

PART TWO

AIRPORTS

AND

AIR TRAFFIC CONTROL

REPORT

I. INTRODUCTION

This report is one of a series commissioned by the Asian Development Bank (ADB), identifying best practice for promoting the role of the private sector in financing and operating infrastructure in its developing member countries (DMCs). The report focuses on the airports and air traffic control (ATC) sectors; other reports cover the power, water supply, roads and ports sectors.

The background to the report is that, in common with other international agencies and commentators, ADB believes there are significant advantages in expanding the role of the private sector in financing and implementing transport infrastructure and related services in the DMCs, principally for two reasons:

- First, private sector participation (PSP) may help to overcome constraints on public sector borrowing, and, equally or possibly even more important, on the public sector's capacity to implement efficiently and cost-effectively large-scale infrastructure programs.
- Second, the active participation of the private sector in all phases of the project life cycle may secure better value-for-money in the project than the traditional design-build model, where the private sector's role was limited to the project construction phase.

The remainder of the report gives an overview of the economics of airports and of ATC services, drawing attention to the diverse range of activities carried out at airports, the existing role of the private sector in providing airport services, the conditions of competition, and the need for economic regulation. The report then describes the alternative models for PSP in core airport activities, and evaluates the strengths and weaknesses of each approach. Although full privatization of airport assets is proposed as the appropriate target model for the sector, it is recognized that this approach is relatively demanding in terms of the legislative and institutional infrastructure required for implementation. More restricted forms of PSP, such as concessions or strategic partnerships, may be appropriate interim vehicles for PSP in the absence of the necessary legislative framework to enable privatization. Drawing on the set of case studies of different approaches to PSP in airports, as well as experience of PSP in other types of transport infrastructure, the report then sets out the contractual and other conditions likely to encourage successful PSP projects. Finally, there is a discussion on the potential role of ADB and other development agencies in facilitating PSP ventures in the airport sector.

II. THE BUSINESS OF AIRPORTS AND AIR TRAFFIC CONTROL

A. Introduction

This section discusses airports as businesses, drawing attention to the wide range of activities carried out at airports, and the role of the airport operator. It describes the sources of revenue for airport operators, covers demand and cost conditions, discusses the conditions of competition applying to different types of services and the implications for economic regulation, and describes the provision of ATC services.

B. Airport Activities and the Role of Airport Operator

An airport can be defined as one or more runways and complementary facilities for aircraft (taxiways, apron areas) together with associated terminals and facilities for handling

passengers and freight. Within the airport framework, the airport operator is typically directly responsible for the provision and maintenance of airport infrastructure, and the provision of essential services, including passenger search and perimeter security, fire fighting, and cleaning and maintenance of passenger terminal areas (the latter often provided by sub-contractors). These services are referred to as core airport activities. The airport operator also allocates space and resources, both between airlines (for example, check-in desks, passenger departure lounges) and between commercial concessionaires (such as retailers or caterers).¹

Other airport services are typically provided by airlines or their handling agents (including check-in processing, baggage handling, and aircraft maintenance) and control authorities (including customs, immigration, policing and ATC). In addition, a wide range of customer services, including retailing, catering, banking, and car hire, are provided by concessionaires appointed by the airport operator.²

Whilst it owns the large majority of the airport capital stock, the airport operator may employ directly only a modest proportion of airport employees, since many activities carried out by other agencies, such as baggage handling and retailing, are relatively labor intensive. An extreme example of this is London Heathrow airport, where the airport commercial activities have been exceptionally intensively developed by the airport's owner, the British Airport Authority (BAA) plc. As a consequence, BAA directly employs less than 10 percent of all full time airport employees.³

C. Airport Operators' Revenues

Airport operators typically derive revenues from airport charges, levied on airlines, to cover the provision of core airport services. Airport operators also obtain revenues from on-airport commercial activities, in the form of concession fees and rents from concessionaires, property rents and charges for services such as airport car parking.

1. Airport Charges

The airport charges paid by airlines usually include:

- Take-off or landing charges, based on aircraft weight.
- Apron or parking charges, again based on aircraft size or weight, and the duration of stay.
- Passenger handling charges, expressed as a rate per departing (or arriving) passenger, and differentiated by domestic and international flights. Such charges are distinct from the departure taxes, imposed by governments in the United Kingdom and elsewhere, which accrue directly to the government concerned as general taxation and not to the airport operator.

Broad principles covering both the costs to be recovered through airport charges and also the structure of charges are set out in guidelines published by the International Civil

¹ In most countries, passenger terminals are provided as common user facilities by the airport operator. However, in some countries, such as the United States (US) and Australia, terminals may be owned and operated by airlines, either as exclusive or as common user facilities.

² Some airport operators continue to provide duty free facilities for international passengers.

³ Around 4,000 out of the total airport employment of 55,000 in 1996.

Aviation Organization (IOAD),⁴ although such guidelines are not mandatory.⁵ Airport charges are more directly constrained in certain respects by international legislation, notably the Chicago Convention, paragraph 15 of which imposes non-discrimination conditions with respect to airport access and airport charges on signatories. Further constraints on airport access and charging may also be specified in bilateral Air Service Agreements governing the provision of scheduled air services.

Table 1 presents an index of airport charges at 40 international airports throughout the world in 1995, based on published airport charges for eight different types of aircraft. Although the data do not take account of factors such as the availability of accounts or the extent to which there may be variations in the range of services covered by the charges, it is clear that there are very wide variations in the level of airport charges in different locations. Average charges in the upper quartile of airports are over three times as high as those in the lower quartile. The average charges show little systematic variation with factors such as airport size, traffic composition or ownership characteristics.

Table 1: Airport Charges Index (ranking of 40 airports world wide), 1995

Airport	Index	Airport	Index
Tokyo	100	Orlando	27
Frankfurt	53	Miami	26
Vienna	52	Singapore	25
Chicago	51	Washington	25
New Jersey	48	Madrid	23
Berlin	44	Heathrow	23
Munich	43	Milan-Linate	22
New York JFK	43	Los Angeles	22
Amsterdam	42	Budapest	22
Brussels	39	Vancouver	22
Paris Charles De Gaulle	39	Bombay	21
Athens	38	Honolulu	21
Oslo	37	Cairo	20
Helsinki	36	Gatwick	19
Moscow	35	Dallas/Fort Worth	18
Copenhagen	33	Hong Kong	16
Stockholm	32	Sydney	12
Lisbon	32	Jeddah	11
Dublin	28	Algiers	10
Johannesburg	27	Dubai	5

Source: *Monopolies and Mergers Commission* (1997, BAA plc).

Note: Based on an average of peak and off-peak charges for eight aircraft types (international arrivals and departures).

The ICAO guidelines also recommend (paragraph 16(i)) that under normal circumstances, charges should be expressed and payable in the local currency of the state concerned. However, it is recognized that under special circumstances, "for example where economic conditions are not stable", airport operators are entitled to denominate user charges in another currency.

⁴ ICAO, Statement from the Council on Airport Charges.

⁵ Thus, the ICAO guidelines recommend that the passenger handling charge is levied on airlines and therefore reflected in airline fares, but many airport authorities continue to levy a charge directly on international passengers at the point of departure.

Table 2 summarizes current practice with respect to the currency used in setting airport charges in a group of twelve DMCs. It shows that in half of the cases (India; Malaysia; Singapore; Thailand; South Korea; and Hong Kong, China) all types of airport charges are denominated in the local currencies concerned. In three cases (Pakistan, Cambodia, and the Philippines) charges are US dollar denominated, and in the three remaining areas (Indonesia, Viet Nam, and Laos), international traffic charges are US dollar denominated, whilst domestic traffic charges are wholly or partly local currency denominated.

As noted in the following section, denominating some or all airport charges in US dollars is a potentially useful instrument for mitigating the currency risk faced by prospective overseas investors in airports, some or all of whose financing costs may be denominated in US dollars.

Table 2: The Currency of Airport Charges

Country	Currency of International Landing Fees	Currency of Domestic Landing Fees	Passenger Charges
India	India rupees	India rupees	India rupees
Pakistan	US dollar	US dollar	US dollar
Malaysia	Malaysian ringgit	Malaysian ringgit	Malaysian ringgit
Singapore	Singapore dollar	Singapore dollar	Singapore dollar
Philippines	US dollar	US dollar	US dollar
Thailand	Thai baht	Thai baht	Thai baht
Cambodia	US dollar	US dollar	US dollar
Indonesia	US dollar	Indonesian rupiah	Indonesian rupiah
Viet Nam	US dollar	US dollar	International: US dollar Domestic: Vietnamese dong
Lao PDR	US dollar	US dollar	Domestic: Laos kip
South Korea	Korean won	Korean won	Korean won
Hong Kong, China	Hong Kong dollar	Hong Kong dollar	Hong Kong dollar

2. Commercial Revenues at Airports

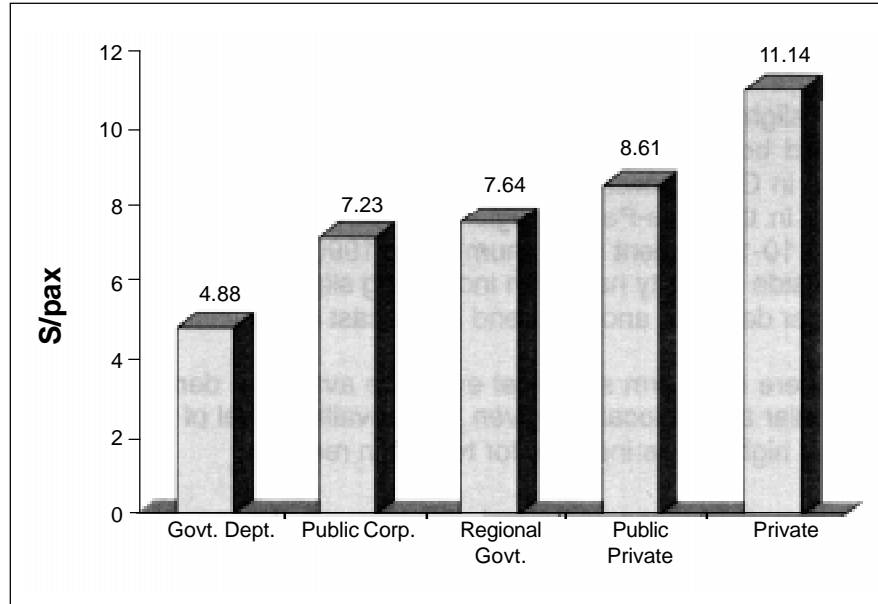
A major potential source of commercial revenues at airports with a significant volume of international traffic are tax and duty-free sales to international travelers. At airports where the traffic is wholly or mainly domestic, the scope for developing retailing activities is more limited, and focuses on services such as catering, car parking, and car hire.

