

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

PART TWO

**WORLD
INVESTMENT
REPORT**

2008

**Transnational Corporations,
and the Infrastructure Challenge**



UNITED NATIONS
New York and Geneva, 2008

PART TWO

TRANSNATIONAL CORPORATIONS AND THE INFRASTRUCTURE CHALLENGE



INTRODUCTION

Infrastructure – especially electricity, telecommunications, transport and water – is important for all economies. They provide goods and services that are crucial for the efficiency, competitiveness and growth of production activity. Furthermore, access to affordable electricity and drinking water is an important determinant of the living standards of a country's population. The fundamental role of infrastructure has been brought into sharp relief in recent years, as a steadily growing number of countries across the entire developing world have been drawn into a cycle of growth and a greater participation in the global economy, but by doing so are finding further growth constrained by the quantity and quality of their infrastructure.

Many low-income countries face huge infrastructure investment needs but lack the necessary capacity domestically to meet them. Mobilizing financial and other resources to respond to these needs, especially in the least developed countries (LDCs), are among the main challenges which beset governments and the international community. The formidable gap between these needs and the availability of necessary resources has been one of the drivers behind the fundamental change in the role of the State in the provision of infrastructure around the world.

Governments in both developed and developing countries have opened up infrastructure industries to much greater involvement by the private sector – including TNCs. This new relationship between the State and the private sector has in some cases been facilitated and shaped by technological changes. These changes have opened up options for the introduction of competition in industries that are in the process of shedding their natural monopoly characteristics. This has been the case, especially in telecommunications and in

parts of the electricity industry, such as power generation. As a result of greater openness in many countries, TNCs have come to assume a significant role in the provision of some infrastructure services.

The internationalization of infrastructure has taken varying trajectories in different parts of the world. Developed countries witnessed the birth of several large infrastructure TNCs in the 1990s. They typically arose out of former public monopolies. Their overseas expansion contributed to increased FDI and other forms of TNC participation, such as concessions and management contracts, among developed countries as well as in some developing and transition economies. In the latter, new investment opportunities emerged from major privatization programmes of State-owned infrastructure assets. In addition, the liberalization of infrastructure industries in developing countries has contributed to the emergence in the South of a number of TNCs in these industries.

Policymakers today have a menu of options for maintaining and developing their countries' infrastructure. The challenge is to assess the potential costs and benefits associated with different options, such as retaining infrastructure services within the public sector, offering concessions to prospective investors and full privatization to the private sector, including TNCs. Some countries have experimented with different solutions for over two decades, and various lessons have been learned. Other countries are still in the process of opening up to foreign involvement. Governments need to consider many factors when deciding whether or not to involve TNCs and, if so, in what way they should promote such involvement.

Which modes of participation have the greatest chances of maximizing the



net benefits of TNC entry, for example, in terms of improved service supply and reduced costs? What does it take to attract desirable forms of TNC involvement? The responses to these and other questions depend on the context. There are no one-size-fits all solutions. Governments need to determine what kinds of policies they will put in place in order to secure the desired outcomes, including helping to eliminate poverty and attain the Millennium Development Goals (MDGs).

After two decades of experience with TNC involvement in the infrastructure industries of many developing countries - including its failures as well as successes - an understanding of the nature, extent and implications of that involvement is just emerging. Mobilizing and facilitating greater financial flows to developing countries, and especially to LDCs, remain a challenge for the international community. It is against the background of the economic and social importance of infrastructure that this year's *World Investment Report* is devoted to the issue of *Transnational Corporations and the Infrastructure Challenge*.

Part Two is organized as follows. Chapter III presents new data on the role and evolution of TNC participation in infrastructure. It explores the characteristics, trends and evolution of infrastructure industries, including the changing role of the state, the rise of new players and an assessment of infrastructure needs (and investment gaps) in developing economies. It goes on to examine the trends and patterns of TNC involvement in different industries, and offer an insight into the universe of infrastructure TNCs, and their competitive advantages, drivers and strategies. Chapter IV assesses the extent to which TNC participation has contributed to achieving various infrastructure-related development objectives. Finally, chapter V maps recent policy developments and considers the implications of the findings of chapter IV for national and international policies to harness TNC participation in infrastructure industries. Particular attention is given to how different forms of financing, whether domestic or foreign, and including overseas development assistance (ODA), can be leveraged in a complementary fashion to meet the specific infrastructure needs of developing countries, particularly LDCs.

CHAPTER III

TNCs IN INFRASTRUCTURE INDUSTRIES

The provision of good quality infrastructure services is a prerequisite for economic and social development. In terms of both the quantity and quality of key infrastructure services and utilities, such as electricity, telecommunications, transport and water supply, there are significant gaps between developing and developed countries and among developing countries at different stages of development. Indeed, in developing countries, insufficient provision of infrastructure and related services is one of the main obstacles to accelerating or maintaining the pace of development and to achieving the Millennium Development Goals (MDGs) set by the United Nations in 2000. One way of addressing the shortfalls in infrastructure and related services in developing countries is to mobilize FDI and other forms of TNC participation to supplement and complement the activities of domestic public and private infrastructure enterprises.

This chapter examines the involvement of TNCs in the establishment and operation of infrastructure facilities and related services, especially in developing countries. It begins with a review of developments in infrastructure industries, examining their distinctive features and the scale and scope of infrastructure investment and operations worldwide. Section A analyses various factors that influence FDI and TNC activity, including the impact of globalization and technological changes, the changing role of the State, the prevalence of investment gaps and the rise of new players to help bridge these gaps. Section B identifies trends in FDI and other types of TNC involvement in infrastructure industries,

especially in developing countries. Section C reviews the main TNC players involved, and section D discusses the determinants of TNC investment and activities.

A. Main features of infrastructure industries and emerging issues

1. Characteristics of infrastructure industries

There is no commonly agreed usage of the term infrastructure, but the concept, in its broadest sense, comprises the physical facilities, institutions and organizational structures, or the social and economic foundations, for the operation of a society. Within this broad concept, social infrastructure (e.g. health and education) can be distinguished from economic infrastructure. The latter directly supports production activities of enterprises at various points of the value chain, and is thus directly relevant to the competitiveness of firms and to economic development. *WIR08* focuses on *economic infrastructure*,¹ which is a homogeneous group in the sense that it underpins the functioning of other economic activities, and is hence directly relevant to the competitiveness of firms and to economic development. Infrastructure² consists of a group of industries, including electricity, gas, telecommunications, water and sewage, airports, roads, railways and



seaports (the last four collectively referred to as transport infrastructure).³ Nevertheless, the definition is fluid, especially with the advent of advanced information and communication technologies (ICT) that have affected the nature of telecommunications facilities and services.

The activities of the infrastructure industries can be considered as including the establishment, operation and maintenance of fixed infrastructure. This report focuses on the infrastructure industries themselves, as presented in table III.1 (listing different categories based on Standard Industrial Classification (SIC) codes), which include both “infrastructure facility operation and maintenance” (e.g. power stations) and “infrastructure services” (e.g. electricity distribution services). It distinguishes between the infrastructure industries per se (“infrastructure”) and broader, related activities, which include services directly relying on the provision of infrastructure (table III.1). For example, airports and seaports – and the services they provide to vehicle and aircraft operators – are included as infrastructure, but not the actual air transport or shipping activities that utilize these infrastructure facilities and services.

There is a close relationship between infrastructure industries and supplier industries and activities, such as the construction industry (backward linkages), and user industries such as air, road or sea transportation services (forward linkages). Both supplier and user industries fall outside the boundaries of infrastructure as used in this report (table III.1), even though they are closely related as providers of inputs or as direct users of services. In addition, the analysis of TNCs in this chapter also makes a distinction between those firms whose primary operations are in an infrastructure industry (infrastructure TNCs or firms “rooted” in infrastructure) and those, such as manufacturing or financial firms, that have ancillary operations in infrastructure (other TNCs in infrastructure).

Infrastructure activities are often regarded by many investors and operators as high-risk undertakings, especially when conducted in developing or transition economies (Ramamurti and Doh, 2004). Some of these risks are common to all kinds of infrastructure projects, while others pertain to a specific industry. These risks may be accentuated when investors operate in foreign countries and investments are undertaken in low-income countries. Risks from the corporate perspective include uncertainty of returns on investment in infrastructure, political risk (e.g. governments reneging on contracts, popular protests against private or foreign firms) and the ability of users to pay. Moreover, not all political and other non-commercial risks can be covered through the private insurance market (Berne Union, 2008). Governments also need to consider the risks

they face from investors, including TNCs reneging on contracts. The high-risk nature of infrastructure activities, as well as other aspects of infrastructure industries that influence investment, derive from some of the distinctive features of these industries:

- Infrastructure industries include very capital-intensive and complex activities (boxes III.1–4). Typically, infrastructure assets last a long time, involve huge sunk costs and are location-specific. This makes them formidable undertakings, especially for developing countries, which often depend on technology, expertise and financial resources from overseas.
- Since infrastructure industries often involve (physical) networks, they are frequently oligopolistic (or monopolistic) in nature. Thus control or access to the network can be a key competitive advantage, and requires strict regulation.
- Many societies regard access to infrastructure services as a social and political issue. Such services may be considered public goods, in the sense that they should be available to all users, and some (e.g. water supply) are considered a human right.⁴ Other infrastructure industries or services, such as ports, are considered by many governments to be of strategic importance.
- Infrastructure industries are a major determinant of the competitiveness of an economy as a whole. Their role as inputs for all other industries means that the entry and performance of private companies (including TNCs) in infrastructure activities have to be evaluated not just in terms of the efficiency and competitiveness of the services concerned (based on cost, price and quality, for example) but also in terms of their impact on industrial users.
- Infrastructure is key to economic development and integration into the world economy (ESCAP, 2006; OECD, 2006a; World Bank, 2005).⁵ Good transportation and telecommunications infrastructure can contribute to an economy’s national and subnational competitiveness⁶ and to poverty alleviation.⁷ The provision of efficient and adequate electricity is vital for industrial development and economic growth, but also for helping countries attain the MDGs, including poverty alleviation (IEA, 2003). The provision of good infrastructure in turn is a major determinant of inward FDI (Bellak, Leibrecht and Damijan, 2007; Kirkpatrick, Parker and Zhang 2006; Asiedu, 2002).

Because infrastructure is essential for development, increasing investment in this area of activities should be a priority for developing countries. It is not a question of “if” but rather “what”, “when”, “how much”, “by whom” and “for whom” (section

Table III.1. Infrastructure industries and related activities

Infrastructure		Supplier industries and activities	Infrastructure sectors		
			Infrastructure industries		Services relying directly on infrastructure
			Facility operation and maintenance	Infrastructure services	
Transport	Seaports	...	Marine cargo handling (4491)	Towing and tugboat services (4492)	Deep sea transportation of freight (441–442)
	Railroads	Railway track equipment (part of 3531)	Railroads, line-haul operating (4011)	Railroad switching and terminal establishments (4013)	Local and suburban transit (4111)
	Roads and highways	Heavy construction other than building (16, exc. 1623)	Terminal and joint terminal maintenance (423)	Terminal and service facilities for motor vehicle (417)	Motor freight transportation and warehousing (421–422)
	Airports		Airports, flying fields, and airport terminals (458)		Air transportation (451–452)
	Other	Parts of heavy construction, not elsewhere classified (1629)	...	Parts of miscellaneous services incidental to transportation (4785)	
Telecommunications	Telephone and telegraph apparatus (3661)		Telephone communications (481)		Radio broadcasting stations (4832), Television broadcasting stations (4833)
	Telephone interconnect systems (7385)		Telegraph and other message communications (482)		
Water			Water supply (494)		Irrigation systems (497)
			Sanitary services (495)		
Power	Water, sewer, pipeline, and communications and power line construction (1623)		Electric services (491) (generation and transmission)	Electric services (491) (distribution)	...
			Natural gas transmission and distribution (4922), gas production (4955)	Natural gas transmission and distribution (4923) and distribution (4924)	
			Combination electric and gas, and other utility (493)		
			Steam and air-conditioning supply (496)		

Source: UNCTAD.

Note: The classification used here is based on the SIC codes indicated in brackets.

A.2). At the same time, the questions surrounding investment by private companies (including TNCs) in infrastructure activities are more far-reaching than in most other industries, and touch on the economic, social and political spheres (chapter IV).

Each infrastructure industry has its own individual characteristics. Therefore, while the above-mentioned features generally apply to all of them, it is important to note the distinctive characteristics of electricity generation, transmission and distribution (box III.1), fixed-line telephony, mobile telephony and Internet telecommunications (box III.2), seaports, airports, roads and railways (box III.3) and water and sewage (box III.4) in the analysis.

