretion over what kinds of long-term facilities and changes to the airports can be made.

### **Relative Merits of Different Levels of PSP**

Evidence suggests relatively few instances of full privatization. This can be attributed largely to governments' reluctance to cede control over what, at least in the case of major capital city airports, is widely regarded as a national asset. This lack of full privatization also has been attributed to the failure to balance the interests of consumers and investors (short and long term), given the highly immobile and long-lived character of ATI assets. Kay (1999) forwarded the view that the terms of U.K. (full) privatizations were too favorable to firms and shareholders and that insufficient attention was paid to the interests of consumers. The lack of adequate explicit mechanisms meant that customers had no chance of securing a fair share of the expected efficiency gains from privatizing. The design of contracts under which private sector participants operate is vital to achieving this balance. Also vital is the framework for economic regulation and regulatory governance, and the strength of the institutions vested with contract and regulatory enforcement.

Partial privatizations have been associated with four main weaknesses. First, the time-limited nature of concessions or leases may restrict the scope for benefit capture and may weaken incentives to invest and innovate, particularly toward the end of the period. Second, the rigidity of formal contractual mechanisms may restrict the scope for flexibility to respond to unexpected market developments. Third, the private participant's costs and prices may be inflated for one or both of the following reasons: (1) the amount of asset depreciation to be included in prices may be higher if explicit provisions are not included for compensating the private participant for the residual value of assets acquired during the PSP period, if the life of those assets extends beyond that period; and (2) the cost of capital used to calculate prices that provide a reasonable return on capital employed may be higher if there is uncertainty about how such technical arrangements (if they exist) are to be applied in practice. Fourth, uncertainty could result in poor incentives to invest, conservative estimates of cash flows, and less favorable financial bids.

Time-limited PSP, however, may have advantages over full privatization by imposing some competitive discipline on the incumbent through periodic competition for the market.

## Contemporary Models of Public Provision

Despite widespread concern about the difficulties of financing investment to upgrade en route ATC, because of constraints on public expenditure and the perceived inefficiency of many state-owned ANSPs, there are few signs of the introduction of PSP in ATC. Apart from partial privatization of NATS and the nonprofit model in Canada, ANS reforms generally have not extended beyond corporatization or commercialization of state authorities. The latter might be considered a step further through incorporation as SOEs governed by general company law, operating under normal commercial principles, and (sometimes) paying dividends to the government as a shareholder. Examples include the Dublin Airport Authority (for the case of airports) and the Irish Aviation Authority (for the case of ANS). Corporatization or commercialization can introduce desirable degrees of management and financial autonomy. Corporatized entities, however, may be restricted from accessing debt in the capital markets or from operating in a purely commercial manner. Examples include Polskie Porty Lotnicze, which owns Warsaw Airport, and the Czech Airport Authority.

Regional and local government ownership and provision of airports is common, facilitating the development of airports in line with regional development plans. As with central government ownership models above, local government models include (1) direct provision—for example, the three airports in Chicago are owned and operated by the City of Chicago (although Midway Airport has an application with the Federal Aviation Administration's Pilot Privatization Program involving five U.S. airports), and Basel-Mulhouse-Freiburg airports are jointly owned and operated by regional governments in France and Switzerland; (2) provision by a specialist agency—for example, Aéroports de Paris, the Port Authority of New York and New Jersey, the Metropolitan Washington Airports Authority, and Los Angeles World Airports; and (3) provision by a local government-owned corporate company—for example, Manchester Airport Group plc, whose shareholders are Manchester City Council and the councils of nine neighboring communities. Models that combine central and local government ownership and provision also exist. For example, ownership and provision of regional airports in Poland are shared between an SOE and local government.

The choice between an SOE with commercial objectives (in which case government retains ownership of the assets) and private profit-maximizing firms for ATI provision likely depends on culture, on the accepted framework for doing things within the country, and on the availability of private and public sector financing and funding. For example, in the United States, the availability of municipal bond financing at tax-advantageous rates of interest, combined with the availability of federally administered funding from the Airports and Airways Trust Fund, puts almost irresistible pressure on airports

to remain in the public sector. In economic terms, private owners have strong incentives to attain cost reductions, and the choice to remain in the public sector is likely to depend on the extent to which these owners perceive that these reductions would have deleterious effects. Private sector provision puts the onus on effective quality regulation, and the lack of sufficient regulation is probably the most logical explanation for the more limited shift toward the introduction of PSP in air navigation and communications. Governments that have available resources and that see ATI as worth spending money on (either for reasons of national image, or because it is key infrastructure) may be concerned that a private sector owner would not invest. Likewise, regional airports often are owned and funded by regional government because they would not be commercially attractive to private sector participants, but are seen as essential to the local economy. The best examples of public ownership and funding include countries (apart from France and the Netherlands) that have transitioned from developing status some time ago, such as Singapore.

Good governance in the public sector is key to retaining government ownership. Governments that retain ownership should seek an appropriate balance between incentives for managers to pursue the objectives of profit and efficiency maximization, within the limits of the constraints imposed by safety and investment requirements. See section 8—Institutional and Regulatory Reform for a deeper exploration of these issues in the context of a private sector owner. Governments as the shareholders of SOEs, however, often have seen their influence in the limited companies that manage and operate airport and air navigation and communication assets disappear. Examples include Schiphol Airport in the Netherlands and Aer Rianta in Ireland. Note also that SOEs usually have a lower cost of capital because of the ability of government to guarantee its debt. Risk, however, remains with the state, creating contingent liabilities that have to be managed, and the situation could encourage overinvestment.

An alternative private solution can engender a commercial approach while retaining relatively “soft” incentives for those cost-reducing efforts that can have deleterious effects on the quality of basic provision: the non-profit model. Nonprofit entrepreneurial firms are thought to use surpluses to consume perquisites, to enhance the lives of employees, or even to improve quality or safety when social goals are involved (Weisbrod 1988). Moreover, they are likely to value perquisites less than the profit-maximizing entrepreneur values profits and also may care about safety or quality for its own sake, thereby dampening any incentives to engage in noncontractible safety- or quality-reducing cost cuts. The nonprofit model adopted in Canada for

ANS provision provides an example.<sup>42</sup> NavCanada was constituted as a nonprofit corporation with a board including representatives of airlines, government, and the ATCO union. The nonprofit sets user charges to cover costs, with any surpluses being used to retire debt or improve services.

### **Expected Gains from Ownership By Private Firms**

Returning to table 6.1, the rights to revenues are defined in the bottom and top lines. In all but the last two PSP types (DBOO and privatization), the government retains the rights to the revenues from ATI. The private firm, which has been vested with all responsibilities 1 to 6, receives the rights to revenue. In all but the first two PSP types, the contracts that define the arrangement may or may not involve performance payments. Only in the DBOOT model are the rights to revenue shared by the government and private firms. In economic terms, the allocation of rights to income streams usually corresponds with a combination of the degree of asset ownership and the degree of responsibility for finance and investment. These residual income rights include the rights to the economic profits arising from existing assets (in the case of ownership) and arising from new assets (in the case of finance and investment). Performance-payment systems involve the distribution of a perhaps greater proportion of residual income rights to the assets' operators, maintainers, financiers and investors, and owners. If a PSP arrangement involves investment by private firms with eventual transfer to the government, the government retains the assets' long-term residual income rights, while the private firm retains the short- to medium-term rights.

Section 4 discussed that the willingness of governments to introduce PSP has its origins in the constraints and failings of government provision. A renewed appreciation for the innovative potential of private firms, however, is another driving force for governments. A firm is a transformation unit concerned only, unless otherwise directed, with converting factor inputs into higher-valued intermediate and final goods and services. In traditional theories of the firm, all firms are assumed to be seeking economic profit maximization. Economic profit is the difference between a firm's total revenue and total costs. Accounting profit only takes account of explicit costs, whereas economic profit includes a residual return to the owner(s) of a firm—that is, an individual entrepreneur or a group of shareholders—for providing capital (upfront money) and for bearing risk. Economic profit is the amount that accrues to the owners (and investors and financiers) after the payment of all explicit costs (payments to outside factor-input suppliers, such as wages, the price of materials, and interest on bank loans) and

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42. This is analogous to the Company Limited by Guarantee model that has been adopted in U.K. rail (Network Rail) and water (Glas Cymru, Wales).

implicit costs (payments for the use of factor inputs supplied by the owners themselves, including returns on equity).

Although a private provider cannot be directed in the same way as a public provider and although its profit incentive can cause it to take actions that are not in the public interest, its independence and single-minded profit motive can help governments achieve certain objectives.<sup>43</sup> It follows that the greater the degree of residual income rights allocated to a private firm, the greater its incentive to invest, maintain, and operate efficiently. Likewise, private firms can inject a management team and management systems that have proven success in commercial environments. Engaging a private firm can create a focus on service and commercial performance by holding the firm accountable for its contribution to service improvements, rewarding it for controlling costs (by providing services with fewer staff, for example), and introducing a businesslike approach to billing and collection. The private firm will expect the government to reward its expertise and professionalism by allowing it to retain as profits at least some of the benefits of this improved operating performance. These improvements, however, can allow for lower fees and charges, reduced subsidies from taxpayers, and higher-quality services for the same levels of fees and subsidies.

Engaging a private firm can make it easier to access financing because banks and bond markets are more willing to put their money into a provider that has a credible, commercial management approach. This means that financing will be provided only when operating cash flows are expected to provide a return on investment. The profit motive may lead the private firm to make better investment decisions, such as investing in quality to reduce future maintenance expenditures. The firm may miss fewer profitable opportunities to expand the business and may build fewer projects with more costs than benefits.

Arrangements with private firms make it more difficult to avoid such issues as setting tariffs or achieving cost savings. Private firms that finance investment care deeply about the rules for setting prices and subsidies because those rules determine whether the firm gets its money back. The private firm will insist on clear and prospectively stable rules for setting prices and subsidies, which, in turn, encourages further investment and helps the government achieve its objectives. Binding legal agreements between governments and private firms can help governments commit not to reverse reforms under subsequent political pressure. Moreover, cost-based user fees are easier to justify politically

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43. This, in turn, depends on the arrangements governing that participation be well defined, which is facilitated by enhancements in the quality and understanding of contracting and regulation since the time when government provision was thought to be the optimal solution (see section 8).

when infrastructure providers are private. PSP offers the prospect of improving policy and its enforcement because governments can enforce compliance more rigorously with private firms than with public agencies.

### Box 6.1

#### Case Study Focus 3: Type of PPP Structure

##### Cameroon:

A 15-year concession to operate, maintain, and develop seven of the country's airports was awarded to Aéroports de Cameroun (ADC). Ownership of ADC was divided among AdP (34 percent); government (29 percent); the Agency for the Safety of Aerial Navigation in Africa (ASECNA) (20 percent); Cameroon Airlines CAMAIR (8 percent); and Banque Internationale du Cameroun (BICIC), UNITAIR, and Air Afrique (3 percent each). Individual representatives of various government departments retained single-share ownership. ADC was allocated responsibility for investment, debt (from Agence Francaise de Developpement) was to be serviced by ADC, and residual income rights were allocated to ADC for the term of the concession.

##### South Africa:

The government sold a 20 percent stake in the Airports Company of South Africa (ACSA) to a strategic partner, Aeroporti di Roma (AdR). A total of 5 percent of shares were allocated to "empowerment investors" (representatives of the historically disadvantaged community). ACSA was allocated responsibility for investment and finance, and AdR received payments for consultancy services. Seven years later, AdR's stake was sold to SA Public Investment Corporation, effectively renationalizing the company. The South African government has not given a reason for ending the PSP. However, while AdR appears to have retrieved its investment, it was much distracted by its internal affairs. By comparison with the rest of Europe, Italy has an under developed air transport sector, and AdR was probably not in the best position to support ACSA.

Air Traffic Navigation Services, South Africa, remains 100 percent government owned. This is a straightforward corporatization.

##### United Kingdom:

The government sold 100 percent of the share capital of British Airports Authority plc (BAA), which owns seven airports, in a public offering. Managers, employees, and pensioners were allowed to purchase a total of 5 percent. BAA plc is responsible for investment and finance and holds all

*continued*

### **Case Study Focus 3: Type of PPP Structure (continued)**

residual income rights. BAA has recently been taken over by Ferrovial of Spain (the latter purchasing the entire share capital of BAA plc), a diversified engineering conglomerate with interests in utilities. Ferrovial is not a substantial airport operator, and some believe that the main reason for the takeover is to take advantage of Spanish corporate taxation arrangements. BAA has become an internationally regarded airport company, both for its operational ability in a highly constrained and complicated site and its skill in contracting its retailers to maximize the retail value of the airport.

The government sold a 46 percent share of National Air Traffic Services Holdings Ltd. (NATS) to the Airline Group, a consortium of British airlines, including British Airways, Britannia, bmi, easyJet, Monarch, My Travel, and Virgin Atlantic. A total of 5 percent was placed in trust for employees and 49 percent was retained by the government. NATS Holdings Ltd. and its operating subsidiaries were allocated responsibility for investment and the servicing of debt. The deal required assurances by the Airline Group that it was not investing to make a profit. What was called the Composite Solution involved the acquisition of a 4.2 percent stake by BAA plc through an equity injection and proportionate reductions in the shares held by the Airline Group and the government. Under the Composite Solution, the PPP appears to be performing well. Time will tell whether it is, in fact, preferable to the nonprofit model or the Company Limited by Guarantee model (Network Rail and Glas Cymru), noting that both have access to debt at effectively sovereign rates.

#### **Greece:**

A 30-year concession for the new Athens airport on a build-own-operate-transfer (BOOT) basis was awarded to a joint venture (Athens International Airport, AIA) between government (55 percent) and a consortium led by HOCHTIEF AirPort (45 percent). Responsibility for finance was shared, while responsibility for investment was vested with AIA. AIA holds residual income rights for the term of the concession, but it is not clear whether it is required to pay the government dividends.

#### **China:**

Using the stock abbreviations, Shanghai International Airport Co., Ltd. (SIA) was vested with all the assets and liabilities of 7 of the original 22 business units of the state-owned company, which incorporated ground handling, leasing space and offices inside the airports to aviation and commercial

*continued*

### **Case Study Focus 3: Type of PPP Structure (continued)**

businesses, advertising, providing services to airfreight, and managing and delivering development and investment projects that were allowed by the government. The company assumed the same responsibilities for Pudong Airport when it was completed. The company keeps separate accounts, is required to acquire finance, invest, and operate separately, and is responsible for its own profits and losses. It is 60.72 percent owned by Shanghai Airport Authority, while nine investment companies in a consortium hold 1 percent each. The company has a purchasing agreement with Hongqiao International Airport for power, water, gas, equipment maintenance, sewerage, security, and fire prevention. Its revenue entitlement includes 25 percent of aircraft landing and takeoff fees and 100 percent of passenger service fees. Shanghai Airport Authority retained the remainder of the functional departments and business units, including airfield, aviation support area, cargo storage, and relevant assets, as well as any subsidiaries, joint ventures, or business units not vested with Shanghai Airport. It is entitled to 75 percent of aircraft landing and takeoff fees. Shanghai Airport (Group) Co., Ltd., administers both Shanghai airports and is responsible for the development of airport investment plans, construction, and reconstruction, with the objective to build Shanghai airports into an Asia-Pacific hub.

#### **Thailand:**

Airports of Thailand (AOT) owns five airports and is 30 percent owned by financial companies. The government (finance minister) retained 70 percent. Responsibilities for finance and investment of the new Bangkok airport were retained by the government in the form of a separate SOE, but debts have been serviced by AOT since it was subsumed following completion of the airport. AOT owns the assets and holds all residual income rights. The government is likely to use its majority control to ensure that AOT reinvests profits rather than delivers returns to minority shareholders. This amounts to poor incentives for the minority private owners.

#### **Lao People's Democratic Republic:**

A private sector consortium, consisting of an airport/ANS subsidiary of the Japanese flag carrier (JAL Trading) and a textiles, food, energy, and machinery company (Tomen Corporation), owns 49 percent of Lao Airport Authority, which owns Vientiane Airport. Recent expansion was financed through donor funds and managed by the government. The allocation of residual income rights is unclear. However, it is more likely that the arrangement involves government subsidies.

*continued*



### **Case Study Focus 3: Type of PPP Structure (continued)**

#### **Australia:**

Southern Cross Airports Corporation Holding Ltd. (SCACHL) was sold 100 percent of the shares in Sydney Airport Corporation Ltd. (SACL), thereby vesting a 50-year lease for Sydney Airport, with the option to extend for a further 49 years. Ownership of SCACHL is divided among Macquarie Managed Funds (59.5 percent), Ferrovial Aeropuertos Australia Management Ltd. (20.9 percent), HOCHTIEF AirPort GmbH (10.5 percent), Ontario Teachers' Pension Plan Australia Trust (5 percent), and the Motor Trades Association of Australia Superannuation Fund (4.1 percent). SCACHL is responsible for finance and investment and holds all residual income rights for the term of the lease. "Step-in" rights were retained by the government in the event of lessee insolvency. Before the sale, SACL was an equity asset on the commonwealth's balance sheet. The sale reduced the commonwealth's equity investments by Australian dollars (\$A) 794 million and reduced net debt by \$A 4.233 billion. The lease was awarded to the highest bidder, subject to satisfaction of the following requirements: that the sole purpose of the lessee's business would be to run Sydney Airport, any airline ownership would be restricted to less than 5 percent, foreign ownership would be restricted to less than 49 percent, cross-ownership of Australian airports would not exceed 15 percent, it would submit a master plan for the development and environmental management of Sydney Airport, and it would comply with the Australian Competition and Consumer Commission.

#### **New Zealand:**

Airways Corporation of New Zealand is 100 percent government owned. The government has refrained from raiding the company's profits and from bowing to pressure to keep charges below cost-recovery levels. The good behavior of the government as shareholder has meant that earnings have been retained for reinvestment.

#### **Argentina:**

A 30-year concession for 32 airports (with the option to extend for 10 years) was awarded to a private consortium (Aeropuertos Argentina 2000 [AA 2000]), which is owned by Corporacion America Sudamerica (35 percent), Ogden Airport Investment Company (28 percent), SEA Aeroporti

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### **Case Study Focus 3: Type of PPP Structure (continued)**

di Milano (28 percent), Simest SPA (8 percent), and Amadeo Riva Construcciones (1 percent). AA 2000 is responsible for finance and investment and retains all residual income rights for the term of the concession. Members of the consortium, however, had commercial interests in airlines and the tourism sector, which, combined with evidence of the refusals by Aerolíneas Argentina to pay outstanding airport charges, suggests a lack of consideration of appropriate incentives.

#### **Mexico:**

A 50-year concession for the Grupo Sureste airports was awarded to Aeropuertos del Sureste de Mexico (ASUR), a company created for that purpose following the restructuring of the state airport operator, ASA. A total of 15 percent of ASUR is owned by a mixed consortium (ITA) consisting of Copenhagen Airport, Ferrovial, Vinci, and Nacional Financiera (the Mexican government development bank). ITA was given the option to increase its share of ASUR by 5 percent subject to the satisfaction of certain performance standards, and the remaining 85 percent of shares were placed on the New York Stock Exchange, although some trading also takes place on the Mexico Bourse. In 2005, various transactions resulted in 51 percent of ATI's 15 percent stake in ASUR being acquired by a Mexican executive and 49 percent by Copenhagen Airport. In effect, commercial interests appear to have replaced the construction and government interests in the consortium following completion of the initial investment program. ASUR is responsible for finance and investment, and its private owners hold all residual income rights for the term of the concession. We presume dividends are paid to them according to their respective shares.

#### **Canada:**

NavCanada was transformed from an SOE into an independent nonprofit company, without share capital or dividends. It is responsible for finance and investment and uses residual income to retire debt or improve services. The government sold existing assets to NavCanada. The company raises finance by issuing securities and has a borrowing limit set by the government.

*Source:* Booz Allen Hamilton.

## Political Economy and the Assessment of Policy Sustainability

The policy of vesting responsibility for the provision, management, and operation of ATI with private firms requires measures to ensure the sustainability of that policy. A vital role for the reform leader that is charged with championing the policy of introducing PSP is instilling a notion of “legitimacy,” which, as described by Kay (1999), is a popularly acceptable basis for the power that the private sector participant exercises. Although the regulatory structures that are designed to control this power are vital, they tend to be less well known and understood than the simple fact that services are now being provided by a private enterprise, rather than government. Consequently, a perception that the private sector participant is accountable to “the man on the street” is important in ensuring policy sustainability. Kay (1999) noted that U.K. privatizations were still unpopular despite substantial price reductions. The rest of this section deals with important steps to ensure the sustainability of a policy of introducing PSP in ATI.

Spiller’s (1995) comparative analysis of privatization programs in developed and developing countries in the 1980s concluded that the most important condition for success is a government commitment to refrain from discretionary, *ex post* expropriation of industry returns.<sup>44</sup> Without that commitment, private companies will not engage in long-term investments and efficiency-enhancing restructurings.<sup>45</sup> Unplanned expropriation by the government demonstrates disrespect for the *ex post* allocation of residual income rights (see Hart 1995).<sup>46</sup> The incentives for greater efficiency, quality, capacity, and innovation are lost.

According to Schmidt (2000), in countries with infant institutional frameworks,<sup>47</sup> the risk of *ad hoc ex post* expropriation is a genuine threat to success because a government may come into power that does not respect the rights granted by its predecessor. Political advisers have argued that a potential safeguard against future policy reversals is for governments to give away

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44. To cross-subsidize other poorly performing firms in the same or other markets, or to fund some other form of government expenditure.

45. Spiller (1995) notes that indicators of this occurrence might include flows of restructuring and foreign direct investments into the country and stock market valuation. In other words, the former is an indicator of the willingness to invest relative to the country’s needs, while the latter is driven by the rational expectations of the market that these companies’ returns will be captured by insiders or government.

46. Under Hart, Shleifer, and Vishny’s (1997) framework, it shows disregard for investment in the noncontactable “quality.” (See section 7—Management Incentives and note 57.)

47. Those designed to protect democratic institutions and constitutional safeguards.

large fractions of the shares of former SOEs to the general population.<sup>48</sup> In particular, Schmidt's findings included evidence of (1) more expropriation the poorer the country, the more skewed its income distribution, the more risk averse its population, and the more rigid its labor market; (2) less expropriation when more shares were distributed to the general population; and (3) less expropriation by distributing shares to the general population than insider privatizations. Additionally, Schmidt found that (4) to lessen ex post expropriation, governments should discourage people from selling their shares for cash; and (5) despite the fact that giving more shares to the general population can reduce the profits going to core investors (thereby adversely affecting their incentives to invest) and government proceeds from privatization, such a policy can induce more investment, higher expected profits, and higher proceeds than a policy that relies exclusively on selling shares to the highest bidder.<sup>49</sup> Although Schmidt focused on Eastern Europe, his theoretical findings can be extended to most developing economies where the long-term sustainability of a policy of privatization is under threat from political instability. Schmidt's focus is on the role of the electorate, but he also notes the role of lobbies and interest groups in the formulation of policy.

Schmidt's work is complemented by Boycko, Shleifer, and Vishny (1994b), who argued that giving away large fractions of shares to insiders (workers, managers, and local governments) as well as to the public is important to glean the necessary political support for privatization. Boycko, Shleifer, and Vishny (1994a) argue that, if nationalized industries are inefficient because they address the objectives of politicians at the expense of efficiency, then privatization should be designed to drive a wedge between politicians and managers, thereby restricting political discretion.<sup>50</sup>

Other important insights are provided by Roland and Verdier (1994) and Laban and Wolf (1993). They note that the probability of a policy reversal will depend on the success of the privatization policy, which in turn depends on the levels of investment and restructuring efforts by private investors. If private investors expect a policy reversal, they will not invest, the policy will fail, and a policy reversal indeed will result. On the other hand, if they can expect to enjoy the returns on their investment, they will invest and the policy will succeed without reversal.

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48. Apparently, this argument extends as far back as the French Revolution in 1789, when it was argued that the real estate that had been expropriated from the Catholic Church should be divided into small portions and distributed as evenly as possible to the general population. This was argued, not on the basis of equity considerations, but on the basis of the long-term strategy of safeguarding against future policy reversals.

49. Vickers (1993) shows that it is theoretically possible that some share giveaways to the general population can, if they reduce the risk of expropriation, maximize sales proceeds.

50. This is also an argument for independent regulation (see section 8—Institutional and Regulatory Reform).

## Box 6.2

### Case Study Focus 4: Policy Sustainability

#### South Africa:

The allocation of 5 percent of shares to “empowerment investors” (representatives of the historically disadvantaged community) may have been designed to add legitimacy to the policy and to achieve greater political support and policy sustainability.

#### United Kingdom:

The periodic reviews of pricing that the Civil Aviation Authority (CAA) and Competition Commission must apply could, in principle, amount to expropriation. U.K. law does set out a legal framework for these reviews, but they vary across sectors, which could affect the degree of protection afforded. Some U.K. privatized companies with a similar situation have experienced such harsh price reviews that they have sought to exit the market, for example, by selling out the right to operate a nonprofit organization. In the case of the British Airports Authority plc (BAA), the wording of the protection is more robust, and this has served to limit the political risk on BAA through four pricing reviews. A windfall tax in lieu of high profitability in the early period after privatization did amount to an ex post expropriation. Fortunately, it was done in a way that suggested it was a one-off event compensating for the favorable financial terms at the time of privatization, and therefore would not be repeated.

The Thatcher privatizations accustomed many U.K. individuals to owning shares, but in practice, most privatization stocks have not ended up held by individual investors. Many private investors made sales to take an immediate profit rather than holding for the long-term. Many companies sold under initial public offering with a golden share eventually were taken over, although in BAA's case this did not happen for about 20 years.

#### Mexico:

The approach of the government to retain significant influence over the company may be motivated by a desire to detract from the acquisition of a majority shareholding or a takeover, thereby maintaining wide share ownership to further the objective of broader political support for the policy of PSP. Excessive government control, however, might be interpreted by private sector participants as a form of expropriation, particularly if it prevents the company from reorganizing to improve efficiency, which may work against policy sustainability.

*Source:* Booz Allen Hamilton.

7.

## ECONOMIC ANALYSIS OF PSP POLICIES

### **Introduction**

This section addresses the issues of project finance, the allocation of responsibilities and risks, and management incentives.

### **Project Finance**

#### *PSP and Subsidies*

Section 3—Recovering Costs of Supply—introduced the fact that some nations support ATI through subsidies. Actual and estimated costs inform governments about the financial commitment (both operating and capital investment costs) required to deliver capacity at the required level of service. The question is whether this amount can be recovered from passengers, airlines, freight operators, and nonaviation commercial activities. If not, governments face a choice between providing subsidies or tolerating reduced capacity or service quality. Tariffs might be considered too high for a number of reasons, including (1) a lack of willingness to pay the full price of service provision, (2) a perception that it would be unjust to be expected to pay the full price, or (3) external and social benefits associated with the infrastructure which don't accrue directly to those paying the tariffs. Many governments in developing countries are particularly unwilling to levy cost-recovering charges on domestic passengers. This can be extremely damaging to the success of a PSP scheme.

With reference to the first tariff consideration, governments might benefit from preparatory work such as willingness-to-pay surveys, which could

reveal a higher willingness to pay than expected. In addition, phasing in higher prices over time, or labeling the new charge as an infrastructure development charge, can gain user acceptance. The perception that prices are too high might be resolved by phasing in price increases or linking them to the successful delivery of capacity or to clear improvements in the level and quality of service. The external and social benefits might be considered reasonable if below-cost airports encourage air transport and its associated benefits.

In many cases, ATI charges were set when the most recent major capital program was implemented, which may have been many years earlier. Particularly in a government finance environment that conducts bookkeeping on a cash basis, it is difficult to justify levying charges for aged capital infrastructure. Working with governments and regulators to identify the actual value of the existing infrastructure and the level of charges required to fully compensate for the capital value can provide a helpful comparison when calculating the charges required to fund new infrastructure.

If subsidies are required, governments need to find a source that provides enough funds to cover the difference between prices and costs. Before deciding on whether to provide subsidies, however, governments should recognize the trade-off between other potential uses for the funds and the value of some or all customers receiving below-cost prices.

Sources of money for subsidies might include cross-subsidies (certain classes of customers subsidize other users), tax revenues, or development agency grants (or loans, typically granted on favorable terms). Subsidies might be output or input based. The latter are paid regardless of output or performance to help the operator meet its costs. They are often ad hoc and implicit, taking the form of debt guarantees, cheap government debt, or the government bearing a disproportionate amount of the business risks. Subsidies should be made contingent, as much as possible, on output delivery and should be set in advance to ensure incentives for enhanced efficiency. Implicit subsidies should be turned into explicit subsidies that target specific goals.

In the presence of subsidies, PSP is still possible and quite normal in the airport sector. For example, remuneration for management contracts might be relatively small compared with the total tariff or with the total airport (company) remuneration, with fees designed such that they are not affected by the financial health of the airport (company) as a whole. If management contracts include a performance element, however, such as involving a degree of profit sharing, the operator is given incentives to improve the financial health of the ATI provider.

If the government wishes to transfer the majority of responsibilities to the private sector participant, but total investment requirements are too large, a certain amount of investment obligations might be allocated to the

private operator, with the rest coming through public finance. A common arrangement, for example, is for the government to cover the capital cost of the airfield infrastructure at an airport, while the terminal-infrastructure capital investment is paid for by the private sector partner, which also takes over the operating cost responsibility for the airfield.

### *Structuring Finance*

Concessions, long-term leases, and divestitures are the PSP schemes normally associated with the mobilization of significant private finance, and the way finance is provided can be complicated. In these circumstances, operators generally are special-purpose-vehicle project companies, specifically created for the arrangement. The project company's special-purpose owner could be a larger airport company (such as BAA), or more commonly, an airport company combined with companies from other parts of the aviation sector or from other sectors, such as the construction or utility sectors.

These owners usually will not provide the majority of finance required. Instead, they might put forward 10 to 30 percent and source remaining requirements from debt or equity flotations. They will seek guarantees against certain risks, especially political risk, including, for example, insurance against the government or regulator not doing what was promised in a contract. The most common sources of finance include equity from project promoters (such as BAA or Macquarie), equity from other investors (such as pension funds, insurers, or private investors), loans from local or foreign banks, bonds, export credit guarantee finance, or loans and grants from development agencies.

Governments can improve the chances of attracting finance if they (1) investigate and design schemes that accommodate the financial structures that different firms or different kinds of firms are used to dealing with; (2) accommodate providers of capital as much as possible—for example, lenders may want provisions that grant them possession of assets or cash flows in the event of default on debt repayments or “step-in” rights to take over ownership of the operating company; (3) recognize the trade-off between the potential loss of control from granting these rights and providing security to financiers, thus making finance easier to attract; (4) provide security through appropriate risk analysis and allocation—for example, lenders may want a low probability of default, which requires a low debt-equity ratio or low exposure to project risks (such as demand or exchange rate risk; and (5) make a political commitment to the arrangement.