Revenues from commercial activities vary widely between airport operators, partly as a function of exogenous factors, principally the role of the airport operator, and whether it operates passenger terminals, and the mix of domestic and international traffic. However, there is also very wide variation in the revenue mix between airports where passenger terminals are owned and operated by the airport owner, and with a similar mix of international and domestic traffic. Kapur⁶ suggests that variations in the level of revenue generated from commercial activities are linked to the ownership status of the airport operator. He shows that land-side (commercial)

⁶ Kapur, Anil (1995), *Airport Infrastructure. The Emerging Role of the Private Sector*, World Bank Technical Paper 313.

revenue per passenger in the early 1990s varied by a factor of almost three between government department owned airports and privately owned airports (Figure 1).

Figure 1: Average Land-side Revenue per Passenger by Ownership Structure



Source: Kapur (1995)

Kapur cites the example of privatized BAA plc as an airport operator which has been especially effective in developing on-airport commercial activities, both in its own airports and, increasingly, as a contracted manager of passenger terminals and commercial facilities in other countries, including Hong Kong, China; Malaysia; and US.

Given the framework of economic regulation in UK, characterized by the application of the so-called “single till” approach,⁷ and price regulation of airport charges, BAA’s success in developing its on-airport commercial activities has translated directly into strong downward pressure on the level of airport charges. Average revenue per passenger from airport charges at BAA’s London Airports fell by approximately 20 percent in real terms over the period 1992/93 to 1996/97.⁸

⁷ Under the “single till” approach, airport charges must be set taking into account the profits from other on-airport commercial activities accruing to the airport operator. The general principles governing the level of airport charges are set out in the ICAO guidelines in the following terms:

“In determining the cost basis for airport charges the following principles shall be applied: the cost to be shared is the full cost of providing the airport and its essential ancillary services ... but allowing for revenues both aeronautical or non-aeronautical accruing from the operation of the airport.”

⁸ See, Monopolies and Mergers Commission (1997), BAA plc.

D. Demand and Cost Conditions

1. Demand Conditions

As with other types of transport infrastructure, the demand for airport capacity is subject to daily and seasonal fluctuations, the nature of which depends on airport location; operating conditions (24-hour or restricted opening); and traffic mix (domestic - international; short haul long haul; business - tourist/recreation). Demand for air travel is relatively income-elastic and has been growing strongly for many years (around five percent per annum world wide for passengers, and slightly above five percent per annum for freight). The rate of growth of demand has varied between regions (Asia-Pacific, Europe, US, etc.), mainly reflecting inter-regional variations in GDP growth rates. Until the recent recession, demand had been growing particularly rapidly in the Asia-Pacific region, where passenger volumes at major airports had been expanding at 10-13 percent per annum in the 1990.⁹ Because of increases in aircraft size, the demand for airside capacity has been increasing slightly less rapidly in recent years than the growth in passenger demand, and this trend is forecast to continue.

Although there is no firm statistical evidence available, demand for airport capacity from airlines at a particular airport location, given the prevailing level of airport charges world wide, is believed to be very highly price inelastic for two main reasons:

- First, airport charges represent only around five percent of total airline operating costs for the International Air Transport Association affiliated airlines (the proportion is somewhat less for long haul operations, but may be as high as 15 percent for short haul services). This means that, on average, even a 100 percent increase in airport charges would only increase airline costs by about five percent;
- Second, there are usually no close substitute airport facilities available, especially for major regional hub airports, such as Singapore, Hong Kong, Bangkok, Manila or Kuala Lumpur.

2. Cost Conditions

The lack of close substitutes on the demand side reflects the fact that the supply of airport services is subject to economies of traffic density, extending at least as far as the traffic throughput of a single runway capable of handling the largest passenger jet aircraft (currently the B747 series). The theoretical capacity of such a runway is determined by the maximum number of incoming and outgoing flights that can be handled, which depends upon the quality and availability of complementary ATC and taxiway facilities. The practical capacity will reflect demand as well as supply side factors, including traffic mix, aircraft size, the airport load configuration, the capacity of passenger terminals and parking areas, and any unsocial hours restrictions on take-offs and landings. To illustrate the traffic volumes that can be accommodated within the basic single runway configuration, Gatwick, one of BAA plc's London system airports,

⁹ During the period 1991-1995, passenger volumes increased annually at major airports as follows:-

Hong Kong:	9.3%
Singapore:	9.7%
Manila:	10.7%
Bangkok:	11%
Jakarta:	12.4%
Seoul:	13.1%

Source: ICAO, Airport Traffic, 1995.

currently handles around 24 million passengers per annum (mppa), and projected capacity for the year 2000 is around 30 mppa.

Network scale economies in the provision of services by airlines probably mean that the minimum efficient scale of airport operation exceeds the capacity of a single runway facility. A two-runway airport handling, say, 50 mppa will offer airline passengers a wider range of interconnecting services to passengers than two single-runway airports each handling 25 mppa. As a consequence, the airlines' willingness to pay for access to the 50 mppa facility will be worth more than twice their willingness to pay for two 25 mppa facilities.

A traffic density of 50 mppa exceeds the demand for air travel at all airports except for a handful of major conurbations throughout the world, such as London, New York, Paris and Tokyo. Table 3 shows 1995 traffic levels at major airports in the DMCs covered in the present study.

**Table 3: 1995 Traffic Levels at Principal DMC Airports
— million passenger miles per annum (mppa)**

Country	mppa
Republic of Korea (Seoul)	30.7
Hong Kong, China	27.4
Singapore (Changi)	21.7
Thailand (Bangkok)	20.9
Malaysia (Kuala Lumpur)	14.2
Indonesia (Jakarta)	12.8
Philippines (Manila)	10.9
India (Bombay)	10.7
Pakistan (Karachi)	4.9

Source: ICAO, *Airport Traffic*, 1995

Although there are strong traffic density economies in airport operations serving a single conurbation or region, there is no evidence that scale effects extend to the operation of more than one airport in different locations. Thus the decision to transfer all seven of the BAA's airports (three in London and four in Scotland) to privatized BAA plc owed more to the UK Government's desire to avoid the complexities and costs of restructuring, and to maximize flotation proceeds at an early stage of the privatization process, than to a considered view on the existence of multi-airport scale effects. In this respect, the more recent policy of the Australian Government in disposing of Federal Airport Corporation airports individually, better reflects the economics of the business, and will improve the effectiveness of economic regulation in the long run, by introducing an element of yardstick or comparator competition into the process.

E. The Conditions of Competition and the Need for Economic Regulation

As well as having market power over the prices of essential airport services used by airlines, airport operators (and/or their agents) at major hub airports also enjoy market power in respect of a wide range of airport-related services, including rentals for on-airport facilities used by airlines or other air transport businesses, and services to passengers which are highly localized in time and space, such as air-side restaurants and airport parking.

The position of many airport concessionaires, such as those operating retailing outlets and land-side restaurants, is somewhat different. Such businesses compete with other local off-airport retail businesses, and in the case of duty-free shops, with duty-free facilities at overseas airports or on aircraft.

The monopoly power enjoyed by airport operators in the markets for air transport services and airport-related ancillary services could be used by profit-seeking businesses to earn profits in excess of those required to attract new investment into the business (so-called “supernormal” profits). Such a policy might manifest itself not only in terms of high prices for services supplied by the airport, but also in under investment in airport facilities, such that capacity expansion programs were unreasonably delayed, leading to poor quality of service to airlines and passengers. Market power can also be abused if the monopolist is able to earn sufficiently high profits given super-competitive cost levels. The ability to abuse monopoly power in these ways would need to be constrained in order to protect the interests of all types of airport user, including airlines, passengers, and freight shippers.

F. Air Traffic Control Services

The provision of ATC services covers two distinct but complementary activities:

- Airport ATC, involving the control of take-off and landing at airports, and of surface aircraft movements within the area of the airport, where the ATC activity is usually carried out from an airport control tower.
- En route ATC, where a single-control center, often quite separate from an individual airport ATC facility, may regulate traffic over a wide area.

The two systems must be closely integrated for operational purposes; as aircraft approach or take-off from the airport, so control passes between the airport and en route ATC centers. Both activities are subject to strongly increasing returns to traffic density and, in the case of en route ATC, to scale, in the sense of the size of area controlled.