Infrastructure, by its very nature, and due to social and political preferences is frequently subject to public intervention. Such intervention adds to the risky nature of infrastructure from a corporate perspective. Nevertheless, private sector involvement in infrastructure has increased in recent years. Indeed, its potential for high returns in the long term is often sufficiently enticing to companies. Consequently,

in recent years a number of players other than infrastructure firms have expanded their presence in infrastructure industries, including private equity funds.

Defined by technology and regulation, each infrastructure industry includes potentially competitive and non-competitive segments (table III.2). Non-competitive areas include transmission and distribution networks, such as transmission lines in electricity; cables and switching centres in fixed line telecommunications; tracks, signals and stations in railways; landing strips at airports; and pipes and sewers in water supply. Such networks, positioned between upstream production and downstream supply, are very capital-intensive and involve large sunk costs and assets that are of minimal use for other purposes. Once built, they are location bound and cannot be moved to other sites. These features mean that such activities retain the characteristics of natural monopolies. Other upstream and downstream segments, on the other hand, offer greater potential for competition. In electricity, telecommunications

Box III.1. Main features of electricity infrastructure

There are three segments to the electricity industry: generation, transmission and distribution. Together, they form an important part of the backbone of a modern economy. Without adequate investment and a reliable supply of electricity, an economy is unable to function efficiently, economic growth targets are difficult to achieve, outages and blackouts are common, and it is difficult to attract FDI to help create employment and advance industrial development. The provision of electricity has a public good element in that it helps reduce poverty, and improves quality of life.

The electricity industry is technology- and innovation-intensive. Technological change, especially in electricity generation, is affected by social considerations, such as national and international concerns over climate change and environmental conservation. The use of environmentally friendly and clean technology, (e.g. hydropower plants) and renewable energy (e.g. wind and wave power) are expected to see continued growth.

In some segments of the electricity industry, economic and technical characteristics make it possible to introduce competition; in other segments they do not. For example, *electricity generation*, if separated (unbundled) from transmission and distribution, can involve a number of independent and competing providers, and hence can be structured as a competitive business. *Transmission networks*, in contrast, are a classic natural monopoly, as it is not economical to build parallel networks to transmit the same energy, which is why most countries have only a single entity owning and operating them.^a At the end of the supply chain, *electricity distribution* can also be made competitive, although that may be constrained by the fact that distribution requires a physical network, which is a natural monopoly. Therefore, while wholesale distribution can usually be a competitive business, retail services can be made so only if regulations allow companies not affiliated with the transmission company access to a network's "final mile", which connects electrical substations with businesses and residences.

Source: UNCTAD.

^a An especially large country might have multiple transmission operators, but even in this case each operator will have a monopoly within its own (typically large) geographic region.

Box III.2. Main features of telecommunications infrastructure

Telecommunications are carried out by transmitting signals over a distance through electromagnetic waves. Within telecommunications infrastructure, fixed-line telephony, mobile telephony, and transmission of digital data are the most important segments. They differ from each other in terms of their technology, how services are delivered, and in some of the specific services they offer to consumers. Investment in telecommunications infrastructure can enhance economic growth directly – through its demand for inputs – and indirectly, as better communication networks help firms in other industries improve and expand their production capacities (Madden, 2008). Given the growing role of telecommunications in development, access for all persons and societies to good telecommunication infrastructures is increasingly regarded as important. Telecommunications can be considered a public good in the sense that every member of society can benefit from them, and they can be used by additional consumers without generally risking depletion, although they are not provided free and users contribute to their cost.

Since all telecommunications are based on networks, it is important that different modes and technologies of communication are able to connect to each other. In this respect, there has been significant progress, although newer segments such as mobile telephony are less dependent on physical infrastructure than traditional fixed-line telephony, which requires greater investment for wired installations.

Technological change has led to increased competition and contestability in the industry, especially because of the rise of mobile telephony. Technological progress has reduced the cost of physical infrastructure, allowed the establishment of parallel mobile telecommunications networks and eliminated dependence on monopolies that control fixed lines. As a result, a large number of new, competing enterprises have emerged. Established firms have had to respond to this challenge by innovating quickly, and by moving into new segments. Introducing competition has been easier in mobile and Internet telecommunications than in traditional fixed-line telephony (ITU, 2007b).

The sector continues to innovate rapidly, with implications for services. For example, digitization allows any type of information to be transmitted over one network: voice, data and video. This is pushing the transition to so-called next generation networks, which are essentially built around Internet protocol (IP) technology and are accelerating the convergence between fixed-line and mobile telephony.

Source: UNCTAD.

Box III.3. Main features of transport infrastructure

Transport infrastructure comprises a heterogeneous group of industries, including roads, railways, airports and seaports. An integrated transport infrastructure that includes all these modes makes it possible to link underdeveloped parts of a country and regions into the global economy. For manufacturing and trading activities, the quality and coverage of transport networks significantly influences the costs of production and distribution (Aoki and Roberts, 2006). In this context, the role played by seaports is critical, because around 80% of global trade is estimated to be carried by sea (UNCTAD, 2008e). Thus efficient seaports can directly and indirectly contribute to the development of an economy by facilitating trade and providing a hub for industry clusters, which may also provide backward linkages in skills, technology and investment.

Technological innovation in transport has occurred mainly through the introduction of sophisticated computerized handling systems in response to the need to manage the global increase in containerized trade. In general, an integrated transport infrastructure offers a wider choice of transport options for users, which in turn encourages greater competition and efficiency, resulting in lower transport costs to the consumer.

For a country to spread development throughout its economy, an integrated, multimodal transport network is necessary. Landlocked countries, some of which are least developed countries (LDCs), have the additional burden of relying on their neighbours to have such an integrated multimodal transport network to link them to the world economy. Consequently, regional transport networks are a significant feature of investment in infrastructure across Africa, Asia and Latin America.

Source: UNCTAD.

Box III.4. Main features of the water industry

All activities along the water industry supply chain – extraction, transmission, distribution and supply – involve economies of scale. For this reason, the provision of water services typically involves high sunk and fixed costs incurred by large-scale centralized projects, and requires significant energy inputs. At the same time, the expansion of services, the replacement or maintenance of existing facilities, and their adaptation to security and environmental norms require large capital investments and considerable planning (OECD, 2007a).

Water supply has failed to keep pace with rising world population, leading to chronic shortages in several regions of the world. This is however due mostly to problems with water management and investment problem, and less to the lack of available sources of water. The gravity of the situation is reflected in the MDG declarations that recognize water availability and access as a priority goal. Even in developed countries, affordability of safe water among the poorer segment of society has become a critical issue. Moreover, it must be borne in mind that water is used not only for direct human consumption, but also for economic purposes in agriculture and manufacturing. In 2000, only 10% of world water withdrawal took place for households. Industry accounted for 20% and agriculture for 70%.^a

The scope of governments for introducing competition in the water industry is limited, although in principle the extraction and retail supply segments could be made competitive. Water distribution remains a natural monopoly because its main costs come from laying a network of pipes to deliver water, and it is economically not interesting to introduce competition by duplicating the network. Moreover, unbundling is not always attractive due to the high costs and problems associated with connectivity, and due to the fact that most of the costs of water still arise in distribution, which is a natural monopoly. Considerations of water as a basic need can further add to the limits of unbundling.

Source: UNCTAD.

^a In developing and transition economies, these shares were 9% (households), 12% (industry) and 79% (agriculture). The calculation is based on data from the Food and Agriculture Organization of the United Nations' Aquastat database (<http://www.fao.org/nr/water/aquastat/>). Data were used for 141 economies of the world for year 2000, and for 17 economies for the latest year available (between 2001 and 2006).

and transportation, technological progress has helped to reduce scale requirements and costs, and enabled the introduction of new sources of competition to some extent.

Private and foreign investors can enter formerly publicly provided infrastructure services if a given segment is unbundled from the rest of the industry. Unbundling refers to a separation of segments of an industry from each other.⁸ Unbundled

segments of infrastructure can be owned and/or operated by different enterprises competing with one another. However, network segments retaining the characteristics of a natural monopoly – regardless of whether they are publicly or privately owned – as well as interactions between more competitive and less competitive segments require special attention (Kessides, 2004; Newbery, 2006; Ure, 2008). If potentially competitive segments are not unbundled,

Table III.2. Non-competitive and competitive segments of modern infrastructure industries

Industry	Usually non-competitive segments	Potentially competitive segments
Electricity	High-voltage transmission and wholesale electricity distribution	Generation and supply to final consumers
Telecommunications	Local residential telephony or local loop	Long-distance, mobile and value-added services
Water and sewage	Local distribution and local wastewater collection	Production, long-distance transportation, purification and sewage treatment
Transport		
Railways	Track, stations and signalling infrastructure	Train operations and maintenance facilities
Air transportation	Airport facilities such as take-off and landing slots	Aircraft operations, maintenance facilities and catering services

Source: UNCTAD, based on Gönenc, Maher and Nicoletti, 2000; and Kessides, 2004.

or if the service provider is protected from competitive pressures, it is difficult to create the necessary incentives for cost control, pricing and enhanced performance and, ultimately, investments (Joskow, 1996; Berg, 2001).

2. The infrastructure investment gap in developing countries

The future investment needs of developing countries for infrastructure development far exceed the amounts currently planned by governments, the private sector and other stakeholders. This has

created a significant gap in financing investment in infrastructure industries. Indeed, such investment needs are growing with increasing population, rapid economic growth and urbanization, among others, and finding the necessary funds remains a major challenge for most developing countries. However, accurate estimates of infrastructure investment needs and financing gaps are difficult to obtain (box III.5). The World Bank has estimated that, on average, developing countries *actually* invest about 3–4% of their GDP on infrastructure annually, whereas that they *should* be spending about 7–9% on new investment projects and maintenance of existing infrastructure, if broader economic growth and poverty reduction goals are to be achieved (World Bank, 2008b; Fay and Morrison, 2007). Of the amount actually invested in developing countries, public funding accounts for about 70% of the total, private financing represents a further 20% and ODA makes up the remainder.⁹ In order to meet the shortfall, governments need to tap into all sources of investment funds, including TNCs.

There is a significant though varying gap between actual and needed finance for infrastructure investment across all developing regions and infrastructure industries. In *sub-Saharan Africa*, this gap may exceed 50%. An estimated annual investment of \$40 billion in new infrastructure facilities and maintenance is needed until 2015 to meet the subregion's MDG poverty reduction targets. This assumes an average annual economic growth rate of 7% and annual investment in infrastructure of 9% of GDP (Estache, 2005a; Taylor, 2007), with roads and electricity requiring the largest investments (table III.3). Yet only, \$16.5 billion is likely to be

Box III.5. Estimating investment needs and financing gaps

It is difficult to obtain comparable, consistent and accurate estimates of infrastructure investment needs and financing gaps. Differences in terms of methodologies and assumptions, data coverage and reliability, sectoral variations, price movements and other factors mean that different estimates for even the same region often differ significantly. For example, recent estimates by the Asian Development Bank (ADB) and the Economic and Social Commission for Asia and the Pacific (ESCAP) of infrastructure financing needs in the Asia and Oceania region for the period 2006–2010 differ for both the total investment needed and the financing gap (box table III.5.1).

Box table III.5.1. Asia and Oceania: Varying estimates of infrastructure financing needs for 2006–2010
(Billions of dollars)

Source	Investment required	Financing gap	Remarks
Asian Development Bank, Japan Bank for International Cooperation and World Bank (2000 prices)	228	180	Estimates are based on aggregate demand
Estimates derived from sectoral studies by ESCAP (2004 prices)	608	220	Estimates are based on sectoral demand

Sources: ADB, JBIC and World Bank, 2005; and ESCAP, 2006.

Most estimates are based on a “top-down” approach, in which investment needs are usually estimated on the basis of infrastructure requirements to support a certain economic growth rate or MDG target, including poverty reduction. Fewer studies use a “bottom-up” approach, which identifies investment needs for each infrastructure sector separately. In addition, some studies only assess investment needs in new infrastructure (e.g. the electricity study by the International Energy Agency), while other studies also cover investment needs for operation and maintenance.

Source: UNCTAD.

forthcoming annually from identifiable internal, external and ODA sources, leaving an estimated annual financing shortfall of \$23.5 billion (Taylor, 2007).¹⁰

The investment needs and financing gap of the *Asia and Oceania* region is also large, especially when considering the significant investment requirements of China and India (ADB, JBIC and World Bank, 2005). ESCAP calculated that over the period 2006–2010, the region would need to invest some \$608 billion annually in infrastructure development, while the actual annual investment in recent years has been only \$388 billion—generating an estimated investment shortfall of \$220 billion (box III.5; Heyzer, 2007). The case of India illustrates some of the financing challenges facing the Asia and Oceania region (box III.6).