The main equity investor usually assumes responsibility for driving the deal. This requires putting together a winning offer to government while simultaneously trying to secure debt finance. Governments, however, need to be aware that because finance is usually agreed late in the process, lenders



may require significant changes to the structure of the arrangement and the allocation of risk from that originally conceived or discussed with potential winning bidders. Moreover, governments need to ensure that changes required to satisfy lenders are not handled on an ad hoc basis, as this could threaten the benefits of a competitive bidding process (for example, value for money and transparency).

Governments can play an important role in avoiding these problems by (1) encouraging the equity provider to act as a good agent for lenders, (2) engaging directly with lenders, or (3) including bankers who understand the interests of lenders on the advisory team. The first role might be achieved by requiring that bidders have debt financing agreements in place prior to submitting their final bid. This can be risky if the government is unsure about whether the arrangement put out to bid will be attractive. Even if it is attractive, lenders might charge the equity provider for the requisite due diligence. Sponsors often will be unwilling to bear this cost before knowing whether they will be successful, which might deter bidding or encourage noncompliant bids or bids that offer less value for money.

Forcing bidders to use debt financing is a good way to ensure the financial robustness of the development. Schemes in which debt financing is not fully in place before project commencement (for example, the PIATCO terminal in Manila) often have good reasons why the financing proved to be difficult. Lenders tend to examine risks (and therefore investment and operating plans) closely and need to be persuaded that they are likely to achieve full repayment of capital and interest.

An important consideration is the amount of investment required and how it can be phased. Urgent rehabilitation or capacity expansions might require heavy upfront investment. This implies increased risk, particularly if debt is denominated in foreign currency. The government should focus initial investment in areas in which an immediate increase in cash flow can be achieved. Facilitating cost-reducing and revenue-increasing strategies for the first two to three years might reduce the need for the project company to take on large amounts of debt. This will make the PSP arrangement more robust.

In the case of management contracts that are designed to achieve operational efficiency, to assist in the clarification of roles and the introduction of a more commercial focus, public finance is likely to be required to support needed investment. Even in the case of concessions, divestitures, and long-term leases, private participants might provide working capital finance and finance only for small remedial works. Public finance or development agency funding may be required to support large investment.

## Responsibilities and Risks

### *Risks Associated with Responsibilities*

Under public provision, the contracting authority (part of the government) assumes all six of the business responsibilities at the beginning of section 6—A Detailed Spectrum of PSP—for asset design and build, finance for asset delivery, asset ownership, operations and maintenance, revenue collection, and management of the organization(s) vested with these responsibilities. Concession- or divestiture-based PSP arrangements vest most, if not all, business responsibilities with the private operator, excluding policy responsibilities, such as setting tariffs and quality standards. Other PSP arrangements are based on sharing the responsibilities; in these cases, a vital part of the design of the arrangement is deciding how to allocate these responsibilities.

Allocating the risks associated with these responsibilities is also an important part of determining the arrangement. Risks arise because the world is unpredictable. Some of the risks corresponding to the broad sets of responsibilities described in the last paragraph might include the following:

- *Asset condition:* The state and value of assets may differ from original assumptions (as occurred in the case of the Argentinean airports), which has implications for operating and maintenance costs.
- *Collection:* Business cases need to assess the potential for bad debts (as occurred in the case of the Argentinean airports and New Zealand ANS).
- *Construction:* Changes in labor costs, the timing of equipment delivery, and the time and cost to obtain planning permits can all affect construction times and costs.
- *Demand risk:* That is, the risk that demand fails to reach the levels required to fill the capacity delivered by a large, lumpy airport investment. Demand forecasts are a function of the macroeconomic cycle, estimates of microeconomic conditions that reflect local demand fluctuations, and income and price elasticities of demand. Forecasts tend to be inaccurate in the short term (three to five years), but are a valuable tool for planning in the longer term. Demand risk can be particularly acute in cases in which the ATI provider's principal (sometimes only) customer is a struggling airline. Demand risk can be offset to some extent by a reduction in capital investment—for example, if it becomes clear that there is a long-term reduction in capacity requirements compared with the plan.
- *Policy risk:* Governments and their agencies may take actions that affect the profitability of investments. Changes in policy might include rules increasing the level of security provision at airports, leading to increased costs for the operator, or a tightening of monetary policy by the Central Bank, causing a recession, which would significantly affect demand

growth. Governments must protect the operator from policy risk—for example, from the government opportunistically cutting prices in response to political pressure after a private firm has invested, or from changes in environmental standards that require additional investment. Otherwise, firms' fears of being expropriated may deter their participation.

Certain risks can, in fact, be a bundle of other risks. For example, construction risk could include unpredictable changes in input prices, the condition of the construction site, or the cost and availability of labor. An airport-terminal construction project might require construction teams to use the same airport-surface transport network as normal airport traffic. This might impose costly delays or require nighttime construction, making labor more expensive than during normal working hours. Risks are also interrelated. For example, an unexpected change in demand can affect revenues, operating and maintenance costs, the need for new investment, and new financing. This in turn may lead to a change in tariffs, which may affect demand.

Responsibilities and risks go hand in hand, and it is therefore useful to consider them simultaneously. If a private operator is given responsibility for something that it is able to do better than the government, it should naturally be expected to assume responsibility for the associated risks. For example, if the private operator assumes responsibility for revenue collection, then it makes sense to make profits in some way dependent on the operator's ability to collect from customers. In this way, the private operator has the correct incentives to improve its billing and collection systems, thereby minimizing bad debts.

Private (or commercialized) firms need to be given the ability and incentives to make good operating and investment decisions, by granting discretion and by exposing them to the related business risks, so that they are rewarded for good decisions and punished for bad decisions. The government should not automatically facilitate renegotiations of agreements when profits decline because of the normal business risks that the firm has agreed to bear. In deciding the appropriate allocation of risk, governments must understand the implications of upside and downside scenarios for the sustainability of investment plans as well as the private operator's profitability. If the present value of total projected cash flows over the life of the contract vary such that, in any one year, cash flows are insufficient to service debt, the government may need to provide an alternative risk allocation.

Responsibilities and risks should be allocated to the party best able to undertake and handle them. This depends on (1) the ability to predict risk factors, (2) the ability to control risk, (3) the ability to manage or find a way around the risk, and (4) the ability to diversify risk. Private operators will

demand something in return for bearing risks. For example, the operator might demand higher initial tariffs if it is forced to accept all demand risk, and customers bear the expected cost. If, however, the government is willing to accept some demand risk, the private operator might be willing to offer lower tariffs.

Governments need to bear in mind that risks allocated to the contracting authority are passed on to taxpayers, whereas risks allocated to a private operator are passed on to shareholders and lenders. The distribution of risk between the private operator and customers is determined by the pricing structure and the rules for adjusting prices. Also, the extent to which risks can be shared effectively will depend on the availability of good information on demand, economic stability, and the operator's willingness to pay.

### ***Risk Allocation Rules***

Many, if not most, risks are allocated through rules for adjusting prices, and the task is to determine whether the rules should allow prices charged to change in response to changes in costs. Such rules are designed to govern cost pass-through costs, tariff indexation, tariff resets, extraordinary tariff resets, and so on.

- *Pass-through costs:* If they are automatically allowed, the risk of cost increases is passed on to customers. Pass-throughs normally are considered appropriate for costs over which the operator has little or no control. In the context of airports, the most obvious example is costs arising from heightened security requirements. The case of U.K. airports is interesting in that the regulatory contract between the CAA and BAA allows an automatic pass-through of 80 percent of increased security costs. BAA is required to absorb the risk associated with the remaining 20 percent to provide incentives for the company to efficiently meet the requirements of changing security regulations. In the case of ANS, increased costs because of changes in safety requirements might justify pass-through costs. Other examples include changes in value added tax and service standards.
- *Tariff indexation formulas:* Tariffs undergo annual adjustments in line with a general index of prices, such as a consumer price index (CPI), rather than with the operator's actual costs. A common variation is the CPI-X formulation, where X is based on a combination of the contracting authority or regulator's views about cost projections and achievable efficiencies. Although this form of general indexation protects the operator from inflation, it does not reflect changes in the costs of specific inputs. It does, however, provide strong efficiency incentives. The CPI-X formulation is used in the U.K. and Irish airports and ANS. It was implemented in Greece as part of the airport concession contract. It is also pos-

sible to use a more customized index that more closely reflects changes in the costs of the operator's most important inputs. (A thorough treatment of indexation mechanisms as used in the regulation of market power is provided in section 8—Optimal Regulatory Contracts.)

- *Tariff resets*: If the risks that could be alleviated through indexation are too great, it may be favorable to arrange for discretionary or planned tariff resets. Governments, however, may choose this avenue simply in recognition of contract incompleteness and, particularly, the difficulty in designing the perfect indexation scheme. Tariff resets require a set of rules, principles, and processes to ensure predictability and can be used to adjust service standards. Risks for the operator increase with the length of time between resets and the greater the amount of cost changes that are not passed on to consumers. When designing tariff reset rules, it is important to consider the objectives (such as guaranteeing an adequate rate of return or allowing an efficient operator a guaranteed rate of return, or returning the operator to an original position before an unexpected change), to agree to the method for determining new tariff, and to agree on what will trigger a review and reset (for example, the options might include a review on request, a periodic review based on substantial grounds—as in Ireland—or event-based reviews).
- *Bonuses/penalties*: These might be used, respectively, for success or failure in meeting service standards. They may need to vary according to severity, frequency, duration, and the effect on customers. These are the main tools used in management contracts for allocating risk to the operator and incentivizing good performance. They have been incorporated into the U.K. CPI-X regulatory regime.
- *Government guarantees*: Governments may wish to provide guarantees for debt or exchange rate risk on foreign debt. Although guarantees make the arrangement more attractive to the operator, they dilute incentives to perform and manage the risk. This could undermine the benefits of PSP if guarantees are provided for risks that the operator is better able to anticipate, control, or absorb.

- *Termination triggers and payments:* Triggers of contract termination might include, for example, a decision by the government to renationalize or an event of force majeure that makes execution of the contract virtually impossible. In such cases, termination payments that compensate the operator are important, especially when the contract involved sunk investments. Compensation might include liability for debts, equity, loss of future profits, and third-party liability from the cancellation of sub-contracts. Providers of debt finance usually closely inspect the provisions for compensation on early termination. Guarantees of debt repayment can make it easier to attract finance, but treating lenders more favorably than equity investors might lead to excessive leverage and greater vulnerability to shocks.
- *Transition period:* If the information required to run or predict the running of the business is inadequate at the outset, allowing for a transition period and subsequent adjustments if the situation is dramatically different than first assumed may be required.

Inappropriate guarantees and renegotiations are undesirable for various reasons, including (1) they are liabilities for future administrations that will not be accounted for in their budgets, (2) they might encourage firms with experience in lobbying to underbid in the expectation of renegotiating later (so-called lowballing), and (3) they make white elephants more likely by reducing the risk that the project will lead to losses for the private firm. Moreover, they amount to privatizing profits while socializing losses, which has a negative impact on public opinion and reduces support for PSP. Guarantees and renegotiations should be as explicit as possible. Subsidies, for example, have the advantage of running through normal government budgetary processes, effectively competing with other government priorities. Government guarantees, on the other hand, face no such screening.

The institutional arrangements for tariff-setting rules also will be affected by risk and its allocation. The less prone the regulatory agency responsible for implementing tariff-setting rules is to regulatory capture, the less likely it is that risks will be inappropriately borne by consumers.

## Box 7.1

### Case Study Focus 5: Project Finance and Risk Allocation

#### Cameroon:

Despite Agence Francaise de Developpement (AFD) agreeing to provide Aéroports de Cameroun (ADC) with a loan of Cameroon francs (CFAF) 7.2 billion and ADC agreeing to a three-year investment program of CFAF 3.45 billion to improve and rehabilitate the airports, the concession failed to generate an adequate revenue stream to justify release of the agreed finance. Despite cancellation of the AFD loan facility, revised investment plans, and the renegotiation of the technical assistance agreement, this has remained the case. Little or no attention has been paid to the risks of owning the concession. Little or no traffic growth and ADC financial losses probably have been the result of a combination of high airport charges, poor service levels and quality, and the depressed economy. This probably has led to the failure to attract finance. Without airport rehabilitation, maintenance, and improvement, the company is caught in a vicious cycle, is unable to attract traffic and, consequently, is unable to attract finance to carry out the necessary investments. This appears to have been the biggest problem arising from Cameroon's approach to private sector participation (PSP).

#### South Africa:

Airports Company of South Africa (ACSA) has had a degree of good fortune in a growing economy, supported by the unwinding of dislocations in the previously distorted apartheid economy, combined with an airline policy that facilitated growth in air transport and limited the impact of the September 11, 2001, terrorist attacks on air travel. The government shareholder was willing to support ACSA with price increases and defend it against political interference. Without any proof, it is possible to assume that ACSA has been a success despite, rather than because of, the PSP. Widely dispersed bids might suggest that there was not sufficient transparency in the transaction, which may have led to uncertainty among the bidders as to the value of the transaction. Economic regulation provides some certainty.

#### United Kingdom:

Regulated prices are fixed based on a forecast of income. In the early 1990s, British Airports Authority plc (BAA) was lucky that unexpectedly low revenue could be set off against reduced construction prices. It also has the luxury of being able to delay expansion investments if a downturn results in capacity

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### Case Study Focus 5: Project Finance and Risk Allocation (continued)

being less strained than expected, because investment timing generally has not been regulated or enforced, with the exception of the Terminal 5 expansion. In other circumstances, traffic risk could have been a serious problem for the viability of the business, as it was for National Air Traffic Services Holdings Ltd. (NATS), which experienced a financial crisis. Fortunately, the arrangements at BAA allowed greater flexibility than at NATS. Security arrangements have been a significant risk. BAA is given latitude to increase its prices, subject to agreement as to the costs of additional security, and the 80 percent rule gives it some incentive to control the associated costs.

In the case of NATS, the company agreed to accept all demand risk as part of the PPP, which led to concerns about its vulnerability to a shock, given its highly leveraged financial structure. The September 11 attacks on the World Trade Center and the Pentagon, combined with the severe acute respiratory syndrome virus, caused exactly the type of demand shock that the CAA and the company had warned against. In particular, it caused the loss of a large proportion of income from North Atlantic traffic (consisting of U.K.-North America and Europe-North America air transport movements). At the time, this constituted only 14 percent of total traffic handled by NATS but 43 percent of total revenues. Moreover, total traffic had not declined as a result of the growth of low-cost carriers at the time, which actually increased the operational burden resulting from more landings and takeoffs on U.K. soil. As part of the Composite Solution (which included a financial restructuring and renegotiated price caps), traffic risk-sharing arrangements were implemented in view of the company's high levels of fixed costs. It is clear that there should have been greater clarity on the circumstances in which the price control would be reopened, especially with regard to downturns in traffic.

As well as traffic downturns, lenders paid inadequate attention to the potential for increases in long-term capital expenditure projections. Given that NATS' finances originally had a project finance structure (as opposed to a normal corporate borrowing structure), such projections had a big impact on NATS' ability to keep within its banking covenants. Given that these projections stretched 20 years into the future, there was considerable uncertainty over such projections, making NATS' financial position vulnerable (from a financial market and cost of finance perspective) to revisions in these forecasts. Under the Composite Solution, NATS moved away from

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### Case Study Focus 5: Project Finance and Risk Allocation (continued)

a project finance structure, which made NATS' financial position much less sensitive to long-term capital expenditure forecasts. The NATS PPP is an example of the importance of a sound commercial lending structure. In a country that boasts one of the most sophisticated financial services industries in the world, things can still go wrong.

A number of other considerations are worthy of mention. First, the varying interests of a range of lending institutions may have made the financial crisis more difficult to respond to, and certainly made it more expensive. Second, the working capital facility only covered cash costs for six weeks, which may have been too low, especially given the lead time for regulatory reviews of prices and the practical difficulties associated with raising prices more than once in any one year. This may have led to more action than was necessary in the Composite Solution. Third, leaving aside the opportunity cost of public funds, public sector borrowing is generally cheaper, and financial markets may not separate PPP debt and government borrowing when the government continues to hold a major share. Finally, the trade-off between, on the one hand, providing resilience, appropriate incentives, and risk allocations and, on the other, minimizing risk premia and transactions costs in doing so is especially important in the case of the NATS PPP.

#### Thailand:

Other major Thai infrastructure projects have had a number of serious problems, particularly those that have been carried out under concession to, or in partnership with, a foreign investor. For example, the government apparently confiscated a privately constructed toll road before any tolls could be collected, and an elevated metro line was abandoned before construction was completed. These problems generally have arisen from inadequately specified contracts, and have given the appearance of high political risk in major infrastructure projects in Thailand. The practices of the Thai administration appear to militate against adequately specified contracts. With this background, the Thai government was probably wise to finance the airport through debt and a local stock market placement, rather than seeking a foreign equity partner or concessionaire that otherwise might have seemed attractive. Indeed, with the perceived high political risk, a foreign partner might have been troublesome to arrange at a good price. The government was wise to take its time considering the reorganization, abandoning complex structures before settling on the simple form it chose, which matches

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### Case Study Focus 5: Project Finance and Risk Allocation (continued)

its main requirements. Suvarnabhumi has had its construction delays, teething problems, and cost overruns, but these problems are not uncommon in investment projects of this magnitude and, in that context, they have been relatively modest. Airports of Thailand (AOT) has been lucky to avoid the downside of serious financial risks of this project. AOT is highly geared, and therefore has limited capacity to handle financial risk. Fortunately, this high gearing came about after the Southeast Asian crash of the late 1990s and the 2001 international air transport crisis, and both the Thai economy and tourism are now growing again. In other scenarios, serious financial problems could have emerged.

#### **Argentina:**

Almost as soon as Aeropuertos Argentina 2000's (AA 2000's) concession commenced, the country was hit by economic crisis and recession. AA 2000 failed to pay the first three biannual concession fees. As the lack of robustness of this PSP transaction in the face of recession clearly illustrates, the highest bid will not always deliver the best outcome if it is unsustainable. The extraordinarily high concession fees constituted an attempt by the government to extract future value by accepting the highest and most lucrative offer at the expense of investment, growth, and efficiency and, in fact, the proceeds themselves. It resulted in exorbitant charges to users, a situation that was in no way assisted by a newly established but ineffective regulatory regime. Moreover, the lead investor claimed that the government had handed over the airports in worse condition than promised, and that many were liabilities because of their poor states of repair and restrictions preventing AA 2000 from closing unprofitable airports. In early 2001, AA 2000 was having difficulties in obtaining airport charges owed by Aerolineas Argentina and was threatening to lock out the airline. Traffic was falling at a rate of 20 percent during 2001 and 2002, severely weakening the company's financial position. Adopted in 1991, 1:1 convertibility with the U.S. dollar was abandoned and the peso fell to a third of its former value. Regardless, the government insisted on receiving concession fees in dollars, while maintaining rules that airport charges be set at regulated peso levels. AA 2000's debt was also denominated in dollars. The company, therefore, was exposed to severe exchange rate risk.

*Source:* Booz Allen Hamilton.

## Management Incentives

As noted in section 6—Expected Gains From Ownership By Private Firms, traditional theories of the firm assume that firms seek economic profit maximization. More recent contributions, namely managerial theories of the firm, have postulated other firm objectives, including sales-revenues maximization and asset-growth maximization.<sup>51</sup> These theories are based on two assumptions: (1) that a divorce of ownership and control allows management rather than its owners to set the firm's objectives (see Berle and Means 1932); and (2) that managers are more interested in sales and asset growth than profit maximization because the size of their salaries and the extent of their power and status are closely linked to the size of the firm.<sup>52</sup> Under such theories, shareholders are not in a position to bring about the efficiency improvements that are associated with the objective of profit maximization. This is the case in which, as with most large private firms, shareholders are a dispersed group with varying ownership stakes. If shareholders do not play any role in the operational management of the business, only large institutional shareholders are likely to be able to exert any influence. Likewise, these theories point to the fact that investment, maintenance, and operational efficiencies are delivered by managers and that, consequently, they should be the target of incentives.

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51. Under sales-revenue maximization, the firm is assumed to seek to maximize sales revenue subject to a minimum profit constraint that is determined by the need to pay dividends to shareholders and to finance expansion. Under asset-growth maximization, salaried managers of joint-stock companies are assumed to seek to maximize the rate of growth of net assets to increase their salaries and power, subject to maintaining a minimum share value, to avoid the company being taken over and losing their jobs.

52. Analogous, but also relevant, are behavioral theories of the firm, which stress the nature of large firms as complex organizations, beset by problems of goal conflict and communications. These theories examine the inherent conflict between the goals of individuals and subgroups within the firm and suggest that organizational objectives grow out of the interaction among them. Cyert and March (1964) suggested five major goals that are relevant to a firm's sales, output, and pricing strategies: the production goal, the inventory goal, the sales goal, the market share goal, and the profit goal. Each is the primary concern of certain managers, and these managers will press their particular goal(s). Goals become the subject of bargaining among managers, and the overall goals that emerge will often be compromises (often stated as, for example, satisfactory-level targets). Behavioral theories recognize that goals are imperfectly rationalized so that new goals are not always consistent with existing policies, not all goals will receive attention at the same time, and goals will change with experience. Behavioral theories also focus on internal communications problems within large firms, recognizing that decision making is distributed throughout the firm rather than concentrated at the apex of the organizational pyramid. This happens because lower-level managers do not just execute the orders of those at the top, but exercise initiative in detailed planning within broad limits set by the firm's owners or top management and in summarizing information to be passed upward as the basis of decision making by their superiors. These communications problems make it difficult for owners and senior managers to impose their objectives on the organization.

In economic terms, managers are thought to be vested with residual control rights over the assets.<sup>53</sup> These rights usually are equated with short-term residual income rights—that is, the rights to determine the use of profits in the short term, while also being accountable for short-term losses. Residual control rights will be enhanced (or, rather, are more valuable) for managers if they pursue sales and asset growth at the expense of profit maximization. This has, on the one hand, led to “gold-plated” ATI facilities and “white elephants” and, on the other, to underinvestment because of the past failures of management and a reluctance by owners to vest them with responsibility for future investments.

The success of a firm in undertaking responsibility for the provision, management, and operation of ATI therefore will depend on the ability of its owners to control managers. The task is to design contracts that reduce the discretion of managers to diverge from the objectives of profit and efficiency maximization, while preventing the abuse of monopoly power. Such contracts need to resolve the trade-off between optimal incentives and optimal risk sharing (insurance). Insurance theory demonstrates that the optimal division of a pie of a random size (call it profit) between a risk-neutral party (shareholders) and a risk-averse one (managers) has the risk-neutral party bear all the risk. In other words, the risk-averse party should get full insurance, constant income over all states of nature. But if the manager can take some action that is costly to him or her and that affects his or her share, and if the manager is given an income that does not depend on this realization, he or she has no incentive to exert effort because it does not affect his or her income.<sup>54</sup>

The reality is that such actions by managers are, more often than not, unobservable and nonverifiable, so contracts inevitably are incomplete. Owners, therefore, must recognize that this results in an ex post allocation of bargaining power (see Hart 1995). The source of this power lies in ownership of the assets and comes in the form of residual control rights (the rights to determine the use of the assets) or residual income rights (rights over the returns from those assets). Herein lies the solution to finding the optimal allocation of residual control and income rights.<sup>55</sup> Allocating a certain amount of residual control rights to managers can provide them with the incentive to pursue the objectives of the firm’s owners because it enhances their power and status, while allocating them a certain amount of residual income rights (through, for example, a profit-sharing scheme) pro-

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53. This derives from a property rights approach.

54. Hart, Shleifer, and Vishny (1997), for the purposes of their analysis of these issues, define actions, such as effort by managers, as investment in noncontractible “quality.”

55. Or of rights to the rewards from investment in noncontractible quality.

vides direct monetary incentives to engage in efficiency-enhancing effort and investment, because they reap some of the returns to that investment, on top of their normal wages.<sup>56</sup> Hart (1995) makes the point that residual control rights and rights over residual income are highly complementary and, therefore, should be allocated to the same economic agent. Otherwise, (1) diverging incentives may create a holdup problem, or (2) agents (managers) holding short-term residual income rights may make decisions that would not maximize the asset's long-term income stream, the rights to which are controlled by the principal (owner).

The task can be summarized as the design of an internal system of incentives and disciplines (or carrots and sticks). Remuneration packages that are linked to the firm's success will enhance the incentive for the company to be run efficiently, while the threat of direct shareholder intervention may help to provide discipline. The difficulties lie in finding the appropriate company performance metrics on which to base remuneration packages and establishing effective monitoring that ensures the most appropriate shareholder interventions. These issues can be addressed directly by the government in the case of continued government ownership. When introducing private participants, a requirement (as part of the bidding process) is to submit plans for the business and operational management of the firms' responsibilities. Subsequently, engagement to ensure that incentives are targeted at managers, who will in effect be responsible for delivering efficiency improvements, can help to ensure a successful policy.

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56. Likewise, the allocation to managers of rights to some of the rewards from investment in noncontractible quality can provide incentives for managers to invest in the optimal amount.

**Box 7.2****Case Study Focus 6: Management Incentives****Cameroon:**

The government signed a technical assistance agreement with Aéroports de Paris (AdP), under which it would provide key expatriate senior managers. Control was vested with a nine-member board of directors with an elected chairman. Until termination of this agreement, however, Aéroports de Cameroun (ADC) was reportedly characterized by low morale, not least because of insufficient investment in maintenance and improvement of the airports and the consequent continuing poor performance. Moreover, the fact that AdP received a fixed fee for providing management probably meant weak incentives to perform. A new agreement was signed with Aerial Navigation in Africa (ASECNA) six years later, under which the latter agreed to provide a managing director and finance and administrative director.

**South Africa:**

Airports Company of South Africa (ACSA) appears to have benefited from the secondment of executives from Aeroporti di Roma (AdR). Given the outcome, however, it seems possible that whatever expertise it gained from AdR could have been substituted more cheaply by international recruitment of suitable executives. Indeed, ACSA's recent success suggests that it was better able to recruit appropriate skills and improve its management itself than was AdR. Since the withdrawal of AdR, ACSA has received awards for its governance, transparency, and avoidance of conflicts of interest, which, in a country poorly rated for corruption, is a significant accolade.

**United Kingdom:**

In preparation for privatization, British Airports Authority (BAA, a government agency) was corporatized and renamed BAA plc. Former government employees became employees of BAA plc. Following the PPP, control of National Air Traffic Services Holding Ltd. (NATS) effectively passed to the Airline Group, which, in 2001, had the power to appoint up to 14 of a possible 17 directors and, after 2003, the power to appoint up to 12. BAA plc, having invested in a stake in the Airline Group, was given the power to appoint two directors. Because the private owners were required to give assurances that the company was not investing to make a profit, we presume management incentives have been easier to align than in a situation of profit maximization. The management structure, with split rights of appointment to the board

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### **Case Study Focus 6: Management Incentives (continued)**

and a government veto, may have been overly complex. At the outset in 2001, there were three executive directors: the chief executive officer (CEO), the chief operating officer, and the finance director. Government-appointed directors have the ability to influence and have additional powers over a limited range of decisions. A stakeholders council, consisting of representatives from the Department for Transport (DfT), NATS' employees, and members of air traffic controller and pilot organizations was appointed to provide guidance and advice to NATS. An executive committee sitting below the board of directors, including the CEO and operations management team, agrees to a contract with the board specifying key performance and operating targets for the coming year.

#### **Greece:**

The profitability of the new airport and the fact that it has been rated highly in passenger satisfaction surveys suggest that management incentives are well aligned with the profit motive of the private sector consortium.

#### **China:**

The profitability of the arrangement, the successful delivery of Shanghai Pudong Airport, and significant output growth suggest that management incentives are well aligned with the profit motive of the private sector participants. This may be masked by significant output growth on the foot of China's economic expansion.

#### **Thailand:**

One of the objectives of the PSP, providing infrastructure to facilitate Thailand's growth, is only indirectly in the commercial interest of Airports of Thailand (AOT). AOT's commercial interest is probably to sweat its assets. It was the government's decision to build Suvarnabhumi, and it seems likely that the government, as majority shareholder, will continue to direct major investment decisions with an eye on the Thai economy as a whole rather than on maximizing AOT's profitability. Profitability has been affected by debt service requirements, but management is generally believed to have contained costs well, to have managed the debt position, and to have contributed to an increase in AOT's share price. Management incentives, however, appear unbalanced and, perhaps, geared toward empire building if government uses its control to ensure reinvestment of profits by AOT rather than distribution to minority private shareholders.

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## Case Study Focus 6: Management Incentives (continued)

### Lao People's Democratic Republic:

The Japanese consortium's interests in the ownership of Lao Airport Authority and in the operation of the airport may have been motivated by the desire to promote Japanese trade interests and to ensure that Japanese aid was managed and spent wisely, thereby acting as a vehicle for the Japanese Overseas Development Bank. Little seems to have been done to grow traffic, and the parent airline company of one of the consortium members (Japan's flag carrier) does not operate air services in Laos PDR or even code share with others.

### Australia:

Management is appointed by Southern Cross Airports Corporation Holding Ltd. (SCACHL), while transitional arrangements were agreed on for some of the existing management of SACL. Fair treatment of Sydney Airport Corporation Ltd. (SACL) employees, including preservation of accrued entitlements, was agreed. Soon after taking over, management undertook a full-scale review of the airport's relationship with its airline customers and corresponding marketing plans; the airport's retail performance, including benchmarking studies, long-term capacity, and investment requirements; funding plans for investment; all costs on a line-by-line basis; development plans to optimize operational efficiency; and management structure and staffing. Strong output, financial, and operational results and a successful master-planning process suggest that management is performing well and that incentives are well aligned with the profit motive of SCACHL.

### New Zealand:

The simple form of PSP adopted, involving corporatization of a state-operated enterprise with an element of private finance, appears to have provided an opportunity for management to reorganize and cut costs, arising from freedom from the operational restrictions on government departments and agencies.

### Argentina:

Presumably, the owners of Aeropuertos Argentina 2000 (AA 2000) appoint board-level management. Ogden was appointed as technical manager; however, following its withdrawal in 2000, the government appointed SEA Aeroporti di Milano. Reportedly, the first master plan for rehabilitation and improvement of the airports did not meet the requirements of the concession contract. The failure of enforcement mechanisms to force Aerolíneas

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### **Case Study Focus 6: Management Incentives (continued)**

Argentina to pay outstanding airport charges may be attributable to management. Otherwise, given the economic crisis that inflicted the country from 1998, it is difficult to assess management performance or the alignment of incentives with AA 2000's private owners.

#### **Mexico:**

The government has taken an overly cautious approach to maintaining strategic influence of the company, including in the areas of price regulation, approval of investment plans, and government board representation with powers of approval of major decisions. Management has not succeeded in improving efficiency despite output growth and expected economies of scale. Remaining government influence, however, may have affected the company's ability to reorganize. It is likely that this has discouraged the acquisition of a majority of publicly traded shares or a takeover. It is unlikely that the airport company's (ITA) consortium members had sufficient incentives to involve themselves with management issues, given such a small commercial interest in the form of a 15 percent stake.