An important aspect of ATC provision is the need for interface between civil and military use of the airspace. In some countries, such as Argentina, this interface is secured by having all ATC services provided by the military authorities. Elsewhere, civil ATC operates within designated controlled airspace, and the military authorities provide ATC services to both military and civil aircraft in so-called uncontrolled airspace. The existence of a strong defense interest in the provision of ATC services, which can affect many aspects of the specification and operation, has sometimes been held to preclude full privatization of ATC assets, other than those supplying airport ATC.

ATC costs are recovered through air navigation charges; as with airport charges, the structure and level of ATC charges are subject to international agreements and conventions. For example, in Europe, ATC charges are subject to the Eurocontrol Multilateral Agreement, under which charges are adjusted annually, so as to recover the full costs incurred by each member state.

III. ALTERNATIVE MODELS OF PRIVATE SECTOR PARTICIPATION

A. Introduction

Airport services do not exhibit the classic public good characteristics of non-rivalry, non-excludability and asymmetric information between suppliers and purchasers which make provision of the services by profit-seeking private sector businesses problematic. They are, however, characterized by pervasive external effects, in the form of noise, visual intrusion, and air pollution, and by spill-over effects and complementarities with other surface transport infrastructures, which mean that public authorities will necessarily continue to play a significant role in project initiation and planning. As noted, core airport services are also natural monopoly activities, so that a framework of economic regulation is required to limit the abuse of a dominant position, irrespective of whether the facility is publicly or privately owned.

However, there is now ample experience world wide of natural monopoly utility assets being owned and operated by private sector businesses within a framework of economic regulation. There is increasing evidence that privatized provision, combined with incentive compatible forms of regulation, based on the price cap approach, offers superior performance outcomes (lower prices, and improved service quality as well as improved profitability) compared to service provision by state-owned enterprises.¹⁰

In this section, the report discusses alternative models of PSP in airport and ATC activities, ranging from complete or almost complete privatization, through flotation or trade sale, to more restricted forms of management contracting. Complete privatization is proposed as an appropriate target model, but it is recognized that this approach works best within a relatively sophisticated regulatory framework involving not only an appropriate legislative framework but also a wider set of conditions covering the conduct of economic regulation. A recent National Economic Research Associates (NERA) report to ADB¹¹ indicates that current regulatory arrangements in most Asian DMCs fall far short of international best practice. In this situation, more restricted forms of PSP may provide appropriate means of extending the role of the private sector in airport activities. The sector also covers the privatization of ATC facilities.

B. Alternative Models of PSP

Table 4 summarizes the key features of alternative models of PSP:

- Full privatization.
- Partial privatization.
 - Concessions.
 - Strategic partnership(s).
 - Management contract(s).

¹⁰ See, for example, NERA (1996), *The Performance of Privatised Industries: Prices and Service Quality*, a report for the Centre for Policy Studies.

¹¹ NERA (1998), *Governance and Regulatory Regimes for Private Sector Infrastructure Development: Final Report*, ADB RETA 5758-REG.

1. Full Privatization

Full privatization involves the transfer of ownership of airport assets from a public corporation to private investors through a flotation or through a trade sale. Following privatization, the privatized entity is fully responsible for operating the airport facilities, directly or through agents/concessionaires, and for financing investments in airport assets internally, from retained earnings, or externally through the issue of new equity or debt.

The first example of airport privatization occurred in UK, with the flotation of BAA plc in 1986. BAA plc took control of the seven airports previously owned by British Airports Authority, a public corporation. Since 1986, several other publicly owned airports have been privatized, including Belfast International, East Midlands, Southampton and Bristol.

Outside UK the most far-reaching privatization program has taken place in Australia, where long term leases (50 years with an option to extend for a further 49 years) were offered for sale over 18 of the 22 airports operated by the Australian FAC in a two phase sales program. The first phase covered the sale of leases on three major international gateway airports, at Brisbane, Melbourne and Perth, and the second phase the sale of leases on a further fifteen airports.

2. Partial Privatization

The evidence on the current extent of PSP in airports, summarized in Appendix 1, shows that there have been relatively few instances of full privatization. There are more examples where private sector financing and operation of airport assets have been introduced via partial privatization measures, although the large majority of cases listed in Appendix 1 refer to situations where some form of partial privatization is being considered or planned but has not yet been realized. The comparative absence of full privatization based on two interrelated factors:

- First, governments' reluctance to cede control over what, at least in the case of major capital city airports, is widely regarded as a vital national asset.
- Second, the lack of an appropriate framework of economic regulation and regulatory governance to balance the interests, short and long term, of consumers and investors, given the highly immobile and long-lived character of airport assets.

These two factors combine to encourage forms of PSP based on long-term contracting or public-private partnerships, in which the contract or partnership mechanism acts, first, to secure investment in airport infrastructure sought by the government partner, and, second, to protect the private investor against arbitrary or opportunistic behavior by government.

Three principal variants of this partial privatization model can be identified:

- Concession or build-operate-transfer (BOT) projects.
- Strategic partnerships.
- Management contracts.

Table 4: Alternative Models of PSP

	Privatization	Partial Privatization		
		Concessions	Strategic Partnerships	Management Contract
1. Roles				
Ownership	Private	State	State	State
Investment	Private	Private/mixed	Mixed	State
Operation	Private	Private/mixed	Private/Mixed	Private/Mixed
2. Regulation	Independent Regulator independent regulator	Contract, ownership or	Ownership	Ownership
3. Examples	UK - British Airports Authority plc (BAA) - Regional airports Australia ¹² - Federal Airport Corporation (FAC) airports	Colombia — Bogota ¹² Philippines — Manila ¹² Cambodia — Phnom Penh Argentina ¹² Côte d'Ivoire — Abidjan ¹²	Thailand ¹² South Africa	US - Indianapolis - Pittsburgh Italy - Naples Malaysia - Kuala Lumpur

¹² Covered in case studies in Appendix 2.

a. Concessions

As demonstrated in Appendix 1, the large majority of actual or planned cases of private sector privatization in airports involve concession contracts, under which control of some or all core airport assets is transferred to a private investor, who is responsible for financing investment and operating the airport for the term of the concession, typically 25-30 years. The precise extent of the private sector operator's responsibilities varies. In some cases, the concession agreement may cover financing and operation of all airport assets; in others, the concessionaire may only be responsible for financing and operating a particular facility, such as a passenger terminal or runways, alongside the incumbent public sector airport operator.

The case studies in Appendix 2 include three airport concession projects in developing countries:

- Abidjan Hophôuet-Boigny Airport, Côte d'Ivoire.
- Ninoy Aquino International Airport, Philippines.
- Bogota El Dorado International Airport, Colombia.

Responsibility for the operation and development of Abidjan Hophôuet-Boigny Airport (AERIA) was transferred through a 15-year concession agreement signed in July 1996 between the Government of Côte d'Ivoire and AERIA, a special purpose company controlled by Société d'Exploitation et de Gestion Aéroportuaire (SEGAP), itself a jointly owned subsidiary of the Marseilles Chamber of Commerce and Industry (MCCI) and Groupe Sofrevia, a French aviation services company. MCCI operates Marseilles airport, and SEGAP also operates Libreville (Gabon) airport under a 30-year concession agreement signed in 1998.

Under the concession agreement, AERIA committed to a four year investment program, covering a major expansion of the international passenger terminal and associated parking apron and taxiway areas together with runway reinforcement and extension, aimed at expanding the airport capacity from around one to 1.7 mppa by 2001. AERIA will finance the investments from airport user charges and other airport revenues; it will also pay concession fees to the Ivorian authorities, amounting to approximately 20 percent of turnover, largely to finance the operation of unprofitable interior airports in Côte d'Ivoire.

At Ninoy Aquino International Airport (NAIA), a concessionaire, Philippine International Air Terminal Company Inc. (PIATCO), has been selected to construct and operate a new international passenger terminal over a 25-year concession period. The Manila International Airport Authority (MIAA), a public corporation, will continue to own and operate other airport assets, including the two existing passenger terminals and runways. Under the concession contract, PIATCO will be able to increase international passenger charges (levied on airlines) from the initial level determined by the Ministry of Transport and Communications in line with a pre-determined formula. PIATCO will also pay a two-part concession fee to MIAA, consisting of a sum fixed in real terms, and a variable fee, expressed as a proportion of total revenues from international passenger charges and other commercial activities. This two-part structure introduces a degree of revenue risk sharing into the agreement.¹³

¹³ There is further discussion of this and other contract design issues in Section IV below.

In the Bogota El Dorado International Airport project, the concessionaire, Compañía de Desarrollo Aeropuerto El Dorado SA (CODAD) will construct and maintain a new runway and taxiway facilities over the 20-year concession period. However, it will also be responsible for maintaining the existing runway, taxiways and parking areas, and will be remunerated by revenues from airport landing charges. The airport passenger terminal facilities will continue to be operated by Aeronautica Civil (Aerocivil), the government agency responsible for operating other airports and ATC facilities in Colombia.

The concession agreement provides for the concessionaire to double landing charges on completion of the new facility. Thereafter, charges will be increased in line with domestic inflation. Unlike the Manila concession, the agreement does not require the concessionaire to make any payments to the Colombian Government. Recently, CODAD has successfully issued 15-year US dollar denominated revenue bonds, on the basis of a minimum revenue guarantee by the Colombian Government. Revenue bonds, linked to tax incentives, have been widely used as a vehicle for airport infrastructure financing by public sector authorities in the US, including the Port Authority of New York and New Jersey.