In Latin America and the Caribbean, the financing gap is equally large. The region currently spends on average less than 2% of GDP on infrastructure annually, while some 3–6% of GDP is required (Omura, 2006; Fay and Morrison 2007). Public sector investment in infrastructure in the

region has fallen considerably. This is partly due to fiscal adjustments to macroeconomic crises and a tendency by some governments to reduce public investment because of privatization initiatives, and a shift towards giving the private sector responsibility for infrastructure financing and management (Fay and Morrison, 2007). Private investment in infrastructure in the region has increased, but not enough to fill the gap in financing; and it has been unequally distributed across industries as well as by countries.¹¹

Regional integration in Asia and Oceania, Africa and Latin America and the Caribbean is also accentuating regional infrastructure development and cooperation in transport, energy grids, ports and airports. Physical infrastructure connectivity is important to support regional integration, which in turn is crucial for facilitating intraregional trade, production and investment. This form of South-South regional cooperation is helping to boost economic development in the respective regions. The investment needs of these projects are also significant, although in some cases intraregional infrastructure activity can help bridge overall financing gaps in countries

Table III.3. Sub-Saharan Africa: estimated annual infrastructure investment needs in selected industries, 2006–2015^a

(Annual average, in billions of dollars)

Item	Electricity	Telecoms	Roads	Rail	Water ^b	Sewage	Total	Financing gap ^c
New investment	5.5	3.2	9.8	-	1.8	2.7	22.8	23.5
Operation and maintenance	3.3	2.0	7.4	0.8	1.4	2.1	17.2	
Total	8.8	5.2	17.2	0.8	3.2	4.8	40.0	23.5

Source: UNCTAD, based on Taylor, 2007; and Estache, 2005a.

^a Based on the estimated annual investment needs of \$40 billion to achieve the subregion's MDG poverty reduction targets by 2015.

^b Excluding investment needs for irrigation.

^c Identifiable financing sources total \$16.5 billion altogether, \$8 billion from internally generated funds, \$5 billion from external funding and \$3.5 billion from international financial institutions, loans and ODA.

Box III.6. India: Financing infrastructure

Over the period 2007–2012, India will need investment averaging \$99 billion per annum in 10 major infrastructure segments, to support a planned annual GDP growth of 9% (box table III.6.1). The public sector is expected to provide 70% of this investment, and the private sector the rest. Moreover, the private sector is expected to take the lead in financing some infrastructure such as telecommunications, ports and airports. However, these ambitious plans could face the same financing gaps as those of the preceding periods: over the period 2001–2010, for instance, the annual financing gap is estimated at close to \$14 billion (box table III.6.1). So far, FDI has played only a very small role in the overall financing of infrastructure. Between April 2000 and February 2008, India attracted an average of only \$1.3 billion of FDI per annum in electricity, roads, telecommunications, ports, railways and airports.

Source: UNCTAD.

Box table III.6.1. India: estimated annual infrastructure investment needs, financing gaps and FDI flows, various years
(Billions of dollars)

Industries	World Bank estimates Fiscal years 2001–2010		Government of India estimates		April 2000 – February 2008
	Investment needs	Financing gap	Fiscal years 2002–2007	Fiscal years 2007–2012	
			Investment needs	Projected investment needs ^a	Actual FDI inflows
Energy	26.5	8.7	14.2	30.0	0.2
Roads ^b	11.6	2.8	7.0	15.2	0.4
Telecom	5.4	1.2	6.0	13.0	0.5
Ports	0.8	0.6	0.2	3.6	0.1
Railways	3.1	0.4	5.8	12.6	0.1
Airports ^c	0.5	0.2	0.4	1.6	0.0
Total	47.9	13.9	43 ^d	98.8 ^d	1.3

Sources: World Bank, 2006; and India, Planning Commission, 2007.

^a In constant 2006–2007 prices.

^b Including construction activities.

^c Including airfreight.

^d Total for 10 infrastructure sectors identified.

through a sharing of development costs or exploiting economies of scale and scope.

The national and regional infrastructure investment gaps in developing countries are resulting in funding shortfalls across all infrastructure activities. A leading example of this gap is in electricity, given the scale of power blackouts in rapidly growing developing economies such as Brazil and South Africa. It has been estimated that during this decade, to 2010, developing countries will need to invest \$160 billion annually in electricity generation, transmission and distribution, but so far, only about half of this amount has been forthcoming. Consequently, blackouts and limited access to electricity will hamper future economic growth and achievement of the MDGs unless further investment is found, a situation made more difficult by the fact that annual investment needs in the industry will rise further to \$250 billion in the period up to 2030 (Krishnaswamy and Stuggins, 2007; IEA, 2007). The investment gap is also large in other infrastructure industries, with the possible exception of telecommunications, in which costs are falling because of rapid technological progress (Minges, 2008).

The magnitudes of the infrastructure investment needs of developing countries are huge, and even with identifiable sources of finance the gaps remain enormous. Unless the current level of infrastructure spending in all infrastructure industries is increased to match projected investment needs, developing countries will face a serious challenge in meeting their targets for growth and development. This is particularly true for those countries and regions where public sector budgets are limited, private investment has fallen short of needs, and where ODA support is declining. Governments will have to seek investments from a variety of sources to help fill the financing gap, including official flows – in particular ODA – and private investors, both domestic and foreign.

3. The role of the State and other players in infrastructure industries

From the period following the Second World War until the 1980s, infrastructure industries were by and large the purview of the State, sometimes run through State-owned enterprises (SOEs). Since then, governments have opened up these industries, resulting in significantly increased involvement of the private sector – including TNCs and other players – in their financing, investment, ownership and management.

The reasons for involving the private sector, and the pace of reforms, have varied by country and industry.¹² They include the need for reducing the

fiscal burden on the public sector and for greater investment in order to rehabilitate deteriorating facilities and services or build new ones, enhancing management performance and encouraging the transfer of technology and expertise (Kessides, 2004; Sharan et al., 2007; Ure, 2008; box III.7). The process of changing the role of the State and increasing private sector participation involved a series of reforms, such as enterprise restructuring, market liberalization and regulatory changes.¹³ Today, the private sector is a significant participant in many infrastructure industries globally, in countries of all political hues, and its role is likely to increase further because of the huge investment, technology, skills and management needs in developed and developing countries alike.

The earliest moves towards liberalization in infrastructure industries, during the late 1970s and 1980s, stressed different aspects of the reform process. For example, in the United States, the emphasis was on regulatory reform and unbundling,¹⁴ in the United Kingdom it was on privatization along with regulatory reform; and in some European countries on different types of reform (including the creation of infrastructure SOEs) depending on the member country (Clifton, Comín and Díaz-Fuentes, 2007).

A variety of experiences also marked the second wave of liberalizations in the 1990s, as countries in Africa, Asia, Latin America and the Caribbean, and South-East Europe and CIS reformed their infrastructure industries. Many of these countries opted for market liberalization through divestitures of State assets and other forms of private participation,¹⁵ including the involvement of TNCs. Indeed, many of these TNCs had been established in the first wave of liberalizations (section C).¹⁶ Other developing countries took different approaches, for instance by choosing a strategy based on the corporatization SOEs (box III.8) as the central or major plank of their infrastructure reforms. However, such an approach is generally feasible only in countries that have (a) relatively good State-owned infrastructure facilities that can be restructured and are able to absorb new technologies and skills; (b) the funds necessary for restructuring; and (c) effective planning processes able to formulate and realize a long-term vision. Because of this, only a limited number of countries have taken this approach, such as China, Singapore and South Africa (Sharan et al., 2007; Heracleous, 2001; Kessides, 2004; section IV.A).

New players have emerged in infrastructure industries in many countries, both as operators and financiers, following the reduced or altered role of the State in infrastructure investment and operations. Some of these new operators – both SOEs and private firms – established mainly since the 1980s, have evolved into TNCs in their own right (section C). In addition, there are also a number of mostly private

Box III.7. Private sector participation in water infrastructure in developing countries

Over the past 20 years, developing-country governments have explored the possibility of opening up elements of water infrastructure to the private sector: 64 developing countries had introduced some form of private participation in the industry by December 2007.

There are several reasons why governments have recently turned to the private sector, the most common being the extreme degradation of water networks in some countries. For example, in water-scarce countries in the southern Mediterranean, such as Algeria, Egypt and Jordan, unaccounted for water exceeds 40%, and average water supply is available for less than 12 hours a day. Therefore their governments introduced private sector participation mainly in order to gain access to more funding and to knowledge on how to manage water infrastructure. In addition, private participation is sometimes used to engage in and accelerate water sector reforms.

However, not all aspects of the water sector have been opened to private businesses. Most of the activities delegated to private firms concern potable water supply and water treatment. The types of contracts range from a simple service contract to full privatization. Experience with full divestiture of municipal water networks has been limited to five developing countries (Brazil, Chile, China, Malaysia and Thailand), with only Chile opting for a fully private system nationwide. Concessions have been by far the most prevalent type of contract since 1990 worldwide but recent data suggest that most new contracts awarded are related to the construction of potable water treatment plants under build, operate, transfer (BOT) arrangements.

A detailed review of case studies and econometric tests shows that the performance of the private sector has not necessarily been better than the public sector, and the choice of one or the other depends on a range of factors. Moreover, the experiences of countries in the southern Mediterranean indicate that TNCs, similarly to other private sector participants,^a possess three specific advantages over domestic private water companies and SOEs: global knowledge, financing capacity and economies of scale. In addition, their large portfolio of activities permits the pooling of risks and reduces the capital cost of each project. TNCs' competitive advantages over domestic private firms (where a domestic private water sector exists) partly explain why most private water contracts are awarded to international players.

Source: UNCTAD, based on Pérard, 2008 and supplementary information supplied by Edouard Pérard.

^a Naturally not all TNCs are private companies and some are partly or wholly State-owned, including in water.

companies in infrastructure-related industries, such as machinery suppliers or construction companies. Of course, there were some significant private sector enterprises in infrastructure before the reforms of the 1980s and they continue to operate.¹⁷

The function of integrating complex projects is becoming increasingly important because of their number, scale and scope, and because developing

countries are trying to leapfrog stages of infrastructural development (box III.9). Newer infrastructure TNCs are joining existing ones as leaders of consortiums and similar integrative activities.¹⁸ Since other firms and organizations possess the skills to manage large and complex projects, some of them, such as private equity funds, sensing profitable opportunities, are

Box III.8. City Power Johannesburg – a successful SOE in infrastructure

City Power is a corporatized public company distributing electricity to Johannesburg, where demand for power grows at an annual rate of 20–25%. Established in 2001 as a successor to a municipal department supplying electricity, it is wholly owned by the city of Johannesburg. It purchases electricity from the two power generation sources present in the Johannesburg Metropolitan Area: Eskom (which supplies to 80% of the market) and Kelvin Power Station (20%).^a Because of the growing demand for power, there is a need for massive investment in new capacities and maintenance. Supply is expected to be tight in the near future as the Government of South Africa would like to accelerate economic growth, and the country and the city have to prepare for the 2010 Soccer World Cup.

City Power is currently profitable because of efficient management and tariff collection, with practically 100% collected from business customers and over 90% from residential customers (up from 70–75% in 2001). The company's tariff system is pro-poor: it allows a quota of free basic electricity for all residents, with fees charged only on consumption that exceeds a specified minimum. Rates are set by City Power's board, on the basis of a formula of cost of electricity, plus mark-up to include profits, and they are approved by the national regulator. City Power believes that the previously low tariffs were mainly responsible for a low investment rate, which in turn led to frequent outages.

Source: UNCTAD, based on information provided by City Power.

^a The shareholders of Kelvin Power Station include foreign investors such as Macquarie Bank (Australia) (40%), FMO Netherlands (19%) and a spinoff company of AES (United States).

Box III.9. Stages of industrial development and infrastructure industries

Since the industrial revolution, today's developed countries have moved from endowed-assets-based industries to knowledge-based ones, as part of the process of economic development. This "ladder of development" reflects a progression of stages: natural-assets-driven (exemplified by apparel in labour-abundant economies and by raw materials and fuels in resource-rich economies) (stage I); scale-driven resource-processing (steel and basic chemicals) (stage II); assembly-based (automobiles) (stage III); R&D-driven (pharmaceuticals and microchips) (stage IV); and information-driven (stage V). At each stage of development, structural upgrading has led to different types of infrastructure to support the needs of the economy and society (box table III.9.1).

Today, developing countries are going through similar stages of development, sometimes a number of them simultaneously, since these stages can be combined or leapfrogged (e.g. the move to mobile telephony in countries where the cost of fixed-line telephony is prohibitive). It is in this context that infrastructure TNCs can actively assist developing host countries to improve and build up their infrastructure facilities and services.^a Their role can time-compress the catch-up process, ensuring that various forms of infrastructure development which used to be related to the stage of a country's industrial development can now be built simultaneously in developing countries. Successful latecomers can thus telescope (and even strategically reassemble) the stages of economic development in catching up with, and thereby joining the ranks of, developed economies (chapter IV).