#### **Canada:**

The board has representation from three interest groups—the government, unions, and the air transport industry. The creation of new revenue streams and the control of labor costs (despite disputes) and management of debt (despite bad airline debts during the 2001 crisis) suggest that management is performing well and has well-aligned incentives.

*Source:* Booz Allen Hamilton.

## Transaction Advisory Support

The types of advisers appointed for a transaction will depend on the size and nature of the transaction. Advisers can take the form of legal, financial, technical, economic, tax, and insurance as well as an overall umbrella transaction adviser.<sup>57</sup>

The legal adviser typically conducts due diligence, reviews draft documents, reviews the existing legal framework, drafts documents and legislation, and considers what further inputs are required from third parties before redrafting any documents or legislation.

The financial and technical advisers review issues such as the demand and revenue forecasts, design the outputs and specifications for the project, develop the financial model, take market soundings, investigate different sources of financing, prepare the bid documents, organize road shows, and review prequalification and bids.

Since 2007, the World Bank has offered transaction support for the St. Petersburg Pulkovo Airport Expansion Project. The requirements for the private investor are as follows:<sup>58</sup>

- Development and expansion of Pulkovo Airport through the timely provision of high-quality airport infrastructure and services (airside and landside) to accommodate the airport's expected rapid air traffic growth in the medium and long term, including the following:
  - Construction of a centralized passenger terminal in midfield location
  - Reconstruction of certain landside existing buildings and structures
  - Construction of certain new landside buildings and structures
  - Reconstruction and extension of part of the existing airside facilities
- The design, implementation, and operation of (1) a minimum level of service (LOS) equivalent to IATA's C level and (2) high-quality management systems
- The establishment of Pulkovo Airport as an international hub in the Baltic Sea region and as a natural port of entry and connection hub into the Russian Federation

The World Bank has provided support by advising the government of St. Petersburg in developing the airport as a PPP, in particular, building capacity in designing and implementing a PPP-based project, interacting with private

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57. "Managing Advisers on PPP transaction: key issues drawn from lessons learned." Presentation as part of panel discussion held at the World Bank with Mark Moseley and Iain Menzies of the World Bank and Frederick Jenney of Morrison & Foerster (December 2008).

58. Taken from "Preliminary Information Memorandum: Public-Private Partnership Pulkovo Airport Expansion Project," prepared by Citigroup Global Markets Limited and Dewey and LeBoeuf at the direction of and from the materials and information supplied by the Government of the City of St. Petersburg and Pulkovo Airport Company.

sector entities and lenders as well as with advisers, and providing strategic advice and guidance in the implementation of the project. The following summary of key terms of reference for the work<sup>59</sup> provides a useful overview of the issues that the transaction adviser needs to cover:

- Support the government in preparing the prequalification stage of the PPP transaction.
  - Includes drafting a preliminary information memorandum and supporting the government to develop operational and financial criteria to be used in judging the suitability of prospective bidders jointly with the legal adviser preparing the package of draft prequalification documents.
- Support the government during the prequalification stage.
  - Includes support in conducting a fair and transparent prequalification process, organizing a road show for potential investors, and reviewing comments of potential applicants.
- Support the government during the bidding stage.
  - Includes support in analyzing prequalification applications, preparing transparent bid evaluation criteria and methodology, supervising lawyers in preparation of tender documents, organizing a public competitive bidding process to award the PPP to a strategic investor, sharing bidders' comments among all participants, and reviewing tender documents and basis of bid evaluation.
- Support the government during the bid award and financial close of the transaction.
  - Includes bid evaluation, support with negotiations, execution of the concession contract, shareholders' agreements, and other documents.

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59. Taken from "Agreement for Advisory Services for the St. Petersburg Pulkovo Airport Expansion (Part 2)," between the Government of St. Petersburg and the World Bank (February 2008).

## 8.

# MARKET, INSTITUTIONAL, AND REGULATORY REFORM

### Market Structure

#### *The Aviation Value Chain*

Given the importance of competitive conditions in achieving economic efficiency (as outlined in note 29), decisions about the structure of the industry and the rules governing competition (where it is possible and allowed) are vital to the success of a policy that bestows the market power that naturally exists in ATI on private sector participants. Industry structure is concerned with the number and size of suppliers in the market. To understand the issue, it is helpful to understand the facilities and services (of which ATI forms part) that are necessary to facilitate the providers of air transport, the largest and most important being commercial airlines that transfer passengers and freight from place to place. Commercial airlines and their customers demand the following:

- Airports
- Air navigation and communications
- Ground handling for aircraft, passengers and their baggage, and freight and mail
- Security, policing, immigration, customs, and fire and rescue
- Surface transport to connect passengers and freight to their final destinations
- Ancillary services such as car parking, car rental, local information, and retail

These six items, along with air transport itself, constitute the aviation value chain. The basic choice faced by governments is the extent of vertical and horizontal integration in their supply.

### *Horizontal Issues*

Horizontal integration involves the allocation of entire responsibility for supply at a single level in this value chain. This is advantageous because it enables the firm to reap economies of scale. In the case of ATI, these (as well as what was outlined in note 30) might include the ability to centrally manage a number of airports or ATC centers, to bulk-buy materials, and to raise finance in bulk and on more favorable terms. Competitive conditions, however, where they are possible, are eliminated. Horizontal integration is common in aviation and, in particular, in the supply of airports and ATC centers. For example, responsibility for the provision, management, and operation of all airports in the state, more often than not, has been vested with a single firm.

As noted in section 4—Motivation for Government Provision of Air Transport Infrastructure, recent evidence suggests that natural monopoly is a feature of airports only up to a certain point and, therefore, competition is possible in many cases. Doganis (1992) found that airports experience significant increasing returns to scale up to 1 million passengers and that unit costs continue to decline up to 3 million passengers, but thereafter, they level off.<sup>60</sup> In general, optimal capacity expansion should lead to long-run constant returns to scale. For larger airports, however, the average cost of expanding capacity is reported (also by Doganis 1992) to increase rather than decrease.<sup>61</sup> Empirical analysis by Pels (2000) confirmed this increase for a number of large European airports, including Rome Fiumicino, Frankfurt, Munich, and Zurich, with others such as Amsterdam Schiphol, Manchester, and Paris Orly showing partial evidence.

Economic theory suggests that, in these circumstances, competition with the large airport should be possible, and that no large-scale airports should be congested, rather only airports of a moderate size operating at or close to their optimal scale of output. Starkie (2002) noted that, as this is clearly not the case, barriers other than returns to scale must prevent entry or make

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60. Strictly speaking, in the short run, when the capital stock is held constant, economies of density (or utilization) are being observed rather than economies of scale. The latter are judged in relation to an expansion of output that requires an incremental increase in the capital stock as well as the other factors of production.

61. Diseconomies of scale (or decreasing returns to scale) describe a long-run increase in average costs that occurs as the scale of output is increased beyond some critical point. The reason for these diseconomies of scale in ATI provision is that, after a certain threshold, it becomes increasingly difficult and expensive to design, build, and operate airport facilities that spatially and functionally coordinate activities over an expanding area (Starkie 2002). Large, expanding airports also face significant costs in planning restrictions, land scarcities, and environmental costs.

it unattractive. He cited two such barriers. The first is access to land, an essential factor input for the establishment of a new airport. Existing airports have a built-in incumbency advantage because of the high opportunity cost of land in their vicinity, thereby increasing the cost of assembling land for new runways and terminals.<sup>62</sup> Moreover, increasing levels of noise, air pollution, and congestion raise the level of political opposition to new airport development. The second barrier is the agglomeration economies associated with the network externalities of hub airports. Airlines gain from the concentration of services at a transfer point because it permits the use of larger, more economical aircraft, and passengers benefit from a wider range of destination choices.<sup>63</sup> These network externalities tie airlines to hub airports and, therefore, make it more difficult for rival airports (particularly new entrants) to attract airlines and passengers through price competition. Agglomeration economies have proved to be less of a barrier when the entrant airport is differentiating itself from the hub by positioning itself as, for example, a low-cost location.<sup>64</sup>

Relatively little analysis is available on the potential for competition in the provision of ANS, especially for upper and oceanic airspace. The conventional wisdom has been that ANS tends, to an even greater extent than airports, toward conditions of natural monopoly. Competition does exist in the area of ANS around airports; however, in the limited number of cases in which this has taken place—for example, in the United Kingdom—it has (necessarily) taken the form of competition for the market rather than in the market.

Although competition in the provision of air navigation and communications remains elusive, many governments have explicitly rejected the more likely notion of competition in the provision of airports in favor of horizontal integration. These governments include Mexico, South Africa, and Thailand, and the U.K. government regarding the privatization of the BAA and its decision not to separate ownership, management, and operation of the three London airports.<sup>65</sup> Other countries, such as Argentina and Cameroon, also favored horizontal integration. In these countries, however, the difference is that of scale. In the case of the less-developed countries, harnessing system economies of scale in the presence of low demand understandably might be more favorable than competition and the duplication of high fixed

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62. Opportunity cost is a measure of the economic cost of using scarce resources to produce one good or service in terms of the alternatives thereby foregone.

63. These benefits will only flow to the extent that the airline(s) operating at that airport operate a hub-and-spoke network.

64. Note, however, that such airports have typically involved established ex-military airports in more remote locations.

65. BAA has appealed to the Competition Appeal Tribunal.

costs. In the case of more developed economies, where scale appears to cause diseconomies of scale at large airports, competition is arguably more feasible than assessments have suggested. Kay (1999) noted that, while the greatest efficiency gain from U.K. privatizations was reduced staffing levels, the benefits were always greater when competition was introduced.

### *Vertical Issues*

Vertical integration involves the allocation of responsibilities for supply at two or more levels in the value chain. Vertical integration has advantages and disadvantages. Advantages include technical economies from the combination of successive processes and the elimination of purchasing and selling expenses in negotiating outside supply by internalizing them. Advantages also include the managerial and bulk-buying economies associated with horizontal integration. The disadvantages lie in the potential anticompetitive effects, such as foreclosure of the market to competitors through unfair internal pricing of different items in the value chain. Vertical integration is common in aviation. Responsibility for ground-handling provision often is vested with commercial airlines (as in Cameroon) or with airport companies (as in some Chinese airports). Air navigation and communications likewise often are vested with airports, and responsibility for the provision, management, and operation of passenger terminals within airports often is vested with airlines (the most pervasive example being the United States). Likewise, airport companies often are vertically integrated suppliers of retail services within airports and of rented space to facilitate the provision of these and other ancillary services by independent suppliers. In some cases, airports provide the equipment required to provide ground handling, security, customs and immigration, and fire and rescue, whereas private firms operating within the airport provide the associated services. Since airports moved into the private sector, airlines have moved strongly to force vertical separation of functions in airports, and in particular to open up the ground-handling market to competition. In the European Union, this has been forced by directive. The reasons the airlines give are that the monopolistic provision of ground-handling services in many cases resulted in either high charges or poor service quality.

**Box 8.1****Case Study Focus 7: Market Structure****Cameroon:**

Responsibility for seven airports was vested with a single firm; however, the scale of the air transport market is not sufficient to allow or justify competition between the airports.

**United Kingdom:**

The government made compromises to maximize value in the short term by (1) keeping the group together with cross-subsidy, when competition might have been in the public interest; and (2) initially providing only weak regulation. Although Stansted has now become a thriving airport, rapidly overtaking Luton, arguably it was developed at unnecessary cost and underused because the British Airports Authority plc (BAA) had no incentive to press for it as long as spare capacity was available at Heathrow and Gatwick. There was an enquiry as to whether the BAA London airports should be split into separately owned companies to improve competition between them. The Competition Commission's findings in March 2009 were that Gatwick and Stansted should be sold.<sup>9</sup> In Scotland, Prestwick Airport was run down until it was sold, but a new owner has developed a low-cost airline business. The proximity of Glasgow and Edinburgh to each other (around 80 kilometers/50 miles) means that scope for greater competition between them would exist if they were under separate ownership. BAA is also required to sell either the Edinburgh or Glasgow airport. Independent competing ground handlers protected airlines from risks of poor quality and overcharging that a monopoly might have created. BAA airports were generally of sufficient size to facilitate such competition.

**China:**

The government's policy is reflected in the establishment of Shanghai Airport Authority (SAA) to satisfy the needs of operating a "One City, Two Airports" concept. Scale is, arguably, sufficient (41 million passengers and 2.2 million tons of freight) for the airports to compete.

*continued*



## Case Study Focus 7: Market Structure (continued)

### Thailand:

Responsibility for Thailand's six main airports (including the old Bangkok airport) was vested with a single firm. It is not clear whether the old airport can be maintained and established as a competing airport for the capital or whether the other four airports are sufficiently proximate to allow competition with the Bangkok airport(s). With a population of 65 million and a growing tourism industry, however, the potential for a more competitive airport market structure may exist.

### Australia:

Southern Cross Airports Corporation Holding Ltd. (SCACHL) was given exclusive rights to any airport that might be built within a 100-kilometer radius of Sydney Airport.

### Argentina:

The government rejected a competitive market structure. This was likely based on economic and financial feasibility because restrictions on Aeroportos Argentina 2000 (AA 2000) prevented the closure of many unprofitable airports. The two Buenos Aires airports, which engage in exclusive provision of domestic and international services, may have sufficient scale, however, to allow them to compete if they operated in both areas.

### Mexico:

Cancún, which had about 9 million passengers in 2003, is the second busiest airport in Mexico. Four other airports in the group have about 2 million passengers each, and the other four have about 1 million in total. Given a scale of about 21 million passengers, competition may be possible, at least between Cancún and the other grouped airports.

*Source:* Booz Allen Hamilton.

*Note:*

a. BAA has appealed to the Competition Appeal Tribunal.

## Institutional and Regulatory Reform

The regulation of market power is crucial in the absence of competition; however, it should be arranged in a manner that does minimal damage to the incentives to perform efficiently, especially in the area of investment. Governments must monitor performance, determine appropriate rewards and penalties, and protect firms from undue risk. Mechanisms to resolve disputes and

the adjustment of tariffs or service standards need to be flexible<sup>66</sup> enough to allow for changing circumstances, while at the same time providing assurance that the result will be fair to all parties. Tariff resets are one of the most difficult and contentious aspects of managing an arrangement with a private sector participant because of the significant financial implications for the government, operator, and customers alike.

As introduced in section 3.5, two bases for the framework are necessary for these functions to be carried out effectively. The two bases are contracts, usually between a “contracting authority” (a government department or agency) and the private firm, and independent regulation of the firm by a sectoral regulator or competition authority.

In contract-based arrangements, tariff or service-standard adjustments are seen as adjustments to the terms of a legally binding contract between the operator and the contracting authority. Institutional options for handling disputes and adjusting tariffs or service standards under the approach might include (1) an agreement between the contracting authority and the operator, (2) the use of third-party mediators or experts to help reach an agreement, (3) a third-party arbitrator or a panel of arbitrators (domestic or international) that follows specified procedures to make a final decision,<sup>67</sup> and (4) settlement through the courts.

The size, scope, and nature of the dispute and the magnitude of the adjustments at stake will determine the appropriate channel.<sup>68</sup> Negotiation has advantages such as speed, lower cost, preservation of relationships, flexibility of solutions, and control by the parties of the process and outcome, while mediation can help negotiating parties to move away from entrenched

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66. A particular trap that designers of PSP schemes in ATI fall into is the attempt to create a robust and watertight agreement between the parties that does not allow flexibility. Unlike, for example, electricity or water utilities, ATI has a highly complex set of outputs and is subject to constant change in demand requirements—not just in terms of absolute traffic levels, but also in areas such as security requirements, technical characteristics of aircraft, and new technologies for check-in. Coping with this change over the life of a PSP arrangement requires handling issues that cannot be predicted at the time of contract signature. Therefore, a rigid contractual scheme will result in either disincentives for the ATI operator to meet the changing needs of its customers, or in a breaking of contract terms, with its attendant complexities.

67. They, however, could move away from conventional arbitration to avoid a solution that simply splits the difference between the parties’ positions. In that case, the parties might choose final-offer arbitration, under which each party proposes a settlement, and the arbitrator is obliged to select one without amendment. This reduces the likelihood that the parties will propose unreasonably one-sided settlements because the arbitrator could always select the other party’s offer.

68. The appropriate institution may not be the same in all cases, so it may be appropriate to offer a range of options. One way of achieving this might be to allow for the progressive escalation of disputes until they are resolved, thereby reconciling demands for speed and low cost with the need to reach fair and enforceable decisions. Care needs to be taken in the design of the escalation process to limit the time it takes to resolve disputes through, for example, deadlines for each stage that trigger the next stage.

positions and reach solutions more easily. If disputes involve technical issues, the opinion of an independent expert can be effective in informing and influencing negotiations. When negotiations fail, binding decisions by an independent expert or panel of experts can end an impasse, while bringing the requisite skills and impartiality for a reasonable solution. A single expert may have advantages in terms of cost, speed, and administrative simplicity, but an individual is more easily influenced than a panel and may not be able to provide all the required expertise.

Binding settlements of major disputes usually require a decision by the courts or through arbitration. Arbitration can offer greater assurance of a fair and competent decision when one or both parties are concerned that judges may be partisan, corrupt, or lack the relevant expertise. Arbitration can offer benefits such as the ability of the parties to appoint people with appropriate skills, flexibility in the choice of the type of arbitration, speed if the right of appeal is narrower than for a judge's decision, continuity of personnel, and informality. Ultimately, however, it may be necessary to have the courts enforce arbitration decisions. Moreover, courts have certain advantages, including the possibility of consolidating similar proceedings under different contracts and robustness at imposing sanctions for noncompliance with time limits. Court proceedings may be less expensive in some cases and are more transparent in many cases. Courts, however, could be avoided by establishing an ongoing arbitration-type institution that incorporates mechanisms to preserve consistency among decisions, increasing transparency and consultation with users, and increasing the level of expertise of the contracting authority.

Disputes arise even when arrangements are well designed, contracts are well specified, and relationships are working well. Efficient dispute resolution procedures are, therefore, crucial. They require the decision maker to have access to the necessary information to resolve the dispute and the skills to understand it and the effects of alternative solutions. Decision makers need the incentives to make good and impartial decisions and a process that effectively balances speed and due consideration of the issues, given the magnitude and complexity of the dispute. Likewise, the cost of resolving the dispute needs to be commensurate with its magnitude and complexity. Finally, decisions made under dispute resolution procedures need to be enforceable and, therefore, effective.

Independent regulation derives from the United States. Decisions are entrusted with neutral, technocratic bodies, empowered by statute to make binding decisions on operators in the form of regulatory contracts. These bodies usually are vested with powers to change tariffs and the terms of the arrangement without the agreement of both parties. Independent regula-

tors can be explicitly asked to consider wider objectives but can increase the risk for both the contracting authority and the operator by reducing their ability to control or influence the outcome. For this reason, attempts to combine the contract-based approach with independent regulation can create risks—for example, if the regulator can effectively override the contract, the operator may be exposed to too much policy risk. A better way of “blending” might be to ensure that independent regulator decisions are governed by the contract and subject to arbitration and that contracts and arbitration are public.

Although the government will always be involved in setting the rules of the game, an independent regulator is insulated from political pressures, whilst still involving customers through consultation and greater transparency. Independent regulators can afford to be more single-minded in monitoring performance against contractual obligations and in disputes over tariffs and service standards. They reduce the risk that political objectives drive regulatory outcomes, which might preclude the achievement of the objectives of the PSP policy.<sup>69</sup> Moreover, exemption from civil service salary limits can give regulatory agencies better access to the required expertise.

A regulator that is independent of political and other interference, however, might fail to make decisions that properly balance the interests of the operator, contracting authority, and customers. Accountability encourages good performance and reduces the potential for improper influence. Processes and appeal mechanisms that can increase accountability and the quality of decisions include (1) prescribing and publishing clear, transparent criteria that the regulator must follow in making decisions; (2) establishing clearly defined and predictable processes, including the requirement to give the operator and stakeholders adequate time and opportunity to make submissions, provide evidence, and comment on draft decisions, and a requirement for the regulator to publish the reasons for its decision; (3) providing for appeal processes, which might include the courts for judicial review of the process or appeals on points of law, or arbitration arrangements with the technical and economic expertise to review the substance of decisions; and (4) allowing appeals to special-purpose expert bodies, such as the U.K. Competition Commission, which may confirm the regulator’s decision or substitute their own.

Independent regulation traditionally is associated with private ownership and the absence of a contract between the operator and the contracting authority. For this reason, transplanting the regulatory agency approach

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69. It should be clear from the analysis that independent regulation is a solution to the problem of government commitment in section 6—Political Economy and the Assessment of Policy Sustainability; however, commitment is also a prerequisite for successful regulation (see section 8—Optimal Regulatory Contracts).

to a developing country, or indeed to a smaller country where government agencies may not be large enough to develop a sophisticated set of regulatory principles, may not be an option. Political and regulatory risks of investment in ATI without contractual protection may be too great for operators. In addition, the culture of the country needs to be considered. In cultures that are rule oriented, regulatory principles often can be successfully implemented by a small regulatory organization. Relationship-based cultures, on the other hand, may not be suitable for this type of regulation, and may require additional checks and balances, perhaps including external reviews and recommendations to assist the regulator in decision making.

The institutional arrangement of contracting and regulation varies across countries in recognition of the fact that, for various reasons, some institutional reforms may be more likely to break down or perform poorly. For instance, sector-specific regulators are regarded as more prone to capture than are competition authorities because of the sustained long-term relationship that develops between firms and the regulators. If this is likely, the costs may outweigh the benefits. This is, perhaps, the motivation for the absence of explicit airport regulation in New Zealand. More heavy-handed arrangements (such as in the United Kingdom and Ireland) might result in the failure to attract private firms, especially in a high-risk environment. More light-handed arrangements might be carried out more effectively through government contracts that are enforceable by existing laws. Moreover, contract monitoring and enforcement in environments with institutional frameworks in their infancy or in litigious environments may be better supported by laws that are supported by precedents (in the area of government contracting and regulation).<sup>70</sup>

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70. Such choices should also be informed by (1) the complementarities between the essential aeronautical and commercial services (such as retail, car parking, etc.) at airports, the high margins of the latter, and the consequent incentives for managers to seek commercial revenue-generating passenger volumes by reducing charges for the essential services; and (2) the countervailing market power of powerful airline corporations, which depends not only on their negotiating power, but also on having viable airport alternatives. The likelihood of this diminishes with greater hub-and-spoke operations.

## Box 8.2

### Case Study Focus 8: Institutional And Regulatory Reform

#### Cameroon:

Approval by the transport ministry was replaced, six years after the commencement of the concession, by a surveillance role vested with the country's civil aviation authority.

#### South Africa:

On airports, a regulatory committee of the Ministry of Transport was established to carry out economic regulation.

On ANS, Air Traffic and Navigation Services Ltd. (ATNS) was initially subject only to the general provisions of competition and monopoly legislation, that is, a threat to investigate it if it was accused of exploiting its market power. Since 2001, ATNS has been subject to explicit incentive regulation by the transport ministry.

#### United Kingdom:

The Civil Aviation Authority (CAA) is responsible for price regulation and the periodic review process, with objectives set out in statute. The CAA's recommendations are required to be assessed by the Competition Commission (in contrast to other U.K. privatizations for which the commission acts as an appeal body). Other British Airports Authority plc (BAA) airports do not have economic regulation, albeit with a threat to regulate should BAA be found to be exploiting its position.

The CAA also regulates the price cap for National Air Traffic Services Holding Ltd. (NATS). NATS has recourse to the Competition Commission if it does not agree with the limits imposed by the CAA.

#### Greece:

Greece does not appear to have established an independent regulatory agency. Rather, a price cap is specified as part of the contract, which is monitored and enforced by government.

#### Thailand:

The Civil Aviation Board sets maximum charges at airports in detail, that is, for landing, parking, passenger charges, and so on. Airports of Thailand (AOT) can revise the tariff subject to those maxima. If AOT wishes to exceed those maxima, it must apply to the board.

*continued*

## Case Study Focus 8: Institutional And Regulatory Reform (continued)

### Argentina:

The government established the Organismo Regulador del Sistema Nacional de Aeropuertos (Regulatory Agency of the National System of Airports, ORSNA) to take responsibility for economic and safety regulation. ORSNA is required to report jointly to the Ministry of Economy and Public Works and Services and the Secretariat of Transport. Economic regulation involved supervision of the concessionaire, access to airports and nondiscrimination, adequate airport capacity, supervision of airport investments (including the approval of master plans), air traffic development, and environmental compliance. ORSNA was also vested with control of the 25 airports that were not concessioned. ORSNA was incorporated into the budget of the Federal Aviation Administration (under the Ministry of Economy and Public Works and Services), with funding of 9 million pesos from an internal loan from financial institutions. In February 2002, full control of ORSNA was transferred to the (now renamed) Ministry of Economics and Production in the context of the financial crisis, the need to restrain spending, and the particular issues of the concession. In early 2003, however, the entire directorate resigned their posts, possibly arising from their bypass by the government in renegotiations with Aeropuertos Argentina 2000 (AA 2000). In April 2004, a report by the auditor general to the government found that ORSNA had failed to follow appropriate processes in approving works to be carried out by AA 2000, to properly assimilate information on investments, and to use appropriate legal processes when AA 2000 fell behind on payments. The lack of clarity of the role and independence of ORSNA vis-à-vis the government led to problems in renegotiations and a lack of credibility once they were in motion. Moreover, the direct involvement of the national executive in the renegotiation of concession terms, thereby bypassing regulatory structures, implied weak regulatory and legal systems for enforcing contracts and a lack of acceptance of the importance of regulation.

### Mexico:

The government has opted for board representation and approval of master and investment plans every five years, rather than the establishment of an independent regulatory agency.

### Canada:

The company's charges are subject to the approval of the minister of transport with periodic rebalancing through a rate stabilization fund.

*continued*

### **Case Study Focus 8: Institutional And Regulatory Reform (continued)**

#### **Australia:**

The Australian Competition and Consumer Commission's mandate was altered from one of price cap regulation (of a state-owned enterprise) to price monitoring (of a private company). The adoption of this more light-handed regulatory approach was largely in recognition of the high price paid by the winning bidder but also of the projected 20-year investment program of \$A 2 to 3 billion. It was asserted that such an approach would be more favorable in encouraging the efficient and economic development and operation of Sydney Airport. It was also asserted that this policy alteration recognized not only the incentive to attract passengers (that is, expand output) to maximize commercial income but also the need for a more cooperative approach to regulation.

#### **New Zealand:**

The government supervises the company in its capacity as shareholder and approves charges that are negotiated with customers.

*Source:* Booz Allen Hamilton.

### **Other Institutional Arrangements**

Contracts, including those set by independent regulatory agencies, still suffer the basic problems of observability and verifiability, which may render useless the incentive structures that they were designed to implement. This fact, combined with the absence of competitive conditions that bestow monopoly power on private sector participants in ATI, increases the importance of complementary measures to achieve the expected efficiency gains of privatization or commercialization. Economists and policy makers have focused attention on optimal regulatory frameworks, as outlined in section 8—Optimal Regulatory Contracts. Other institutional factors, however, can also play a role in improving the performance of the firm's management. (See Alexander and Mayer 1997 for a survey of these issues.) The two most important issues are bankruptcy procedures and the market for corporate control.<sup>71</sup>

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71. The principles outlined are largely applicable to private firms. They apply equally to state-owned firms. The institutional measures, however, are, in this case, substituted with the threat of direct government (as shareholder) intervention (akin to the direct shareholder intervention described in section 8—Other Institutional Arrangements) to replace the firm's existing management.



Debt imposes a hard budget constraint on managers by presenting a simple choice: (1) reduce slack (including cutting back on empire building and perquisites) or (2) face bankruptcy. With bankruptcy threatening job losses, managers likely will choose the first option. For the threat of bankruptcy to be credible, bankruptcy procedures that involve a loss of power for management (which ensures the right incentives to avoid bankruptcy) are required. It is important, however, to note the interaction, on the one hand, between the risk of bankruptcy and the regulatory regime (as outlined in the previous section) and, on the other, between the risk of bankruptcy and the legal system, which often prevents infrastructure companies from going bankrupt (as in France, for example).

If shareholders are not satisfied that the company's management is delivering efficiency, they will be inclined to sell their shares (usually at a premium) to shareholders who feel they can achieve efficiency. This provides the incentive for management to work harder to prevent the job losses that accompany hostile takeovers. The structure of the transaction driving the introduction of private sector participation can impede the market for corporate control by, for example, restricting maximum shareholder levels (a feature, for example, of utility privatizations in the United Kingdom and of the privatization of Copenhagen airport). Competition law, legal measures to protect incumbent shareholders, and country-specific controls on takeovers can inhibit the effectiveness of the market for corporate control in achieving efficiency.

Other institutional challenges in establishing optimal economic regulation include regulatory commitment.<sup>72</sup> In other words, regulators need to be strong enough to resist pressures, either from government, the media, or the firm itself, to change regulated prices after they have been determined. Governments need to clearly define the role of and relationship with regulators in statute to ensure independence and accountability (Hendriks and Andrew 2004). Another challenge is regulatory discretion. Flexibility may be desirable because of the difficulty in accurately forecasting demand and costs when regulated prices are established. Discretion, however, can dilute the incentives for cost minimization and optimal investment, thereby sacrificing the long-term efficiency of the firm.<sup>73</sup>

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72. In the presence of economic regulation, the regulator determines the allocation of residual income rights, which has the effect of transferring responsibility for commitment to refrain from ad hoc ex post expropriations to the regulator.

73. Alexander and Harris (2005) provide an important survey of the regulation of investment in utilities (including airports).

## Optimal Regulatory Contracts

Regulatory contracts have become more popular as tools to ensure correct management incentives (of both public and private firms) and optimal allocations of risk. The objective of regulation should be to promote economic efficiency, involving efficient and correct levels of investment, production at minimum cost, the provision of services at a level of quality that users are willing to pay for, and pricing structures that ration capacity efficiently where it is in short supply, or that enable cost recovery with minimum welfare loss. This amounts to encouraging the provision of adequate facilities and services to facilitate competition in the newly liberalized air transport environment and the development of complementary nonaeronautical services.

Different means to achieve these objectives can be distinguished by the degree to which they rely on incentives (Hendriks and Andrew 2004). This can be neatly expressed by equation 8.1:

$$P = k + \beta C \quad (8.1)$$

where  $P$  represents the maximum price allowed by the regulator,  $k$  represents a level of costs that is independent of the firm's actual costs,  $C$  represents the firm's actual costs, and  $\beta$  is the cost pass-through coefficient (which is bounded by the condition  $0 \leq \beta \leq 1$ ). Cost-plus regulatory models (under which all the firm's costs are remunerated at some stage) are represented by the cases  $\beta = 1$  and  $k = 0$ . High-powered pure incentive regulation (where the regulatory agency sets prices according to its own estimate of the firm's costs  $k$  is represented by the case  $\beta = 0$ . A continuum of options exists for  $0 < \beta < 1$ , where the process of determining  $k$  and  $\beta$  can be thought of as involving the optimization of a social welfare function.