The majority of concession projects identified in Appendix 1 cover specific investment projects, similar to those implemented at Manila and Bogota. Francophone countries, in particular, such as Gabon and Cambodia, offer examples of more wide-ranging concession agreements, covering the upgrading and operation of an entire airport. On a much larger scale still is the recently concluded concession agreement covering the transfer of 33 of Argentina's 59 civil airports to a private sector-led consortium.¹⁴ In this case, the 30-year concession agreement requires the concessionaire to finance and undertake a US\$2 billion upgrading and modernization program covering the principal international and regional airports, and to pay the government an annual concession fee of US\$171 million throughout the concession period. The airports included in the concession include a mix of profitable and unprofitable facilities; investment and operating losses at the unprofitable airports will be financed by cross-subsidy from the profitable airports. It is expected that the investment program will be financed by a combination of free cash flow from existing airport operations and some limited project finance.

The make-up of a concession consortium depends upon factors such as the nature of the project and the extent of any constraints imposed by governments on stake-holdings (many governments require a significant, or majority, ownership stake to be held by indigenous businesses). For projects involving construction and operation of passenger terminals, the consortium would normally include an airport operator, such as BAA plc, alongside a construction company (often local) and an investment bank. Shareholders usually take only a very limited equity stake (5-10 percent of funding) with the bulk of the financing taking the form of externally held debt, sometimes including an element of development bank funding.

¹⁴ See Appendix 2 for further details.

b. Strategic Partnerships

Under the strategic partner model, a private sector firm or consortium acquires a stake (typically a minority shareholding) in a state owned airports operator. Proposals for re-structuring the Airports Authority of Thailand (AAT) via a strategic partnership are currently being considered by the Thai Government,¹⁵ and the South African authorities have offered a minority stake in the Southern African Airports Company Limited to a strategic investor, as a possible step towards full privatization.

In Thailand, it is expected that, apart from taking an equity stake in the re-structured airports operating company, the strategic partner will also be awarded a management contract covering the operation of a range of airport ancillary activities, such as internal telephone systems, car parking and aircraft maintenance facilities.

Strategic partnerships provide a vehicle for introducing private sector finance and operational expertise in order to directly relieve public financing constraints and to improve operational and financial performance. Another form of partial privatization occurs when a minority of shares in a state-owned airports operator are sold to private investors, usually through a flotation. This approach has been followed in Vienna Airport (Austria) and in Copenhagen Airport (Denmark). The incumbent management, and through its power to appoint top management, the state, retains control of the business, but the conduct of the business is exposed to a measure of external capital market discipline. As with strategic partnerships, this may be the precursor to eventual privatization.

c. Management Contracts

Under the management contract model, a private sector contractor is retained to manage airport assets, usually passenger terminal facilities or retailing activities within passenger terminals. Other airport operational activities, such as maintenance and operation of runways and ATC facilities, continue to be undertaken by the airport owner or other state sector agencies. This model enables the private sector contractor to transfer best practice across a range of airport activities, thereby reducing costs and enhancing revenues and improving standards of services. Responsibility for funding investment in airport assets is retained by the airport owner, but the prospects for more wide-ranging types of privatization may be greatly improved by the increased profitability of the business under the management contract.

The concessionaire would either receive a management fee, linked to revenues generated in the activities for which it was responsible, or it would receive a share of airport revenues, but would pay a lease or rental charge to the airport owner. With responsibility for financing major investments remaining with the airport owner, the length of a management contract would tend to be significantly shorter than the term of a BOT contract.

To date, management contracts have been almost exclusively applied by public airport authorities in developed OECD countries as a means of improving 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.

¹⁵ See Appendix 2 for further details.

C. Full and Partial Privatization Compared

It was argued above that given the current political climate and regulatory practice in DMCs, full privatization of airports as in UK or Australia, is probably not feasible in these countries. However, if the climate was to change and regulatory arrangements were to move closer to international best practice, so that full privatization was feasible, what are the pros and cons of the two approaches?

The first point to make is that any improvement in regulatory practice will generally be expected to improve the terms on which the private sector is willing to invest in DMCs. Although contractual mechanisms might be regarded as a substitute for economic regulation, concession contracts will almost certainly need to be revised over the term of the concession in light of unexpected market developments. The presence of an effective regulatory governance framework both increases competition for the market and improves performance under contracts, by giving investors better assurance that contract terms would be revised in a manner which respected their interests as well as those of consumers.

The potential advantages and disadvantages of full and partial privatization reflect the economic characteristics of the two approaches. By comparison with full privatization, in which all operational assets are owned and operated by the private sector, partial privatization arrangements, are certainly time limited, and are often scope limited. Experience to date indicates that BOT projects and management contracts, in particular, are often embedded within a wider set of airport activities which continue to be provided by a public sector agency. Finally, partial privatization through strategic partnership requires control to be shared between the public and private sector partners.

Compared to full privatization, these characteristics of partial privatization may have certain potentially adverse effects on the performance of the service provider:

- Weaker incentives to invest and to innovate, especially during the later stages of the concession, because its time-limited nature restricts the scope of benefit capture.
- Higher transaction costs associated with incomplete contracting.
- More generally, a partial privatization framework based on formal contractual mechanisms may restrict the private sector partner's ability to respond flexibly to unexpected market developments, etc.
- Finally, concessionaire's costs may be inflated for one of two (mutually exclusive) reasons. First, suppose that the concession agreement does not contain explicit provisions for compensating the concessionaire for the residual value of all assets acquired during the concession period,¹⁶ but whose economic life extends beyond the end of the concession terminal date. The concessionaire will need, prudently, to amortize the cost of the assets over the remaining term of the concession, since there is no guarantee of the concession being extended. This would mean that the level of depreciation to be recovered through airport charges will be higher than if the airport assets had been privatized. Alternatively, if the agreement does contain compensation provisions, there may still be significant uncertainty as to how they will be applied in practice, especially in first generation concessions and in the absence

¹⁶ As several existing concession agreements do not.

of mature regulatory institutions and precedents. This uncertainty will either be reflected in a higher cost of capital (conceptually similar to the so-called “regulatory risk premium”) or in conservative estimates of the terminal cash flow element, leading to less favorable financial bids.¹⁷

However, performance outcomes will also depend upon the nature and extent of competitive pressures on the incumbent, and in this respect, a time-limited concession approach offers some advantage over full privatization, since it enables periodic competition for the market, albeit across a more restricted set of activities. This benefit is attenuated in practice because of the long term nature of airport concessions, which is required in order to provide the concessionaire with adequate incentives to invest in very long-lived assets, in the absence of robust arrangement for compensation based on residual asset values. The extent of any advantage is also uncertain because a privatized business will itself be subject to competitive pressures from the capital market.

On balance, its advantages over partial privatization solutions means that full privatization of airport operations should be regarded as an appropriate target model for DMCs. Improvements in regulatory practice should therefore not only improve outcomes under existing partial privatization initiatives, but should bring wider benefits, by improving prospects for full privatization of airports.

D. Air Traffic Control

There is clear evidence of rapidly expanding interest in and experience of private sector financing and operation of airports. However, there are few signs of any corresponding developments in ATC provision, despite widespread concern regarding the difficulties of financing investment to upgrade en-route ATC, given constraints on public expenditure, and the perceived inefficiency of many state-owned ATC providers.

Apart from full privatization of the Civil Aviation Authority’s (CAA) ATC division National Air Traffic Services (NATS), which was proposed by the UK Government in 1994, but not subsequently implemented, two other types of structural reform of ATC provision have been implemented in recent years:

- Provision of ATC services by a non-profit making trust. This approach has been adopted in Canada, where the Canadian Air Navigation System was sold to NAV CANADA in 1996. NAV CANADA is constituted as a non-profit corporation, with a Board comprising representatives of airlines, government and the air traffic controllers’ union. It is allowed to set user charges to recover costs, but any surpluses must either be used to retire debt or enhance traffic services.
- Corporatization of the ATC activity, either by transforming an existing authority into a public corporation (as in New Zealand) or by transferring ATC assets from an authority to an existing corporation (as in Malaysia, where ATC assets are now owned by the state airports corporation).

Following the abandonment of full privatization in 1995, the UK Government has explored a partial privatization approach to ATC, within the so-called Private Finance Initiative

¹⁷ It should, however, be noted that problems of this kind may arise under full privatization, for example, if regulators change the rules of the game with respect to regulatory asset values, or apply discretion in deciding which assets should be included in the regulated firm’s regulatory asset base.

framework. This would involve a BOT contract for construction and operation of a new en-route control center in Scotland.

This approach has been strongly criticized by the existing NATS management, who claim that it would be significantly more costly than traditional public sector financing for three reasons:

- A higher private sector cost of capital.
- Additional bidding and transaction costs (which NATS claimed would add around two percent to project costs).
- Loss of potential competition for subsequent upgrading contracts.

Both NATS and the CAA have argued that it would be preferable to privatize NATS as a regulated utility subject to a price cap.

IV. MEASURES TO ENCOURAGE SUCCESSFUL PRIVATE SECTOR PARTICIPATION

A. Introduction

This section reports on the existing experience of PSP in airports and in other types of transport infrastructure, both in DMCs and elsewhere, in order to identify measures likely to encourage successful privatization initiatives in the airports sector. The discussion is organized as follows:

- the importance of establishing a favorable public policy environment to encourage PSP.
- the case for restructuring the airports industry in order to accommodate PSP.
- a discussion covering aspects of the legal and regulatory framework necessary to secure the interests of key stakeholders following privatization.
- the allocation of risk between the state and privatized airports operators.
- measures to encourage efficient tendering outcomes where privatization is implemented either through trade sale of leases or concessions.
- a review of options for engaging the private sector if the airport is unprofitable.
- the main lessons, both positive and negative to be learned from experience to date.