Box table III.9.1. Stages of development and related infrastructure industries

Stage	Related infrastructure
I	Essential infrastructure: water, sanitation, roads, canals and ports
II	Large-scale physical infrastructure: coal-based and hydroelectric plants, extensive rail networks, freighter-accommodating ports, telegraph and telephony
III	Transport and logistics, including an extensive highway network, airports and commuter infrastructure
IV	Infrastructure supporting science clusters
V	Wireless telecommunications and virtual ICT networks

Source: UNCTAD, based on Ozawa, 2008.

Source: UNCTAD, based on Ozawa, 2008.

^a In other words, infrastructure TNCs are "infrastructure arbitrators" in the sense that they contribute to closing the gap between developed and developing countries, though perhaps not in all segments of infrastructure. This may, however, lead to another new gap within host countries, between the modern infrastructure provided by the TNCs in particular (notably in high-tech areas), and the still underdeveloped infrastructure in others – an unbalanced situation often described as "a cell phone for everybody, but no clean water."

also becoming significant players (Clifton, Comín and Díaz-Fuentes, 2007; Ernst & Young, 2007).

The new financiers, which as a group now provide some 20-30% of project finance in infrastructure (Orr and Kennedy, 2008; Hu, 2007),¹⁹ are a heterogeneous set of institutions which belong to two broad categories. The first group are private equity investors attracted specifically by opportunities in infrastructure industries, both in their home and foreign markets.²⁰ This group includes: (i) infrastructure investment funds,²¹ (ii) institutional investors, such as pension and mutual funds,²² and (iii) investment vehicles created by banks or infrastructure companies for the purpose of supporting their project financing or investment activity (Orr and Kennedy, 2008; McKinsey, 2007).²³ These investors are very significant in their domestic and foreign markets, both in financing and systems integration. For example, in 2007 they raised some \$34 billion of funds for infrastructure investment, and this is set to rise.²⁴ Several private equity firms are active in infrastructure in a number of developing countries.²⁵

The second group of new financiers are a variety of State-owned or government-linked entities, including sovereign wealth funds (SWFs), which have arisen mostly in developing countries as a result of trade surpluses in manufactured goods and services (e.g. in China, India, Malaysia, the Republic of Korea

and Singapore) or in commodities, especially oil (e.g. the Bolivarian Republic of Venezuela, Saudi Arabia and the United Arab Emirates) (McKinsey, 2008b; Part One of this *WIR*). These new players do not invest exclusively in infrastructure (including infrastructure TNCs); for strategic reasons, some of them (e.g. infrastructure financiers from China, India and South Africa) also invest to support other activities, including in the extractive industries overseas (as discussed in section D below and *WIR07*).

Despite the expansion of the private sector and the emergence of new players as both operators and financiers over the last two decades, the State's role in infrastructure remains critical (Sharan et al., 2007; Commission on Growth and Development, 2008). The State has always assumed multiple roles in infrastructure industries: as investor, customer, regulator and mediator (Doh and Ramamurti, 2003),²⁶ but is now increasingly involved as regulator and mediator (Sharan et al., 2007; Ure, 2008). Governments also recognize the crucial role that private operators and financiers play in establishing efficient and effective industries. Governments will continue to experiment with new models of building infrastructure facilities and delivering services, a good example of which is the rise of public-private partnerships (PPPs) in developed countries and, increasingly, in developing ones (Saghir, 2007; Northoff, 2008).

B. TNC involvement in infrastructure industries

This section analyses the generally rising trend in TNC involvement in infrastructure industries, focusing on developing and transition economies. Developments since the 1990s have historical parallels, since infrastructure services were commonly provided by private enterprises in the past, quite often by foreign investors (box III.10). After a rise in infrastructure FDI in the 1990s, mostly by TNCs from developed countries, the turn of the century witnessed a decline in infrastructure FDI flows, followed by a recovery more recently. Moreover, while developed-country TNCs divested from some failed or difficult projects, several developing-country infrastructure TNCs emerged, and are increasingly becoming significant players worldwide.

TNCs participate in infrastructure projects through equity or non-equity legal forms, or a combination of the two (box III.11). In addition, given the high risk, long gestation period and high capital intensity of such projects, they may enter host countries either as sole investors, or via special purpose vehicles or consortiums in cooperation with other

investors. The overall range of modalities extends from 100% equity ownership to fully contractual forms, without any equity involvement.

Privatization sales and greenfield projects are forms which entail equity participation by TNCs. Privatization sales²⁷ resulting in FDI occur when a foreign TNC buys an equity stake in a former State-owned enterprise through a direct asset sale. This can be a full privatization(s) (i.e. the government sells 100% of the equity in a State-owned company to the new owner) or a partial one (the government sells only part of the equity).²⁸ Privatization sales can be accompanied by additional investments (Kessides, 2004). Greenfield FDI projects may be wholly owned by foreign investors or take the form of a joint venture with local (private or State-owned) partners. Foreign investors obtain ownership of assets at the beginning of such a project and build a new facility, with the government normally providing no guarantees of revenue. The investor also assumes construction, operating and market risk for the project.

Non-equity forms, such as management and lease contracts, usually involve no ownership by participating firms. Firms assume the management responsibilities of State-owned assets for a fixed period, while ownership and investment decisions

Box III.10. TNCs and the early globalization of the electricity industry

“Modern” infrastructure, especially electricity, telecommunications and transport, began primarily as a private, international phenomenon in the late nineteenth and early twentieth centuries. One of the best examples of this is the early history of electrification and the role of TNCs in propagating the industry globally.

The emergence of the electricity industry in the late nineteenth century coincided with the beginning of the first age of globalization and creation of the first modern TNCs. Despite the rise of nationalism after the First World War, foreign ownership of electric utilities in the early twentieth century was common, in both developed and developing host countries. For example, in around 1930, electric utilities in many developed countries had foreign ownership of 10% or more, including Austria (with foreign ownership of 20%), Canada (34%), France (10%+), Poland (74%), Romania (50%) and Spain (27%). A similar situation prevailed in many developing countries, sometimes with far higher levels of foreign ownership, examples being Brazil (67%+), Chile (88%), China (51%+), Ethiopia (100%), Malaysia (46%) and Thailand (88%). A large number of TNCs from developed countries were involved, including those from Canada, France, Germany, Spain, Switzerland, the United Kingdom and the United States, with extensive investments in Africa, Asia and Latin America and the Caribbean. As today, there were many types of players.

Only rarely did electric utilities become TNCs; instead, other TNCs made foreign direct investments in electric utilities – among them TNCs in electrical equipment manufacturing, holding companies, and free-standing companies (i.e. companies headquartered in rich countries, but with no operations there). TNCs did not necessarily establish or create the electricity industry in host countries; instead, they frequently acquired existing enterprises and offered advanced technology, expertise and capital, which raised productivity and service quality.

Public sector involvement and the “domestication” (the transformation from foreign private to domestic – private or public – ownership) of infrastructure began after the First World War, and accelerated after the Second World War. This process was the result of various push factors: the growing notion of public services for essential commodities, including electricity (giving rise to political pressures to control prices, for instance), “natural” monopoly considerations, host countries’ perceptions of an “obsolescing bargain” (i.e. when the bargaining power shifts to the local authorities once an investment has occurred and operations begin), “national security” considerations and nationalism.

But just as it seemed as though TNCs had vanished from this industry by the end of the 1970s, there was a new round of TNC involvement that accelerated in the 1990s.

Source: UNCTAD, based on Hausman, Hertner and Wilkins, 2008.

Box III.11. Selected forms of TNC participation in infrastructure projects

In addition to pure equity or non-equity forms of participation in projects, TNC activities can take various forms that combine elements of both (box table III.11.1). In most cases, these mixed forms are either linked to concessions under which the TNC invests equity at least for a given period (the equity component) but also commits itself beyond that equity component, or to other equity-based participation in which the equity engagement is not time-bound. Taken together, these forms can be called “concessions”. Some combined forms resemble the FDI forms, as the elements of TNC ownership and equity participation dominate. In *build, own and operate* (BOO) contracts, for example, the main difference from greenfield projects is that the investor also brings in resources related to the host government’s guarantees for a minimum revenue. *Build, lease and own* (BLO) contracts are similar to BOOs, the main difference being that the foreign investor becomes full owner only at the end of a lease period. However, it builds a new facility largely at its own risk, although after the construction phase it transfers ownership to the government and leases the facility from the government. In this form, too, the government usually provides revenue guarantees.

In other combined forms, the foreign TNC is only a temporary owner of the facilities, and turns them over to the host country at the end of a concession period. However, as these periods are very long (often 20–25 years), the equity component of the investment realized during the concession period is still important. In such contracts, such as *build, operate and transfer* (BOT) and *build, own, operate and transfer* (BOOT) arrangements, the foreign investor builds the facility at its own risk, owns (and operates) it at its own risk, then transfers ownership of the facility to the government at the end of the concession period. The government usually provides revenue guarantees. In *build, rehabilitate, operate and transfer* (BROT) contracts, the foreign developer not only builds a new facility, but combines it also with the extension of an existing facility, or it completes a partially built facility and rehabilitates existing assets. Otherwise, it works like a BOT or BOOT contract. However, because of the element of rehabilitation, the non-FDI element can also be quite important.

Box table III.11.1. Equity and non-equity forms of TNC involvement in infrastructure

Fully equity	Concessions						Fully non-equity	
FDI projects (including privatization and greenfield projects and joint ventures)	Build, own, and operate (BOO)	Build, lease, and own (BLO)	Build, own, operate, and transfer (BOOT)	Build, operate, and transfer (BOT)	Build, rehabilitate, operate, and transfer (BROT)	Rehabilitate, operate, and transfer (ROT)	Rehabilitate, lease or rent, and transfer (RLOT)	Management and lease contracts

Source: UNCTAD.

In contracts starting with a rehabilitation phase, the non-FDI element may dominate. Under *rehabilitate, operate and transfer* (ROT) arrangements, the foreign investor rehabilitates an existing facility, then operates and maintains the facility at its own risk for the contract period. In the case of *rehabilitate, lease or rent, and transfer* (RLOT) contracts, the foreign investor rehabilitates an existing facility at its own risk, leases or rents the facility from the government, then operates and maintains the facility at its own risk for the contract period.

TNCs have invested in the different legal forms of infrastructure projects described in this box through long-term public-private partnerships (PPPs) with the host government and/or its SOEs.

Source: UNCTAD.

remain in the hands of the State. In a management contract, the government pays the foreign firm a fee for managing the facility, while the operational risk remains with the government. In a lease contract, the government leases the assets to the foreign firm, which also takes on the operational risk.

Other forms of TNC participation, such as build, operate, transfer (BOT) contracts, combine equity and non-equity elements: TNCs invest equity capital for the period of their engagement in the contract, and normally obtain control over the operations of the project. However, the TNCs also provide non-equity finance in order to carry out their contractual obligations. In the majority of infrastructure projects, TNCs leverage their equity with significant debt, and the latter is often the higher of the two (IJ

Online, 2008). Combined contracts are of two types: “greenfield” projects, if TNC participation involves a “build” phase in the project, or “brownfield” projects, if participation involves the rehabilitation of existing facilities. There is also a distinction between “concessions” (if at the end of the contractual period the assets revert to the State) and “other equity-based projects” (if at the end of the contractual period the TNC retains ownership of the facilities) (box III.11).

A range of factors affect the concrete form of TNC involvement in a given infrastructure project. Apart from issues such as regulations and the availability of takeover targets, other aspects include the scale, capital intensity and complexity of projects, their geographical extent (e.g. they may be regional in scope), the characteristics of the TNC and the level

of risk involved. Hence, there is no uniform pattern in the evolution of legal forms of TNC participation in infrastructure industries: the modalities vary between industries and regions, and over time.

1. Global trends

Trends in TNC involvement in infrastructure industries are difficult to discern because data are scarce and partial. The picture of global trends presented in this and the next section therefore relies on multiple sources of information, including data on FDI, cross-border mergers and acquisitions (M&As) and investment commitments, each with their respective strengths and limitations (box III.12).