Cost-plus regulation is commonly known as rate-of-return regulation because it guarantees a fair return on investment for the firm. This guarantee has the advantage of protecting the firm's investment, but it is not likely to encourage efficiency, and usually is accompanied by inefficient operations and gold plating. Hendriks and Andrew (2004) equate high-powered incentive regulation with a greater focus on outputs, the idea being that the regulated firm should be able to produce the same amount of output as the "most efficient" firm in the industry for the same cost. Although the firm faces maximum incentives to reduce costs, the fact that the firm's own costs are not considered means that, on the one hand, if the firm cannot meet the projected efficiencies and gets into financial difficulty, the risk of bankruptcy is high, and, on the other, if the predicted efficiencies are not challenging enough, the risk is high that the firm will

earn abnormal returns. With security of supply and regulatory credibility at stake, regulators have tended to shy away from pure high-powered incentive regimes.

The generally accepted compromise (involving  $0 < \beta < 1$  and  $k > 0$ ) has taken the form of retail price index (RPI)-X regulation, for which a key objective is to incentivize the firm to reveal its true costs by allowing the firm to keep cost savings and efficiency gains in excess of the gains reasonably predicted by the regulator. Although the incentives for cost minimization are reduced, so too are the risks of bankruptcy and excess returns. Under RPI-X price caps, the regulated maximum price is set in advance and must fall in real terms by X percent per year,<sup>74</sup> where the magnitude of X depends on how the regulator assesses the trade-offs under its objectives, given the cost and demand climate (Hendriks and Andrew 2004).

Section 5—Objectives of PSP Policies concluded that, in most countries, the principal objective in introducing PSP has been to facilitate investment by removing public sector financial constraints. Consequently, the regulator's primary concern is likely to be providing incentives for investment in required capacity or quality. In this case, the X factor is likely to assume lower positive values (lower annual price reductions) or a negative value (annual price increases). Some ATI is of greater social or infrastructural value to a country's economy than its direct commercial contribution, in which case the regulatory mechanism needs to be flexible enough to facilitate and promote investment in socially desirable infrastructure at the socially desirable level of quality. Likewise, average cost typically rises substantially following major investment, so regulation needs to ensure that it does not exclude commercially and socially valuable investments by sustaining prices that are too low.

If cost reduction is the regulator's main priority or if the regulator simply believes that the firm can achieve significant cost reductions in the next price control period (usually five years), X is likely to take on a high positive value, resulting in a demanding price cap on the firm. In such cases, however, regulators need to ensure that firms are not tempted to cut quality to achieve the demanding cost reductions, which requires complementary quality regulation.

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74. The nominal reduction is RPI-X, where RPI represents inflation, or the yearly increase in the general level of prices.

The effectiveness of incentives under RPI-X regulation usually depends on a combination of (1) the objectives of the regulated firm, (2) the credibility and duration of the control period, and (3) the sharing of risks inherent in the price cap. On the first, publicly owned corporatized companies may have less incentive to maximize profit and, therefore, efficiency because of the absence of shareholder discipline on managers—that is, the option of falling back on government as a (perceived, at least) higher authority than the regulator, and the fact that managers are more likely to be interested in empire building and consequent overinvestment.<sup>75</sup> On the second, a regulator that frequently resets the price cap within the control period is likely to dilute the incentives for cost minimization. If the regulator adopts an ex post policy that does not allow investments to be included in the calculation of prices, the firm will perceive an opportunity to argue for greater pass-through costs, as well as the incentives for optimal investment. On the third, if the firm is protected from, for example, demand risk through triggered adjustments in or promises to reopen the price cap, the incentives on the firm are likewise diluted.<sup>76</sup>

The decision of whether to introduce or retain regulation should be informed, of course, by an assessment of the social costs and benefits, including ongoing regulatory impact assessments, and the inclusion of sunset provisions when regulation is no longer required. Likewise, regulation should be introduced and sustained only where market power and a strong likelihood of its abuse exist. Market power assessments, therefore, should form a crucial part of the cost-benefit assessments of regulation.

Another significant regulatory challenge involves finding the optimal level of involvement to determine quality standards. In that context, the following characteristics of aviation quality are important: (1) ATI is jointly produced along the value chain by ANSPs, airports, airlines, and ground handlers; (2) different airlines require different service levels and quality; and (3) airports have the incentive to provide sufficient space and time for passengers to spend more time in retail outlets, which may be in excess of the optimal level required for the efficient delivery of air transport. Involvement in quality standard-setting may require undesirable interference in investment decisions, in ensuring adequate consultation with airline customers, and in adequate appraisal of the investment option.

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75. Incentive regulation of publicly owned companies is unusual but not unknown; for example, in the cases of Dublin and Manchester Airports. In the case of Dublin, the problem of regulating such companies was, arguably, manifested by a costly legal challenge to the regulator's determination of maximum airport charges.

76. Methods to overcome issues include rolling incentive mechanisms, which help preserve the power of incentives in the price cap, and clearly articulate policies on the treatment of new investment through the regulatory asset base and depreciation.

**Case Study Focus 9: Regulatory Contracts****Cameroon:**

The cost-plus approval of airport charges by the transport ministry and the subsequent surveillance role vested with the country's civil aviation authority have proven ineffective in providing incentives for Aéroports de Cameroun (ADC) ownership and management to perform. Moreover, given monopolistic provision by Cameroon Airlines (CAMAIR) and the fact that charges appear not to have reflected the level of service being provided, the terms under which ground-handling services were provided at the Cameroon airports may have warranted regulatory attention.

**South Africa:**

Prices are regulated at RPI-X with a five-year periodic review. Regulation commenced in 2001 and X was set for the period January 2002 to May 2006, which provided for price increases to increase the rate of return to take account of the increased income needed to pay the financing costs of investment. Airports Company of South Africa (ACSA) has applied for additional price increases to pay for enhancements required for the 2010 football World Cup. Airport charges are high by international standards. The trade association representing airlines in South Africa filed a complaint to the competition authorities about the charges in 2002, but nothing resulted.

Since 2001, Air Traffic Navigation Services Ltd. (ATNS) has been subject to explicit CPI-X regulation, with charges reset each five years, with a target real rate of return of 8 percent. Charges reduced rapidly from the 2001 level with three years of X at -5 percent to -6 percent. Charges rebounded in the following two years. Charges are very low by international standards. In recent years, the government has sought to reassure airline customers and give them some degree of certainty over charges through a CPI-X price control. The effect of swings in investment, however, and traffic variations on a system with high fixed costs, has resulted in large and fluctuating values of X, so charges have not had the stability that this system might be expected to produce. The Canadian system, with financial reserves, has been more successful in this regard. This type of system can result in a financial crisis if the air transport market experiences a downturn (as the experience of National Air Transport Services Holding Ltd. [NATS] in the United Kingdom shows). ATNS was fortunate that the 2001 air transport crisis was not as severe in South Africa as it was in other parts of the world. ATNS had its own crisis

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### **Case Study Focus 9: Regulatory Contracts (continued)**

when its costs expanded out of control in 2004. Following earlier reductions, charges have been allowed to increase substantially, but in the context of charges that are very low by international standards.

#### **United Kingdom:**

British Airports Authority plc (BAA) is subject to RPI-X single-till regulation on its three London airports. Price caps are subject to five-year periodic reviews. At privatization, BAA was in effect (albeit not explicitly) required to invest in the expansion of Stansted Airport, which was funded by a cross-subsidy, even though it would not become profitable for many years. If BAA had not carried out this investment, it would have risked an unfavorable review of its charges. Profitability was seen as high in the early years, partly because regulation was not as strict as consultants had recommended. Consequently, heavy price cuts were applied at the first review. Airport charges at Heathrow and Gatwick generally have fallen (after deducting inflation) substantially since privatization. Substantial cuts in charges were made during the second five-year period after privatization, as the regulator observed the effects of economies of scale and increasing commercial revenues, and imposed stricter efficiency targets and a lower cost of capital. As a result, Heathrow and Gatwick charges are now low by international standards. Excess demand for the use of Heathrow and Gatwick is substantial, because the airports cannot meet all applications for landings at those prices, and the airports run at or close to capacity all day. These below-market prices for scarce capacity are a potential impediment to the economic viability of alternative airports. For the first 15 years, regulation provided for cross-subsidy among the three London airports, but now that Stansted is profitable in its own right, this cross-subsidy no longer applies. Service quality was perceived to have fallen in the years following privatization, in the absence of any formal system for measuring or enforcing it. In particular, aircraft delays increased, terminals became crowded, and check-in times increased. Noncritical facilities such as moving walkways and escalators were frequently out of operation. This situation was alleviated following the introduction of a formal quality measurement and incentivization regime. All U.K. privatizations with weak quality control eventually have had to bring in quality regulation because the company has an incentive to cut quality—for example, in BAA's case, to squeeze as much through its airport as possible and leave noncritical assets (escalators,

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### Case Study Focus 9: Regulatory Contracts (continued)

etc.) out of service. The ground-handling companies are a major contributor to quality of service at airports, so the fact that they were competitive probably protected quality to a degree and allowed regulators to ignore quality for much longer than other privatizations for which quality control had to be retrofitted.

Price cap regulation of NATS was intended to provide incentives to reduce costs and delays, including penalties for not meeting performance targets and bonuses for exceeding them. Price caps were to be determined every five years and, during control period 1 (CP1, spanning the date of commencement of the PPP till the end of 2005), the CAA imposed a requirement for prices to fall in nominal terms by RPI-4 percent (4 percent real) in 2003 and 2004, and by RPI-5 percent (5 percent real) during 2005. A major relaxation of the regulatory regime by the CAA formed a key part of the Composite Solution. This included lower required annual price reductions of RPI-2 percent (2 percent real), based on a central traffic scenario and traffic risk-sharing arrangements. As a result, price increases would be higher than implied by RPI-2 if traffic were lower than foreseen by the central traffic scenario, and the regulatory asset base would increase by 12 percent (the asset value on which NATS was allowed to earn a return). As well as the requirement for a 15 percent real reduction in charges during control period 2 (CP2), if traffic forecasts are realized, some of the more detailed features of the price cap regime have been amended as follows: (1) a greater weighting on early morning delays in the penalty and bonus system for delay performance, to provide incentives for the company to work harder to reduce delays at this key time; (2) a reallocation of demand risk by granting a fixed revenue allowance equal to 50 percent of costs and allowing an uplift in the variable element should demand be less than forecast by a certain proportion; (3) account of the fact that distance is a better indicator of ATCO workload than service units (the composite function of aircraft weight and distance traveled used for charging purposes) and that aircraft weights are largely irrelevant to ANS costs; and (4) extension of price control to London Terminal Approach charges.

#### Greece:

A price cap based on an allowed return on equity is included in the concession. In practice, prices initially have been set well below the cap for commercial reasons. Although the airport is subject to regulation on a dual-till basis, it

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### **Case Study Focus 9: Regulatory Contracts (continued)**

seems more likely that it is actually single till. Dual till should mean that the price cap is set with regard to the rate of return on aeronautical assets (only in relation to the profits from aeronautical revenues). This requires an allocation of the assets and revenues of the airport between aeronautical and commercial. It does not appear that financial results are reported in this way. In a single till, it is common for the prices of commercial services not to be capped; however, in setting the price cap, the entire revenues of the airport and entire assets are taken into account. This is precisely the single-till method but is commonly described incorrectly as dual till. This likely is the case here.

#### **Thailand:**

Apparently, no explicit time limit has been set on maximum airport charges, nor is there any inflation indexing. Inflation is sufficiently high in Thailand that this presents no opportunity for profiteering. The grounds upon which the Civil Aviation Board might approve a price increase are not clear. Regulation is intrusive and lacks transparency. This is acceptable to private shareholders only because the government is the major shareholder and does not wish to see Airports of Thailand fail, as it is essential to support the economy of the country and its ongoing rapid growth.

#### **Argentina:**

Changes in airport charges were to be subjected to a cap, which was to be reviewed every three to five years. In practice, this turned out to be a weak form of incentive regulation. Charges for baggage handling, rents, and other nonaeronautical items are not regulated. Aeropuertos Argentina 2000 questioned and objected to every regulatory decision. A regulation was issued in July 2001 requiring both the concessionaire and the state to respect Organismo Regulador del Sistema Nacional de Aeropuertos (ORS-NA's) tariff rulings.

#### **Mexico:**

Dual-till regulation with reviews every five years, taking into account the rate of return. Booz Allen Hamilton believes this means that there is single-till regulation with unregulated prices for nonaeronautical services. Ground-handling services and access services are included in the regulated prices. Aeropuertos del Sureste de Mexico is not currently, or was not initially, pricing up to the maximum allowed yield. The price regulation and investment master plan was reviewed in 2003, and a similar level of investment is intended for the second five years.

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### **Case Study Focus 9: Regulatory Contracts (continued)**

#### **Australia:**

The regulator allowed the company to move to a dual-till basis, which, in turn, enabled a 100 percent price increase of aeronautical services. The regulator's role has become one of mediation in airport and airline price negotiations. In the course of those negotiations, however, the outcome under the hypothetical situation of continued price cap regulation was calibrated. The Southern Cross Airports Corporation Holding Ltd. (SCACHL) 2005 Annual Report refers to a new long-term pricing agreement with the Board of Airline Representatives, which subsequently has been revised downward to give 2.15 percent annual increases. The airport, however, was found to have abused its market power in changing from aircraft weight-based charging to passenger-based charging by unduly favoring full-service carriers at the expense of low-cost carriers. Nonetheless, the airport and airlines appear to be working well in negotiating prices, in the knowledge that they have recourse to the regulator as mediator and to the courts as final arbiter.

*Source:* Booz Allen Hamilton.

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## PERFORMANCE ASSESSMENTS, DIAGNOSTIC TOOL FOR POLICY MAKING, AND SUMMARY OF KEY MESSAGES

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This part covers the following:

- Performance assessment of private sector participation (PSP) focusing on the case studies (section 9)
- Diagnostic tool for early decision making focusing on selecting the appropriate form of PSP (section 10)
- The summary of key messages emanating from the paper (section 11)



## 9.

# PERFORMANCE ASSESSMENTS

### Introduction

This chapter outlines the main features of 14 PSP case studies, compiled and analyzed by Booz Allen Hamilton, from the following locations:

- Cameroon
- South Africa (airports and air navigation services [ANS])
- United Kingdom (British Airports Authority plc [BAA] and National Air Traffic Services Holdings Ltd. [NATS])
- Greece (Athens)
- China (Shanghai)
- Thailand
- Laos (Vientiane)
- Australia (Sydney)
- New Zealand
- Argentina
- Mexico
- Canada

These case studies represent a variety of PSP types, including three that could be characterized as corporatization, management contracts, and leases; three airport concessions; one greenfield airport concession; six trade sales and partial divestitures; and one stock market flotation. The case studies also include several different types and sizes of airports and ANS.

Basic information on each case study, detailing each country's per capita gross domestic product (GDP), the number of passengers (pax) per airport

or number of the air traffic movements (ATM), type of PSP, the vehicle used to implement PSP, management arrangements, and sources of finance, is provided in table 9.1.

**Table 9.1 Principal Features of the PSP Case Studies**

Country	GDP per Capita	Output (pax for airports or ATMs for ANS)	Type of PSP	Vehicle	Management	Finance
<b>Cameroon</b> (1993)	US\$934 (2001)	0.72 m (2002)	Concession (for a fee of US\$253,000)	Minority state-owned company (ADC)	Technical assistance agreement with majority shareholder (for a fixed fee); transferred to ASECNA <sup>a</sup> in 1999	100% French development agency debt
<b>South Africa</b> airports (1998)	US\$12,200 (2005)	13 m (2005 est.)	Strategic partnership through sale of 20% of shares for US\$172 million	Majority state-owned company (ACSA)	Appointed by government and minority private shareholder	Unclear, but likely includes private equity and government-guaranteed debt
<b>South Africa</b> ANS (1993)	US\$12,200 (2005)	0.583 m (2005)	Commercial company	State-owned company	Appointed by government	Government subsidies for first 2 years; investment largely funded through cash flow; some private debt
<b>U.K. (BAA)</b> (1986)	US\$34,400 (2005)	140 m (2004)	IPO (proceeds of approx. £1.3 billion)	Wholly private company (BAA)	Appointed by owners of BAA	100% private debt and equity
<b>U.K. (NATS)</b> (2001)	US\$34,400 (2005)	2.2 m (FY2004/05)	Partial divestiture (proceeds of £800 million for a 46% share)	Mixed ownership company (no majority) (NATS Holdings Ltd.)	Majority appointed by private shareholders; minority by government	100% private debt and equity
<b>Greece (Athens)</b> (1995)	US\$20,300 (2005)	13.7 m (2004)	Concession on BOOT basis	Joint venture company with majority government share (AIA)	9 board members; 4 appointed by government; 5 by private shareholders (including CEO) and 1 independent member	63% private (including 41% from EIB), 29% grant funding, and 7% government equity

Country	GDP per Capita	Output (pax for airports or ATMs for ANS)	Type of PSP	Vehicle	Management	Finance
<b>China (Shanghai)</b> (1998)	US\$7,600 (2006 PPP est.)	36 m (2004)	Partial divestiture of a subsidiary of an SOE; complex arrangements	Majority state-owned company (Shanghai International Airport Co., Ltd.)	Provided by state-owned Shanghai Airport Authority (majority shareholder of vehicle)	Mixture of government investment, private debt, and equity
<b>Thailand</b> (2004)	US\$8,300 (2005)	36.4 m (2004)	Partial divestiture (proceeds of approx. US\$100 million)	Majority state-owned company (AOT)	Appointed by government and, presumably, minority private shareholders	70% debt finance for new Bangkok airport from Japan Bank for International Cooperation; 30% government investment
<b>Lao PDR (Vientiane)</b> (1998)	US\$350 (2004)	0.4 m max (2006)	Partial divestiture	Majority state-owned company (LAA)	Provided by minority private consortium	100% donations assembled by Asia Development Bank
<b>Australia (Sydney)</b> (2002)	US\$32,200 (2005)	28.3 m (2005)	Long-term (97-year) lease (for \$A 4.233 billion)	Wholly private company (SCACHL)	Appointed by owners of SCACHL ("step-in" retained by government)	100% private debt and equity
<b>New Zealand</b> (1987)	US\$24,800 ('05)	1 m (2005)	Commercial company	State-owned company	Appointed by government	100% private debt
<b>Argentina</b> (1998)	US\$3,835 (2005) (PPP US\$12,000)	15.6 m (2004) (5 largest airports; largest airport accounts for 90 percent)	Concession for all airports in Argentina (for an annual fee of US\$171.1 million) (replaced by 15% tax on revenues in 2006)	Wholly private company (AA 2000)	Board appointed by owners of AA 2000; operations by Aeroporti di Milano (previously Ogdén)	100% private debt and equity (since 2006, 15% tax on revenues to be used to fund investment)
<b>Mexico</b> (1999–2005)	US\$10,500 (2005)	18 m (2003 est.)	Concession (for 5% of annual revenues)	Wholly private company (ASUR)	Provided by owners of ASUR	100% private debt and equity

Country	GDP per Capita	Output (pax for airports or ATMs for ANS)	Type of PSP	Vehicle	Management	Finance
Canada (1996)	US\$34,000 (2005)	5 m (2005 est.)	Nonprofit independent company (Can\$1.5 billion paid to government for assets with a NBV of Can\$2.6 billion)	State-owned company (NavCanada)	Appointed by government and representing government, unions, and the air transport industry	100% private debt; no share capital or dividend

Source: Booz Allen Hamilton.

Note: AA 2000 = Aeropuertos Argentina 2000; ADC = Aéroports de Cameroun; ACSA = Airports Company of South Africa; AIA = Athens International Airport; ANS = air navigation services; AOT = Airports of Thailand; ASECNA = Aerial Navigation in Africa; ASUR = Aeropuertos del Sureste de Mexico; ATM = air traffic movement; BAA = British Airports Authority plc; BOOT = build-own-operate-transfer; CEO = chief executive officer; EIB = European Investment Bank; GDP = gross domestic product; IPO = initial public offering; ; NATS = National Air Traffic Services Holdings Ltd.; NBV = Net book value; PPP = public-private partnerships; PSP = private sector participation; SCACHL = Southern Cross Airports Corporation Holding Ltd.; SOE = state-owned enterprise.

a. Agency for the Safety of Aerial Navigation in Africa. A 16-nation (former French colonial) corporation responsible for ANS, airport, fire and rescue, and aviation safety regulation in Cameroon.

Table 9.2 offers an assessment of the performance of the different PSPs, considering levels of investment, output, prices, financial performance, operating efficiency and cost, service level, and quality. These performance indicators are considered in the light of what is known about institutional strength in these countries and wider experience of what has worked and not worked in other countries. This case study evidence is used to develop a diagnostic tool that can inform policy makers on appropriate forms of PSP for a given market size and level of development.

The case studies are the basis for 40 lessons learned (see appendix II), which detail lessons on motivation, vision, and objectives; reform processes; types of PSP and ownership; policy sustainability; project finance and risk allocation: management incentives; market structure; regulatory and institutional reform; and optimal regulatory contracts.

In the airport cases analyzed, PPPs involving the award of concessions to mixed-ownership companies (in the cases of Argentina, Cameroon, and Mexico) and partial divestitures and strategic partnerships (in the cases of China, Greece, Laos PDR, South Africa, and Thailand) are the dominant policy of choice. Only two case studies provided examples of full privatization (BAA, United Kingdom through an initial public offering [IPO], and Sydney Airport through a trade sale and long-term lease) and no cases studies provided examples of confinement of the private sector's role to management and operations.

In the ANS cases analyzed, the United Kingdom is the only country to have introduced profit-maximizing PSP, while Canada has established a nonprofit private independent company involving government representation on the board. In New Zealand and South Africa, policy involved a more commercial focus through commercialization and corporatization by converting government agencies to state-owned enterprises (SOEs). Table 9.1 summarizes the principal features of these case studies.



**Table 9.2 Summary Performance Assessments of the Case Study Models**

Country	Investment	Output	Prices	Financial	Operating Efficiency	Service Level and Quality
<b>Cameroon</b>	Poor; basic rehabilitation and improvement required; agreed finance not forthcoming	Poor; little or no growth by domestic monopoly carrier; airports dependent on loss-making airline; tourism not supported	Poor; high at US\$18 per embarking passenger; equivalent tax levied by finance ministry despite no subsidies; ineffective regulation	Poor; retained losses of US\$3.6 million recorded in 2000 despite revenue growth; disputes over accounting methods	Poor; excessive cost of running old and oversized facilities; 20% cost reductions since revised management arrangements despite increased employee numbers	Poor; cost of air conditioning a major factor; inadequate asset and equipment maintenance
<b>South Africa airports</b>	Good; urgent essential investments were being undertaken immediately prior to PSP; since PSP, investment has proceeded well within the financial capacity of the company; additional resources will be required ahead of the 2010 World Cup	Strong; 9% annual growth in domestic passengers; 5.5% annual growth in international passengers	Poor; airport charges are high by international standards; complaints of anticompetitive conduct by South African airline trade association	Good; strong revenue growth driven by increases in airport charges; modest increases in operating profit but exceeds investment needs; long-term debt represents less than a single year's investment needs	Stable; operating costs have been contained; no increase in employees; passengers per employee in line with overall growth; international benchmarks suggest a relatively efficient operator of airports in their class	No evidence; complaints of anticompetitive conduct suggest poor performance; however, if investment is optimal, this would be surprising
<b>South Africa ANS</b>	Good; a steady flow of investment, largely funded from cash flows, including replacements of outdated systems and enhanced runway capacity to support greater traffic while reducing delays; ambitious plans for capacity expansion ahead of World Cup	Good; modest increases in flights handled despite a doubling of passengers; 2.5–3.5% annual growth expected until 2016/17	Good; charges very low by international standards; effective incentive regulation through price caps; falling prices since 2001 because of 5–6% required real reductions per year over 3 years; charges have increased in 2005 and 2006 with a relaxation of the price cap	Good; modest income growth up to 2003, which has increased with price cap relaxation; investment mostly funded through cash flows; modest debts; 2005 returns in excess of regulatory calculations; successful commercial income-generating activities	Poor; large spike in 2004 costs because of the need to correct salaries to discourage emigration of ATCOs for better terms and the need to increase employee numbers; cutbacks achieved in 2005	Good; attributable delays have fallen, despite a temporary spike in 2003 on foot of increased traffic for Cricket World Cup; average attributable delay per flight was 27 seconds in FY 2004/05; steady decrease in ANS safety-related incidents

Country	Investment	Output	Prices	Financial	Operating Efficiency	Service Level and Quality
<b>U.K. (BAA)</b>	Strong; several new terminals (including T5), a high-speed rail link, many developments and pier capacity expansions	Strong, despite dwindling market share because of competition and constrained expansion in London	Good; substantial nominal reductions since privatization because of strong regulation and performance improvements; some cross-subsidization in the past; charges inefficiently low given scarce capacity	Strong; revenues have doubled since privatization; strong returns on assets and equity	Good; substantial real cost reductions since privatization; increasing with congestion and spatially wide expansions	Good; deteriorated initially but has improved since introduction of formal quality regulation
<b>U.K. (NATS)</b>	Good; investments initially stalled by revenue shock caused by the 9/11 attacks; 2005–06 business plan projects £1 billion investment over the next decade	Good; 4.8% growth in the number of flights handled in FY 2004/05; expected to rise by another 36% by 2013	Good; despite the crisis, charges appear to have fallen in real terms since PSP, outstripping other comparable European ANSPs, whose charges have increased; for example, Germany's DFS	Good; 7% revenue growth in FY 2004/05; 20% growth since FY 2002/03; pretax losses of £80 million in FY 2001/02 have been converted into pretax profits of £69 million in FY 2004/05	Good; 11% operating expense reductions between 2002 and 2005; commitment to reduce further as part of the Composite Solution; planned reductions of £106 million during the period 2006–11	Strong; average delay per flight (attributable to NATS) has fallen from 2.2 mins in FY 2002/03 to 0.3 mins in FY 2004/05; a relatively small proportion of the total average delay per flight of 17.1 mins; safety incidents have fallen since 2001
<b>Greece (Athens)</b>	Good; greenfield development with leadership by reputable private sector airport company (HOCHTIEF); master plan to deliver 50 million passengers agreed	Strong; 12% passenger growth and 45% cargo growth since 2001	Stable; price increases since 2001 but midrange in European terms	Strong; 44% increase in revenues between 2001 and 2004; 32% aero. revenue and 100% nonaero. revenue increases; 35% EBIT margin in '04	Stable; operating expenses increase since 2001, but 2004 may be distorted by additional expenses incurred on Olympic Games	Good; passenger satisfaction surveys indicate a high European rating; airlines have benefited from modernization with more slots and less congestion

Country	Investment	Output	Prices	Financial	Operating Efficiency	Service Level and Quality
<b>China (Shanghai)</b>	Good; Pudong Airport a greenfield development with 20 million passengers per year capacity; expansion planned	Good; 14.5% passenger growth in 2005; nearly 0.4 million ATMs and 2.2 million tons of cargo; ranked 8th in the world for cargo throughput; set to continue with strong Chinese economic growth	Stable; airport charges have been reduced by 20% for foreign airlines, increased by 70% for domestic airlines flying international, and by 15% for domestic airlines flying domestic routes	Good; net profit recorded in 2004	No evidence	No evidence but likely to be high given new international airport, adequate capacity, and planned expansion
<b>Thailand</b>	Stable; Suvarnabhumi (Bangkok) is a greenfield development that opened in September 2006, about 3 months late; several early difficulties, including congestion, breakdowns, and safety issues; major investments in Chiang Mai and Phuket also	Good; passenger throughput was stationary from 2000 to 2003; 20% growth in 2004; Bangkok is a major hub but is losing market share to airports in Singapore and Hong Kong; diversion of flights for repairs and reopening of Dom Muang (formerly Bangkok) airport unlikely to have helped the situation	Stable; no direct evidence but revenue per passenger has remained stationary, suggesting that airport charges have not increased	Good; revenue growth in line with passenger numbers during 2000-04; slow growth in gross profits because of increased operating expenses per passenger; net profits halved by servicing of US\$1.2 billion debt; share price increase driven by cost containment and manageable debt position	Stable; despite increases in operating expenses per passenger and employee numbers, management is generally believed to have contained costs and managed the debt position well	Stable; problems with newly opened Suvarnabhumi, including congestion, breakdowns, and safety issues because of cracks appearing in the runway
<b>Lao PDR (Vientiane)</b>	Good; new passenger terminal and ATC tower, renovation and extension of runway to handle wide-bodies completed in 2 years for US\$15 million	Poor; little or no domestic demand because of poverty; air travel driven by modest incoming tourism; potential to be low-cost location for manufacturing	No evidence	No evidence	No evidence	No evidence; but likely to be good given excess capacity

Country	Investment	Output	Prices	Financial	Operating Efficiency	Service Level and Quality
<b>Australia (Sydney)</b>	Good; 20-year master plan agreed; investment program of US\$ 1.5 billion; recent investments in baggage screening and A380 facilities	Strong; 19% passenger growth, 12.5% ATM cargo growth since 2002; 10% GA share of ATMs; aim of 68 million passengers by 2024	Stable; 100% increase in aeronautical charges because of more light-handed regulation; effective negotiation of long-term pricing agreements; potential market power abuses	Strong; 43% aero. revenue, 30% nonaero. revenue, and 31.6% EBITDA growth since 2002	Good; 8.5% operating expenses and 23% operating expenses per passenger reductions since 2002; reduced employee numbers	Good; given successfully negotiated high price increases; a high-specification airport, but service quality may require monitoring with such high price increases
<b>New Zealand</b>	Good; key investments in the modernization of ANS systems have taken place; closures and disinvestment at minor aerodromes have been a concern	Stable; a 1.5% decline in commercial flights handled since 2000, but on a strong base	Good; following initial adjustment on foot of the introduction of commercial charging, they have increased at less than the rate of inflation; incorporate cross-subsidy to smaller aircraft; user consultation supports this principle, but it may restrict competition in nonmonopoly services	Good; company made a profit in its first year of commercialization and has since made a profit in most years, barring modest losses around 2001 (driven by bad debts of bankrupt airlines); reports a return on equity and pays a modest dividend to government as shareholder; finance of investment largely through retained earnings has resulted in relatively low levels of debt	Good; the company has rationalized its number of locations from 4 to 1 at a lower cost than expected; as a result, the company had 40% fewer employees in 2000 than at the time of vesting, increased by 15% by 2005 but still 35% lower than in 1987	Good; no complaints at major aerodromes; adequate capacity for the size of the country's aviation market; service has been removed from least profitable aerodromes and, although it does not have a monopoly, alternative providers do not exist

Country	Investment	Output	Prices	Financial	Operating Efficiency	Service Level and Quality
<b>Argentina</b>	Poor; first master plan did not meet requirements of concession contract; investment levels hit by economic crisis and difficulty collecting airport charges from the dominant domestic airline; basic rehabilitation and improvement required	Poor; Buenos Aires unattractive for hubbing because of separate domestic and international airports; unstable airline market posteconomic crisis; Aerolíneas Argentinas suffered severe financial difficulties up to 2004	High by international standards at US\$30 per passenger; driven by high allowed rates of return and unsustainable concession fees; ineffective regulation	Poor; failure to pay concession fees and denomination in U.S. dollars while airport charges denominated in the significantly devalued peso has resulted in mounting debts; falling traffic levels leading to falling revenues; several regional airports proved to be liabilities	Poor; high costs because of restrictions preventing the closure of unprofitable regional airports	Poor; high airport charges disproportionate to the level and quality of service; lack of investment, despite this; Buenos Aires Ezeiza Airport achieved ISO 9002:1994 quality control certification, and other airports achieved ISO 9002:2000
<b>Mexico</b>	Good; investment agreed under terms of concession contract appears to have taken place; master plan agreed to for the next 5 years involving a similar level of investment	Good; 30% growth in passenger numbers in the first 5 years (in contrast to stagnation elsewhere in Mexico); driven by continued growth in international tourism to southeast Mexico	Stable; airport charges are on a rising trend from US\$11–13 per passenger; IATA has complained of monopolistic pricing; midrange by international standards	Good; revenue growth driven by increased throughput, increased airport charges, and strong growth in commercial revenues; net profits (after depreciation) have doubled	Stable; operating costs per WLU have not fallen; surprising given the expectation of addressing inherited inefficiencies by spreading costs over greater traffic; may be impediments to restructuring of the airports	No evidence; poor performance is, however, suggested by the fact that the private sector consortium has not exercised its option to increase its share of ownership by 5%, which was contingent on improved performance; also suggested by IATA complaints about airport charges

Country	Investment	Output	Prices	Financial	Operating Efficiency	Service Level and Quality
Canada	Good; before reform, noted for underinvestment owing to government cash limits; has invested Can\$1 billion since	Strong; 35% growth in number of flights handled between 2000 and 2008	Good; previously funded by a passenger tax; user charges reportedly lower; fell by 10% during 1999; substantial increases were required in 2003 and 2004, despite attempts to absorb the impact of 9/11 through its Rates Stabilization Fund; charges expected to fall post-2005	Good; 9/11 caused bad debts with the collapse of airlines and a deficit in the Rates Stabilization Fund; deficit peaked in 2003 but has been extinguished by price increases; company criticized for exposure to airline bad debts—even the restructured Air Canada escaped some of its liability; charge enforcement regimes have been tightened; despite limits on borrowing, has managed to retain sufficient headroom for stability and flexibility; low cost of capital and AA-rated debt	Good; claims to have reduced cost by Can\$100 million per year; employee numbers down 20%; cost per WLU down 15% in first 3 years, costs rose again during 2001 crisis; on a net basis, costs have remained below initial levels in real terms because of new revenue streams; a number of labor disputes over salaries; senior managers take modest salaries compared with commercial companies of a similar size	Good; before reform, noted for underinvestment and understaffing, which caused flight delays and safety incidents; has reduced delays and enhanced safety

Source: Booz Allen Hamilton.