B. Public Policy

All other things being equal, the role of the private sector in financing and operating all types of public utility infrastructure will develop most rapidly when the stance of public policy is openly and consistently supportive, and recognizes that privatized provision of utility services should be regarded as the rule rather than the exception.

How precisely this environment is achieved will depend upon the legal and administrative traditions of the countries concerned. In UK, for example, the process of utility privatization

developed in a relatively ad hoc fashion. The major privatizations of the mid 1980s, involving British Telecommunications, British Gas, and BAA were each justified in terms of the specific circumstances of the nationalized industries concerned, and an increasing recognition of the benefits of privatization to the public finances. It was only in the mid-late 1980s that a coherent philosophy emerged regarding privatized ownership of the utilities as the norm.

Other countries, including some in Eastern Europe and some DMCs, have taken a different approach, and have created legislative frameworks to facilitate privatization across the utilities sector. The Philippines, for example, has passed the so-called BOT law authorizing the financing, construction, operation, and maintenance of infrastructure projects by the private sector. As amended in 1993,¹⁸ the law begins with the following declaration of policy:

“It is the declared policy of the State to recognize the indispensable role of the private sector as the main engine of national growth and development and to provide the most appropriate incentives to mobilize private resources for the purpose of financing the construction, operation and maintenance of infrastructure and development projects normally financed and undertaken by the government. Such incentives, aside from financial incentives as provided by law, shall include providing a climate of minimum government regulations and procedures and specific government undertakings in support of the private sector.”

As well as identifying the specific types of PSP covered by the legislation, other sections of the law make provisions covering, inter alia:

- The duty of government agencies to identify candidate PSP projects and to give wide publicity to the projects thus identified.
- Procedures for tendering and project award.
- Authorization for concessionaires to derive revenues from user charges or rentals stemming from the possession and use of infrastructure assets.
- Arrangements for terminating or extending concessions.
- Arrangements for establishing Regulatory Boards, to supervise pricing and performance of the private sector.

Similar provisions are contained in legislation on concessions in some Eastern Europe countries such as Hungary, where the legislation¹⁹ enables concessions in public transport (including airports), water services, telecommunication networks, energy/supply and postal services. The Hungarian legislation has provided a framework for negotiating BOT motorway projects, but so far has not been applied to the airports sector.

¹⁸ Republic Act 7718.

¹⁹ Act XVI, 1991 on concessions.

C. Industry Restructuring

In most countries, the existing structure of the airports industry falls into one of the following categories:

- A highly concentrated industry structure in which a national airports or civil aviation authority or corporation owns and operates all major civil airports.
- A more fragmented industry structure, characterized either by local or regional authority ownership of airports, or by a combination of state and local authority ownership.

If airport ownership is highly concentrated, the issue arises of whether, and, if so, how, the industry should be restructured in order to accommodate PSP.

The case studies in Appendix 2 illustrate different approaches to this issue. In UK, for example, privatization has taken place without any significant industry restructuring. The BAA, a state corporation, which owned and operated a total of seven airports, three in south-east England and four in Scotland, was privatized as a single entity, BAA plc. Although ownership of the non-BAA airports is relatively fragmented, the industry remains highly concentrated by virtue of the predominance of BAA's south-east airports as international gateways.

At the other extreme, the airport sector in Australia has been radically re-structured as a result of the privatization process. Prior to privatization, the FAC, a state corporation, owned and operated an extensive network of international and regional airports. Following the privatization process, which involved the sale of very long term leases on 17 of the principal airports, ownership is now divided between 10 different consortia, with no single consortium controlling more than one of the major international gateway airports so far offered for privatization.

In between these two extremes, the case studies of Thailand, Côte d'Ivoire and Argentina offer examples where privatization has been, or will be, accompanied by some degree of industry re-structuring. The simplest case is in Côte d'Ivoire, where, prior to privatization, a national civil aviation authority - Agence Nationale de l'Aviation Civile et de la Météorologie -owned and operated airports and ATC facilities throughout the country. Following the concessioning of the major airport at Abidjan in 1996, the remaining airport and ATC activities were transferred to a newly created state corporation, le Service Météorologique National de la Côte d'Ivoire (SODEXAM), which also acts as the conceding authority in relation to the Abidjan airport concession.

In Argentina, airports and ATC facilities were operated by the Argentina Air Force. Thirty three of the principal airports, including the major international gateway at Buenos Aires were transferred to a single private sector concessionaire in 1998; the remainder, many heavily loss-making, were transferred to the regional governments concerned.

The most complex re-structuring is envisaged in Thailand, where major airports are currently owned and operated by a state corporation, the AAT. The Thai Government plans to offer a minority stake in a newly created joint venture company, the Airport Authority of Thailand Co. Ltd., to a strategic partner. The Airport Authority of Thailand Co. Ltd., in turn, will be either the sole or majority shareholder in two successor companies, the first responsible for operating the existing international airport at Bangkok, and the second for developing and operating a new international airport at Bangkok. AAT's major regional airport assets will be transferred to a newly created regional airport company, in which the majority shareholder will be a private

sector partner, possibly the same as the strategic partner participating in the development of the Bangkok system.

An important factor in this complex set of proposals is the need to preserve a state sector majority shareholding in the entity charged with developing the new airport, in order to benefit from a large soft loan facility, offered by Overseas Economic Cooperation Fund, to finance the new airport construction, which is only available on a government-to-government basis.

The discussion in Section II indicates that there is little evidence of significant scale benefits flowing from multiple airport operation; equally, however, there is little evidence of significant scale diseconomies. The case for significantly reducing the concentration of airport ownership at privatization therefore depends on the trade-off between the up-front and visible costs of re-structuring, and possibly less tangible benefits of increased competition resulting from break-up. The competition benefits in this industry are not clear-cut, primarily because major airports mainly serve distinct regional markets. Even in UK, where BAA's south-eastern airports were clearly serving broadly the same regional market, competitive pressures at the time of privatization were weakened by traffic distribution rules (although these have since been abandoned), and, more fundamentally, by the dominant position of Heathrow within the system (although this has possibly weakened somewhat as a result of traffic growth at the other airports).

In UK, the authorities took the view that any potential competition gains from breaking up BAA prior to privatization would have been offset by restructuring costs. In Australia, by contrast, the government has preferred to restructure and reduce industry concentration radically, emphasizing the following public policy benefits of the approach:

- The possibility of some limited inter-airport competition for long haul international traffic.
- The benefits of fragmented ownership in generating yardstick evidence, enabling regulatory agencies to assess individual operator performance more effectively; and in introducing a limited element of competition by emulation between operators.

D. Regulatory Institutions and Practice

Irrespective of whether PSP in airports and ATC involves full or partial privatization, arrangements are needed to safeguard the interests of airport users and to balance the long-term interests of users and investors.

1. Regulating Fully Privatized Airports Operators

The economic regulation of fully privatized airports involves the imposition of constraints, either on the maximum prices charged, or on airport profitability, as measured by the rate of return on capital. Both UK and Australia have preferred to regulate prices rather than profitability, in the belief that this form of regulation will encourage better performance outcomes, in particular, in respect of cost efficiency.

In UK, the primary legislation, the Airports Act, 1986, identifies a set of licensed airports, where the license conditions impose obligations on the airport authority relating to the safe operation of the facilities, and delegate powers to the authority, such as the power to set local by-laws needed to fulfil these obligations. Within the set of licensed airport operators, the Airports Act also specifies a minimum threshold scale of operations, currently £1 million of

turnover,²⁰ above which the airport operator is subject to economic regulation, in the sense that it must apply to the regulator for permission to levy charges. Within the airports subject to economic regulation in this way, secondary legislation identifies a further subset of four airports, London Heathrow, Gatwick and Stansted, all owned by BAA, and Manchester International Airport, where the airport license includes conditions relating to the maximum level of charges.

The rationale for only designating four airports as subject to price regulation offered when the legislation was passed was that charges at other airports would be constrained by competition from other airports, including those subject to price regulation, the provisions of existing UK and European Union (EU) competition policy legislation, and the threat of designation.

A broadly similar approach has been followed in Australia, where price cap regimes have been applied at major international gateway airports and at a number of larger regional airports.²¹ At smaller airports, the regulatory agency is able to determine charges if the airport operator is unable to agree charges with airline customers.

Another common feature of economic regulation in UK and Australia is the establishment of an independent regulatory agency, separate from the executive departments of government.

In UK, responsibility for the economic regulation of airports has been vested in the CAA, a specialized sectoral regulator, which also owns and operates ATC facilities, and exercises safety and economic regulatory responsibilities in relation to UK registered airlines. In Australia, the task of setting and reviewing airport price caps and of monitoring service quality performance and compliance with other contractual obligations has been given to the Australian Competition and Consumer Council, which has wider responsibilities as a competition policy agency.

In both UK and Australia, the decisions of the regulatory agency in respect of the maximum prices to be allowed, are taken in the light of certain public interest criteria, specified in primary legislation. For example, Section 39 (2) of UK Airports Act, 1986, states that the CAA shall perform its functions so as to:

- Further the reasonable interests of users of airports within the UK.
- Promote the efficient, economic and profitable operation of such airports.
- Encourage investment in new facilities in time to satisfy anticipated demands by the users of such airports.
- Impose the minimum restrictions that are consistent with the performance by the CAA of its functions.

The criteria in Section 39 thus recognize that whilst the regulatory agency must protect the interests of airport users, it must also balance the interests of consumers and investors, to encourage continuing investment in new facilities.