Available data on *global inward FDI stocks* suggest that the share of infrastructure industries in total FDI globally currently hovers at close to 10%, but this represents a large increase over their roughly 2% share in 1990.²⁹ The biggest jump in this ratio occurred in the early 1990s, after which there was little change, despite a large absolute increase in infrastructure FDI (table III.4). Indeed, the share of electricity, gas and water as a group remained at around 2%, or less, of total FDI between 1995 and 2006; while that of transport, storage and communications reached a peak of 7% in 2000, but fell back to 6% in 2006. This global picture in FDI stock is also true at the regional level, with some exceptions, such as the relatively high share of electricity, gas and water industries in

Box III.12. Sources of data on TNC involvement in infrastructure

There is no single comprehensive source of data and information to provide a full picture of TNC involvement in infrastructure industries. The UNCTAD *FDI/TNC database* contains FDI data by industry for a limited number of countries. UNCTAD's *cross-border M&A database* provides information on individual deals in a larger number of countries, but their value does not necessarily correspond to the FDI value. In addition, there is little information available separately on FDI flow/stock data for transport infrastructure (airports, roads, railways, seaports), as it includes, for example non-infrastructure segments such as shipping and airlines. The World Bank's *Private Participation in Infrastructure (PPI) Database* covers all kinds of TNC involvement in developing countries, but only on a commitment basis. For these reasons, this and later chapters combine and utilize information from all of these databases, as well as other sources, including case studies prepared for this *WIR*.

The following are some observations on the coverage, strengths and limitations of each data source:

- Data on FDI stocks and flows (derived from UNCTAD's FDI/TNC database) are an accurate measurement of the equity participation of TNCs in infrastructure projects, but they only cover a limited number of countries. For example, inward stock data are available for 66 countries altogether, of which 28 are developing countries.
- Cross-border M&A data derived from UNCTAD's cross-border M&As database are available for almost all economies of the world, but cover only M&As, and not other modes of TNC entry, such as greenfield projects.
- The World Bank's PPI Database covers both equity and non-equity modes of TNC involvement. However, it is available only for the economies that are classified as "developing" by the World Bank.

Source: UNCTAD.

Table III.4. Inward FDI stock in electricity, gas and water, and in transport,^a storage and communications, by region, 1990, 1995, 2000 and 2006
(Millions of dollars)

Region	1990		1995		2000		2006	
	Electricity, gas and water	Transport, storage and communications	Electricity, gas and water	Transport, storage and communications	Electricity, gas and water	Transport, storage and communications	Electricity, gas and water	Transport, storage and communications
World	7 427	17 542	22 543	54 806	91 938	337 910	186 847	598 328
Developed countries	5 120	13 026	14 591	30 514	57 833	253 380	137 996	439 217
Developing countries	2 307	4 488	7 824	20 476	33 277	78 566	47 270	151 626
Africa	-	132	73	1 901	180	5 737	15	12 813
Asia and Oceania	14	1 366	1 875	10 944	5 884	34 708	13 833	80 121
Latin America and the Caribbean	2 293	2 990	5 876	7 630	27 213	38 121	33 422 ^b	58 692 ^b
South-East Europe and the CIS	-	28	129	3 816	828	5 965	1 581	7 486
Memorandum item: LDCs	-	1	240	209	396	627	2 511	870

Source: Annex table A.III.1.

Notes: Regional and world totals cover only 42 countries in 1990, 62 countries in 1995, 67 countries in 2000, and 66 countries in 2006 accounting for over three-fourths in 1990 and about three-fifths in 1995, 2000 and 2006 of world inward FDI stock. Totals for LDCs cover 5 countries in 1990, 7 countries in 1995, 8 countries in 2000 and 5 countries in 2006, accounting for 3%, 17%, 37% and 18% of LDCs inward stock respectively in 1990, 1995, 2000 and 2006.

^a Including transport services.

^b Estimated on the basis of partial data, and of cumulative FDI inflows to Brazil (2001–2006), Colombia (2003–2006) and Panama (2001–2006) in the respective industries.

FDI to Latin America and the Caribbean during the 1990s (annex table A.III.1).

The share of developing countries in global FDI stock in infrastructure increased between 1990 and 2000, from 27% to 37%, but fell back to 25% in 2006. Despite divestments from Latin America and the Caribbean, the region remained the largest host in 2006 for electricity, gas and water (table III.4). In transport, storage and communications, developing countries accounted for 37% of world FDI stock in this industry in the peak year of 1995, but for only 25% in 2006. This decline was partly because of divestments in Latin America and the Caribbean. The share of this region fell behind that of Asia, which by 2006 had emerged as by far the largest developing host region, accounting more than half of the inward FDI stock in the industry in developing countries.

The origin of FDI stocks in infrastructure is predominantly from developed countries though the relative share of developing and transition economies in total outward FDI stock in infrastructure has increased markedly (annex table A.III.2). In electricity, gas and water, the share of developing and transition economies in FDI stock in the industry had reached 7% by 2006, while the equivalent share in transport, storage and communications was 9%. These two groups of industries also feature prominently in the outward FDI strategies of a number of developing and transition economies.

In terms of individual countries, the United Kingdom, France, Spain, the United States and Canada – in that order – are estimated to account

for the largest share of worldwide of FDI stock in infrastructure (table III.5).³⁰

TNC involvement is an important source of infrastructure financing for developing countries. For instance, according to the World Bank PPI Database, the share of *foreign investors* in total investment commitments in developing economies in infrastructure industries (box III.13) was 29% over the period 1996–2006 (figure III.1).³¹ By region, the ratio of foreign to total commitments was relatively low in Asia (20%), where domestic private investment plays a relatively important role, and higher in Africa and Latin America and the Caribbean (36% and 33% respectively) (figure III.1). The ratio for South-East Europe and CIS was higher than that of any developing region in all infrastructure industries except telecommunications and water and sewage. In telecommunications, the share of foreign

Table III.5. Largest outward FDI stocks in infrastructure industries,^a latest year available
(Millions of dollars)

Rank	Home country	Year	Value
1	United Kingdom	2006	208 196
2	France	2005	99 524
3	Spain	^b	89 325
4	United States	2006	49 120
5	Canada	2006	41 610

Source: Annex table A.III.2 and UNCTAD, FDI/TNC database (www.unctad.org/fdistatistics).

^a Including transport services.

^b Cumulative FDI outflows between 1992 and 2006.

Box III.13. Interpreting data from the World Bank's PPI Database

The *Private Participation in Infrastructure (PPI) Database* of the World Bank covers all forms of financial commitments by “private” entities in the infrastructure industries of countries that the World Bank defines as “developing”. However, its definition of developing countries differs from that of the United Nations. On the one hand, it excludes the high-income developing economies of Asia, such as Hong Kong (China), the Republic of Korea, Singapore and Taiwan Province of China; on the other hand, it includes all middle- and low-income transition countries, as well as those new EU members that are not high-income economies. Moreover, some “private” investors in the database are publicly owned foreign enterprises, either entirely or in part. The database registers financial commitments by all partners in a project (State and private), provided the private participant's share of the total project value is at least 15%. These commitments include both equity and non-equity contributions to investment (such as debt instruments). The database aims to be as comprehensive as possible on projects in the countries it covers, resulting in improved coverage and better methodology, especially since the mid-1990s.

Statistics on foreign commitments in infrastructure industries shown in this *WIR* are based on the PPI Database, but they are presented differently from the original PPI data:

1. They include only projects in which foreign investors were involved.^a
2. They show only the value of foreign investment commitments in the projects in which foreign investors participate.
3. They exclude projects the status of which was “cancelled” or “under distress”.

These adjustments having been made, the PPI data presented in this report are a good proxy for the financial commitments made by foreign investors in infrastructure projects that took place in a large number of (but not all) developing and transition economies (including new EU member States).

Source: UNCTAD.

^a Except figure III.1, which compares foreign commitments with domestic private and public commitments.

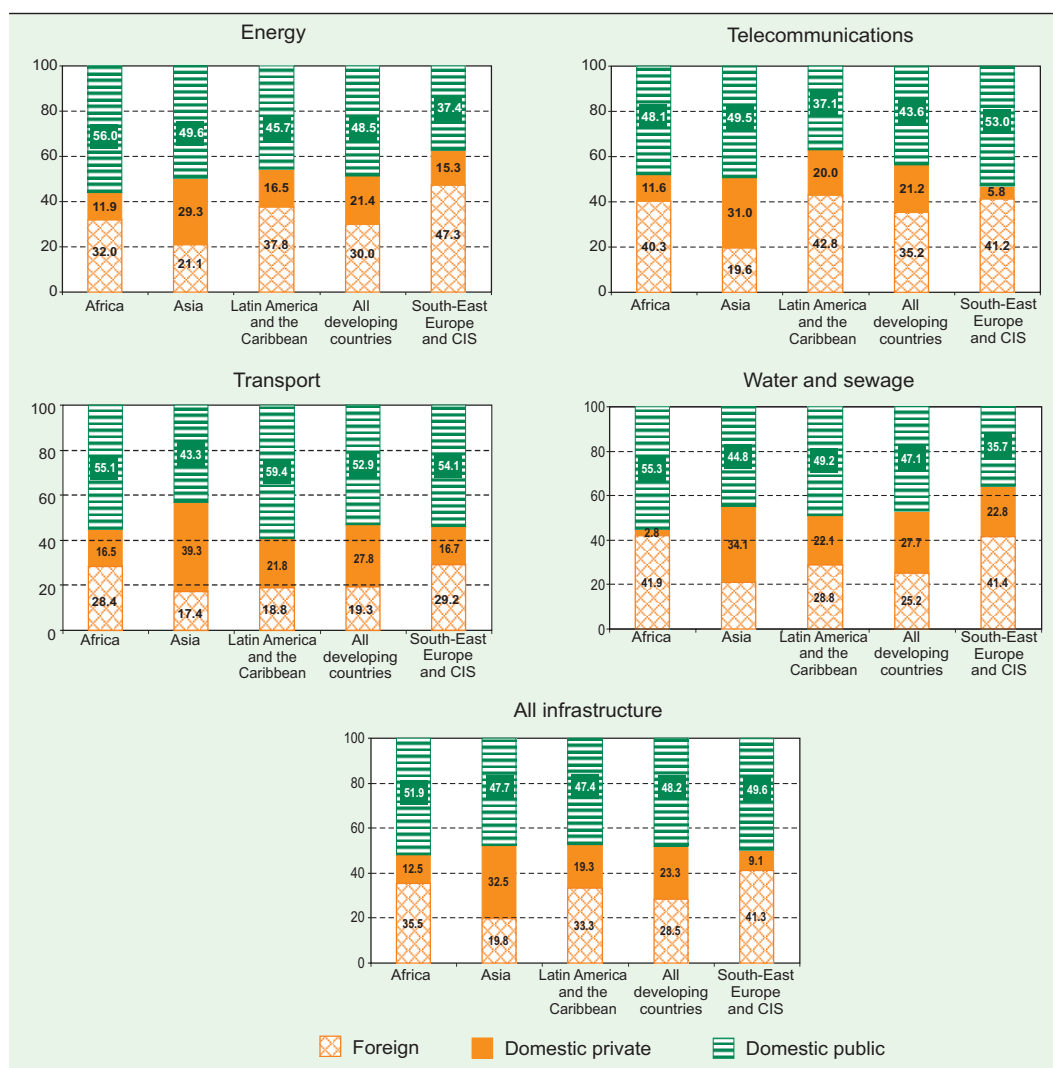
investors in total commitments was high, exceeding 40% in all developing and transition regions, except Asia. In other industries, foreign investors' share of commitments was significant in all regions, exceeding 15% in transport and 20% in energy and water (except in Asia) (figure III.1).

Data on *FDI flows* in infrastructure industries show that since the 1990s, TNC involvement in infrastructure industries has been rising, with a major surge (primarily in telecommunications) in the late 1990s and a downward correction in 2001–2003 (figure III.2).³² The period 2004–2006 was characterized by a partial recovery. Cross-border M&A data for all infrastructure industries and for the majority of countries (including developing

countries) confirm and complement this picture.³³ As in most industries, developed countries accounted for the bulk of cross-border M&As in infrastructure in 1991–2007 (figure III.3).

The worldwide industry composition of TNC involvement in infrastructure has changed over time. For example, the latest M&A data indicate a relative shift in emphasis towards electricity and away from other infrastructure industries, especially telecommunications (table III.6). In recent years, except for 2006, transport and water have been more modest target industries. Patterns of TNC involvement in infrastructure are largely determined by trends in mega transactions (box III.14).

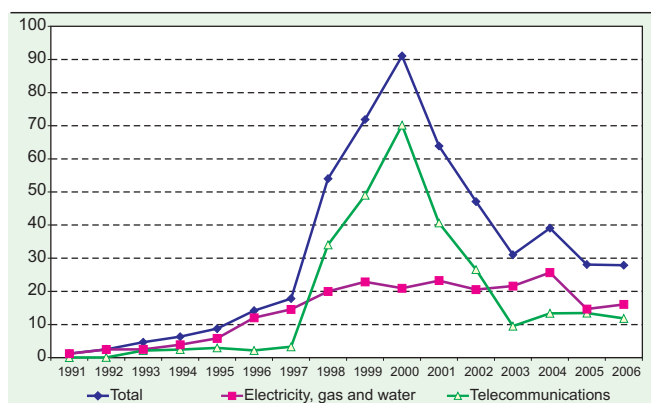
Figure III.1. Share of foreign and domestic private and public investors in the investment commitments of the infrastructure industries of developing and transition economies, by industry and region, 1996–2006 (Per cent)



Source: UNCTAD secretariat calculations, based on data from the World Bank's PPI Database.