Note: ANS = air navigation services; ANSP = air navigation service provider; ATC = air traffic control; ATCO = air traffic controller; ATM = air traffic movement; BAA = British Airports Authority plc.; EBITDA = earnings before interest, taxes, depreciation, and amortization.; IATA = International Air Transport Association; ISO = International Organization for Standardization; NATS = National Air Traffic Services Holdings Ltd.; PSP = private sector participation; WLU = work load units.

## **Performance Assessments**

Building on the information in table 9.1, the performance assessments summarized in table 9.2 assess the performance of different PSPs, considering levels of investment, output, prices, financial performance, operating efficiency and cost, service level, and quality.

For more comprehensive and current comparisons of data across airports, see the work of the Air Transport Research Society and the Transport Research Laboratory. The Air Transport Research Society has developed a comprehensive database that compares tariffs, traffic, revenues, and investment, as well as recent productivity gains in airports around the world and across different regions. The Transport Research Laboratory produces annual publications of airport (and airline) performance indicators and airport charges comparisons (see the bibliography).

## 10.

# DIAGNOSTIC TOOL FOR EARLY DECISION MAKING: SELECTING THE APPROPRIATE FORM OF PSP MODEL

Booz Allen Hamilton has developed a diagnostic tool to help policy makers identify the type(s) of PSP best suited to their ATI needs. Although the diagnostic tool is not intended to offer a definitive or singular course of action, it provides a first measure of PSP options available and some basis for comparison to other similarly situated airports. The tool is based on experience contained within the case studies as well as broader transactional experience.

The framework for the diagnostic tool is illustrated in figure 10.1. It covers a number of types of PSP as they apply to airports. ANS providers were not included in this analysis, as the body of evidence is not yet large enough to provide evidence of appropriate sizes and approaches. The approach is based on simple inputs:

- Amount of traffic (current and likely)
- Revenue (which incorporates effect of competition and consumer willingness to pay)
- Level of sophistication of institutions/prior experience with PSP

The framework uses weighted work load units (WLU) equivalent to one passenger or 100 kilograms of air freight per year. A weighting is used to characterize the specific situation of the airport under consideration based on two parameters: the amount of income received at the airport per WLU (Multiplier 2), and the sophistication of the local economy in dealing with infrastructure PSP in general (Multiplier 1). Multiplier 2 incorporates the

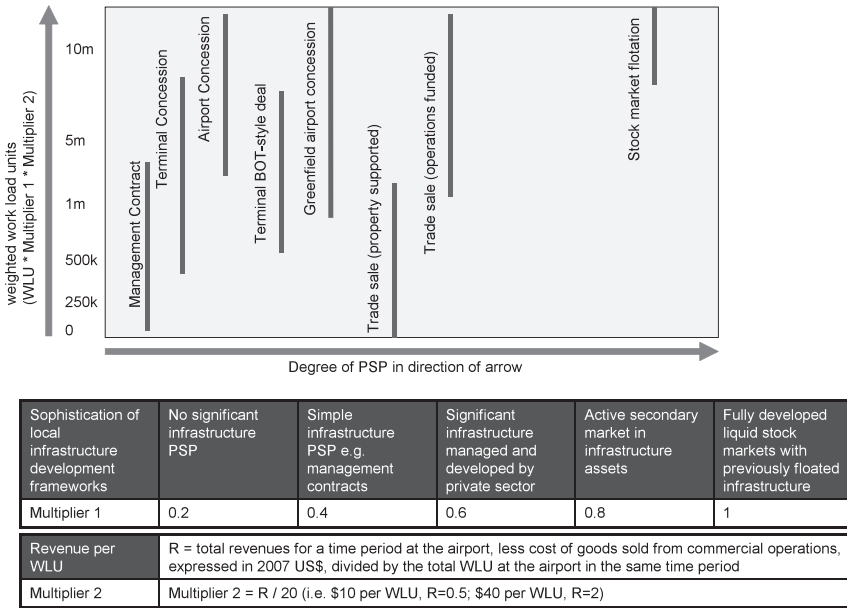


impact of airport and airline competition and willingness to pay and affordability. The weighted WLU = WLU x Multiplier 2 x Multiplier 1. The different types of PSP are then plotted on the chart with a range of weighted WLU values on the y-axis.

In Booz Allen Hamilton’s experience, each form of PSP is likely to be successful within the range of weighted WLUs set out by the individual bars. In many cases, the upper limit is not a hard limit, but enters a zone where other forms of PSP are likely to be more successful. The lower limit is more critical. Below the size indicated, after allowing for weighting, PSPs are likely to run into trouble through lack of scale and a low level of self-sustainability of the airport asset.

If measures of level of sophistication of the economy in dealing with PSP and average revenue per passenger are input, the diagnostic tool outputs a measure of the number of WLUs per year (required) for different forms of PSP to be viable under the assumptions. This incorporates demand for use of ATI and its facilities. Understanding likely demand for ATI services is therefore critical. Success likely depends on the ATI attracting a certain level of throughput with volume of demand measured in WLUs.

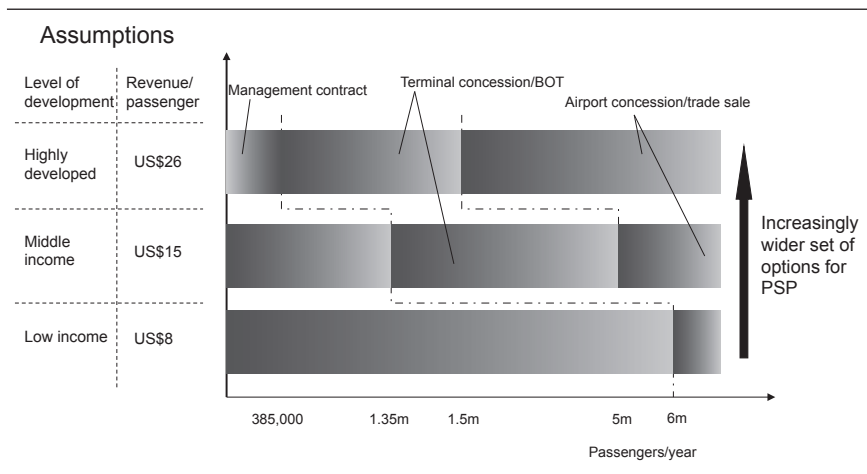
**Figure 10.1 Diagnostic Tool for Choosing the Appropriate Level of PSP**



Source: Booz Allen Hamilton.

In some cases, a successful PSP structure can be developed if additional property assets are granted to the private sector entity. These assets provide a level of stability over and above that driven by the asset performance alone. This is indicated by the “property supported” trade sale within this framework.

**Figure 10.2 Indicative Outputs of Diagnostic Tool**



Source: Based on outputs from diagnostic tool developed by Booz Allen Hamilton.

Alternatively, the tool can be used to determine the level of throughput that makes each level of PSP viable. Figure 10.2 shows that—for a set of assumptions on the left panel—as levels of institutional development and revenue per passenger increase, the threshold number of passengers at which more ambitious forms of PSP can be introduced decreases. A low-income country with low willingness to pay per passenger would require consistent demand of several million passengers per year before a sustainable transition could be made from a management contract to a concession contract. In contrast, in the most developed countries, the policy maker can transition to a limited concession for significantly fewer than half a million passengers a year. Most cases will fall between these two extremes.

The following are example outputs from the diagnostic tool, although it can be used for a host of different combinations of assumptions:

## Box 10.1

### Sample Outputs from Diagnostic Tool

Assume a **highly developed market** with **well-developed institutions**, a track record of PSP through successful stock market flotations, and an average revenue per passenger of US\$26. In these circumstances, as few as 385,000 passengers would be required to transition from a management contract or the like to a terminal concession or build-operate-transfer (BOT) or small-scale greenfield airport. More than 1.5 million passengers a year would be required to consider an airport concession or trade sale funded by operations.

Assume a **middle-income country** with moderately **well-developed institutions**. The country has experience with several management contracts and some experience with infrastructure developed by the private sector. Average revenue per passenger is US\$15. In these circumstances, more than 1.35 million passengers would be required to transition from a management contract or the like to a terminal concession or BOT or small-scale greenfield airport. More than 5 million passengers a year would be required to consider an airport concession or trade sale funded by operations.

Assume a **low-income country** with **limited institutions** with some simple infrastructure PSP present, such as management contracts. Average revenue per passenger is US\$8. About 6 million passengers per year would be required to shift from considering a simple management contract or trade sale supported by commercial property to a more ambitious form of PSP, such as a terminal concession or terminal BOT.

*Source:* Outputs from Booz Allen Hamilton diagnostic tool.

## 11.

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# SUMMARY OF KEY MESSAGES

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This final section of the report synthesizes the most important best practice guidelines for introducing PSP in ATI. These key messages are based on the outcomes of this report, the case studies in appendix 1, and the lessons learned in appendix II.

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### **Motivation, Vision, and Objectives**

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*ATI reforms should fully consider wider benefits of timely and efficient movement of people and freight, such as growth, development, and poverty alleviation.*

Therefore, a clear articulation of a vision for the sector is required when introducing PSP reform in ATI. While reducing the burden on the public sector is valuable, it is clear that such objectives should not target maximum income alone. The principal motivation for incorporating PSP into ATI should be to get things done—things that governments have either failed to do or are unable to do because of binding constraints. Governments must make a wide assessment of the implications of different objectives. Income from the PSP “deal” affects future prices, which then affect the development of air services and trade, investment, and tourism. Also relevant is the effect on future tax revenues, which can be higher if prices are higher and demand is relatively inelastic (as is the case for most ATI). In the case of an IPO, the government should balance the benefits of wider share ownership with other goals such as development and trade.

In most case study countries, the objectives centered on facilitating investment by removing public sector financial constraints, improving responsiveness to customers, and improving ATI provision by increasing efficiency.

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## Reform Processes

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*Having a process in place to attract the most appropriate bid for the circumstances is as important as attracting the highest possible offer.*

The quality of the process relies on consultation, transparency, robustness (through sound financial and technical analysis and advice), and competitive mechanisms for choosing PSP. Well-designed competitive bidding processes (supported by adequate financial and technical expertise in the assessment of bids) should be favored over direct closed negotiations. Competitive processes are more likely to deliver the incentives for bidders to reveal true and realistic valuations of the contract.

Guarding against vested interests and unrealistic bids is important. During the selection process, governments can introduce some level of independence from the policy makers who are framing the objectives of the reform effort. Decision makers should be willing to expend resources for quality advice while balancing these resources against the size of the deal and its likely impact.

Processes for attracting PSP and subsequent management and regulation should be appropriate to the realistic level of detail, reliability, and timeliness of available financial and operational data in the country.

The case studies analyzed for this report all appear to have kept the scale of the process in proportion to the scale of the transaction. In the case studies presented, however, some evidence points to excessive complexity and resulting high transactions costs. In addition, issues such as adequate consultation and transparency, robustness through expert financial and technical advice, and optimal mechanisms for the choice of the best firm may have been overlooked in some countries.

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## Types of PSP and Ownership

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*The extent of PSP should depend on the underlying conditions on the ground.*

In pursuing PSP, governments must consider whether the country has sufficient institutional strength to enforce elements of PSP such as contracts and regulations. Based on the state of existing institutions, experience with PSP, and other factors, the extent of PSP and risk allocation should be carefully decided. Evidence suggests that for significant private sector involvement in ATI (that is, long-term lease or concessioning of airports), annual traffic levels should be at least 1 million WLUs, and institutions should be well developed. Where these conditions do not exist, there may be opportunities for more limited forms of PSP such as provision of retail, baggage-handling, and maintenance services.

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## Policy Sustainability

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*The sustainability of PSP in ATI is largely determined by the economics of the infrastructure to be provided and the population using that infrastructure.*

As a general rule, Booz Allen Hamilton suggests that airports with fewer than 1 million passengers (or at least 1 million WLU) will not be able to cover operating costs, and that airports with fewer than 5 million passengers will not be able to fully cover total capital expenditure. In these cases, PSP involvement has to be structured so that some elements of fixed costs are covered by the government or through the regulatory regime, which might require more detailed consideration of ownership structures. Examples include the Shannon and Cork airport authorities in Ireland, which are owned by the Dublin Airport Authority to safeguard the operations while decisions are made about their liability for large debts.

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## Project Finance and Risk Allocation

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*Where there is potential for macroeconomic (especially demand) shocks, it is important to ensure a robust financial structure for the company and ex ante tariff resetting arrangements that are flexible enough to allow a transparent and agreed resetting of the financial burden after a shock.*

The allocation of risk, guarantees, and the conditions under which renegotiation of regulatory contracts can take place should be made completely explicit. The exposure of the firm to demand risk is closely related to the level of monopoly power in the market for air transport. An obvious risk to work around is the insolvency of one of the major customer airlines.

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## Management Incentives

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*The payment of fixed fees to private companies for management services is unlikely to deliver appropriate performance incentives.*

Managers should be responsible for delivering performance improvements. Incentives need to be targeted toward improvements. Bonus provisions in chief executive officer and senior management contracts linked to firm performance are an option. More stringent quality or benchmarking-based regulation may be required.

In more developed market environments, the sale of a substantial share of equity capital to a company with a proven record of accomplishment in profit maximization is likely to lead to well-aligned management incentives from the firm's owners. Management needs sufficient flexibility and rights to income streams to make the commercial decisions necessary to grow the business.

On ANS, continued government ownership with a well-crafted private sector service contract can create expertise to pursue efficiency while ensuring that management maintains expenditure on safety. In larger markets with more certain movement numbers, divestment of a proportion of the equity capital is likely to be successful.

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## Market Structure

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*Market liberalization in air transportation makes competition among airports most likely. Competition in the provision of air navigation and communications is generally elusive.*

Competitive ATI market structures can reduce the regulatory burden but are achievable only with enabling air transport liberalization. Experience suggests that direct competition between two airports with fewer than 5 million passengers each is unlikely to be sustainable.

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## Regulatory and Institutional Reforms

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*Regulatory reforms will be beneficial only if the design of the other aspects of the arrangement is robust.*

Even if regulation is not independent, it should be as transparent and non-intrusive as possible to ensure appropriate certainty and incentives for the firm. Regulation by the national independent competition authority is likely to be feasible only in an environment that is nonlitigious and in which a balance of power exists between the ATI provider and its customers.

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## Optimal Regulatory Contracts

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*Regulatory contracts should ensure that consumers secure a fair share of the expected benefits of the PSP policy. It is vital for the sustainability of the deal that the terms do not unduly favor firms and shareholders at the expense of consumers.*

Regulatory contracts, however, may need to allow large price increases in the short term to facilitate catch-up with prevailing international market levels or compensate for higher quality of service.

There is an important trade-off, however, between the level of prices and investment to improve quality of service. Incentives to provide quality that exceeds consumers' willingness to pay should be avoided, particularly in the case of airports that wish to attract low-cost carriers and dedicated cargo operators. The basic assumption is that operators will be willing to pay for services that meet global standards for safety and security.

Regulatory contracts should provide strong incentives for investment and innovation, flexibility to respond to unexpected market developments, and minimum uncertainty on the remuneration of investment. The design of the regulatory instrument or contract should take full account of the realistic quality and speed of availability of financial and operating data in the country. Where few reliable data are available, the regulatory instrument should make provisions for the information it requires to be effective.

In the absence of incentives for owners and managers to maintain quality of service, regulatory contracts may need to take an incentive-based or mandatory approach to delivering certain quality standards.





## APPENDIX I

### CASE STUDIES

The following case study information was collected by Booz Allen Hamilton

#### CAMEROON

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##### Contract Overview

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Award Date	1993
Type	Concession contract
Duration	15 years
Contracting Authority	Central government
Operator	Aéroports de Cameroun (ADC). A newly created private limited liability company, with mixed ownership by the Cameroon Government (29 percent), Aéroports de Paris (AdP) (34 percent), Aerial Navigation in Africa (ASECNA) (20 percent), Cameroon Airlines (CAMAIR) (8 percent), Banque Internationale du Cameroun (BICIC) (3 percent), UNITAIR (3 percent), and Air Afrique (3 percent). Single-share ownership was retained by individuals to represent the interests of government departments.

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##### Setting Vision and Sector Structure

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Motivation	Inefficiency arising from the excessive cost of operating old and oversized facilities; the deteriorating condition of the airports because of inadequate maintenance; resulting inefficiencies in the provision of air services; and lack of government resources.
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Objectives	Introduce better airport management (with a commercial approach) and attract finance for investment in airport rehabilitation and improvement.
Market structure	<p><i>Horizontal structure:</i> The contract vested exclusive responsibility to operate, maintain, and develop seven airports. Douala, Yaoundé, Garoua, Maroua, and Ngaoundere serve scheduled traffic. Neither Bamenda nor Bertoua serves scheduled traffic.</p> <p><i>Vertical structure:</i> The contract included responsibility for the purchase of new equipment for ground handling at all seven airports and for air navigation service (ANS) at the five smallest airports. CAMAIR provides ground-handling services and maintains new and existing equipment. ASECNA provides ANS and fire and rescue, including equipment investment at the two largest airports. The Civil Aviation Authority (CAA) provides security.</p>
Competition constraints	<p><i>Competition for the market:</i> None. The government mandated Agence Francaise de Developpement (AFD) to carry out the feasibility study and recommend the model and then for AdP to create ADC.</p> <p><i>Competition in the market:</i> The government explicitly rejected a competitive airport market structure because of the small scale of the country's air transport industry.</p>

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#### Details of the Arrangement

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Contract cost	ADC paid Cameroon francs (CFAF) 177 million (US\$253,000) for the concession contract.
Management	<p>The government signed a technical assistance agreement with AdP for provision of key expatriate senior managers. ADC's board would consist of nine members with an elected chair.</p> <p>The agreement terminated in 1999 and a new agreement was signed with ASECNA to provide a managing director and finance and administrative director.</p>

Finance	<p>The ADC owners had no obligation to inject equity beyond the price paid for the concession contract. AFD agreed to provide ADC with a loan of CFAF 7.2 billion with a 25-year term and an interest rate of 5 percent. Before cancellation in 2001, only CFAF 422 million was drawn down.</p> <p>External finance for medium-term investment was to be sourced after 2001, but this has not been forthcoming.</p>
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### Service Standards, Tariffs, and Subsidies

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Operator obligations	We found no evidence of obligations for inputs or outputs, performance targets, or penalties for not meeting those targets.
Cost recovery	Airport charges of CFAF 10,000 (US\$18) per embarking international passenger. ADC was entitled to 20 percent of ground-handling revenues collected by CAMAIR.
Subsidies	None, despite a finance ministry levy equal to the airport charge.

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### Incentives, Risk, and Investment

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Allocation of responsibilities	<p>ADC: To operate, maintain, and develop the seven airports; to purchase new ground-handling equipment for all seven airports and ANS equipment for the five smallest airports.</p> <p><i>Government:</i> Ownership of all physical infrastructure and equipment.</p>
Investment	<p>ADC agreed to a three-year investment program of CFAF 3.4 billion to improve and rehabilitate the airports. An inadequate revenue stream to justify provision of the agreed finance by AFD, however, meant insufficient improvements in airport facilities.</p> <p>Under the new technical assistance agreement, ASECNA launched a Technical Assistance Mission, which led to a plan of urgent maintenance and rehabilitation to be completed by mid-2002 (costing US\$5.3 million, to be financed from internal revenues) and a three-year program to be completed by 2004 (costing US\$15.7 million, to be financed externally). The latter has not emerged.</p>

Incentives	AdP received a fixed fee for management under the technical assistance agreement, which meant little or no incentive to perform.  ADC is owned by a disparate set of government and quasi-government agencies, which meant little or no incentive to maximize returns.
Risk allocation	We found no evidence of attempts to allocate risks.

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### **Institutional Arrangements**

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Regulation	Before 1999, the transport ministry was responsible for the approval of airport charges (on a cost-plus basis) and airport investment.  In 1999, the CAA was granted responsibility for the surveillance of changes in aeronautical charges, including landing and lighting fees, approach and departure fees, passenger service, and cargo-handling fees. The CAA was bolstered by receiving autonomous financial status.
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## **SOUTH AFRICA (AIRPORTS)**

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### **Contract Overview**

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Award Date	1998
Type	Partial divestiture/strategic partnership
Duration	Seven years (effective renationalization)
Contracting Authority	Central government
Operator	Airports Company of South Africa (ACSA). Aeroporti di Roma (AdR) took a 20 percent stake, and 5 percent of shares were allocated to “empowerment investors” (representatives of the historically disadvantaged community). In 2005, AdR’s stake was sold to the SA Public Investment Corporation.

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## Setting Vision and Sector Structure

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Motivation	<p>The South African government was engaged in a general policy of corporatizing state industries and selling minority stakes to strategic partners in many cases. It also was engaged in a policy of involving the historically disadvantaged community, partly through individual investors and partly through the Black Empowerment Fund. It was apparent that a substantial investment in the main international airports was required and that ACSA did not have sufficient income to cover even urgent and essential investments without seeking external finance.</p>
Objectives	<p>To provide for the major investment required without recourse to government funds. To take advantage of the expertise of technically and commercially experienced foreign airport operators. To advance the government's policy of empowerment of the historically disadvantaged community. To take advantage of South Africa's business leadership in the region and to exploit international commercial opportunities in the airports' management.</p>
Market structure	<p><i>Horizontal structure:</i> ACSA runs South Africa's 10 main airports, which handle about 90 percent of air transport movements and include the three main airports at Johannesburg, Cape Town, and Durban.</p> <p><i>Vertical structure:</i> Unclear.</p>
Competition constraints	<p><i>Competition for the market:</i> A competition was held for the strategic partner. A total of 29 international airport operators expressed interest, from which a short list was chosen for the main bid. The short list consisted of AdR, British Airports Authority plc (BAA), Schiphol Airport, and a consortium of Flughafen Frankfurt and Aéroports de Montréal.</p> <p><i>Competition in the market:</i> Many of the non-ACSA airports are commercially run or owned by regional governments. There is no effective competition for ACSA's airports.</p>

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### Details of the Arrangement

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Contract cost	AdR paid South African rand R 891 million (approximately US\$172 million) for the 20 percent stake, which was about 40 percent higher than the next-highest bidder.
Management	AdR was given a number of places on the board of directors and received payments for consultancy services.  ACSA has received awards for its governance, transparency, and avoidance of conflicts of interest. In a country poorly rated for corruption, this is a significant accolade.
Finance	ACSA is financed by long-term debt, which, in 2005, represented less than one year's investment needs.  ACSA's main impediment at the time of the PSP was lack of access to suitable finance. Given the strong underlying business, this could have been addressed by a purely financial solution, rather than by setting up a strategic partnership.

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### Service Standards, Tariffs, and Subsidies

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Operator obligations	ACSA was contractually committed to deliver a certain amount of investment.  We found no evidence of obligations regarding inputs or outputs, performance targets, or penalties for not meeting those targets.
Cost recovery	Airport charges.  These charges are high by international standards. The trade association representing airlines in South Africa made a complaint to the competition authority about charges in 2002, but nothing resulted.
Subsidies	None.

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### Incentives, Risk, and Investment

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Allocation of responsibilities	ACSA: To own, operate, maintain, and develop the 10 airports under its jurisdiction.  <i>Government:</i> Majority ownership of ACSA.
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Investment	<p>A number of urgent and essential investments were being made before the PSP. Since the PSP, investment proceeded well within the financial capacity of the company. Additional resources may be needed for a spike in investment associated with the 2010 football World Cup.</p> <p>A new airport will be required in Durban, probably around 2015, because the present site is unsuitable for further expansion. It will be interesting to observe what, if any, role ACSA plays in this development in the political stronghold of the opposition Inkatha party.</p>
Incentives	<p>AdR received payments for consultancy services (secondment of executives), which may have led to poor incentives to perform.</p> <p>ACSA remained majority owned by the government, which has supported requested price increases, probably leading to poor incentives for profit maximization.</p>
Risk allocation	<p>There was only a temporary halt to growth after the international air transport crisis following 2001. ACSA has seen strong annual growth of 9 percent since 2001. This fortunate position suggests little need to be concerned about demand risk. Prices are regulated according to a retail price index (RPI)-X formula and were set for fiscal years (FYs) 2001/02 to 2005/06 to allow price increases that would bring the rate of return up and take account of the increased income needed to pay the financing costs of investment. ACSA has applied for additional price increases to pay for enhancements required for the 2010 football World Cup.</p>

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**Institutional Arrangements**

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Regulation	<p>A regulatory committee of the transport ministry was set up at the same time as the PSP to carry out economic regulation. Five-year periodic reviews of the RPI-X formula were allowed.</p>
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## SOUTH AFRICA (AIR NAVIGATION SERVICE)

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### Contract Overview

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Award Date	1993
Type	Corporatization and commercialization
Duration	Indefinite
Contracting Authority	Central government
Operator	Air Traffic Navigation Services Ltd. (ATNS), South Africa.

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### Setting Vision and Sector Structure

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Motivation	The South African government was engaged in a general policy of corporatizing state industries. ATNS was in need of some investment.
Objectives	To facilitate investment without drawing on government funds. To introduce a commercial approach to charging and operating the service. To take advantage of South Africa's business leadership in the region to exploit international commercial opportunities in its core skills.
Market structure	<i>Horizontal structure:</i> ATNS provides services at 21 aerodromes, including all the main airports in South Africa. <i>Vertical structure:</i> ATNS provides en route services and approach and tower services, and controls a large oceanic Flight Information Region (with very little overflight).
Competition constraints	<i>Competition for the market:</i> Not applicable. <i>Competition in the market:</i> None.

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### Details of the Arrangement

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Contract cost	Not applicable.
Management	Given the freedom to operate and finance the business' activities.
Finance	The corporatization and commercialization included the possibility of taking on commercial finance.

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### Service standards, Tariffs, and Subsidies

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Operator obligations	We found no evidence of obligations for inputs or outputs, performance targets, or penalties for not meeting those targets.
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Cost recovery	The corporatization and commercialization included empowerment to charge directly for its services, instead of being funded from fuel tax.  Charges are low by international standards.
Subsidies	The company was subsidized for the first two years of operation to allow charges to increase gradually, and is expected to break even thereafter.

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### Incentives, Risk, and Investment

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Allocation of responsibilities	ACSA: To operate, maintain, finance, invest, and charge for air navigation and communications services on a commercial basis.  <i>Government:</i> 100 percent ownership of ACSA.
Investment	A continuing flow of investment has taken place, largely funded from cash flow. ATNS has made major replacements of outdated systems and has invested in increasing the capacity of existing runways, while reducing delays. It has ambitious plans for further capacity expansion to support the 2010 football World Cup.
Incentives	Given the safety-critical nature of ATNS's services, keeping them in the public sector gives some reassurance that costs will not be cut at the expense of safety and that capacity expansion will meet national requirements. Performance suggests adequate incentives for management to perform.
Risk allocation	Substantial price increases following significant cost increases around 2004 through what appears to be a resetting of X in the RPI-X regulatory formula suggest that ATNS is exposed to very little risk. Given that charges are very low by international standards, however, this may not be a significant issue.