²⁰ To be altered to 1 million passengers per annum under current government proposals.

²¹ The following 12 airports are subject to price regulation:

Darwin, Townsville, Brisbane, Coolangatta, Sydney, Canberra, Melbourne, Adelaide, Alice Springs, Perth, Hobart, and Launceston.

The Airports Act also determined the procedures for carrying out periodic reviews of airport charges at airports subject to price cap regulation. Under these provisions, the Monopolies and Mergers Commission (MMC) was given responsibility for reviewing performance under the existing price cap and on any other aspects of airport operator conduct referred to it by the CAA. The MMC review process involved extensive interchange of information and opinion with the regulator and other parties, such as airlines. On the basis of the results and expectations about future market developments, the MMC then recommended, in a published report, a new quinquennial price formula. The CAA was given final responsibility for determining the price formula in light of the MMC recommendations, although it was not bound to accept these recommendations. Once again, the GAA's decision and its justification was published.

This set of institutions, conduct rules and processes scores highly in terms of five of the six criteria of good practice in regulatory governance identified in a recent NERA report to ADB.²² Specifically it ensures:

- Clarity in the role and objectives of the regulating agency.
- Regulatory autonomy.
- Effective participation by regulatees and other interested parties, such as airlines, in the regulatory process.
- Regulatory transparency.
- Regulatory accountability.

It did not ensure regulatory predictability, since the MMC was not bound by its own previous decisions. However, it can be argued that other characteristics of the review process, notably clarity of objectives and regulatory transparency, at least help to reduce the likelihood of inconsistency of approach between reviews. In practice, in contrast to the position in some other UK regulated industries, it appears that the regulatory authorities have so far taken a consistent approach at successive periodic reviews over matters such as regulatory asset valuation.

The roles assigned to the MMC and the sector regulator (the CAA) under the 1986 Act were, in fact, distinctive in relation to practice in other UK regulated industries, where the regulatory agency, such as the Office of Telecommunications, was responsible for conducting the periodic review and making proposals for resetting the price cap. The MMC would act as an appeals body in the event that the regulated company and the regulator could not reach agreement on a revised price cap formula.

Following a recent review of utilities regulation, the Government has announced proposals for bringing the conduct of future periodic reviews in the airports sector into line with practice in the other industries. The CAA, in common with other such regulators, will be responsible for reviewing outcomes and making proposals for resetting the price cap, with the MMC acting as an arbitrator if the parties cannot reach agreement. In the event of an MMC referral, the MMC's report will be published.

²² NERA (1998), *op cit*.

2. Economic Regulation under Partial Privatization

Under partial privatization involving a concession, the government (or its agent) acts as a purchaser of the services provided by the private sector contractor, following a process of competition for the market, and the resulting contract terms act as the primary instrument of regulation. The case studies of airport concessions in Appendix 2 include examples of different approaches to regulating concessionaire conduct.

In the Côte d'Ivoire, the terms of the concession agreement require the concessionaire, AERIA, to consult with the conceding authority (SODEXAM) before adjusting airport charges. However, the conceding authority is obliged under the concession agreement to sanction any increases in charges necessary to maintain the concessionaire's financial equilibrium, defined in the agreement as the full recovery of operating and financing costs. If approval is withheld, then the government must compensate the concessionaire directly. This framework therefore corresponds closely to a rate of return or cost of service form of regulation, which is generally believed to weaken the cost efficiency incentives of the concessionaire. The concession agreement appears to address the resulting incentive problem by envisaging a high degree of interaction between the concessionaire and the conceding authority, with annual negotiations on tariff adjustments and other operational aspects of the concession agreement, similar to those that might occur between a state-owned enterprise and its sponsoring ministry.

In the cases of Argentina, Colombia, and the Philippines the concession contract contains a price cap mechanism to restrict the maximum permitted rate of increase in airport charges. In contrast to cost of service regulation, the price cap approach offers strong incentives to the concessionaire to be cost-efficient, reducing the need for the intrusive regulation that appears to characterize arrangements in the Côte d'Ivoire. However, airport concessions are typically very long lived, and arrangements must be made to monitor regulatee performance under the contract, especially over matters such as the timely completion of investment projects, and service quality, to review and revise financial and other contract terms in the light of outturn experience (which may differ significantly from assumptions on which the contract was based) and, finally, to discourage opportunistic behavior by government.

As shown in the section below, contractual mechanisms that allocate risks efficiently between the parties can significantly reduce the need for formal contract review mechanisms. It can also be argued that the issues posed by uncertainty and opportunism are less important in the aviation sector than in other types of transport infrastructure, such as roads or light rail transport systems. Uncertainty over future demand is arguably less of a problem for airports (and ATC) because there are few substitutes and demand is not highly price sensitive. Also, government has fewer incentives to behave opportunistically over airport charges than over user charges in other sectors, whose impact is more widely felt by domestic consumers (and voters).

However, governments may behave opportunistically over other terms of the concession agreement than those relating to airport charges. An example of this has occurred recently in Cambodia, where the concession agreement at Phnom Penh airport included a Government commitment to designate Phnom Penh as the sole international gateway for Cambodia.²³ Subsequently, the Government has reneged on this commitment by permitting international flights to land at an airport elsewhere in Cambodia, and it is not yet clear whether some

²³ Similar provisions are included in the Ninoy Aquino International Airport BOT agreement. See Appendix 2.

compensating adjustment to the terms of the concession has been negotiated between the government and the concessionaire.

It seems certain that actions of this kind will adversely affect the private sector's future willingness to invest in Cambodia. Such effects might have been mitigated by the existence of an independent arbitrator, armed with clear conduct rules, to whom the concessionaire could have appealed in the event of a failure to agree an appropriate adjustment to contractual terms with the Government.

Assessing current regulatory practice in six DMGs (Bangladesh, India, Indonesia, Malaysia, Pakistan, and the Philippines) against criteria of good practice, NERA's recent report to ADB²⁴ found that whilst there was evidence of a clear trend towards generally more effective regulatory governance, there was as yet:

“no clear evidence of convergence to best-practice or any other common solution. It remains to be demonstrated whether international best-practice regulatory frameworks can and do work effectively in Asian DMCs.”

As recent experience in Cambodia, Côte d'Ivoire, Gabon, the Philippines, and in several Latin American countries, illustrates, imperfections in regulatory governance do not prevent PSP in airports, given certain favorable characteristics of the market environment (strong growth in demand, strong market position of hub airport operators). However, they may well reduce the flow of private sector investment in infrastructure projects, and worsen the terms on which the private sector is willing to invest.

E. Contract Design and Risk Management

An important aspect of good practice in the concession model of PSP is the management of risk through contract design. It is necessary at the outset to define what is meant by risk management in this context. Mainstream finance theory distinguishes between systematic risk, which refers to the relationship between the variation in project returns and variations in the average return across a wide portfolio of assets (the market return), and the specific risk of a project, which refers to the variability in the expected return to the project. Mainstream theory emphasizes the role of systematic risk in determining the cost of equity capital, under efficient capital markets.

1. Sources of Risk

The term risk management as used in the present context is distinct from these more familiar concepts of risk, and can perhaps best be understood by considering the set of variables which determine the expected present value of an airport investment project to a potential contractor. These are shown in Table 5, together with some of the factors affecting outcomes in respect of each variable. With the exception of exchange rate risk, where outcomes are entirely exogenous, outcomes under the determining variables reflect a combination of external factors and contractor performance.

The objective of efficient contract design is to allocate risk to the party best able to manage it. This means that the government may protect the concessionaire from certain types of risk, such as risk arising from planning delays or changes in externally imposed safety or

²⁴ NERA (1998), *op cit*.

security regulations whilst leaving them exposed to factors reflecting their own performance, especially those relating to costs.

Table 5: Sources of Risk

Variable	Risk Factors	
<i>Construction cost/time</i>	Contractor performance External	<ul style="list-style-type: none"> - planning/legislative time scale - regulatory factors - safety/security regime - purchaser behavior (change of specification). - inflation - exchange rate (for imported equipment)
<i>Operating cost</i>	Contractor performance External	<ul style="list-style-type: none"> - change in security regime - inflation
<i>Demand/revenues</i>	Contractor performance External	<ul style="list-style-type: none"> - charges - macroeconomic factors - airline industry factors - inflation
<i>Financing cost</i>	Contractor performance External	<ul style="list-style-type: none"> - market perception of project risk - investment bank policies
<i>Exchange rates</i>	External	

2. Managing Risks

The approach now widely adopted in concession projects in the airports sector, and in other types of transport infrastructure, is to identify a range of external risk factors, such as those shown in Table 5, and to specify compensating adjustments in the financial terms of the contract in respect of pre-defined outcomes under each factor. For example:

- Contractors are not normally exposed to planning risk, which covers a variety of contingencies that arise because large transport infrastructure projects, such as major airport developments, are prone to suffer both delays and cost increases as a result of planning enquiries or legislative processes. Thus, if planning processes lead to a requirement for greater expenditure on environmental protection than was anticipated when the contract was negotiated, the contractor would normally benefit from a compensatory adjustment to contract terms.
- Similarly, contractors are also protected against general inflation risks, though price indexation clauses in contracts (including price cap mechanisms).

a. Exchange Rate Risks

The recent Asian economic downturn has highlighted the potential importance of exchange rate variability and demand uncertainty as determinants of project viability. Exchange rates affect viability because user charges, including airport charges, are set in local currencies, whereas a proportion, possibly the majority, of the concessionaire's liabilities may be hard currency denominated.