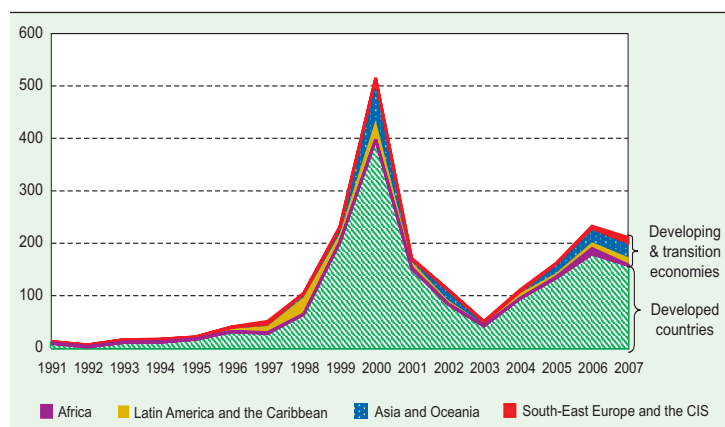
Note: Data cover all developing economies, except high-income developing economies such as Hong Kong (China), the Republic of Korea, Singapore, Taiwan Province of China; and all the transition economies (i.e. South-East Europe and CIS), except Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia, which are members of the EU and are classified as developed countries by the United Nations.

Figure III.2. FDI inflows in electricity, gas and water, and in telecommunications,* 1991–2006
(Billions of dollars, three-year moving averages)



Source: UNCTAD, FDI/TNC database (www.unctad.org/fdistatistics).
* This figure shows data for 62 economies. The availability of data varied by year, between 3 (1991 in telecommunications) and 45 economies (2003 and 2004 in electricity, gas and water).

Figure III.3. Cross-border M&As in infrastructure by target region, 1991–2007
(Billions of dollars)



Source: UNCTAD cross-border M&A database (www.unctad.org/fdistatistics).
Note: The data cover only those deals that involved an acquisition of an equity stake of more than 10%.

Table III.6. Cross-border M&As in infrastructure by target industry, 1991–2007
(Annual average, millions of dollars)

Target industry	1991-1995	1996-2000	2001-2005	2006	2007
All infrastructure	14 074	188 341	121 001	232 417	210 764
Electricity and gas	5 560	39 118	45 049	45 455	119 492
Electricity and related services	4 965	36 305	37 362	41 706	98 052
Gas production and distribution	595	2 813	7 687	3 748	21 440
Telecommunications	5 760	138 381	66 553	118 469	61 066
Transport	2 437	6 696	5 856	51 195	19 328
Airports and airport terminal services	111	1 485	1 895	26 291	4 649
Railways	1 489	1 479	986	1 020	3 252
Seaports	205	316	945	6 193	4 580
Roads	633	3 416	2 030	17 691	6 847
Water	317	4 146	3 544	17 299	10 878

Source: UNCTAD cross-border M&A database (www.unctad.org/fdistatistics).

2. TNC involvement in developing countries

TNC involvement in the infrastructure industries of developing countries, measured by FDI, cross-border M&A and PPI data, mostly followed global trends, though there were regional differences. The inward FDI stock of developing countries in electricity, gas and water increased rapidly between 1990 and 2000 (from an estimated \$2 billion to \$33 billion) and reached \$47 billion in 2006 (table III.4), despite divestments in Latin America (ECLAC, 2008, box III.15). In transport, storage and communications, FDI stock in developing countries surged between 1990 and 2000, and continued to expand after the turn of the century, reaching a record \$152 billion by 2006. Investments in Asia and Africa during the period 2000–2006 grew much faster than in Latin America and the Caribbean; for example, in Africa investment more than doubled, to reach nearly \$13 billion in 2006 (table III.4).

As in the case of stocks, *FDI flows* to infrastructure in developing countries largely mirror global trends. For instance, in the *electricity, gas and water* industry, FDI flows to developing countries as a whole increased from around \$2.5 billion per annum in 1991–1995 to \$12 billion in 1996–2000, followed by a significant decline thereafter. In *transport, storage and communications*, FDI inflows into developing countries increased steadily, from \$4 billion per annum in 1991–1995 to \$13 billion in 1996–2000, and to \$16 billion in 2001–2006. This group of industries avoided the global decline in FDI flows in 2001–2006 due to a strong increase of such flows to Asia, and a more moderate increase to Africa. The continued rise of these two regions more than compensated for the decline in Latin America and the Caribbean.

Data on *cross-border M&As* of infrastructure companies in developing countries (figure III.4) supplement FDI data, as they cover a larger number of host countries. These figures broadly confirm the trends in FDI flows, and suggest that developing countries paralleled world cross-border M&A trends in infrastructure industries, including the peak level reached in the late 1990s

Box III.14. The largest cross-border M&A deals in infrastructure

Cross-border mega acquisitions,^a by way of reducing the number of large players and increasing the size of the remaining ones, are reshaping the global landscape of infrastructure industries. In the period 1991–2007, there were no less than 346 mega deals in those industries. Most of these transactions took place between TNCs headquartered in developed countries (annex table A.III.3). The acquisition of AirTouch (United States) in 1999, and of Mannesmann (Germany) in 2000 by Vodafone (United Kingdom), so far the two largest deals in the history of cross-border M&As, changed the configuration of the telecommunications industry, making Vodafone the largest company in the industry. The third largest transaction, France Telecom's acquisition of Orange (United Kingdom) in 2000, can be interpreted as a response by one of the main competitors of Vodafone to its huge concentration of market power. In electricity, similar trends took place in 2007, when Enel (Italy) acquired Endesa (Spain) and Iberdrola (Spain) bought Scottish Power (United Kingdom) (the 8th and 9th largest cross-border M&As in infrastructure) (annex table A.III.3). The airports industry also witnessed consolidation with the takeover of BAA (United Kingdom) by Grupo Ferrovial (Spain) in 2006. Some developing-economy TNCs also figure among acquirers, such as DP World (United Arab Emirates), Pacific Century (Hong Kong, China), and SingTel (Singapore), especially in industries in which those TNCs have aspired to become global players.

Source: UNCTAD.

^a Mega deals are transactions of \$1 billion or more.

(primarily because of deals in telecommunications). These trends were in part driven by changes in policies that privatized State-owned assets, especially in Latin America and the Caribbean,³⁴ and by private cross-border M&As, especially in Asia.³⁵

The dynamics of foreign investment commitments of TNCs in the infrastructure industries of developing countries – including FDI, non-FDI and combined forms (box III.11) – also confirm the overall trends outlined above: A rise, followed by a

Box III.15. Divestment by TNCs of infrastructure operations in developing countries

Some infrastructure TNCs have either exited or scaled down their operations in developing countries, especially in the electricity and water industry (box table III.15.1). For example, the Spanish water TNC, Agbar, has exited or scaled down its operations in Brazil, Uruguay, Argentina and Chile. In telecommunications, Verizon (United States) pulled out of the Dominican Republic in 2006 and out of Puerto Rico in 2007, selling its assets in both countries to América Móvil (Mexico). Telekom Malaysia left Africa, partly as a result of changes in its investment strategy with a refocus on Asia (Telekom Malaysia, 2004). In electricity, some United States and European companies have pulled out of developing countries. In 2002 and 2003, AES (United States) suffered major losses and exited from India and Uganda, in addition to selling its operations in the transition economies of Kazakhstan and Ukraine (Nazareth, 2008).

Box table III.15.1. Examples of divestment of TNCs in the water industry in Latin America and the Caribbean, 2002–2007

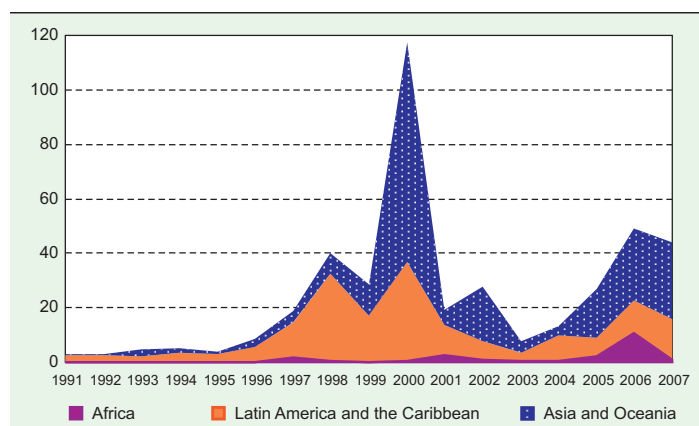
TNC	Home country	Contracts sold or terminated in host country	Year
Suez	France	Argentina (Buenos Aires)	2006
		Argentina (Santa Fé)	2006
		Bolivia (La Paz/El Alto)	2007
		Puerto Rico	2007
SAUR	France	Venezuela, Bolivarian Rep. of (Estado de Lara)	2002
Thames Water	United Kingdom	Chile (Concepción)	2006
Anglian Water	United Kingdom	Chile (Valparaíso)	2003
Aguas de Bilbao	Spain	Argentina (Buenos Aires)	2006
		Uruguay (Maldonado)	2005
Azurix	United States	Argentina (Buenos Aires)	2002
		Argentina (Mendoza)	2004
Aguas do Portugal	Portugal	Brazil (Rio de Janeiro State)	2007

Source: UNCTAD, based on Lobina and Hall, 2007.

The literature indicates that the main reasons for the exit of infrastructure TNCs reflect global and local strategic issues, such as a restructuring and consolidation of operations worldwide (e.g. many electricity companies are paying more attention to the significant infrastructure needs of developed countries, especially where these are their home economies); problems in the host countries, including unsuccessful renegotiations of contracts (usually arising from unforeseen events, such as the economic and financial crisis in Asia and other parts of the developing world in the late 1990s); and public opposition to TNC or private involvement in infrastructure (especially in electricity and water, e.g. in India and many parts of Latin America).

Source: UNCTAD.

Figure III.4. Cross-border M&A sales in infrastructure by developing target region, 1991–2007
(Billions of dollars)



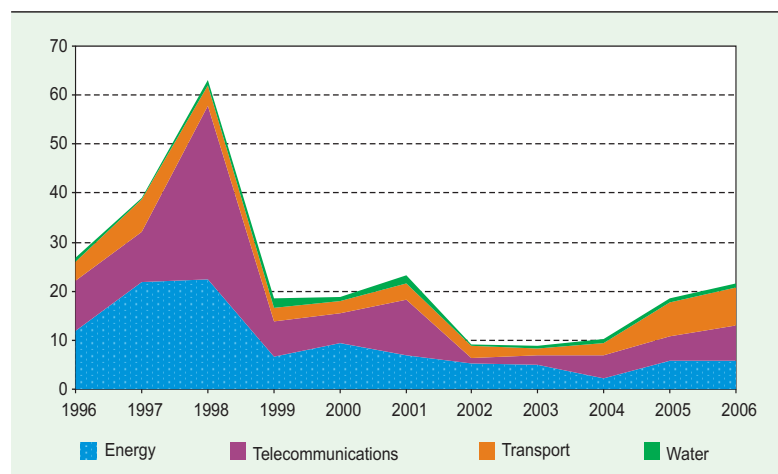
Source: UNCTAD, cross-border M&A database (www.unctad.org/fdistatistics).

Note: The data cover only those deals that involved an acquisition of an equity stake of more than 10%.

significant fall, and then a partial recovery of TNC involvement in developing countries over the period 1996–2006, although with some differences in the peak years and the period of decline (figure III.5).³⁶

Most foreign investment commitments in the infrastructure industries of developing and transition economies during the period 1996–2006 were by developed-country TNCs. In electricity, France, Spain and the United States were the most important sources of commitments; in road projects, Spain dominated; while in water and sewage, France was the largest source country. In telecommunications, both developed and developing countries were important sources of commitments, led by France, Mexico and

Figure III.5. Foreign investment commitments in the infrastructure industries of developing and transition economies, by industry, 1996–2006
(Billions of dollars)



Source: UNCTAD secretariat calculations, based on data from the World Bank's PPI Database.

Note: See figure III.1.

Spain. Finally, in seaports, Hong Kong (China), a developing economy was the main source (annex tables A.III.6–8).