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## **Institutional Arrangements**

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Regulation	Initially, ATNS was subject only to the general provisions of competition and monopoly legislation—that is, a threat to investigate if it was accused of exploiting its market power. Since 2001, it has been subject to explicit RPI-X regulation by the regulatory committee of the transport ministry that was established in the context of the airport PSP.
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## **UNITED KINGDOM (AIRPORTS)**

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### **Contract Overview**

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Award Date	1986
Type	Full privatization through sale of share capital through an initial public offering (IPO)
Duration	Indefinite
Contracting Authority	Central government
Operator	British Airports Authority plc (BAA)

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### **Setting Vision and Sector Structure**

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Motivation	<p>The Thatcher government was carrying out a major privatization program, believing that businesses were better managed in the private sector where possible. It believed that the innovative RPI-X style of price regulation devised by Professor Stephen Littlechild provided a means to privatize monopolies with better incentives than established forms of economic regulation of monopolies—for example, as seen in the United States. The public was mostly suspicious of privatization, and the government believed that the intuitive form of regulation (that is, prices must fall relative to inflation) would improve perception. The public was allowed an allocation of shares at fixed prices as another sweetener, but also to promote popular capitalism.</p> <p>The government needed the cash to finance deficits. The government wished to encourage local authorities to privatize their airports, and the privatization of BAA would provide a demonstration project.</p>
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Objectives	To raise income for government at a time of large public sector deficits. To ensure that future investment needs were provided by the private sector, thus freeing the business from constraints on government borrowing. To encourage greater efficiency in operation and investment. To promote commercial management. To promote wider share ownership. To introduce better airport management and to attract finance for investment in airport rehabilitation and improvement.
Market structure	<p><i>Horizontal structure:</i> BAA plc owned seven airports: London Heathrow, London Gatwick, London Stansted, Glasgow Paisley, Glasgow Prestwick, Edinburgh Turnhouse, and Aberdeen Dyce. It subsequently sold Glasgow Prestwick and bought Southampton Airport. It held a 73 percent share of passengers and an 85 percent share of cargo passing through U.K. airports. Separation of and competition between the three London airports was rejected for the sake of the perceived benefits of system management of London runway capacity and to facilitate investment in Stansted, which otherwise would be unprofitable for many years.</p> <p><i>Vertical structure:</i> BAA plc is internationally admired for maximizing the retail value of its airports. It has, however, been found guilty of anticompetitive behavior in ancillary services.</p>
Competition constraints	<p><i>Competition for the market:</i> Not applicable.</p> <p><i>Competition in the market:</i> Since privatization, BAA plc has lost market share. In part this is because general growth in air transport enabled more economic operation at regional airports, and in part because physical constraints at the London airports impeded growth. Many regional airports previously were owned by local authorities but most now have been privatized. Manchester is the significant exception.</p>

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#### Details of the Arrangement

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Contract cost	Approximately U.K. pounds sterling (£) 1.3 billion was raised from the sale of the share capital of BAA plc.
Management	The new owners of BAA plc appointed a board of directors. Existing operations management was retained.

Finance BAA plc is financed through private debt and equity.

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**Service Standards, Tariffs, and Subsidies**

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Operator obligations A formal system of measuring and enforcing service standards was not introduced at the time of privatization. The rationale was that the main quality of service came from ground handling, which is competitively supplied. In the early years, however, core service quality was perceived to have fallen, with increased aircraft delays, more crowded terminals, and longer check-in times. Facilities such as moving walkways and escalators frequently were out of operation.

This situation has been alleviated following the introduction of a formal quality measurement and incentive regime.

Cost recovery Airport charges. Because of RPI-X-type price controls, airport charges at Heathrow and Gatwick generally have fallen (after deducting inflation) substantially since privatization. Substantial cuts in charges were made during the second five-year period after privatization, as the regulator observed the effects of economies of scale and increasing commercial revenues, and imposed stricter efficiency targets and a lower cost of capital. As a result, Heathrow and Gatwick charges are now low by international standards for airports of this category. These below-market prices for scarce capacity impede the economic viability of alternative airports in the London catchment area. Excess demand is substantial for the use of Heathrow and Gatwick, capacity being limited primarily by their technical runway slot availability, and the airports run at or close to capacity all day.

Subsidies None.

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## Incentives, Risk, and Investment

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Allocation of responsibilities

*BAA plc:* To own, operate, maintain, and develop the seven airports.

*Government:* Retained a golden share, preventing takeover of the company by a single large investor for a number of years. In 2006, the company was taken over by Ferrovial of Spain, a diversified engineering conglomerate with interests in utilities. Ferrovial is not a substantial airport operator, and some believe that the main reason for the takeover is to take advantage of Spanish corporate tax arrangements.

Investment

At the time of privatization, BAA plc was, in effect (albeit not explicitly), required to invest in the expansion of Stansted Airport, even though it would not become profitable for many years and was funded by cross-subsidy. If BAA had not carried out this investment, it would have risked an unfavorable review of its airport charges.

Since privatization, the company has invested substantially at Stansted, Gatwick, and Heathrow, including terminals and high-speed rail links. It has undertaken major redevelopments and innumerable pier expansions at all its airports. Currently, it is close to completion of the new Terminal 5 at Heathrow, which, together with its ancillary works, is one of the largest single-site construction projects in the world. Although it is risky to make such claims before the project is complete and bedded in, the project has already been praised for innovative management techniques to avoid the delays and overruns common in large construction projects. The company is currently applying for permission to expand Stansted with a second runway and second terminal. It has invested in many overseas airports and has become one of the world's leading commercial airport partners.

BAA plc is suspected of a tendency toward sweating its assets and delaying investments, impacting service quality, but also of gold plating when it does invest.

Incentives	The price control regime has been effective more recently in providing the most important incentives for investment.
Risk allocation	<p>Regulated prices are fixed based on a forecast of costs and income. BAA plc was lucky in the early 1990s that unexpectedly low revenue could be set off against reduced construction prices. It has the luxury of being able to delay expansion investments if a downturn results in capacity being less strained than expected, because investment timing generally has not been regulated or enforced, with the exception of the Terminal 5 expansion.</p> <p>In other circumstances, traffic risk could have been a serious problem for the viability of the business, as it was at National Air Traffic Services (NATS), which experienced a financial crisis as a result. Fortunately, the arrangements at BAA allowed greater flexibility than at NATS.</p> <p>Security arrangements have been a significant risk. BAA is given latitude to increase its prices, subject to agreement as to the costs of additional security, and the 80 percent rule gives it some incentive to control the cost of new arrangements.</p>

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### **Institutional Arrangements**

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Regulation	The three London airports were subject to RPI-X single-till regulation in five-year periods, with periodic reviews. The CAA is responsible for carrying out the periodic review, with objectives set out in statute. The CAA's recommendations are required to be assessed by the Competition Commission (in contrast to other U.K. privatizations for which the commission acts as an appeal body). Other BAA airports do not have economic regulation, albeit with a threat to regulate should BAA be found to be exploiting its position. Manchester International Airport is also subject to economic regulation.
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Planning controls restrict the expansion of airports. The planning inquiry that gave BAA permission to build Terminal 5 at Heathrow took seven years. Heathrow's two runways are restricted to operating in separated mode for noise protection, whereas mixed mode would allow a 10 to 20 percent increase in air traffic movements. Although the government policy is to allow Heathrow, Stansted, and Gatwick each to build a new runway (a short runway at Heathrow, and not before 2021 in Gatwick's case because of existing covenants), they still would have to pass a planning inquiry, at which considerable opposition might be expected.

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## UNITED KINGDOM (AIR NAVIGATION SERVICES)

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### Contract Overview

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Award Date	2001
Type	Partial divestiture/strategic partnership
Duration	Indefinite
Contracting Authority	Central government
Operator	<p>NATS Holdings Ltd., with four operating subsidiaries. Mixed ownership by the Airline Group (AG) (46 percent) (consisting of British Airways, Britannia, bmi, easyJet, Monarch, My Travel, and Virgin Atlantic), the government (49 percent), and employees (5 percent placed in trust).</p> <p>The ownership structure was altered as part of the Composite Solution. It is now 48.87 percent owned by the government, 41.94 percent owned by the AG, 4 percent owned by BAA plc, and 5 percent owned by employees.</p>



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## Setting Vision and Sector Structure

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Motivation	Substantial funds were required for the air traffic system, particularly to finance the upgrade of the London [[spell out]]ACC at Swanwick. The air traffic system was in competition with other government programs and therefore was limited by the Public Sector Borrowing Requirement. Between 1993 and 1998, funds available for air-traffic-system investments declined from £130 million to £36 million. By 1997, NATS estimated that investments of £100 million would be required every year for 10 years to support projected traffic growth.
Objectives	Articulated in a 2002 National Audit Office report as, above all, to at least maintain standards of safety and national security, in particular by separating service provision from safety regulation. Also, to attract an injection of private sector money and improved project management skills to free NATS from public sector constraints, thereby giving the company greater freedom to invest and to improve its services, and to safeguard the interests of the taxpayer in achieving these prime objectives.
Market structure	<i>Horizontal structure:</i> NATS competes with Serco for the provision of aerodrome control services at U.K. airports. <i>Vertical structure:</i> NATS holds a monopoly in the provision of en route, oceanic, and approach control services.
Competition constraints	<i>Competition for the market:</i> A competitive bidding process for the strategic partner. <i>Competition in the market:</i> Only in the provision of aerodrome control services at U.K. airports, which takes the form of competition for the relevant market.

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## Details of the Arrangement

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Contract cost	£800 million was raised for the 46 percent stake taken by the AG.
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## Management

The board of NATS Holdings Ltd., may comprise between 9 and 17 directors, including a chair. The government can appoint three directors, BAA (following the restructuring in 2003) can appoint two, and the AG appoints the rest (including the chair and executive directors). At the outset in 2001, there were three executive directors: the chief executive officer (CEO), the chief operating officer, and the finance director. Control of the company passed to the AG, which in 2001 had the power to appoint 14 of the 17 directors, and after 2003 the AG had the power to appoint up to 12 directors. The government directors have the ability to influence and have additional powers over a limited range of decisions. A stakeholders council, consisting of representatives from the Department for Transport (DfT), NATS' employees, and members of air traffic controller and pilot organizations was appointed to provide guidance and advice to NATS. Initially, the executive committee (sitting below the board of directors), comprising the CEO and management team, agrees to a contract with the board specifying key performance and operating targets for the coming year.

## Finance

The deal included commitments of £50 million from the AG for investment, £15 million in loans from BAA, £733 million of debt finance (from a group of four banks), a £690 million fund negotiated by the AG for future capital investment, and a £30 million working capital fund.

The financial restructuring components of the Composite Solution involved a £65 million investment by BAA plc in return for a 4 percent shareholding, an equivalent equity injection by the U.K. government, government assistance in renegotiating the terms of the company's three major lending facilities to improve financial robustness, and the implementation of a temporary working capital facility. NATS Holdings Ltd., agreed not to draw down further debt and to fund capital expenditure from operating cash flow.

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**Service Standards, Tariffs, and Subsidies**

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Operator obligations	The deal required an assurance by the AG that it was not investing to make a commercial return. NATS is required to minimize delays, and the average delay per flight that is attributable to NATS has fallen from 2.2 minutes during FY 2002/03 to 0.3 minutes during FY 2004/05. This is a relatively small proportion of the total average delay per flight of 17.1 minutes in 2004/05.
Cost recovery	Regulated charges. Despite the financial crisis, NATS claims that charges still fell in real terms since the PPP, outstripping other comparable European air navigation service provider (ANSPs), whose charges often rose—for example, Germany’s DFS.
Subsidies	None.

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**Incentives, Risk, and Investment**

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Allocation of responsibilities	<i>NATS Holdings Ltd.</i> : To finance and carry out investment and to operate services on a commercial basis. <i>Government</i> : Partial ownership and control of the company.
Investment	Investment has proceeded well despite the financial crisis.
Incentives	Price cap regulation is designed to provide incentives to reduce costs and delays and involves penalties for not meeting performance targets and bonuses for exceeding them.

Price caps were to be determined every five years and, during control period 1 (CP1, spanning the date of commencement of the PPP till the end of 2005), the CAA imposed a requirement for prices to fall in nominal terms by RPI-4 percent (4 percent real) in 2003 and 2004, and to fall by RPI-5 percent (5 percent real) during 2005.

A major relaxation of the regulatory regime by the CAA formed a key part of the Composite Solution. This included a required annual reduction to RPI-2 percent (2 percent real), based on a central traffic scenario, and a 12 percent increase in the Regulatory Asset Base (the asset value on which NATS was allowed to earn a return).

As well as the requirement for a 15 percent real reduction in charges during CP2 if traffic forecasts are realized, some of the more detailed features of the price cap regime have been amended as follows: a greater weighting on early morning delays in the penalty and bonus system for delay performance, to provide incentives for the company to work harder to reduce delays at this key time; account of the fact that distance is a better indicator of air traffic controller (ATCO) workload than service units (the composite function of aircraft weight and distance traveled used for charging purposes) and that aircraft weights are largely irrelevant to ANS costs; and extension of price control to London Terminal Approach charges.

## Risk allocation

The CAA and the (original) company expressed concerns about the vulnerability of such a highly leveraged company to demand shocks, especially in light of a regulatory regime in which NATS Holdings Ltd., accepted all demand risk.

The September 11 attacks on the World Trade Center, combined with the severe acute respiratory syndrome virus, caused exactly the type of demand shock that the CAA and the company had warned against. In particular, it caused the loss of a large proportion of income from North Atlantic traffic (consisting of U.K.–North America and Europe–North America air transport movements). In 2004, the National Audit Office reported that, at the time, while transatlantic flights constituted 14 percent of flights controlled by NATS, they accounted for 43 percent of revenues.

NATS' owners, directly affected by the downturn in traffic, desperately needed an intervention to continue the business. Moreover, the banks were unwilling to lend additional funds, given the already highly leveraged nature of the business. In early 2002, NATS' management alerted shareholders to the possibility that, on the basis of the worst-case traffic scenario, it could run out of cash and be forced into administration.

This prompted a reallocation of demand risk as part of the Composite Solution by granting a fixed revenue allowance equal to 50 percent of costs and allowing an uplift in the variable element should demand be less than forecast by a certain proportion.

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## Institutional Arrangements

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Regulation	<p>Price cap regulation by the CAA. NATS has recourse to the Competition Commission if it does not agree with the limits imposed by the CAA.</p> <p>Price caps were to be in place for five years and were only to be reopened “on the occurrence of exceptional circumstances where it would not be reasonable for the circumstances not to be taken into account prior to the next price review,” or during a “national security period.” Exceptional circumstances are defined as circumstances “outside the licensee’s control and which (a) have had or will have a negative effect on its financial position; and (b) that effect is such that its ability to meet its current or future obligations under the Act or the License is, or is threatened to be, materially impaired.” A national security period allows the secretary of state to enact emergency control over NATS during a time of crisis, war, or national emergency.</p>
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## GREECE

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### Contract Overview

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Award Date	1995
Type	Partial divestiture through a trade sale. The New Airport Development Agreement is a concession on a build-own-operate-transfer (BOOT) basis.
Duration	30 years
Contracting Authority	Central government
Operator	Athens International Airport (AIA). A newly created limited liability company with mixed ownership by government (55 percent) and HOCHTIEF AirPort.

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### Setting Vision and Sector Structure

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Motivation	To construct a new airport as part of the modernization of the country’s economy, and as a necessity for the 2004 Olympic Games.
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Objectives	To avoid financing the airport from public funds; build and commission the airport on time and budget; introduce commercial practices and efficient operational practices; and accelerate the modernization of the economy.
Market structure	<p><i>Horizontal structure:</i> Single-firm ownership of a single airport. The old Athens airport will not be viable as a competing entity in the future because it was closed down and redeveloped as a public park.</p> <p><i>Vertical structure:</i> AIA has engaged in substantial outsourcing of various airport activities.</p>
Competition constraints	<p><i>Competition for the market:</i> A competitive bidding process began in 1991. Two bidders were short-listed.</p> <p><i>Competition in the market:</i> Other than the old airport, no other airport in the Athens area, nor any reasonably proximate city, can offer a practical alternative airport.</p>

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#### Details of the Arrangement

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Contract cost	No evidence.
Management	The board of directors has nine members; four are appointed by the government and five (including the CEO and an independent member) are appointed by private shareholders.
Finance	Around 63 percent of the required finance was acquired from commercial sources, including 41 percent from the European Investment Bank (EIB), 14 percent from commercial banks, 6 percent private share capital, and 2 percent from private shareholders' loans. A total of 29 percent was sourced from grant funding, including 13 percent from the Airport Development Fund (built up through a departure tax since 1975), 6 percent from Greek state grants, and 10 percent from the European Cohesion Fund. A total of 7 percent was sourced from Greek state share capital and 1 percent from other (prepayment) deposits.

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#### Service Standards, Tariffs, and Subsidies

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Operator obligations	No evidence of obligations on inputs or outputs, performance targets, or penalties for not meeting those targets.
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Cost recovery	<p>Airport charges.</p> <p>These charges are more than five times the charges at the old airport, an increase deemed necessary to cover financing of the new airport and the costs of operating a much-enhanced facility. This increase has simply moved Athens from being the cheapest in Europe to a charging level that is typical for an airport in its class. While there was a material increase in 2004, airline representatives brokered an agreement not to have charges increased in 2005. Increased airport charges have had a fairly significant effect on airline ticket prices for short flights.</p>
Subsidies	None, other than the grant-funded elements of the project.

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**Incentives, Risk, and Investment**

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Allocation of responsibilities	<p><i>AIA:</i> Meet requirements of a 30-year concession on a BOOT basis, with full rights to enjoy the income of the airport over the term of the concession, subject to regulation.</p> <p><i>Government:</i> Majority ownership of AIA and eventual ownership of the airport once transferred back at the end of the concession term.</p>
Investment	<p>The new airport at Spata was built to replace the old Hellenikon airport in time for the 2004 Olympic Games. It has two runways and a single integrated terminal. It is separated from the urban area by a mountain. New motorways and a rail link connect the airport to the city. The airport opened in 2001; road connections to the city were completed months later and the rail link delivered just in time for the Olympics.</p> <p>The objectives of the state appear have been achieved. Athens has a new, well-connected airport that is profitable and satisfies customer needs. It has good scope for further expansion.</p>



Incentives	The private partner was given a 45 percent equity stake in AIA, which appears to have provided an adequate incentive to perform. The strong performance of the airport suggests that management is performing well and that its incentives are well aligned with the profit motive of the private sector participants. The fact that prices are set by AIA below the prevailing price cap is probably the result of innovative use of outsourcing by management.
Risk allocation	We have no evidence on the allocation of risk. Given, however, that the airport was delivered on time, that profitability was achieved in the second year of operation, and that traffic is growing strongly, we presume that, so far at least, risk has not been a major factor. Risk allocation is, however, likely to become a more important issue toward the end of the concession period.

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### **Institutional Arrangements**

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Regulation	The price cap appears to have been specified as part of the concession contract and so far has been non-binding. Presumably, the government has determined a loose price cap to facilitate recovery of investment and debt servicing. The government may need to consider regulatory and other institutional reforms well before the end of the concession period.
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## **CHINA**

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### **Contract Overview**

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Award Date	1998
Type	Partial divestiture through initial public offering (IPO)
Duration	Indefinite
Contracting Authority	Central government

Operator	Shanghai International Airport Company, Ltd. (SIA). This is a mixed-ownership company with responsibility for the management and delivery of airport investments, as well as the commercial aspects of the Shanghai airports business. A 60.72 percent stake is government owned, through the Shanghai Airport Authority (SAA), which in turn is owned by the Shanghai Airport (Group) Company, Ltd. SAA manages and operates the two Shanghai airports, while the group company administers SAA and both airports, and is responsible for development and investment planning. The remaining 29 percent is owned by a disparate set of private investors, including nine investment banks with a share of less than 1 percent each, and small private investors.
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#### Setting Vision and Sector Structure

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Motivation	To raise low-cost funds to build Shanghai Pudong Airport; to promote the sustained development of Shanghai and the Yangzi River Delta region.
Objectives	To finance and build an airport with the capacity to handle 20 million passengers and 750,000 tons of cargo. Other objectives included the following (articulated in the June 2002 Regulation on Foreign Investment in the Civil Aviation Industry): encouraging foreign participation in the ownership, development, and financing of China's airports; encouraging airports to go public in overseas markets; breaking new ground for the restructuring of large state-owned companies; and exposing Chinese partners to advanced management and mature business models.
Market structure	<p><i>Horizontal structure:</i> Single-firm ownership of two large-city airports and the commercial operations associated with them.</p> <p><i>Vertical structure:</i> SIA's activities include ground handling, leasing space and offices inside the airports to aviation and commercial businesses, advertising services to airfreight, and managing and delivering development and investment projects that are allowed by government.</p>

Competition constraints	<p><i>Competition for the market:</i> Not applicable.</p> <p><i>Competition in the market:</i> The government’s policy is reflected in the establishment of SAA to satisfy the needs of operating a “One City, Two Airports” concept. Scale is, arguably, sufficient (41 million passengers) for the airports to compete. It is not clear whether SIA holds exclusive rights for ground handling at the airports.</p>
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**Details of the Arrangement**

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Contract cost	No evidence.
Management	No evidence; however, we presume minority SIA board membership has been granted to the disparate group of private investors.
Finance	<p>Chinese yuan (Y) 9.925 billion has been invested in the new Pudong Airport. SIA sourced the initial Y 1.4 billion for Phase I. Y 5.475 billion was to be sourced by the Group Company. Foreign investors were to receive priority in other “aviation-related projects” (such as aviation oil supply, aircraft maintenance, cargo storage, ground services, food catering, and parking lots). This is probably the source of the remaining Y 3.5 billion.</p> <p>Finance for an estimated Y 15 billion investment in the extension of Pudong Airport is to be raised (by the Group Company) through self-possessed funds, bank loans, and capital finance.</p>

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**Service Standards, Tariffs, and Subsidies**

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Operator obligations	No evidence of obligations for inputs or outputs, performance targets, or penalties for not meeting those targets.
Cost recovery	<p>Airport charges.</p> <p>SIA is entitled to 25 percent of aircraft landing and takeoff fees and 100 percent of passenger service fees. The company has a purchasing agreement with SAA for power, water, gas, equipment maintenance, sewerage, security, and fire prevention.</p>
Subsidies	None.

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## Incentives, Risk, and Investment

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Allocation of responsibilities	<p><i>Government:</i> Ownership of Shanghai Airports (Group) Co., Ltd.</p> <p><i>Shanghai Airports (Group) Co., Ltd.:</i> Development of airport investment plans, construction, and reconstruction, with the objective to build the Shanghai airport system into an Asia-Pacific hub. Administration of SAA, SIA, and the two airports.</p> <p><i>Shanghai International Airport Co., Ltd. (SIA):</i> The management and delivery of certain airport investments, as well as the commercial aspects of the Shanghai airports business.</p> <p><i>Shanghai Airport Authority (SAA):</i> The management and operation of the Shanghai airports. In 2005, was assigned responsibility by the Group Company for the extension of Pudong Airport.</p>
Investment	<p>Y 9.925 billion has been invested in the new Pudong Airport. An estimated Y 15 billion will be invested in the extension of Pudong Airport.</p>
Incentives	<p>SIA and the other Shanghai Airport companies are profitable; however, this is more than likely to do with the growth of the Chinese economy than with powerful ownership and management incentives.</p>
Risk allocation	<p>No evidence on the allocation of risk; however, given powerful growth, this is unlikely to be an issue in the short to medium term.</p>

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## **Institutional Arrangements**

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Regulation	<p>The Civil Aviation Administration of China controls most medium and small airports and is responsible for safety, development, and reform of the aviation industry, air navigation services, planning and the environment, security, and fire and rescue at airports.</p> <p>In 2004, the Civil Aviation Administration of China implemented new pricing regulations titled “Trial Edition for the Proposal of the Civil Airport Charging Reform.” This involved conversion of per passenger airport construction fees to a tax on airline ticket prices, reductions of 20 percent in airport charges for foreign airlines, increases of 70 percent for domestic airlines flying international routes, and increases of 15 percent for domestic airlines flying domestic routes.</p>
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## **THAILAND**

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### **Contract Overview**

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Award Date	2004
Type	Partial divestiture through IPO
Duration	Indefinite
Contracting Authority	Central government
Operator	Airports of Thailand. A majority stake of 70 percent was retained by the finance minister. A total of 30 percent is owned by a diverse collection of mainly Thai financial interests.

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### **Setting Vision and Sector Structure**

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Motivation	The government has a general policy toward state-owned enterprises (SOEs) and corporatization and encouraging private sector participation. The new Suvarnabhumi Airport is an important project for Thailand, and the government needed to raise additional money to assist in financing its completion.
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Objectives	The objectives of the corporatization of Airports of Thailand (AOT) and subsequent partial sale were stated to be enhancing the competitiveness of the state-owned organization; giving AOT the flexibility to meet rising demand, promote travel, and contribute to Thai economic growth; and boosting the potential of Thai capital markets. When the share sale actually arose, it was apparent that the main objective was to raise finances to facilitate the completion of the New Bangkok International Airport, Suvarnabhumi, which was experiencing delays, cost overruns, and construction problems.
Market structure	<i>Horizontal structure:</i> Single-firm ownership of the six main airports in Thailand, including the new Suvarnabhumi and old Dom Muang airports in Bangkok. <i>Vertical structure:</i> Unclear.
Competition constraints	<i>Competition for the market:</i> Not applicable. <i>Competition in the market:</i> No competition between airports. Unclear whether the provision of ground handling is competitive.

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#### Details of the Arrangement

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Contract cost	The IPO raised Thai baht (B) 4.235 million, or approximately US\$100 million.
Management	No evidence; however, we presume minority AOT board membership has been granted to the disparate group of private investors.  Some management at AOT falls short of best practice, but this is probably of modest impact overall on the air transport industry. Bringing airports into existence and in operation generally is more important for the economy and air transport industry as a whole than squeezing out every last efficiency.
Finance	The Japan Bank for International Cooperation provided about 70 percent of the finance required to build the new Suvarnabhumi Airport. Another 10 percent was provided through the proceeds of the IPO, and the remainder was provided by the government.

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**Service Standards, Tariffs, and Subsidies**

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Operator obligations	No evidence of obligations for inputs or outputs, performance targets, or penalties for not meeting those targets.
Cost recovery	Airport charges.
Subsidies	None, other than government injection of funds for constructing the new airport.

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**Incentives, Risk, and Investment**

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Allocation of responsibilities	<p><i>Airports of Thailand:</i> Ownership, management, maintenance, and operation of Thailand's six main airports (including the old Bangkok airport).</p> <p><i>Government:</i> Majority ownership of AOT and total ownership of (New) Bangkok International Airport (NBIA) (the company formed to construct the new airport) until completion in 2006, when all liabilities and employees were transferred to AOT.</p>
Investment	<p>The total cost of the new Suvarnabhumi Airport was B 43,000 million (US\$1,000 million). It has one of the largest passenger terminals in the world and a new passenger terminal for low-cost airlines is expected to be built.</p> <p>After various delays, and some live tests, Suvarnabhumi fully opened in September 2006. On opening Suvarnabhumi, Dom Muang was closed.</p>

## Incentives

The regulation of AOT is intrusive and lacks transparency. This is only acceptable to private shareholders because the government is the major shareholder and will not wish to see AOT fail, since it is essential to support the economy of the country and its ongoing rapid growth. On the other hand, it seems likely that the government will use its control to ensure AOT reinvests rather than delivers high returns to minority shareholders. If the government were to make a substantial reduction in its stake, or prioritize efficiency and cost reductions ahead of investment and development, then the minority shareholders would do well to demand a more transparent regulatory system.

The objectives of this PSP apparently included facilitating development to assist Thailand's growth, yet in reality, providing infrastructure to facilitate Thailand's growth is only indirectly in the commercial interest of AOT. AOT's commercial interest is probably to sweat its assets. It was the government's decision to build Suvarnabhumi, and it seems likely that the government, as majority shareholder, will continue to direct major investment decisions with an eye on the Thai economy as a whole rather than maximizing AOT's profitability. These were the grounds upon which the Singapore government chose not to privatize Singapore Changi Airport.



**Risk allocation**      The new airport was delivered about three months late. The airport faced several early difficulties. Despite its large size, it experienced congestion problems and a variety of breakdowns. When ruts were found in the runway, the safety certificate of the airport was temporarily revoked; under Thai law, this did not result in the closure of the airport, but some flights were diverted while repairs took place. Following these difficulties, airlines lobbied for the reopening of Dom Muang airport. The government appears to have permitted this, but it has restricted it to domestic traffic, which limits its attractiveness to most airlines.

Suvarnabhumi has had construction delays, teething problems, and cost overruns, but such is not uncommon in projects of this magnitude, and in that context, these problems have been relatively modest.

AOT has been lucky to avoid the downside of serious financial risks of this project. AOT is highly geared and therefore has limited capacity to handle financial risk. Fortunately this high gearing came about after the Southeast Asian crash of the late 1990s and the 2001 international air transport crisis, and both the Thai economy and tourism are growing strongly again. In other scenarios, there could have been serious financial problems.

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### **Institutional Arrangements**

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**Regulation**      The Civil Aviation Board sets maximum charges at airports in detail—that is, for landing, parking, passenger charges, and so on. AOT can revise the tariff subject to those maxima. If AOT wishes to exceed those maxima, it must apply to the board. Apparently, these maxima have no explicit time limit nor any inflation indexing. Inflation is sufficiently high in Thailand that this presents no opportunity for profiteering. The grounds upon which the Civil Aviation Board might approve a price increase are not clear.

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## LAO PEOPLE'S DEMOCRATIC REPUBLIC

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### Contract Overview

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Award Date	1998
Type	Partial divestiture through trade sale
Duration	Indefinite
Contracting Authority	Central government
Operator	Lao Airport Authority, a mixed-ownership company with a majority stake (51 percent) retained by the government and a 49 percent stake held by a consortium of two private Japanese firms, JAL Trading (a subsidiary of the Japanese flag carrier) and the Tomen Corporation.

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### Setting Vision and Sector Structure

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Motivation	Lao PDR, Cambodia, and Vietnam have been cooperating, through the Mekong Forum, in an attempt to grow tourism income. To this end, Cambodia and Thailand have taken steps to liberalize aviation policy: Cambodia is operating an open skies policy; and Thailand, while more restrictive, has begun to restructure Thai Airways International by splitting off loss-making domestic routes with a view to growing the market. A broader program of improvements had commenced at the Laotian airports, including a new passenger terminal building at Luang Prabang, which was funded by grants from the Kingdom of Thailand and handed over in late 1996; a runway extension at Luang Prabang, also funded by grants from Thailand and opened in 2001; improvements at Pakze Airport, funded by the Asian Development Bank; and air traffic control (ATC) modernization at Vientiane Airport, undertaken by a Thomson-Siemens consortium and including a stand-alone unit at Savannakhet (South Laos) and controller training in Toulouse.
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Objectives	The main objectives in introducing PSP were to attract finance for investment in a new passenger terminal and an ATC tower, renovation, and extension of the runway to handle wide-body aircraft. PSP would incorporate ongoing operation of the airport and its new facilities.
Market structure	<i>Horizontal structure:</i> Single-firm ownership of Vientiane Airport. <i>Vertical structure:</i> Unclear.
Competition constraints	<i>Competition for the market:</i> Private negotiations rather than an open competition. <i>Competition in the market:</i> competition between airports is impossible given the scale of the air transport market.

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#### Details of the Arrangement

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Contract cost	No evidence.
Management	Appointed by the private consortium.
Finance	The Asia Development Bank raised US\$15 million from sources, including Japan (through the Japanese Overseas Development Assistance program), Thailand, France, and the Nordic Development Fund, to finance airport investment. This funding appears to have been provided on the basis that ongoing operations would be vested with a private consortium of Japanese firms.

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#### Service Standards, Tariffs, and Subsidies

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Operator obligations	No evidence of obligations for inputs or outputs, performance targets, or penalties for not meeting those targets.
Cost recovery	No evidence, but unlikely to be covered by airport charges.
Subsidies	No evidence, but we presume that, given the scale of the air transport market, ongoing subsidies are involved.