To the extent that exchange rate fluctuations reflect, or cause, variations in the rate of domestic inflation relative to global inflation, indexation of output prices in local currency offers a measure of protection against exchange rate risk. A more extreme solution would be to have airport charges denominated in a hard currency, such as US dollars. Whilst this would still leave the operator exposed to currency risk in relation to services from commercial activities, such as retailing and car parking, many of the costs arising in these activities would also be denominated in local currency.

As noted above, setting charges in a non-local currency is admissible under ICAO recommended procedures:

“in special circumstances, for example, where economic conditions are not stable.”²⁵

According to the evidence on current airport charging practice, several DMCs now set many or all airport charges in US dollars. Moreover, the only two DMCs in the group shown in Table 2 to have implemented airport concessions to date, Cambodia and the Philippines, have each adopted a policy of dollar denomination of charges.

b. Demand and Revenue Risk

The case studies and experience in other types of transport infrastructure project have identified widely differing approaches to the treatment of demand and revenue risk in concession projects:

- At one extreme, some concession contracts allocate demand and revenue risk entirely to the project promoter.
- Elsewhere, a range of contractual mechanisms has been devised to share revenue risk between the government purchaser and the project promoter.

Contractual mechanisms where revenue risk remains with the contractor take one of two forms:

- The concessionaire pays a once-for-all or annual concession fee to the government that is fixed in real terms, or if the project is unprofitable, the concessionaire receives a fixed payment from government. Projects are awarded to the concessionaire offering the highest (least negative) fee. Examples of this type of agreement include the Argentine airports concession, where there is a constraint on the maximum level of charges that can be set by the concessionaire, and the original concession

²⁵ ICAO, Statement by the Council on Airport Charges, Section I C.

agreement for the Channel Tunnel Rail Link (CTRL) in UK, where the market was judged to be competitive, and so no constraint on charges was imposed.

- The concessionaire retains project revenue for a fixed term and the contract is awarded to the bidder offering the lowest level of user charges (a Chadwick auction mechanism).

Fixed fee or revenue retention contracts of this kind are favored because they provide the strongest possible incentives for the concessionaire to perform effectively. The potential difficulties which they introduce are well illustrated by the recent experience with the CTRL concession. Fixed price bids for the project were sought at a time when future demand was highly uncertain. In the event, realized demand has been far lower than that projected by the bidder, and the agreement has had to be abandoned, at considerable expense to both the concessionaire and to the UK Government. The outcome exemplifies the “winner’s curse” problem characteristic of this type of bidding process, since the winning bid was based on a highly optimistic view of the level of future demand for the project. It can be argued that the level of demand uncertainty in airport development projects is generally less significant than for projects, such as CTRL or roads, where there may be far closer substitutes available, and where realized demand may be greatly affected by competitor response.

A range of contractual devices are available for sharing demand and revenue risk. The airports concession projects covered in the case studies illustrate three variants of this approach:

- The most straightforward is when, as in Côte d’Ivoire, the concession agreement is based on cost of service regulation. Given price inelastic demand for airport services, this approach would enable the concessionaire to increase charges in real terms to whatever extent was necessary to restore financial equilibrium, allowing market risks to be fully transferred to airport users.
- A government minimum revenue guarantee (Bogota). This approach is conceptually similar to devices such as minimum offtake agreements, observed in concession contracts in the power sector. The Bogota project was awarded to the bidder seeking the lowest guaranteed level of revenue and the lowest average landing fee.
- Concession fees variable with airport revenue (the Philippines). In this case, the concession fee payable to MIAA contains both a fixed and a variable element, the latter expressed as a proportion of total revenue accruing through passenger terminal operations. In this case, the contract has been awarded to the bidder offering the highest expected concession fee revenue, with the revenue being evaluated across a range of demand scenarios.

Other risk sharing devices observed in transport sector concession projects include:

- Variable concession lengths; this approach has been applied in a number of tolled motorways and bridges. If the present value of concession revenue reaches a certain pre-determined level before the maximum term of the concession, which is specified, the concession is terminated. This approach leaves some residual revenue risk with the concessionaire, but the maximum concession length is usually based on a pessimistic view of future traffic levels, so that this residual risk is very limited in practice.

- Shadow tolling; in UK design-build-finance-operate program, the concessionaire's revenue varies with the level of traffic. However, bids are expressed in terms of a declining block tariff structure, such that the marginal rate of shadow toll payment falls with successively higher levels of traffic. The variation in revenue is damped, and should broadly match the variation in operating costs with traffic at the margin. Although this approach has so far only been used to underpin concession projects involving non-tolled facilities, it could equally well be applied to airport runway projects, such as the Bogota El Dorado airport concession. In this case, the public sector airport operator would retain landing charge revenues, and the concessionaire would be remunerated through the shadow toll mechanism.

The impact of revenue risk sharing measures on the terms potential private sector contractors are willing to offer (given expected market conditions), will depend upon the precise nature of the measure. Two effects can, in principle, be identified.

First, any such action reduces the specific risk in a project, either by curtailing downside risk, or by capping both downside and upside risk. Although orthodox finance theory would suggest that changes in specific, i.e., diversifiable, risk should not affect the terms on which capital markets are willing to supply capital to a project, it is not clear that the assumptions underpinning the theory are completely satisfied given the infant industry character of airport concession projects. If not, then a reduction in specific risk may reduce the required rate of return sought by potential concessionaires.²⁶

Second, measures such as minimum revenue guarantees, that underwrite downside risks without capping upside risk, increase the expected private net present value of the project, although the expected social net present value is unchanged. In itself, this would tend to improve the private sector's willingness-to-pay for the project, given expected market conditions, etc.

The potential downsides of contingent contracting and bidding mechanisms are, first, that they may weaken the contractor's incentives to perform effectively, by maximizing demand and revenue and by completing projects to time, and, second, that the bid evaluation procedures may be more complex than under fixed fee/term contracting, since in some cases, bids must be evaluated across a range of demand scenarios.

The emerging consensus in favor of different forms of contingent approach suggests that market participants expect the potential downside effects to be outweighed by the potential risk sharing benefits of the contingent approach.

3. Other Aspects of Contract Design

A frequently cited problem with time-limited concessions in industries such as airports, where the assets are specific and long-lived, is that the economic life of the assets acquired by the concessionaire may be far longer than the concession period. Because there is no guarantee that the concession will be renewed, the concessionaire must seek to amortize such assets over the remaining term of the concession, and to recover these costs from user charges. As a result, the cost base is inflated compared to the full privatization model; the cost inflation impact is especially acute for assets acquired later in the concession period.

²⁶ For further discussion, see Jones, I, Zamani, H, and Reehal, A (1996), *Financing Models for New Transport Infrastructure*, Luxembourg, Office for Official Publications of the European Community.

Provisions in the Abidjan airport concession agreement, which are similar to recent developments in water industry concessions, offer the prospect of mitigating, if not altogether removing, such an effect. The approach in these agreements is to make provision in the concession contract for paying compensation to the concessionaire based on the residual value of assets not fully depreciated under industry standard accounting rules, if the concession is terminated or transferred to another party following a rebidding process at the end of the concession period. The impossibility of fully mitigating the effects stems from the need for the conceding authority to protect itself against underwriting unwise or opportunistic investment by the concessionaire. Thus, water industry compensation terms may incorporate concepts such as “used and useful”, which introduce some element of ex-ante uncertainty for the concessionaire as to what the conceding authority will offer. Uncertainty of this kind may be limited by provisions offering arbitration if agreement cannot be reached between the parties on a fair valuation of stranded assets, as in the Abidjan airport concession agreement. The introduction of explicit provisions for dealing with stranded assets in airport concession contracts involving more than the construction and operation of a particular facility, such as a runway, thus offers scope for improved performance outcomes.

F. Securing Efficient Tendering Outcomes.

The net benefits of engaging the private sector through concessions and other forms of contracting arrangement will generally be higher the more effective is competition for the market, which, in turn, is linked to the effectiveness of public procurement procedures. Experience in the EU, where public procurement throughout the Union is subject to a series of EU Directives,²⁷ indicates that good practice covers the following aspects of procurement:

- The absence of restrictive (or preferential) conditions on bidder eligibility (in the case of the EU directives, this takes the form of banning discrimination on grounds of nationality).
- Transparency in selecting potential contractors and awarding contracts, secured by
 - the requirement to publicize any contract whose estimated value exceeds a specific threshold (which will vary according to the nature of the goods or services being purchased). In this way, potential contractors are kept well informed about possible opportunities;
 - the use of objective criteria which must be known beforehand in order to prevent a contracting authority from selecting candidates and tenders on the basis of criteria different from those initially stated;
- a precise indication of which of the permissible award procedures has been chosen:
 - an open procedure, in which any firm may tender;
 - a restricted procedure, in which only firms that have been invited to tender by the contracting authority may do so;

²⁷ Directive 93/36/EEC (public supplies); Directive 93/37/EEC (public works); and Directive 92/50/EEC (public services). A further directive, 89/665/EEC, covers measures to ensure compliance with the primary directives.

- a negotiated procedure, in which the contracting authority consults selected firms and negotiates the contract terms with one or more of them; and
- compliance with explicitly stated technical requirements standards.

The case studies in Appendix 2 offer examples of widely differing levels of competition either for concession contracts or, in the case of airport privatization in Australia, for airport leases. In Côte d'Ivoire, procedures for awarding the concession at Abidjan airport were informal, in the sense that the initial call for expressions of interest was not tightly specified, and only limited financial accounting data were available on the performance of the airport. This was followed by an extended process of negotiation, initially with two, but finally with a single favored bidder, selected on the basis of the overall quality of the expression of interest.