An analysis of the regional composition of *foreign projects* in infrastructure industries in developing and transition economies indicates that over the period 1996–2000, TNC commitments were concentrated in Latin America and the Caribbean. This region accounted for more than half of the total value of commitments in infrastructure in developing countries (table III.7, figure III.6). However, after the turn of the century, TNC commitments shifted away from Latin America and the Caribbean to Asia and Oceania, which became the largest recipient region (table III.7). Africa's share of foreign commitments almost tripled (to 30%), largely owing to investments in telecommunications. In spite of this increase, commitments fall far

short of the amounts needed to cover infrastructure investment needs. For instance, as a comparison, total TNC investment commitments in infrastructure in Africa during the *decade* spanning 1996–2006 were \$45 billion – an amount (even if fully realized) that is barely equivalent to Africa's current *annual* investment needs of \$40 billion (section A.2).

In terms of *industry composition* of foreign commitments in the infrastructure industries of developing and transition economies, telecommunications and energy have dominated. Together, they accounted for almost four-fifths of foreign commitments during the period 1996–2006. The share of transport infrastructure remained below

20%, despite its rise after 2000, and the share of water remained very low (less than 5%). Within transport infrastructure, roads and seaports were the most important sub-industries, while foreign commitments in the two other sub-industries – airports and railroads – were limited (table III.8).

There were major differences in the geographical composition of foreign commitments of individual infrastructure industries by developing and transition host regions. In the period 1996–2006, Latin America and the Caribbean was the largest recipient region, overall and in each industry (accounting for 52% of commitments), followed by Asia,

Table III.7. Foreign investment commitments in the infrastructure industries of developing economies, by industry and host region, 1996–2006
(Millions of dollars and per cent)

Region	Energy				Telecommunications			
	1996–2000		2001–2006		1996–2000		2001–2006	
	Value (\$ million)	Share in total of developing economies (%)	Value (\$ million)	Share in total of developing economies (%)	Value (\$ million)	Share in total of developing economies (%)	Value (\$ million)	Share in total of developing economies (%)
Africa	6 837	9.1	5 724	19.1	11 502	18.5	13 966	54.3
Asia and Oceania	20 532	27.4	10 652	35.6	4 957	8.0	9 678	37.6
Latin America and the Caribbean	47 688	63.5	13 544	45.3	45 755	73.5	2 063	8.0
Total for developing economies	75 057	100.0	29 920	100.0	62 214	100.0	25 707	100.0
<i>Memorandum items:</i>								
LDCs	1 314	1.8	3 256	10.9	3 878	6.2	2 517	9.8
South-East Europe and CIS	1 788	..	1 798	..	6 926	..	5 381	..
New EU members	2 108	..	11 871	..	19 836	..	1711	..
Region	Transport				Water			
	1996–2000		2001–2006		1996–2000		2001–2006	
	Value (\$ million)	Share in total of developing economies (%)	Value (\$ million)	Share in total of developing economies (%)	Value (\$ million)	Share in total of developing economies (%)	Value (\$ million)	Share in total of developing economies (%)
Africa	1 264	6.5	5 544	23.1	88	1.6	239	5.5
Asia and Oceania	6 091	31.1	8 691	36.3	1 753	31.6	2 383	55.0
Latin America and the Caribbean	12 232	62.4	9 723	40.6	3 709	66.8	1 708	39.5
Total for developing economies	19 587	100.0	23 957	100.0	5 549	100.0	4 330	100.0
<i>Memorandum items:</i>								
LDCs	557	2.8	1 460	6.1	30	0.5	2	0.04
South-East Europe and CIS	330	..	737	..	160	..	563	..
New EU members	287	..	4 604	..	1 398	..	239	..
Region	All infrastructure							
	1996–2000		2001–2006					
	Value (\$ million)	Share in total of developing economies (%)	Value (\$ million)	Share in total of developing economies (%)				
Africa	19 691	12.1	25 473	30.4				
Asia and Oceania	33 332	20.5	31 404	37.4				
Latin America and the Caribbean	109 383	67.4	27 038	32.2				
Total for developing economies	162 407	100.0	83 915	100.0				
<i>Memorandum items:</i>								
LDCs	5 778	3.6	7 234	8.6				
South-East Europe and CIS	9 203	..	8 478	..				
New EU members	23 628	..	18 424	..				

Source: UNCTAD secretariat calculations, based on data from the World Bank's PPI Database.

Note: See figure III.1.

Table III.8. Industry composition of foreign investment commitments in the infrastructure industries of developing and transition economies, 1996–2006

(Millions of dollars and per cent)

Infrastructure industry	Value (\$ million)	Share in foreign commitments to developing and transition economies (%)
All infrastructure	264 003	100.0
Energy	108 562	41.1
Telecommunications	100 229	38.0
Transport	44 611	16.9
Airports	5 669	2.1
Railroads	7 111	2.7
Roads	18 450	7.0
Seaports	13 381	5.1
Water and sewage	10 602	4.0

Source: UNCTAD secretariat calculations, based on data from the World Bank's PPI Database.

Note: See figure III.1.

Africa and South-East Europe and CIS, in that order (table III.7). In telecommunications, Africa received more commitments over the entire period than Asia, and the share of South-East Europe and CIS was only just short of Asia's, which was 15%. In water, Africa's share was minuscule compared to the other regions, at less than 1%, but appreciable in energy and transport.

Foreign commitments in particular infrastructure industries in developing regions have been concentrated in a handful of host economies. In electricity, for example, Brazil alone attracted 54% of the total foreign commitments in Latin America and the Caribbean in 1996–2006. During the same period, China accounted for almost one quarter of the Asian total, and Morocco was the largest recipient in Africa, with almost 50% of that region's commitments. There were similar patterns in other industries, with countries

such as Brazil, Chile, China, Ecuador, Egypt, Nigeria and Turkey among the largest recipients.

The *group of LDCs*, accounted for less than 1% of world FDI inward stocks in infrastructure in 2006 – and 2% of the FDI inward stocks of developing countries (table III.4). Their share of world FDI inflows in infrastructure also remained low (less than 5%). This marginal status is also confirmed by data on *foreign commitments*. LDCs attracted only 5% of the total foreign commitments in developing and transition economies over the period 1996–2006 (table III.9). The telecommunications industry was by far the largest recipient (accounting for almost half of total commitments to LDCs) (table III.9).

Table III.9. Industry composition of foreign investment commitments in the infrastructure industries of LDCs, 1996–2006
(Millions of dollars and per cent)

Infrastructure industry	Value (\$ million)	Share in LDC total (%)	Share of LDCs in foreign commitments to developing and transition economies (%)
All infrastructure	13 013	100.0	4.9
Energy	4 569	35.1	4.2
Telecommunications	6 394	49.1	6.4
Transport	2 017	15.5	4.5
Airports	208	1.6	3.7
Railroads	652	5.0	9.2
Roads	433	3.3	2.3
Seaports	724	5.6	5.4
Water and sewage	32	0.2	0.3

Source: UNCTAD secretariat calculations, based on data from the World Bank's PPI Database.

Note: See figure III.1.

In the period 1996–2006, developing countries accounted for a high proportion of foreign investment commitments in the transport and telecommunications industries of LDCs (table III.10), but they had virtually no investments in water and sewage. Overall, their share in total foreign investment commitments in infrastructure was higher in LDCs (almost 40%) than in all developing and transition economies (32%) (table III.10). This difference was particularly pronounced in transport, where, because of TNCs such as DP World (United Arab Emirates), investors from the South accounted for 65% of foreign investment commitments in LDCs (table III.10). In energy and telecommunications, their shares in foreign commitments in LDCs were almost as high

as they were in all developing and transition economies (table III.10).

Finally, turning to *modalities of foreign investment commitments* (legal forms), in *energy* – electricity and natural gas – concessions appear to have been the dominant form of TNC involvement in developing and transition economies during the period 1996–2006 (62%, figure III.6), especially BLO and BOO (box III.11), which together represented 35% of the number of investment projects. Other concessions represented 27% of the cases, while equity forms/FDI (privatizations/acquisitions and greenfield) together accounted for 36%. Management and lease contracts were marginal during the entire period.³⁷

In the *transport* infrastructure of developing and transition economies over the same period foreign participation was largely in the form of concessions: these alone accounted for 86% of the number of projects (figure III.6). Privatizations, the second most important form, accounted for less than one-tenth of the total. The dominance of concessions in transport worldwide has resulted in a proliferation of individual operators. This is particularly evident in ports,³⁸ where the majority of international players have expanded by winning new concessions, and only more recently, through M&As.

Telecommunications was the only industry among those covered in developing and transition economies, in which TNC involvement was largely through equity forms (figure III.6). Reflecting the importance of mobile telephony in developing countries, 67% of the investment projects registered in 1996–2006 were greenfield FDI projects, while privatization (mostly of fixed-line operations) accounted for only 16% of the cases of investment. In recent years, non-privatization M&As (which are not covered in the World Bank's PPI Database) have also been an increasingly important mode of

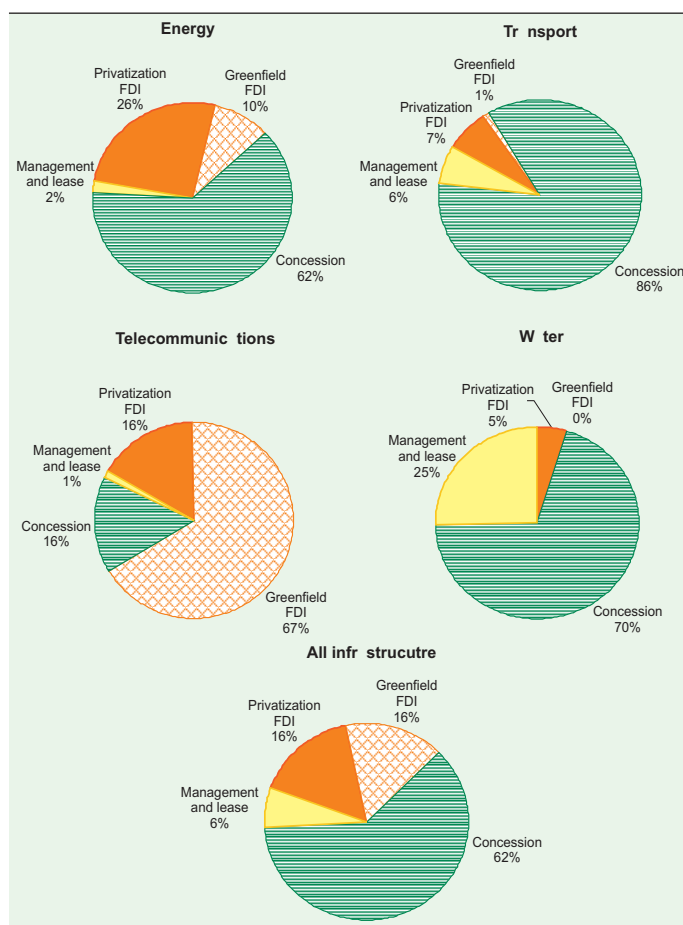
Table III.10. Sources of foreign investment commitments for the infrastructure industries of LDCs, and of developing and transition economies, 1996–2006
(Millions of dollars and per cent)

Infrastructure industry	Host region: LDCs			Host region: Developing and transition economies		
	Source of commitment		Share of developing economies (%)	Source of commitment		Share of developing economies (%)
	World	Developing economies		World	Developing economies	
All infrastructure	13 013	5 029	38.6	264 003	85 456	32.4
Energy	4 569	1 083	23.7	108 562	20 912	19.3
Telecommunications	6 394	2 629	41.1	100 229	46 701	46.6
Transport	2 017	1 317	65.3	44 611	16 376	36.7
Water and sewage	32	-	-	10 602	1 467	13.8

Source: UNCTAD secretariat calculations, based on data from the World Bank's PPI Database.

Note: See figure III.1.

Figure III.6. Main legal forms of foreign investment commitments in the infrastructure industries of developing and transition economies, by industry, 1996–2006
(Based on the number of projects; in per cent)



Source: UNCTAD secretariat calculations based on data from the World Bank's PPI Database.

Note: See figure III.1.

foreign market entry by TNCs in telecommunications (Curwen, 2005; Ure, 2008).

In the *water* industry, TNCs entered developing and transition economies mostly through concessions (70% of the projects, figure III.6). Management and lease contracts were also used frequently, reflecting pressure in some countries for public sector financing and owning infrastructure facilities (section A.3). In the water industry there were few instances of privatizations.