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#### Incentives, Risk, and Investment

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Allocation of responsibilities	<i>Lao Airport Authority:</i> And specifically the private consortium, is responsible for all airport-related operations, including security, catering, and ground handling. <i>Government:</i> Majority ownership of Lao Airport Authority and, apparently, of all airport infrastructure.
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Investment	Construction work in Vientiane began in 1996 and was completed in 1998. The airport continued operations but was restricted to B737 aircraft. As a result, Singapore Airlines and Malaysia Airlines suspended service, while Thai Airways International, Vietnam Airlines, Royal Air Cambodge, and Lao Aviation continued with smaller aircraft. Civil works were executed under contract.
Incentives	<p>JAL Trading involvement was probably motivated by the promotion of Japanese trade interests and to ensure that Japanese aid investment was managed wisely. Although JAL is involved in the provision of a wide range of airport- and air-navigation-related services in Japan, its parent does not operate air services to Lao PDR or even code share with others. Moreover, there is no evidence of an international presence by the company in similar projects. These facts suggest that JAL's involvement was a vehicle for the Japanese Overseas Development Agency.</p> <p>The Tomen Corporation is involved in textiles, food-stuffs, energy, and machinery (including transport of oil by sea). It has been 35 percent owned by the Toyota Group since 2005 and provides airport fire and rescue vehicles, but it does not appear to be involved in airport management elsewhere. The company has a "liaison representative" in Vientiane and does other business in the country. Its involvement, therefore, may be seen as offering business development opportunities.</p>
Risk allocation	No evidence; however, it would appear that the level of subsidy required rather than the allocation of risk is the issue.

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### **Institutional Arrangements**

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Regulation	No evidence of regulation; it is likely to take the form of monitoring to minimize subsidies.
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## AUSTRALIA

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### Contract Overview

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Award Date	2002
Type	Full privatization through trade sale
Duration	A 50-year, long-term lease, with the option to extend for another 49 years.
Contracting Authority	Central government
Operator	Southern Cross Airports Corporation Holding Ltd. (SCACHL). Ownership of SCACHL was organized as follows: 59.5 percent by Macquarie Managed Funds; 20.9 percent by Ferrovial Aeropuertos Australian Management Ltd.; 10.5 percent by HOCHTIEF Air-Port GmbH; 5 percent by the Ontario Teachers Pension Plan Australia Trust; and 4.1 percent by the Motor Trades Association of Australia Superannuation Fund. SCACHL purchased 100 percent of the share capital in Sydney Airport Corporation Ltd., and consequently, the rights to the lease on Sydney Airport.

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### Setting Vision and Sector Structure

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Motivation	The Australian government had successfully privatized in several sectors, including financial and fiduciary, energy, communications, and transport. These privatizations generally involved partial trade sales and partial IPOs, with majority ownership retained by the government. Regarding the airports, the government's motivation for the introduction of PSP included fiscal constraints, the need for greater efficiency and performance, and the need for enhanced customer focus, thereby facilitating the further development of air transport. Sydney Airport was the last to be privatized.
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Objectives	The main objectives in introducing PSP were to reshape management and ensure sufficient management capabilities for the airports, to improve their productivity and profitability, and to remove bureaucratic control. The more detailed list of objectives was to upgrade the airports, including both aeronautical and nonaeronautical; to attract, plan, and realize airport investments that are timely and environmentally sound; and to optimize sales proceeds and minimize the government's exposure to residual risk. It was the government's view that a trade sale likely would deliver against objectives more rapidly than an IPO.
Market structure	<p><i>Horizontal structure:</i> Single-firm ownership of Sydney Airport. Scope is limited for competition between the main Australian airports and is probably confined to long-haul routes.</p> <p><i>Vertical structure:</i> SCACHL has extensive commercial operations. It is unclear to whether this includes ground handling.</p>
Competition constraints	<p><i>Competition for the market:</i> A three-stage tendering process to attract and choose consortia willing to bid for the trade sale.</p> <p><i>Competition in the market:</i> SCACHL was given rights to any airport that might be built within a 100-kilometer radius of Sydney Airport.</p>

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#### Details of the Arrangement

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Contract cost	Proceeds from the trade sale were Australian dollars (\$A) 4.233 billion.
Management	The winning consortium appointed the management team. The existing management was transitioned out over a period of approximately 12 months following privatization.
Finance	100 percent private equity and debt.

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#### Service Standards, Tariffs, and Subsidies

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Operator obligations	No evidence of obligations for inputs or outputs, performance targets, or penalties for not meeting those targets.
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Cost recovery	<p>Airport charges and commercial income.</p> <p>Contrary to the assertion that the move to the more light-handed regulatory approach of price monitoring from price cap regulation recognized the incentive of the airport to attract passengers to maximize commercial revenues, which would have the effect of disciplining market power in the pricing of essential aeronautical services through a single till, the regulator allowed the company to move to a dual-till basis. This, in turn, enabled a 100 percent price increase of aeronautical services. The regulator's role has become one of mediation in airport and airline price negotiations. In the course of those negotiations, however, the outcome under the hypothetical situation of continued price cap regulation was calibrated. SCACHL's 2005 Annual Report refers to a new long-term pricing agreement with the Board of Airline Representatives, which subsequently has been revised downward to give 2.15 percent annual increases. The airport, however, was found to have abused its market power in changing from aircraft-weight-based charging to passenger-based charging by unduly favoring full-service carriers (FSCs) at the expense of low-cost carriers (LCCs).</p>
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Subsidies	None.
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**Incentives, Risk, and Investment**

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Allocation of responsibilities	<p><i>Southern Cross Airports Corporation Holdings Ltd. (SCACHL)</i>: Ownership and operation of the 50-year lease on Sydney Airport.</p>
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*Government*: Management of the sale process by the Department of Finance and Administration, with advice from the Department of Transport and Regional Services. The Department of Transport and Regional Services' other responsibilities include protecting regional air services development, balancing public and private interests, ensuring optimal airport development, managing airport access (slot allocation), and monitoring compliance with the contractual arrangements agreed as part of the sales process, as well as its responsibilities for environmental issues.

Investment	Investment of \$A 70 million in baggage screening facilities and \$A 100 million in projects to accommodate the A380 in 2005; approval of a 20-year master plan in 2004, involving \$A 2–3 billion.
Incentives	Soon after taking over, Sydney Airport’s management undertook full-scale reviews of the airport’s relationship with its airline customers and corresponding marketing plans, the airport’s retail performance (including benchmarking studies), long-term capacity and investment requirements for the airport, funding plans for investment, all costs on a line-by-line basis, development plans to optimize operational efficiency, and management structure and staffing. Correspondingly, management appears to be performing well, given the financial and output results above and the following: reductions in operating costs of 8.5 percent between 2002 and 2005, and of 16.7 percent since 2001; reductions in operating costs per passenger of 23 percent since 2002; reductions in employee numbers from 482 in 2001 and 400 in 2002 to 287 in 2005; successful leasing of office space in the international terminal; and formation of a finance subsidiary to complete company refinancing (in September 2004) and to maintain debt-funding efficiency.
Risk allocation	The allocation of risk to the lessee was likely greater than could be achieved with IPO. This was complemented by a good system of assurances for successful airport operation.



## Institutional Arrangements

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### Regulation

Immediately before the privatization process started, the Australian Competition and Consumer Commission allowed a shift to a full dual-till approach to price regulation for Sydney Airport, which resulted in an approximately 100 percent increase in airport charges because of a recognition of the value of land tied up in the airfield business. The Australian Competition and Consumer Commission's mandate was altered from one of price cap regulation (of an SOE) to price monitoring (of a private company) shortly before the consortia submitted the final bids. This change applied to all airports in Australia, including those that had been privatized in previous rounds. The adoption of this more light-handed regulatory approach probably resulted in higher bid prices being received. It was asserted that such an approach would be more favorable in encouraging the efficient and economic development and operation of Sydney Airport. It was also asserted that this policy alteration recognized the incentive to attract passengers (that is, expand output) to maximize commercial income, but also the need for a more cooperative approach to regulation.

Since privatization, regulatory policy has evolved to a light-handed state in recognition of the high initial and ongoing investment required of the new owners of Sydney Airport. Although market power was abused, the airport and airlines appear to be working well in negotiating prices, in the knowledge of recourse to the regulator as mediator, and to the courts as final arbiter.

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## NEW ZEALAND

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### Contract Overview

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Award Date	1987
Type	Corporatization and commercialization
Duration	Indefinite
Contracting Authority	Central government
Operator	Airways Corporation of New Zealand (Airways). The department was converted to a commercial company wholly owned by the government. Some reorganization took place, in that fire safety services were reassigned to airports.

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### Setting Vision and Sector Structure

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Motivation	Upcoming major investment needs that the government was unable to fund. New Zealand at the time had a radical government determined to cut the size of the public sector by privatization and other PSPs, having inherited economic stagnation and large deficits from the previous government.
Objectives	No explicit statement, but the main issues appear to be removing the burden of finance from the government budget, improving efficiency, moving to a more commercial charging structure, and covering the airport's operational and financial costs.
Market structure	<i>Horizontal structure:</i> Single-firm provision of all aerodrome control services. <i>Vertical structure:</i> Single-firm provision of all aspects of ANS.
Competition constraints	<i>Competition for the market:</i> Not applicable. <i>Competition in the market:</i> None.

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### Details of the Arrangement

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Contract cost	Not applicable.
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Management	<p>Appointed by government.</p> <p>The corporatization has provided an opportunity for reorganization and cost cutting, simply because of the removal of the operational restrictions on departmental bodies.</p> <p>The company has substantially fewer employees than previously and has rationalized its number of locations. The original transformation was performed much more cheaply than expected. The company has carried out a policy of removing service from the least profitable aerodromes. Although Airways does not have a monopoly of aerodrome service, alternative providers do not exist. The CAA is now considering whether some of these aerodromes might be compelled to obtain service on safety grounds, which might leave those aerodromes in a difficult position. Employment was reduced by about 40 percent from the level at vesting, but has subsequently increased.</p> <p>The company remains a nationalized industry with the low levels of financial discipline that implies. Although the company is plainly much more efficient than before, suspicions remain about the scope for substantial further improvements.</p>
Finance	Commercial loans were drawn from international lenders without government guarantee.

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**Service Standards, Tariffs, and Subsidies**

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Operator obligations	No evidence of obligations for inputs or outputs, performance targets, or penalties for not meeting those targets. The size, however, of the New Zealand aviation market means that not much pressure is placed on its air navigation resources, which appear to be adequate.
Cost recovery	<p>ANS charges.</p> <p>Following initial adjustment, charges have increased at less than the rate of inflation. Although charges now conform to a more usual form, they still incorporate a degree of cross-subsidy to smaller aircraft. User consultations apparently support this principle.</p>
Subsidies	None.

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## Incentives, Risk, and Investment

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Allocation of responsibilities	<p><i>Airways Corporation of New Zealand:</i> Investment in and provision of ANS and communications.</p> <p><i>Government:</i> Ownership and regulatory supervision of the company.</p>
Investment	<p>The company has carried out the desired major investments. Disinvestment at minor aerodromes has been a concern.</p>
Incentives	<p>The company made a profit in its first year after vesting and has since made a profit in most years, albeit with some modest losses around 2001.</p> <p>Although the New Zealand government has not made any explicit investment in the company, the company reports a return on equity, equity comprising retained earnings used for finance. The company pays a modest dividend to the government on this finance. Through funding investment from retained earnings, the company now relies on relatively low levels of debt.</p>
Risk allocation	<p>The company had to write off some bad debts from bankrupted airlines post-2001.</p> <p>The government shareholder has had the self-discipline to avoid raiding its profits or responding to interest pressure to keep charges low, but rather has allowed the company to make a profit and retain most of its earnings for reinvestment. This has allowed it to evolve to a low level of debt following the initial borrowings, and gave it the resilience to survive the 2001 crisis.</p> <p>Withdrawing service from some aerodromes, which the CAA might deem not acceptable, raises the issue of public service obligation in the absence of other providers. The government has retained the power to instruct the company to provide a noncommercial service and cover its losses, but this has not so far been employed, and it is not a satisfactory framework for public service obligation.</p>

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## Institutional Arrangements

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Regulation	<p>Charges are not explicitly regulated, although the company acts under the supervision of its government shareholder. The company carries out user consultation on its charges.</p> <p>The company's cross-subsidies may be popular with the customer base, but prevent any competition from emerging for nonmonopoly services.</p>
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## ARGENTINA

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### Contract Overview

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Award Date	1998
Type	Concession contract
Duration	30 years (with a provision to extend for 10 years)
Contracting Authority	Central government
Operator	<p>Aeropuertos Argentina 2000 (AA 2000), a newly created private limited liability company, with private ownership by Corporacion America Sudamerica (34 percent), Ogden (28 percent), SEA Aeroporti di Milano (28 percent), Simest SPA (8 percent), and Amadeo Riva Construcciones (1 percent). In April 2000, Ogden sold its stake, giving Corporacion America Sudamerica a 63 percent controlling stake. In 2004, AA 2000's shareholders reduced their stakes proportionately and floated 33 percent on the Buenos Aires stock exchange in a public share offering.</p>

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### Setting Vision and Sector Structure

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Motivation	<p>An airport infrastructure deficit in light of international agreements and the desired development of domestic and international traffic, shortages in public resources to grow and modernize the infrastructure, the wider policy of deregulation, and the involvement of private capital.</p>
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Objectives	To transfer responsibility of operating and investing in airport infrastructure to a more competitive private sector firm and end the government’s operational and managerial control of the system.
Market structure	<p><i>Horizontal structure:</i> The contract vested exclusive responsibility for “all commercial, industrial, and service activities related or connected with airport activity” for 32 airports. Control of the country’s other 26 airports was vested with Organismo Regulador del Sistema Nacional de Aeropuertos (ORSNA).</p> <p><i>Vertical structure:</i> The contract included responsibility for ground handling and all aeronautical and nonaeronautical facilities.</p>
Competition constraints	<p><i>Competition for the market:</i> A competitive bidding process began in winter 1997. Restrictions on bidders were not published, but they were believed to include a requirement for an Argentine partner. The list of bidders was never published.</p> <p><i>Competition in the market:</i> The government implicitly rejected a competitive airport market structure. This was likely based on economic and financial feasibility, because restrictions on AA 2000 prevented the closure of many unprofitable airports.</p>

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#### Details of the Arrangement

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Contract cost	AA 2000 was required to pay biannual concession fees equal to US\$85.5 million. The government declared that the fees would be reinvested in the country’s 26 other airports and in the ANS system.
Management	<p>Ogden was presented as the leader of the consortium that formed AA 2000. Its airport portfolio at the time included Macau International Airport (Dominican Republic) and a build-operate contract for a second runway at Bogota, Chile.</p> <p>In July 2000, following the withdrawal of Ogden from AA 2000, the government appointed SEA Aeroporti di Milano as technical operator.</p>
Finance	In March 1999, AA 2000 received a US\$300 million loan from the Italian bank Banco Medito Credito Central.

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### Service Standards, Tariffs, and Subsidies

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Operator obligations	<p>AA 2000 was required to make investments to rehabilitate the airports and provide for projected traffic growth. A master plan was to be developed for approval by ORSNA.</p> <p>No evidence of obligations for inputs or outputs, performance targets, or penalties for not meeting those targets.</p>
Cost recovery	<p>Airport charges of around US\$30 per passenger. These are high by international standards and driven by (reportedly) high allowed rates of return and the concession fees.</p>
Subsidies	<p>None.</p>

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### Incentives, Risk, and Investment

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Allocation of responsibilities	<p><i>AA 2000:</i> Responsible for “all commercial, industrial, and service activities related or connected with airport activity” related to the 32 airports, including ground handling and all aeronautical and nonaeronautical facilities.</p> <p><i>Government:</i> Ownership of all physical infrastructure and equipment.</p>
Investment	<p>In one report, AA 2000 was asserted to have committed to a US\$3.1 billion investment program. In others, a minimum investment requirement of US\$2 billion was reported. Yet another asserted having access to the investment profile, which included a US\$562 million investment in the first four years. It also noted that this commitment had not been fulfilled.</p> <p>The first master plan did not meet the requirements of the concession contract, and there have been several complaints that AA 2000 is permitted to levy tariffs that are disproportionate to the level of service being provided. The contribution of high airport charges and the lack of adequate investment are likely the main reasons.</p>

Incentives	The International Air Transport Association (IATA) commented in 2005 that the privatization of Buenos Aires Ezeiza Airport had been “a very bad deal for customers. The structure of the lease sale has meant very high charges, underinvestment, and poor customer service quality. The absence of an independent economic regulator and the clear conflict of interest as apparent from extremely high royalty fees has lead to a very confrontational relationship between government, airport operator, and customers to the benefit of none.”
Risk allocation	It is reasonable to conclude that the Argentine government left the company unduly exposed to financial and demand risk in the face of an economic crisis, because of the extraordinarily high concession fees and the fact that many of the airports became liabilities because of their poor condition. Moreover, with the abandonment of 1:1 convertibility with the U.S. dollar and the devaluation of the peso, and the government continuing to insist on receiving concession fees in U.S. dollars while maintaining the rules that airport charges be set at regulated peso levels, the company was exposed to severe exchange rate risk.

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### **Institutional Arrangements**

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Regulation	The government established ORSNA to take responsibility for economic and safety regulation. ORSNA was required to report jointly to the Ministry of Economy and Public Works and Services and the Secretariat of Transport. AA 2000 was obliged to provide all necessary information to ORSNA to allow verification that contractual obligations were being met.
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## MEXICO

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### Contract Overview

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Award Date	1999–2000
Type	Full privatization through partial trade sale and partial (New York and Mexico) stock market flotation
Duration	A 50-year concession to manage the nine Grupo Sureste airports in Mexico (including Cancún)
Contracting Authority	Central government
Operator	<p>Aeropuertos del Sureste de Mexico (ASUR). In early 1999, a 15 percent stake in ASUR was sold to ITA for \$115 million. ITA is a consortium initially having four approximately equal shares for Copenhagen Airport, Ferrovial, Vinci, and Nacional Financiera, the Mexican government development bank. After various transactions, by 2005, a Mexican executive and Copenhagen bought out the shares of the rest in ITA, the executive obtaining a 51 percent stake and Copenhagen 49 percent.</p> <p>In 2000, the remaining 85 percent of shares were placed on the New York Stock Exchange for \$335 million, although some trading also takes place on the Mexico Bourse. The shares held by ITA have additional benefits in terms of board representation, and so on, which explains the higher price paid by ITA.</p>

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### Setting Vision and Sector Structure

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Motivation	The Mexican economy was being constrained by poor infrastructure, and the state infrastructure providers tended to be inefficient, even corrupt, with no funds for investment. In the mid-1990s, the Mexican government was short of money following an earlier economic crisis.
Objectives	No explicit statement of objectives is available, but we believe the intentions were to raise money for the government, to improve the efficiency and effectiveness of the operations of the airports, and to secure adequate investment to satisfy demand without government contribution.

Market structure	<p><i>Horizontal structure:</i> Single-firm ownership of nine airports.</p> <p><i>Vertical structure:</i> Airports appear to provide ground-handling services.</p>
Competition constraints	<p><i>Competition for the market:</i> Competition for the 15 percent stake taken by ITA, which was subsequently traded.</p> <p><i>Competition in the market:</i> None. Cancún had about 9 million passengers in 2003 and is the second-busiest airport in Mexico. Four other airports in the group have about 2 million passengers each, and the other four have about 1 million in total. Given a scale of about 21 million passengers, the potential for competition may exist, at least between Cancún and the other grouped airports.</p>

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#### Details of the Arrangement

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Contract cost	<p>US\$115 million was raised for the 15 percent stake sold to ITA. US\$335 million was raised in the stock market flotations.</p> <p>An annual concession fee of 5 percent of revenues is paid to government.</p>
Management	<p>All of the individual airports now appear to be profitable. Income has grown because of increases in throughput, price increases, and much higher growth in commercial services; net profits (after depreciation) have more than doubled. The company is achieving a good rate of return, and it was forecast to do so after the 2003 review.</p> <p>Our analysis suggests that operating costs per work load unit (WLU) have not fallen over the concession up to 2004, which is surprising. We would have expected the concession to have inherited inefficiencies and to have been able to spread costs over growth in traffic. We are not aware of any impediment to restructuring the airports.</p>
Finance	<p>Commercial loans were drawn from international lenders without government guarantee.</p>

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### Service Standards, Tariffs, and Subsidies

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Operator obligations	No direct evidence on quality of service. ITA does not appear to have taken up its 5 percent option. Whether this is because it chose not to, or because it was prevented by poor performance, is unknown.
Cost recovery	Aeronautical revenues of the group are on the order of \$11 to \$13 per passenger, on a rising trend. IATA has complained about the level of airport charges for this airport group, describing them as “monopolistic.” Prices of this level are not unusual, or even high, by comparison with regional airports in Europe.
Subsidies	None.

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### Incentives, Risk, and Investment

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Allocation of responsibilities	<p><i>ASUR:</i> Grupo Sureste comprises about 10 to 15 percent of available seat capacity in the Mexican market, a share that has grown since the transaction.</p> <p><i>Government:</i> Ownership of the airport assets; board representation; regulatory supervision of the company.</p>
Investment	The scheduled investment appears to have taken place in the first five years, and a master plan for a similar level of investment in the subsequent five years has been accepted. The airports have been (at least) adequate to accept the substantial growth in traffic.
Incentives	<p>In effect, commercial interests have replaced the construction and government interests in the consortium following the completion of the initial investment program.</p> <p>Given the strong government influence retained, it is notable that the concession company maintains an office in Mexico City, outside its operational area.</p>
Risk allocation	Grupo Sureste had about 30 percent growth from 2000 to 2005, reflecting growth in international tourism and emigrants returning to visit relatives. In contrast, Mexican airports as a whole have stagnated over the same time, reflecting a period of economic stagnation.

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**Institutional Arrangements**

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Regulation	Minimum investment requirement in the first five years; subsequently, an investment master plan must be presented every five years to be approved by the government. The government has retained representation on the board and in major decisions.
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**CANADA**

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**Contract Overview**

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Award Date	1996
Type	Conversion of an SOE into an independent nonprofit company.
Duration	Indefinite
Contracting Authority	Central government
Operator	NavCanada

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**Setting Vision and Sector Structure**

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Motivation	We have not seen any explicit exposition, but the following appear to be the key points: cumulative underinvestment was constrained by public sector cash constraints, staff resource was misaligned because of restrictive civil service hiring policy, a large investment program appeared likely to be overrun, and the government appeared eager to take NavCanada out of the public sector so that the overrun did not hit the government's books.
Objectives	We have not seen any explicit exposition, but the following appear to be the key points: move to commercial finance and remove it from government books; move to commercial operating policies to respond to staff misalignment, and so on; move to a more transparent charging regime; and cover full costs with charges, but smooth charging over the air transport cycle and manage commercial risks.

Market structure	<i>Horizontal structure:</i> Single-firm provision of all aerodrome control services. <i>Vertical structure:</i> Single-firm provision of all aspects of ANS.
Competition constraints	<i>Competition for the market:</i> Not applicable. <i>Competition in the market:</i> None .

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### Details of the Arrangement

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Contract cost	NavCanada purchased the existing assets and incomplete investment projects from the government for Canadian dollars (Can\$) 1,500 million, compared with a net book value of Can\$2,600 million. The work in progress also appears to have been sold at a discount compared to money spent on it.
Management	The board has representation from three interest groups—governments, unions, and the air transport industry.  Corporatization has given the company the freedom to restructure its labor force, although arguably it was lucky to inherit it at a time when wages were generally too low. Senior managers have not profited. Management of major investment projects has appeared prudent, with little sign of gold plating. Nonetheless, following the early gains, questions remain about the longer-term incentives to tackle inefficient labor practices and other internal inefficiencies.
Finance	The company is without share capital or dividend. Debt was used to finance the purchase of the assets and incomplete investment projects. The company has a borrowing limit set by the government.

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### Service Standards, Tariffs, and Subsidies

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Operator obligations	NavCanada was noted for persistent underinvestment, understaffing in key ATC roles, and general overstaffing. These were causing flight delays and some safety issues.  The obligations on the company were to reduce delays and safety incidents.
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Cost recovery	<p>ANS charges.</p> <p>It is difficult to carry out a before/after assessment of charges, because previously ANS was funded through a passenger tax rather than explicit charges on airlines. NavCanada claims that the charges are substantially lower than the earlier tax. Charges fell substantially (about 10 percent) in mid-1999. Following the events of September 2001, NavCanada initially tried to absorb the commercial impact through its stabilization fund, but eventually substantial charge increases were required in 2003 and 2004. Another problem was that a number of airlines became bankrupt or went completely out of business, leaving bad debts. By mid-2004 charges were, in real terms, similar to those in early 1999, albeit that they had been rather lower than the consumer price index (CPI) tracker in the meantime. Passenger levels returned to pre-2001 levels only in 2005. Charges are now expected to fall again relative to CPI.</p>
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Subsidies	None.
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**Incentives, Risk, and Investment**

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Allocation responsibilities	<p><i>of NavCanada:</i> Investment in and provision of ANS and communications.</p> <p><i>Government:</i> Board representation.</p>
Investment	NavCanada has invested about Can\$1,000 million since vesting.

## Incentives

The nonprofit company reassures customers that all financial benefits will be applied to the industry, and reduces the incentive for profiteering at the expense of safety in a safety-critical role. The structure of the board, with representatives of stakeholder groups, also increases the acceptability to customers. The problem with such a structure could be a lack of concern for efficiency, which is commented on below.

Economic theory suggests that a trade-off exists between the incentive to efficiency and risk taken, so some reduced-efficiency incentive is surely the price of the well-designed risk management regime. In terms of the overall cost of the air transport industry, of which this is a small part, this may be considered a small price to pay.

## Risk allocation

The Rates Stabilization Fund went into deficit following the events of September 2001. This resulted in an immediate reduction in traffic, and also in the bankruptcy of some airlines, leaving bad debts. The deficit peaked in 2003 and was extinguished in 2005 after charges had been increased. NavCanada has been criticized for its exposure to airline bad debts. Even Air Canada, which has been reconstructed following bankruptcy, has escaped some of its liability. NavCanada has now tightened up its charge enforcement regimes and will be less exposed to bad debts in any future crisis. Although it has imposed limits on its borrowing ability, it has managed to retain sufficient headroom for stability and flexibility.

The air transport industry is noted for its exposure to traffic risk, as the Gulf War in the early 1990s showed. Further, equity-free companies are noted for a higher exposure to risk. While this could be handled by allowing the company to recover its costs every year, that would heighten the risk on other parties in the industry. In addition, an equity-free company can potentially subvert attempts to control its risk by overborrowing. The design of NavCanada has tackled these risks carefully: A financial reserve handles any short-term increase in cost or reduction in revenue, a stabilization reserve allows it to smooth price changes from year to year, a borrowing limit reduces its ability to crank up its own risk, and a price limit based on debt cover, rather than CPI-X, subject to the use of stabilization and financial reserves, gives flexibility of response, while reassuring customers in the longer term. The approach has achieved a high credit rating, a low cost of capital, and stability. The disadvantage of this approach is that customers have less certainty about the future evolution of charges than they might under a CPI-X regime. The company initially paid insufficient attention to the risk of bad debts.

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### **Institutional Arrangements**

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Regulation	The company's charges are subject to the approval of the minister of transport. In general, the company is required to levy sufficient charges to cover its costs (but see the following explanation of the stabilization fund), and it is empowered to levy charges so that its debt service cover is no more than 125 percent. The company must maintain financial reserves amounting to three months' operating costs and one year's debt service to protect it from bankruptcy. All revenues in excess of costs are placed into the rate stabilization fund, which exists to respond to the cyclical nature of the air transport industry, and thereby to keep ANS rates stable. The fund is permitted to go into deficit temporarily.
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## APPENDIX II

# LESSONS FROM CASE STUDIES

### Motivation, Vision, and Objectives: Lessons 1–4

Motivations and objectives for air transport infrastructure (ATI) reform appear not to have been clearly articulated or agreed upon by all parties in all of the case studies. Likewise, it appears unlikely that in each case the objectives complemented an overall vision for the sector, or that the sustainability of commercial operations was adequately considered.

In Cameroon, oversized airport facilities led to inadequate maintenance and excessive operating costs, and thus poor service for airlines and customers. These issues, coupled with a depressed economy, may explain the failure to increase air traffic and revenue sufficiently to justify the promised financing. A failure to address depressed demand for flights, through broader aviation policy, may have contributed as well. Greater demand could have increased revenue and justified the financing for airport rehabilitation and improvement. Similar thinking can be applied to the Lao People’s Democratic Republic case, where the attraction of development funding and private sector participation in operations and management was not complemented by adequate measures to increase traffic.

#### *Lesson 1*

*ATI reforms should be complemented by broader aviation policy measures aimed at ensuring commercial sustainability.*

The overall vision for the sector cannot be realized through ATI reforms alone. It should recognize the vital role of air transport in economic growth and poverty alleviation.

## Lesson 2

*Clear articulation of the vision for the sector and of the objectives for the ATI reform was observed to facilitate successful outcomes.*

## Lesson 3

*Policy makers should avoid prioritizing attempts to maximize proceeds from private sector participation (PSP) transactions at the expense of other, more important, objectives.*

If ATI investment and provision is made less dependent on limited government funds and on the public sector, governments' financial position should naturally be expected to improve. The United Kingdom and Mexico airport cases included the objective to promote wider share ownership. In the United Kingdom, privatization took the form of an initial public offering (IPO). In Mexico, 85 percent of the share capital of Aeropuertos del Sureste de Mexico (ASUR) was traded on the New York Stock Exchange and the Mexican Bourse. In the case of British Airports Authority plc (BAA plc), ownership quickly became concentrated. In Mexico, excessive government involvement in company affairs (possibly resulting from the lack of a sufficiently concentrated single private shareholding) may be preventing the expected gains of introducing PSP.

## Lesson 4

*It may not be optimal to pursue broader share ownership to support policy sustainability if alternatives are more likely to deliver the gains expected from the introduction of PSP.*

## Reform Processes: Lessons 5–11

In the case studies analyzed, in general, the scale of the processes appeared proportionate to the scale of the transactions. We did find some evidence, however, of excessive complexity resulting in higher-than-necessary transaction costs.

In the Cameroon case, Caisse Francaise de Developpement (now Agence Francaise de Developpement, AFD) carried out the initial feasibility study. It is possible that AFD hired the consulting arm of Aéroports de Paris (AdP), namely Aéroports de Paris International, to undertake the study. Either way, having adopted the recommended model, the government mandated AdP to create the company that would purchase the concession. AdP not only created the company, it also retained the largest shareholding, negotiated the terms of the concession with the government, and agreed to provide the company's management team. The Cameroon government, therefore, allowed a situation whereby its policy of introducing PSP in its airport sec-

tor was developed by a foreign company, which then benefited from the policy, a clear conflict of interest. Moreover, the lack of a transparent appraisal and bidding process meant that it was unlikely to maximize proceeds from, or find the best possible consortium for, the concession. Wider consultation and deeper consideration of the issues might have led to more suitable arrangements. In Argentina, a competitive bidding process was initiated but no list of bidders or restrictions to be applied was published.