In Australia, the airport privatization program attracted a great deal of interest and the sales proceeds were higher than had initially been expected. Several factors appear to have contributed to the success of the privatization program:

- The establishment of a regulatory framework and process which set down clear guidelines within which the newly privatized airports would operate.
- The provision of as full as possible disclosure of information on the current and expected performance of the airport businesses.
- The use of transparent tendering procedures setting out clear and unambiguous rules by which tenders would be assessed.

The first two factors meant that prospective bidders had as clear as possible a view of the commercial potential of the businesses; the third factor ensured that bids were well-focussed and observed the same rules of the game, enabling the authorities to make decisions that were defensible in terms of the specified criteria.

The Philippine BOT law, referred to earlier, contains provisions covering procedures for tendering and awarding BOT projects, relevant extracts from which are in Appendix 3. These provisions score highly in requiring public authorities wishing to award BOT contracts to publicize the opportunity widely, and in setting out admissible procedures and decision criteria leading to the award of contracts.

As described in more detail in Appendix 2, the BOT project to construct and operate a second international terminal at NAIA resulted from an unsolicited bid, admissible under Section 4-A of the BOT law, in respect of financially viable projects. This provision recognizes that public sector agencies may well not be able to identify all potentially viable projects, and offers scope for entrepreneurial initiatives from the private sector. However, it is also important to ensure that the projects promoted through this process are economically viable, on the basis of comprehensive and rigorous cost benefit and financial analyses. In the case of the new international terminal at NAIA, doubts were initially expressed about the economic justification for the project, first, because it appeared to conflict with existing plans to develop a new international gateway airport for the Manila region at Clark Airforce base, and, second, because the project will require the premature closure of another existing terminal. While subsequently it was demonstrated that the project was economically viable, in other circumstances, issues of this kind would tend to weaken the private sector's willingness to bid for a project, because they would increase the risk that the Government might not continue to support the project. Conversely, the availability of Government-sponsored studies demonstrating a strong case for

the project would signal to prospective private sector bidders that the Government would be committed to the project.

The Philippine law requires the purchasing agency concerned to seek competitive bids for any project for which an unsolicited bid has been received. In this case, a competitive bid was submitted, offering very significantly better terms than those offered in the unsolicited bid, which the original bidder felt unable to match. As a result, the BOT contract was awarded to the competitive bidder.

G. PSP in Unprofitable Airports

There are several possible mechanisms for engaging the private sector in unprofitable airport operations, defined as a situation where the expected present value of future airport revenue streams is less than the expected present value of future operating costs, including both current and capital expenditures.

First, the airport may be offered to the private sector with an element of government subsidy, injected either through a negative concession fee mechanism, or by a grant towards the cost of a capital project. This approach has been extensively applied elsewhere in the transport sector, notably in the provision of unprofitable rail or bus services, but there is no evidence of its application in the airport sector.

An alternative approach, which removes the need for any direct or explicit subsidy payment from government, is to bundle unprofitable airport activities with profitable airports, or possibly with property or commercial development opportunities, where the activities are closely complementary to the airport. The Argentine airport privatization program provides an example of the bundling of profitable and unprofitable airports within a single multi-airport concession, which preserved the pattern of cross-subsidy within the existing state-owned entity. The authorities in Côte d'Ivoire are currently examining options for developing the airport at San Pedro, in the south-west of the country, in conjunction with a major expansion of tourist facilities in the region; one possible approach would be to offer a concession covering both the airport and hotel development, etc.

The Australian authorities also considered, but rejected, the idea of bundling groups of airports together in reviewing structural options for the privatization program. In doing so, the Government took the view that it would be more efficient to allow the ownership structure to be determined by the market, rather than imposing a structure ex-ante. The availability of incentive compatible mechanisms for allocating subsidy through a competitive bidding process, added to the public policy benefits of increasing the transparency of subsidies, further reinforces the advantages of the unbundled approach to engaging the private sector.

H. Conclusions: The Main Lessons from Experience of Airport Privatization to Date

In drawing lessons from the existing experience of airport privatization, it should be emphasized that the extent of this experience remains strictly limited. The flotation of BAA plc, the first major airport privatization episode, occurred in 1986, and it is only in the past 2-3 years that PSP, in what we characterized earlier as core airport activities, has become at all widespread, chiefly as a result of developments in Australia and Latin America.

The key lessons to be learned from experience to date are summarized in Figure 2.

Figure 2: Key Lessons

<p>Public Policy</p> <ul style="list-style-type: none"> • Airport privatization will be encouraged by the existence of legislation, in the form of a BOT law or similar, signaling the state's recognition of the need for private participation in infrastructure provision. • It is also important to ensure that government is able to demonstrate that any projects offered to the private sector are economically viable. <p>Industry Structure</p> <ul style="list-style-type: none"> • In the absence of any significant scale benefits from multi-airport operation, there are advantages from using the privatization process as an opportunity for reducing high levels of industry concentration. • Equally, the existence of unprofitable airports does not justify the maintenance of a highly concentrated industry structure to facilitate cross-subsidy. <p>Regulatory Framework and Mechanisms</p> <ul style="list-style-type: none"> • The process of PSP will be encouraged by the existence of good regulatory governance structures, based on independent regulatory agencies, operating within well defined public interest criteria, and with well-articulated appeal or arbitration mechanisms. • Such a framework is equally relevant under both full and partial (concession based) privatization scenarios. • The price cap approach to constraining airport charges is likely to encourage better performance outcomes than one based on rate of return regulation. <p>Risk Allocation</p> <ul style="list-style-type: none"> • Some sharing of revenue or market risks between a concessionaire and government may offer a better deal for the purchaser than full transfer of such risks to the concessionaire. • Denominating some or all airport charges in US dollars may be a useful device for encouraging PSP in airports in the wake of the recent currency crisis. • There would be advantages in the widespread adoption of mechanisms already present in some concession agreements for compensating concessionaires for stranded assets in the event that the concession is terminated or transferred to another party when it is rebid. <p>Tendering Procedures</p> <ul style="list-style-type: none"> • Competition for the market will be encouraged by a clear and transparent tendering process, based on equal treatment of bidders and full disclosure of information to enable bidders to make as informed an assessment as possible of the business opportunity.
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V. THE ROLE OF ADB

A. Introduction

This concluding section discusses ADB's role in facilitating PSP in airports and ATC services in DMCs. In this section the report examines how ADB can assist in disseminating good practice, both in respect of the mechanics of contracting, and in the wider context of public policy and regulatory structures and conduct. Further, ADB's role in providing training for officials in DMC government agencies, to equip them for the tasks of negotiating contracts with private sector organizations is considered. Finally, the discussion shows how ADB's actions can improve the terms on which the private sector is willing to participate in financing and operating infrastructure facilities.

B. Disseminating Good Practice

Through this medium and other projects undertaken under ADB's regional technical assistance umbrella, ADB can provide decision makers in DMCs with authoritative and impartial assessment of the rapidly evolving experience worldwide of PSP in infrastructure development. In the case of the airports sector, much of the experience currently available relates to the type of arrangements that are feasible. There is as yet little substantial evidence on what particular arrangements are likely to produce better performance outcomes in practice than others. However, there are some aspects of public policy, industry structure, regulatory practice, contract design and public procurement procedures, where the elements of "good practice" are now visible.

C. Role in Training

Transforming the basis for procuring infrastructure services from the traditional publicly financed design and build model (with subsequent operation by the public sector agency) to a private financing and operation model, requires significant changes in the procurement and project management activities of public sector agencies. To make BOT arrangements work effectively, the public sector must develop new capabilities in contract negotiation, especially in the area of risk allocation and management, and in the regulation of contract performance in the operational phase, which extends over many years, and may include contract review and renegotiation.

In the short term, shortage of necessary skills may be covered by hiring external advisers. However, in the long run it will generally be more cost effective to develop internal agency skills, especially if there is a steady flow of new projects to be negotiated. Moreover, parameters of the procurement process should become increasingly standardized on whatever model emerges as best practice in light of experience. The more routine the process, the more efficiently it can be managed by bureaucratic rules and procedures within public sector agencies.

Experience with programs such as the Private Finance Initiative in UK suggests that developing the necessary agency skills can be achieved by a combination of re-training of existing agency staff and external recruitment, although external recruitment may be problematic because of disparities between public and private sector remuneration.

Agencies such as ADB can act both as direct training providers, especially during the early pump-priming stages of the process of transforming public procurement strategies, and through initiatives to encourage indigenous training capabilities. These include supporting the development of "model" training programs, facilitating secondment of staff from DMCs to agencies in other countries with greater experience of private sector provision of infrastructure and assisting in the establishment of training centers in the DMCs, such as the BOT Center in the Philippines.

D. Improving Financing Terms

ADB has a fivefold role in improving the financial terms on which the private sector is willing to provide airport and ATC infrastructure services in DMCs:

- First, by encouraging the corporatization of existing state-owned providers of airport and ATC services, so that potential private sector investors are better able to understand the business proposition in which they might be engaged.
- Second, by promoting good practice in regulatory governance and public procurement.
- Third, by promoting good practice in contract design, to encourage the efficient allocation of risk between the DMC government agencies and private sector contractors
- Fourth, by assisting DMC agencies to bring forward economically viable projects which attract widespread support from relevant constituencies within the DMC.
- Finally, ADB's willingness to invest in or sponsor a project can act as a signaling device to private investors about the soundness of the project, which, in turn, should improve the terms on which external investors are willing to participate.