In contrast, the Australian government initiated a three-stage tendering process to find bidders for an arrangement that had already been assessed and decided. Bidders were required to submit detailed plans, and the Department of Finance and Administration was appointed to manage the process, with advice from the Department of Transport and Regional Services. Between them, they were responsible for ensuring that the sale outcome was consistent with regulatory, environmental, foreign investment, competition, access, and pricing policies, as well as demonstration by bidders of their commitment to the future development of the airport. The three-stage process facilitated the formation of a range of consortia from which government could choose, while the prospect of a trade sale attracted investors with deep pockets and, ultimately, led to maximization of the sale proceeds. Similar processes were introduced in the United Kingdom for National Air Traffic Services Holdings Ltd. (NATS) and BAA, in Greece for the new Athens airport, and in Mexico.

#### *Lesson 5*

*Greater consultation and transparency leads to better outcomes.*

The multitude of problems some countries faced makes it difficult to isolate the role of process in poor performance. The relatively strong performance in cases in which better processes were adopted, however, justifies some general lessons.

#### *Lesson 6*

*The quality of the process can determine the success of the PSP arrangement.*

“Quality” here refers to consultation and transparency, robustness through sound financial and technical advice, and more competitive mechanisms for the choice of the private sector participant. These will aid the identification of winners and losers, the best arrangement for local needs and circumstances, and the best firm for that arrangement, which can be just as important as attracting the best possible offer.

Another important lesson concerns transaction costs and complexity. In the case of NATS, the bidding process, although transparent and expertly advised, was complex, involving two government departments, a regulator,

NATS, the seven members of the Airline Group, four banks, and financial and legal advisors. The National Audit Office reported that the cost to the bidders was approximately British pounds (£) 30 million and that the costs to the Department for Transport (DfT) were £44 million (£17 million more than anticipated because of the complexity of the transaction and the fact that it took longer than expected). According to these calculations, total transaction costs were 9.25 percent, and the direct cost to the taxpayer (£44 million) was 5.5 percent of the eventual proceeds. Further costs were incurred during the formulation of the refinancing that formed part of the Composite Solution. In the case of NATS, an equally effective solution might have been provided by the NavCanada nonprofit model or by the company-limited-by-guarantee model (as applied in the case of Network Rail and Glas Cymru), possibly leading to significant savings in the transaction costs. This analysis leads to our seventh lesson.

#### *Lesson 7*

*The transaction costs of process refinements and arrangement improvements should be carefully considered, and may justify less optimal but more economical arrangements.*

Policy makers should pay for good advice, but they should be aware that the in-depth analysis that is justified for long-term arrangements in a major city, for example, might be too expensive for short-term arrangements in a small town.

In the case studies in which competitive bidding processes were used to choose the private sector participant, such as in Australia, Greece, Mexico, and the United Kingdom, performance has tended to be better than those where private negotiations were used and nontransparent choices made. A striking feature of the Cameroon case is the extremely low valuation of the 15-year concession to run the country's seven main airports, which was awarded for US\$253,000. Even on a conservative estimate, this is a significant underestimate of the current and future income-generating potential of at least three jet-capable runways and three substantial passenger terminals, not to mention the other four smaller airports. Moreover, annual revenues in 1999 were equivalent to US\$15.3 million, which, if operating costs could be reduced through airport rehabilitation, maintenance, and improvement, could yield a healthy profit stream from such a low passenger base (720,000 in 2002). This is confirmed in a study commissioned by the U.S. Trade and Development Agency and undertaken by LPA Group and IOS Partners, which, based on a redesign (and retender) of the concession and forecasted traffic levels, projected a 22 percent rate of return even if revenues were 10 percent lower than estimated.

In contrast, the imposition of biannual fees of US\$86 million for the 30-year concession to run 32 Argentinean airports represents a significant overestimate of its potential. Indeed, the lack of robustness of the terms of the transaction was exposed in the face of the 1998 economic crisis and recession, which automatically imposed pressure on the financial viability of Aeropuertos Argentina 2000 (AA 2000). Similarly, in the case of NATS, the £800 million proceeds from the sale of a 46 percent share to the Airline Group may have contributed to a highly leveraged capital structure that proved unsustainable in the face of a revenue downturn (because of the significant reduction in transatlantic traffic) that was, notably, not matched by a demand downturn (because of the growth of the low-cost carrier [LCC] sector).

The 50-year lease on Sydney Airport generated proceeds of 17.7 times the airport's 2002 earnings. On the face of it, this seems rather high. Given, however, that the discounting methods used by private financiers do not, in general, support the assessments of the revenue potential of long-term assets, and that therefore airports have indeterminate future potential given adequate levels of investment to maintain infrastructure at a steady-state level, the Australian government may have struck an appropriate balance between flexibility for the new airport operator and maximization of proceeds from the PSP transaction. In the case of BAA, the Thatcher government, in seeking to widen and deepen share ownership to increase the popularity and prevent the reversal of the policy of privatization, may have foregone significantly greater proceeds from a trade sale. At the time, however, the market for trade sales may not have been sufficiently well developed.

#### *Lesson 8*

*Well-designed competitive bidding processes, supported by adequate financial and technical expertise in the assessment of bids, should be favored, where possible, over direct, closed negotiations.*

Such processes are more likely to deliver the correct incentives for bidders to reveal true and realistic valuations of the contract. Projections of future prices for the infrastructure and services to be provided under the contract are intimately linked with bids for the contract. Governments' task, through the bidding process, is to extract a realistic proportion of the future value of the contract. Overestimates of this value can result in inefficiently high prices. Likewise, a lack of adequate contract enforcement and price regulation might lead the winning bidder to try to recover disproportionate amounts of the cost of the contract, through higher prices, as soon as possible. In the Mexico case, the objective of the transaction was to maximize revenue for the government, while ensuring continued investment. This

probably resulted in higher prices, but given the high proportion of travelers who are foreign nationals or wealthy Mexicans, the government may have been only modestly concerned by the small premium on their airline ticket prices.

#### *Lesson 9*

*Overestimates in the valuation of the contract can result in higher prices.*

If the objective is to maximize proceeds, the corresponding benefits need to be weighed against the costs imposed by higher prices. This may include effects on the development of air services and the consequent effects on trade, investment, and tourism. Also relevant is the effect on future tax revenues if prices are higher and demand is relatively inelastic, as is the case for most ATI.

A considerable problem for the U.K.'s airports policy has been that as Heathrow became an ever-more-valuable proposition for airlines, its prices tended to fall through economies of scale and increasing subsidy from BAA's effective retail offering. This has resulted in incumbent airlines sitting on their valuable and underpriced landing rights, to the exclusion of more innovative airlines. Trading slots is theoretically illegal, though it happens informally to some degree. This means that the output of the airport is not used most efficiently. It has also made it difficult for the government to plan airport expansion in the London area, as most projects are not financially acceptable—airlines will not tolerate paying more to receive less. This is a general problem at European airports, rather than being specific to the BAA privatization. It implies that the government could have extracted more money from the airports. Bilateral treaties on aviation, in particular the U.S. bilateral, however, restrict the ability of the U.K. government to extract value from the market value of the airport.

#### *Lesson 10*

*Underestimates in the valuation of the contract can result in allocation inefficiency.*

Another important lesson can be inferred from the Argentina case. The annual renegotiated payments are (based on 15 percent of current revenues) one-fifth of the original figures, the second-place bidder's offer was only a quarter of AA 2000's (the winning consortium), and AA 2000 has continuously withheld the concession fee and objected to every regulatory decision. These outcomes have raised questions about the arrangements. Similar issues of anticompetitive strategic behavior by bidders have occurred in other Argentine privatizations, including repeatedly in rail.

## *Lesson 11*

*It is necessary to guard against unrealistic bids that are motivated by objectives contrary to the public interest.*

There are many levels of government, and by introducing some independence in the management of the process, “honest” policy makers can prevent the unfavorable outcomes that can result from corrupt vested interests within the government.

In the case of Sydney Airport, Ansett went bankrupt in the middle of the bidding process; however, despite delays, it probably made little difference because it was recognized that another airline (or airlines) would take up the traffic handled by Ansett. In other words, given the long-term stability of traffic levels, an airport privatization bidding process is likely to be robust in the face of airline bankruptcies. The events of September 11 were the catalyst for the collapse of Ansett, but from the point of view of the bidding for the airport, those events resulted in a downward shift in the traffic growth trend line that, despite individual airline bankruptcies, has regained its stability.

## **Types of PSP and Ownership: Lessons 12–16**

The case studies are dominated by retained government ownership and involvement in the range of elements of management and strategic direction, even in cases in which this may not have been optimal. Only in some cases were the right kinds of firms attracted and included as private sector participants.

Evidence suggests relatively few instances of full privatization. This can largely be attributed to governments’ reluctance to cede control over what, at least in the case of major capital city airports, is widely regarded as a national asset.

## *Lesson 12*

*The conditions that determine whether, and to what extent, PSP will be introduced should be clearly articulated.*

Such conditions might include the discontinuation of government involvement if it is not indispensable for safeguarding the public interest or if other public policy measures are sufficient. In the case of Greece, the government matched its requirements to the transaction. A fully commercial approach, high quality, and timely delivery of a new airport were required. In that light, it selected a strongly commercial partner with a reputation for delivery and quality. It gave the partner a substantial equity stake so it would be motivated to perform and complete freedom to design a commercial organization that would manage the airport using commercial methods (using,



for example, outsourcing where it was deemed necessary). The task was made easier by setting up an entirely new organization, rather than relying on existing heavily unionized organizations that frequently have impeded such reform in Greece. In the Lao PDR case, neither of the investors in Lao Airport Authority had any real experience in any major aspect of airport management or operations (other than JAL's role in ground handling).

In the Cameroon case, AdP was significantly involved in the airports concession. AdP, however, is a majority state-owned company, which meant that ownership of the consortium was distributed among a disparate set of government and quasi-government agencies that appear to have had neither the time, resources, nor interest to maximize returns. Consortia that were willing to make the initial investments in the airports and then, having taken the associated risks, run the airports to grow traffic, and make a commercial return on those investments, might have achieved a better outcome. In the case of Mexico, a 15 percent stake in ASUR was sold to a consortium consisting of Copenhagen Airport, Ferrovial, Vinci, and Nacional Financiera (the Mexican government development bank). Copenhagen Airport later took 49 percent of this 15 percent stake. It seems unlikely that this small stake was sufficient for the representatives of the consortium to have taken a strong commercial interest, especially given the high level of retained government involvement in the strategic control of the company.

### *Lesson 13*

*Sometimes it is necessary to significantly incorporate experienced international airport companies that bring valuable skills and knowledge to the development of ATI investment plans, the securing of relevant inputs, and the management and operation of airports and air navigation services (ANS).*

In the case of the South African airports, the government sold a 20 percent stake in Airports Company of South Africa (ACSA) to Aeroporti di Roma (AdR). Seven years later, this was sold to the SA Public Investment Corporation, effectively renationalizing the company. AdR was itself being privatized at the time of the transaction, having been the subject of a 45 percent placing in 1997, followed by a sale of the remaining stake in 2000. In 1997, stock in AdR was widely held, but in 2000 the Leonardo consortium of Italian industrial companies took a large stake. In 2002, Leonardo sold a 45 percent stake in AdR to Macquarie Bank of Australia, which has a major portfolio of airport investments. Macquarie apparently has effective control of AdR. AdR has minority holdings in two regional airports in Italy, but ACSA was its first and only overseas investment. Macquarie Airports appears to have been pleased to sell its share in ACSA to fund AdR's home investment needs. This suggests another lesson.

#### *Lesson 14*

*Avoid potential private sector participants that are undergoing significant restructuring.*

In the case of Sydney Airport, it was the government's view that a trade sale would likely deliver against its objectives more rapidly than an IPO. While a trade sale was more likely to have maximized the value of BAA plc in the United Kingdom, it is possible the market for trade sale partners was not sufficiently developed at the time, given the date of the IPO and the size of the airports involved. Nonetheless, trade sales to an experienced commercial operator are likely to have advantages in the sense that competition exists among informed buyers for the company. The buyers, being experienced commercial operators, can identify and carry out commercial and managerial reforms that the incumbent managers may be unaware of. A key disadvantage of an IPO (seen more clearly in other U.K. privatizations) is the need to obtain the cooperation of management, which typically entrenches itself and holds out for favorable financial terms, to make the arrangements for the IPO. In many U.K. privatizations by IPO, incumbent managers have enriched themselves, made expensive mistakes at their shareholders' expense, and delayed their replacement with more effective managers. In many cases, the major cost-cutting reorganizations took place only following a takeover by a commercial company experienced in the sector. As it happened, BAA did develop itself into a company of international repute. The BAA privatization promoted today's international market of commercial airport operators. BAA's takeover, however, has not been by such a company, and it seems unlikely that Ferrovial has ambitions for major reforms of BAA.

#### *Lesson 15*

*Measures should be put in place to prevent incumbent managers from unduly enriching themselves, delaying their replacement (with more effective managers), and making costly mistakes at the expense of shareholders.*

In the area of ANS, an interesting comparison can be made between the NATS public-private partnership (PPP) in the United Kingdom and the non-profit model adopted for NavCanada. The NATS deal required assurances by the Airline Group that it was not investing to make a profit. The non-profit model may have provided greater reassurance to the public that all financial benefits would be applied to the industry and that incentives for profiteering would not threaten the safety-critical nature of provision. The nonprofit model, combined with the rates stabilization fund, may have been more successful in managing and allocating risk. The NATS PPP model, however, may be more successful in terms of efficiency incentives. In the

case of South Africa, the corporatization gave the freedom to manage and finance Air Traffic Navigation Services Ltd. (ATNS's) activities, thereby providing for the needs of the economy better than restricted government departments, provided sufficient financial controls are applied. Given the safety-critical nature of ATNS's services, keeping them firmly in the public sector gives some reassurance that costs will not be cut at the expense of safety or to direct capacity expansion for national requirements.

#### *Lesson 16*

*In the case of ANS, the type of PSP adopted must carefully balance two critical needs: safety and efficiency.*

Regarding Sydney Airport, Australia has a long tradition of infrastructure investment, large domestic financial markets, and a mature banking system, which could support the large-scale investments by the owners of Southern Cross Airports Corporation Holding Ltd. (SCACHL), who were required to purchase the shares of Sydney Airport Corporation Ltd. (SACL) and take control of the lease on Sydney Airport. Moreover, given the maturity of the Australian aviation industry and the apparent ability of the airport and airlines to effectively negotiate airport charges (subject to the charges of anticompetitive conduct), the 100 percent private ownership model was probably the best choice.

Governments should carefully assess the timescale and extent of PSP and balance this against the potential benefits from the competitive effects of periodic retendering.

### **Policy Sustainability: Lessons 17–19**

#### *Lesson 17*

*Airports with fewer than 1 million passengers may require operating subsidies, and airports with fewer than 5 million passengers may require investment subsidies, unless cross-subsidization is possible through common ownership of these and other large-scale airports within a stable regulatory regime.*

Alternatively, investors should be granted something else that can generate income. Examples include Abu Dhabi, where a free zone is being planned adjacent to the airport that will help with the income deficit, and Blackpool, where, when the airport was privatized, a tranche of development land was made available to the purchaser. Other examples might include airports with adjacent business parks, commercial lettings, and car parking and hotel operations.

### *Lesson 18*

*Airports with fewer than 1 or 5 million passengers could be granted other income-generating assets such as property and development land and ancillary commercial operations.*

It is necessary, however, to get the size of the project right and, in doing so, deliver focused solutions that do not unduly burden the private sector participant. In the Cameroon case, airport facilities that German development agency aid previously financed were already oversized. In a depressed economy, it was perhaps too ambitious to expect a single semiprivate firm to provide the necessary finance for rehabilitation and maintenance as well as operation. In the Argentina case, many of the airports in the concession became liabilities for the private sector participant. Governments, in determining whether and to what extent to introduce PSP, need to consider whether the country's environment is sufficiently stable to support the institutions necessary to enforce contracts and regulation.

### *Lesson 19*

*Identify the areas most in need of improvement and provide focused solutions that do not unduly burden the private sector participant.*

### **Project Finance and Risk Allocation: Lessons 20–23**

In the case of NavCanada, while the company is required to levy sufficient charges to cover costs, it is empowered to levy charges so that debt service cover is no more than 125 percent. All revenues in excess of costs are placed into the rate stabilization fund, which exists to respond to the cyclical nature of the air transport industry and to keep ANS rates stable. The fund is permitted to go into deficit temporarily, and it allows NavCanada to smooth price changes from year to year. A borrowing limit reduces its ability to crank up its own risk. The price limit based on debt cover, subject to use of the stabilization fund, appears to give flexibility of response, while assuring customers in the longer term. The company has achieved a high credit rating, a low cost of capital, and stability. The potential disadvantage is that customers might have less certainty over the future evolution of charges than they might under a consumer price index (CPI)-X price cap.

In the case of NATS, however, where price cap regulation was applied, there was no clarity on the circumstances in which the CPI-X price control could be reopened, especially with regard to downturns in traffic. At the time of the company's financial crisis, there was also controversy over whether the highly leveraged nature of the company was the cause, or whether it was simply the downturn in transatlantic traffic. Either way, it is likely that the impact of potential traffic downturns, and who was supposed to be bearing

the risk, were not considered adequately. As part of the Composite Solution, the traffic risk-sharing arrangements were significantly changed and the allocation of demand risk made completely explicit. The company was given a more robust financial structure as well. In contrast, the arrangements regarding BAA plc have allowed greater certainty and flexibility. In the case of Australia, the allocation of risk to the lessee was likely greater than could be achieved with an IPO. This was complemented by a good system of assurances for successful airport operation.

Airports of Thailand (AOT) is a highly geared company that has limited capacity to handle financial risk. Thus far, it has been lucky to avoid serious downside risks associated with the construction of the new Bangkok Airport, although postopening problems may yet result in financing difficulties. In the case of Argentina, the risk was the result of extraordinarily high concession fees and the fact that many of the airports became liabilities owing to their poor condition. Moreover, with the abandonment of 1:1 convertibility with the U.S. dollar and the devaluation of the peso, as well as the government's continued insistence on receiving concession fees in U.S. dollars while maintaining the rules that airport charges be set at regulated peso levels, the company was exposed to severe exchange rate risk.

#### *Lesson 20*

*The allocation of risk, guarantees, and the conditions under which renegotiation of regulatory contracts can take place should be made completely explicit.*

#### *Lesson 21*

*When the potential exists for severe demand shocks, it is important to ensure a robust financial structure for the company and tariff resetting arrangements that are flexible enough to maintain financial stability.*

Regarding demand risk, the greater the political power of a local or national flag carrier, the greater will be the uncertainty about future demand growth, especially where competition to engender efficiency and growth is lacking. This is illustrated by the situation in Argentina, with the national carrier withholding airport charges that were owed to AA 2000, and New Zealand, where Airways Corporation of New Zealand had to write off bad debts from bankrupted airlines in the wake of the 2001 crisis.

### *Lesson 22*

*The exposure of the firm to demand risk is closely related to the level of monopoly power in the market for air transport. The firm needs to carefully guard against bad airline debts.*

This care needs to be balanced, however, by the need to expose the firm to the normal business risks it should be expected to bear.

### *Lesson 23*

*Risks should be allocated to those that are able to mitigate them at minimum cost.*

## **Management Incentives: Lessons 24–29**

Evidence suggests a number of failures and successes in the area of management incentives. For example, in Cameroon, the government signed a technical assistance agreement with AdP, under which the latter would provide key expatriate senior managers for Aéroports de Cameroun (ADC). Under this agreement, however, AdP received a fixed fee, which probably resulted in little incentive to perform. Likewise, in the case of the South African airports, AdR was given a number of seats on the board and received payments for consultancy services. This, combined with the small 20 percent stake in the company, probably led to poor incentives to perform. Indeed, ACSA's recent success suggests that, since the departure of AdR, it was better able to recruit appropriate skills and improve management of the company. The fact that ACSA has won awards for transparency and governance in a country poorly rated for corruption lends further support to this theory.

### *Lesson 24*

*The payment of fixed fees to private companies for management services is unlikely to deliver appropriate performance incentives.*

In the case of Sydney Airport, bidding for the trade sale of shares in Sydney Airport Corporation, Ltd. (SACL) included a requirement to submit the proposed management structure and the proposed approach to managing the business. This requirement—along with the fact that the main objectives of the privatization were to reshape management and ensure sufficient management capabilities for the airport, to improve their productivity and profitability, and to remove bureaucratic control—meant a greater likelihood of ensuring that managers had the right incentives to perform.

The NATS PPP involved the appointment of an executive committee, consisting of the chief executive officer (CEO) and operations management team, and sitting below the board of directors. The committee was

required to submit and agree on a contract with the board specifying key performance and operating targets for the coming year. In the case of BAA, however, airport service quality fell in the years following privatization, in particular, in the absence of any formal mechanism for measuring or enforcing quality. Aircraft delays increased, terminals became crowded, check-in times increased, and noncritical facilities, such as moving walkways and escalators, were frequently out of service. These problems were alleviated only following the incorporation of formal quality measurement, with penalties and bonuses, into the regulatory regime.

#### *Lesson 25*

*Because managers will be effectively responsible for delivering performance improvements, incentives need to be targeted toward them.*

Bonus provisions in CEO contracts linked to firm performance might be considered. In the absence of incentives from the firm's owners, more stringent regulation may be required. In the case of Athens airport, management incentives seem to be well aligned, demonstrated by the fact that five of the nine board members (including the CEO) are elected by the minority private owner, which has strong incentives to maximize returns given its 45 percent stake, and the fact that the airport is performing well after only a few years of operation. Moreover, the fact that prices are set well below the prevailing price cap is probably due to management's innovative use of outsourcing.

#### *Lesson 26*

*The sale of a substantial share of equity capital to a company with a proven track record in profit maximization is likely to lead to well-aligned management incentives from the firm's owners.*

Recent events in Saudi Arabia and in Abu Dhabi (as witnessed by Booz Allen Hamilton) suggest that the risk-averse nature of the public sector is causing difficulties in terms of effective management of the airports. To prevent money being misappropriated, all lease payments and landing charges go to the finance ministry, which then allocates money to the airport organization to cover operating costs. This has led to behavior by airport managers that may not be in the public interest or in the long-term interests of the airport, as these managers attempt to procure money on the side that they can use for discretionary spending. For example, in Saudi Arabia, tender documents are sold to bidders because this is the only way for managers to fund the consultants they need to properly manage the tender. In Abu Dhabi, massive discounts on landing charges have been granted in an attempt to attract airlines that in turn provide passengers who have spending money to use in duty-free shops (which the airport could keep). These activities make no

economic sense and are a reflection of the government environment. Government rules are designed to stop people from spending money unnecessarily, but they result in less income from trading organizations, as these organizations cannot invest in growth.

#### *Lesson 27*

*Management needs sufficient flexibility and rights to income streams to provide appropriate incentives to grow the business.*

In the case of New Zealand ANS, corporatization has provided the opportunity for reorganization and cost cutting, simply because of the removal of restrictions on departmental bodies. The company has rationalized its number of locations and reduced its number of employees by 40 percent. The good behavior of the government as shareholder has meant that earnings have been retained for reinvestment, allowing the company to evolve to a low level of debt following initial heavy borrowings. This low debt level gave the company the resilience to survive the 2001 crisis. The company, however, remains nationalized with, arguably, low levels of financial discipline, and although it is much more efficient than before, scope exists for further improvements. In New Zealand and South Africa, keeping the firm in the public sector provides some reassurance that costs will not be cut at the expense of safety. In South Africa, however, ATNS was subsidized for its first two years of operation to allow charges to increase gradually.

#### *Lesson 28*

*Regarding ANS, continued government ownership in small markets can ensure the flexibility needed to pursue efficiency, while also ensuring that management will not cut costs at the expense of safety.*

#### *Lesson 29*

*A clear understanding of the risks that the new owners are expected to bear is vital to ensure the correct alignment of incentives between owners and managers.*

### **Market Structure: Lessons 30–31**

Although competition in the provision of air navigation and communications services is rare, competition among airports is more realistic. Despite this fact, many governments have explicitly rejected the notion of airport competition. The U.K. government decided not to separate the three London airports when embarking on the BAA privatization. Arguably, the government made compromises to maximize value in the short term—namely, keeping the group together when competition might have been in the public interest.



The ability of BAA plc to cross-subsidize Stansted has enabled Stansted to become a thriving airport, but arguably at the expense of Luton Airport, which challenged what it saw as the anticompetitive nature of the arrangements. In Scotland, Glasgow Prestwick was run-down until it was sold, but a new owner has developed a thriving low-cost airline business. The proximity of Glasgow and Edinburgh to each other (around 80 kilometers/50 miles) means scope would exist for greater competition between them if they were owned separately. The Australian government, likewise, rejected the notion of a competitive airport market structure by granting the winning bidder for the 50-year lease the exclusive right to provide any airport that the government might decide is to be built within a 100-kilometer radius of Sydney Airport. Other governments, such as Mexico and South Africa, have implicitly rejected competition by vesting several airports (as least some of which could survive alone) with single companies. Competition was rejected for the Shanghai airports in China and the airports in South Africa.

The Cameroonian and Argentine governments explicitly rejected the possibility of a competitive airport market structure. In Cameroon, however, the scale of demand for air transport does not support competition and is even struggling to support single-firm (semiprivate) provision to an extent that would justify the release of development agency finance. In Argentina, the two capital city airports provide complementary domestic and international services, rather than operating, let alone competing, in both.

#### *Lesson 30*

*Competition between two airports with fewer than 5 million passengers each may be an unrealistic goal.*

Although airport competition is proven to be possible, it has greater potential in more liberalized air transport environments. In these environments, less concentrated market structures can reduce the regulatory burden. In environments in which concentrated market structures are unavoidable, air transport liberalization should be considered.

#### *Lesson 31*

*Competitive ATI market structures can reduce the regulatory burden but are only achievable when paired with air transport liberalization.*

### **Regulatory and Institutional Reform: Lessons 32–36**

In the cases of Cameroon and Argentina, the regulatory reforms that were instituted most likely failed because of the poor design of other aspects of the arrangements.

### *Lesson 32*

*The success of regulatory reforms is contingent on the design of other aspects of the arrangement.*

In South Africa, a principal motivation for PSP in airports was to provide for major investment without recourse to government funds. The regulatory committee that was established to carry out economic regulation failed to keep charges in line with international standards. Moreover, ACSA has been accused of anticompetitive conduct. Given that operating costs have been contained, revenue growth is strong, and investment appears to be progressing well within the financial capacity of the company, the committee may have underestimated the potential for lower prices. Given the size of the company and the reasonably large airports under its control, regulatory capture remains an issue.

### *Lesson 33*

*Regulation that is independent of government may be more appropriate for large firms that control reasonably large airports.*

This lesson is suggested by the relative success of independent regulation in the United Kingdom. In Greece, price regulation appears to have been specified as part of the concession contract for the new Athens airport. Although airport charges are more than five times those at the old airport, they are reasonable by international standards and understood by users to be necessary to finance the construction and operation of the new airport. Price regulation so far has been nonbinding, and customers negotiated not to have charges increased in 2005. As the airport grows and becomes more powerful, however, the Greek government may need to reconsider the need for independent regulation.

### *Lesson 34*

*Although initially it may be sufficient to specify price regulation in government contracts with the ATI provider, the situation should be monitored with a view to future regulatory reform.*

In the case of Thailand, price regulation by the Civil Aviation Board is intrusive and lacks transparency. This is acceptable only because the government is the majority shareholder, and it will not wish to see AOT fail given the important role it plays in the economy of the country. If the government were to reduce its stake or prioritize efficiency and cost reductions instead of investments (which it has prioritized up to now), the private shareholders would do well to demand a more transparent regulatory system.

### Lesson 35

*Even if regulation is not independent, it should be as transparent and non-intrusive as possible to maintain the appropriate incentives and levels of certainty for the firm.*

In the case of Sydney Airport, the independent Australian Competition and Consumer Commission already carried out economic regulation. While this did not change, in recognition of high initial and ongoing investment required of the new owners, it adopted a more light-handed approach than the previous price cap regime. The airport and its airline customers appear to be working well in negotiating prices, with the knowledge of recourse to the regulator as mediator and to the courts as final arbiter.

### Lesson 36

*Regulation by the national independent competition authority is likely feasible only in an environment that is nonlitigious and characterized by a balance of power between the ATI provider and its customers.*

### Optimal Regulatory Contracts: Lessons 37–40

The features of the regulatory contracts that apply in many of the case studies have been discussed in previous sections. The cases in which incentive-based regulation is applied using retail price index (RPI)-X price caps can be said to be performing well only where prices were initially low (as in the case of South African ANS), the initial period of large-scale investment has passed or is only now starting to pick up again (as in the case of BAA plc and Athens airport), or initial problems with risk have been ironed out (as in the case of NATS). In cases in which the regulatory contract is still driven by investment requirements (as in the case of South African airports), price caps are performing less well. Commercial negotiations are performing reasonably well in the cases of Sydney Airport and New Zealand ANS, while the cost-plus regimes (involving ad hoc approval of investment plans) in Thailand and Mexico are performing adequately.

While it is not possible to recommend an appropriate model because of the differing arrangements regarding the other aspects of the PSP policy and the differing stages of operators in their investment cycle, it is possible to offer two general lessons on regulatory contracts.

### Lesson 37

*Regulatory contracts should be designed to ensure that consumers secure a fair share of the expected benefits of the PSP policy. It is vital to ensure that the terms do not unduly favor firms and shareholders at the expense of consumer interests.*

### *Lesson 38*

*Regulatory contracts need to ensure optimal incentives for investment and innovation, optimal flexibility to respond to unexpected market developments, and minimum uncertainty regarding the remuneration of investment.*

In some cases, the regulatory contract will need to facilitate price increases that allow the provider to catch up with prevailing international market levels. Airport charges are often set too low for too long. For instance, many airports listed in the International Air Transport Association (IATA) Charges Manual have not revised their prices since the 1970s or 1980s, when the airports were opened. Price increases are necessary to allow the operator to bear the current cost of operations, maintenance, and capacity expansions.

### *Lesson 39*

*Regulatory contracts may, in the short term, need to be designed to grant large price increases to facilitate catch-up with prevailing international market levels.*

Regulatory contracts may need to be concerned with quality of service as well. In the case of BAA plc, a formal system of measuring and enforcing service standards was not introduced at the time of privatization, the rationale being that the main quality of service element comes from ground handling, which is competitively supplied. In the early years of privatization, however, core service quality fell. These issues were alleviated only following the introduction of a formal quality measurement and incentive regime by the Civil Aviation Authority.

### *Lesson 40*

*In the absence of incentives for owners and their managers to maintain quality of service, regulatory contracts may need to include formal quality measurement and incentive regimes.*



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