C. The universe of infrastructure TNCs

The universe of infrastructure TNCs is diverse: the firms have different characteristics by size, industry and geographical reach. This section focuses on the main corporate players and their key features, with special reference to dynamic changes

in the composition of these players, especially the rise of infrastructure TNCs from developing and transition economies. The analysis distinguishes between firms whose main activities are in infrastructure (infrastructure TNCs), and those for which it represents activities additional to their core business.³⁹

1. Major infrastructure TNCs

In 2006, the world's 100 largest infrastructure TNCs, ranked by foreign assets, was dominated by developed-country companies, and by three industries: electricity, telecommunications and transport (annex table A.III.4). However, there is also a significant presence of TNCs from developing and transition economies – much larger in fact (22 firms) than those in the list of the world's 100 largest TNCs in all industries (6). Moreover, in some sub-industries, such as ports, developing-economy firms – DP World (United Arab Emirates) and Hutchison Whampoa (Hong Kong, China) – are industry leaders, while in others, such as telecommunications, they are gaining in importance (table III.11).

Of the top 100 infrastructure TNCs, 78 were headquartered in a developed country, with the United States accounting for 14, Spain for 10, and France and the United Kingdom 8 each (table III.12). Among developing and transition economies, half of the 22 TNCs in the list were based in three Asian economies, Hong Kong (China) (5 firms), Malaysia (3) and Singapore (3). The internationalization of the top 100 infrastructure firms, as measured by the ratio of foreign to total assets, varied considerably: TNCs from Italy and the United States, for instance, had particularly low levels of internationalization, while the ratio was high among most other European Union-based firms. The industry composition of the top 100 infrastructure TNCs included 37 firms in telecommunications, 28 in electricity (with an additional 3 in electricity and water combined),⁴⁰ and 19 in transportation (table III.13). Eight of the largest infrastructure TNCs were active in more than one industry.⁴¹

In general, developed-country infrastructure TNCs are much larger than developing-country ones, and their foreign assets in particular tend to be much larger as well.⁴² Vodafone (United Kingdom) was the largest company in 2006, while Hutchison Whampoa (ranked 8th in the top 100) was both the

Table III.11. Largest TNCs in infrastructure industries, ranked by foreign assets, 2006
(Companies highlighted are based in developing or transition economies)

Rank	Electricity	Telecommunications	Transport	Water and sewage	Natural gas	More than one infrastructure industry
1	Electricité de France	Vodafone Group	Grupo Ferrovial	Veolia Environnement	Gaz de France	Suez
2	E.ON	Telefónica	Abertis	Grupo Agbar	Spectra Energy Corp.	Hutchison Whampoa
3	Endesa	Deutsche Telekom	AP Moller-Maersk	Waste Management Inc	Centrica	RWE Group
4	Vattenfall	France Télécom	DP World	Shanks Group	Gas Natural	Bouygues
5	National Grid	Vivendi Inc	China Ocean Shipping	Waste Services Inc	Transcanada Corp.	YTL Power
6	AES Corp.	Liberty Global Inc	Canadian National Railways Co.	Stericycle Inc	Enbridge Inc	Babcock & Brown Infrastructure
7	Fortum	TeliaSonera	Skanska	Hyflux Limited	Sempra Energy	Enka Insaat ve Sanayi
8	Duke Energy Corp.	SingTel	PSA International	Clean Harbors Inc	El Paso Corp.	NWS Holdings
9	EDP Energias de Portugal	Telenor	Hochtief	..	Hunting Plc	..
10	International Power Plc	Nortel Networks	Vinci	..	Williams Companies	..
11	CLP Holdings	KPN	Macquarie Airports	..	Hong Kong & China Gas Co.	..
12	Iberdrola	BT Group	Deutsche Bahn	..	Distrigaz 'D'	..
13	Unión Fenosa	Verizon Communications	Orient Overseas International	..	Canadian Utilities Ltd.	..
14	PPL Corp.	SES	Grupo ACS	..	Iwatani International Corp.	..
15	Atel - Aare Tessin	Telecom Italia	Obrascon Huarte Lain	..	..	..
16	Public Service Enterprise Group	América Móvil	Kansas City Southern	..	..	..
17	Keppel Corp.	Mobile Telecommunications Co.	Canadian Pacific Railway	..	..	..
18	Cofide-CIR Group	TDC A/S	First Group	..	..	..
19	Edison International	Portugal Telecom	BBA Aviation	..	..	..
20	Enel	Tele2	China Communications Construction Co.	..	..	..

Source: UNCTAD, based on annex tables A.III.4 and 5.

Table III.12. Foreign and total assets of the world's 100 largest infrastructure TNCs, by home economy and region, 2006
(Millions of dollars and per cent)

Home region / economy	Number of firms	Foreign assets		Total assets		Foreign assets as a share of total assets (%)
		Value	Share in total (%)	Value	Share in total (%)	
World	100	1 601 063	100.0	4 062 647	100.0	39.4
Developed economies	78	1 416 178	88.5	3 712 743	91.4	38.1
European Union	53	1 228 041	76.7	2 586 748	63.7	47.5
France	8	368 835	23.0	737 063	18.1	50.0
Germany	6	270 926	16.9	571 337	14.1	47.4
Spain	10	233 338	14.6	440 796	10.8	52.9
United Kingdom	8	185 705	11.6	301 174	7.4	61.7
Sweden	4	62 849	3.9	95 198	2.3	66.0
Denmark	2	18 562	1.2	68 965	1.7	26.9
Portugal	2	17 990	1.1	49 547	1.2	36.3
Italy	4	15 681	1.0	205 530	5.1	7.6
Luxembourg	3	15 501	1.0	15 656	0.4	99.0
Austria	2	2 971	0.2	17 302	0.4	17.2
Other European Union	4	35 683	2.2	84 181	2.1	42.4
Other developed economies	25	188 137	11.8	1 125 995	27.7	16.7
United States	14	119 079	7.4	948 638	23.4	12.6
Canada	6	34 230	2.1	100 402	2.5	34.1
Australia	3	13 638	0.9	45 740	1.1	29.8
Other	2	21 190	1.3	31 214	0.8	67.9
Developing economies	20	180 493	11.3	321 413	7.9	56.2
Africa	2	8 319	0.5	22 540	0.6	36.9
Latin America and the Caribbean	2	14 490	0.9	53 739	1.3	27.0
Mexico	2	14 490	0.9	53 739	1.3	27.0
Asia and Oceania	16	157 683	9.8	245 134	6.0	64.3
Hong Kong, China	5	84 663	5.3	116 771	2.9	72.5
Singapore	3	29 583	1.8	47 503	1.2	62.3
Malaysia	3	10 046	0.6	24 639	0.6	40.8
Kuwait	2	9 818	0.6	14 504	0.4	67.7
Other Asia	3	23 573	1.5	41 718	1.0	56.5
South-East Europe and CIS	2	4 392	0.3	28 491	0.7	15.4
Russian Federation	2	4 392	0.3	28 491	0.7	15.4

Source: UNCTAD, based on annex table A.III.4.

Table III.13. The world's 100 largest infrastructure TNCs, and the 50 largest infrastructure TNCs of developing and transition economies: industry breakdown, 2006
(Number of firms)

Industry	World	Developing and transition economies
Airports	2	1
Airports and roads	1	-
Electricity	28	10
Electricity and water	3	1
Natural gas	7	1
Railroads	5	-
Roads	6	8
Roads and electricity	1	1
Roads, electricity, water and seaports	-	1
Roads and telecom	1	-
Seaports	5	5
Seaports, electricity and telecom	2	1
Telecom	37	20
Water	2	1
Total	100	50

Source: UNCTAD, based on annex tables A.III.4 and 5.

largest developing-country infrastructure TNC and the largest infrastructure conglomerate overall (annex table A.III.4).

A separate list of the 50 largest infrastructure TNCs from developing and transition economies (referred to here as the top 50 developing-country infrastructure TNCs) by foreign assets shows a wide geographical spread in terms of home countries (annex table A.III.5). In 2006, no less than 16 home economies were represented in the top 50, with the largest number of firms headquartered in Malaysia (8), Hong Kong (China) (7), Singapore (6) and South Africa (5). By continent, Asia dominated (38 of the 50 TNCs). There were also notable differences in size among infrastructure TNCs headquartered in different

economies. Hong Kong (China), the home economy for Hutchison Whampoa accounted for 25% of the total assets and more than 40% of the foreign assets of the firms on the top 50 list.⁴³ Firms from Singapore and China were also large in terms of foreign and total assets, while Russian TNCs have exceptionally large total (but not foreign) assets due to the energy monopoly UES (annex table A.III.5, table III.14).

As noted above, developing-country TNCs were especially well present in seaports, road transport and telecommunications: they accounted for two-thirds of the total number of developing-country TNCs (table III.13). Only 11 firms in the list were involved in electricity and gas together, and only 1 firm was in the water industry.

A large number of infrastructure TNCs have mixed private-public ownership. This reflects the fact that a number of major TNCs have roots in publicly owned domestic entities,⁴⁴ some of which were partly or wholly privatized prior to internationalizing.⁴⁵ In developed countries in the past this was especially the case in electricity and water, but less so in telecommunications and transport in which private firms were established and active at the outset. In contrast, many developing-country infrastructure firms, which later became TNCs, were established to support economic development at home, and therefore honed their competitive advantages in this process. Whether they are SOEs or private companies often reflects the endowments and strategies of their respective home economies. For example, infrastructure TNCs from Hong Kong (China) are private companies, whereas many from Singapore are SOEs.

Table III.14. Foreign and total assets of the 50 largest infrastructure TNCs of developing and transition economies, by home country and region, 2006
(Millions of dollars and per cent)

Home region / economy	Number of firms	Foreign assets		Total assets		Foreign assets as a share of total assets (%)
		Value	Share in total (%)	Value	Share in total (%)	
Total	50	196 542	100.0	499 267	100.0	39.4
Developing economies	47	191 636	97.5	412 298	82.6	46.5
Africa	7	9 880	5.0	35 236	7.1	28.0
South Africa	5	5 051	2.6	25 747	5.2	19.6
Egypt	2	4 829	2.5	9 490	1.9	50.9
Latin America and the Caribbean	2	14 490	7.4	53 739	10.8	27.0
Mexico	2	14 490	7.4	53 739	10.8	27.0
Asia and Oceania	38	167 267	85.1	323 323	64.8	51.7
Hong Kong, China	7	85 699	43.6	124 714	25.0	68.7
Singapore	6	31 041	15.8	53 039	10.6	58.5
China	2	11 560	5.9	34 969	7.0	33.1
Malaysia	8	11 236	5.7	30 118	6.0	37.3
Kuwait	2	9 818	5.0	14 504	2.9	67.7
Turkey	3	4 134	2.1	13 260	2.7	31.2
Korea, Republic of	2	1 344	0.7	23 601	4.7	5.7
India	3	691	0.4	7 803	1.6	8.9
Thailand	2	273	0.1	2 185	0.4	12.5
Other Asia	3	11 471	5.8	19 131	3.8	60.0
South-East Europe and CIS	3	4 906	2.5	86 969	17.4	5.6
Russian Federation	3	4 906	2.5	86 969	17.4	5.6

Source: UNCTAD, based on annex table A.III.5.

Interestingly, infrastructure TNCs from the North and the South are competing head-on in international markets (table III.11), including in developing countries, and it is important for governments to understand their relative advantages and disadvantages (section D).

2. Major infrastructure investors in developing countries by industry

The composition of the universe of infrastructure TNCs investing in developing economies varies by industry. The analysis in this section focuses on the main features of investors in individual infrastructure industries, concentrating on the period 1996–2006.

The global *electricity industry* has been and still is dominated by TNCs from developed countries, because of their technological advantages as well as financial, technical, project management and other expertise. The world's largest electricity TNCs in terms of foreign commitments in developing countries are primarily from Europe and the United States (annex tables A.III.6–8). The consolidation of the electricity industry in Europe through M&As has led to the emergence of a few very large electricity firms known as the “Seven Brothers” (EDF, Electrabel, Endesa, Enel, E.ON, RWE and Vattenfall), all of which are active international investors (IEA, 2003).⁴⁶ In North America, electricity firms such as AES, American Electric Power and TransAlta are also investing abroad. In general, cross-border M&As are a preferred strategy for consolidating an international presence in electricity. M&As in electricity have soared in recent years, both in terms of volume and magnitude of deals, reflecting the trend towards industry consolidation (PricewaterhouseCoopers, 2006). Cross-border M&As in electricity are concentrated in Europe, the United States and developing Asia.⁴⁷

TNCs' participation in the global electricity industry has evolved substantially, reflecting changing policies, market opportunities and corporate strategies over the years. The increasing trend towards PPPs in the provision of electricity services is an example, as is the emergence of new players, such as independent power producers in developing countries (ECA and UNEP, 2007). In addition, some technology providers have moved up the value chain and become producers and suppliers of electricity themselves. For example, technology suppliers such as Suzlon (India) and Alstom (France) are beginning to compete with traditional utilities in developing countries for transmission and distribution activities (Gils et al., 2007; Nazareth, 2008). In addition, government policies aimed at encouraging the use of

renewable energy in power generation have prompted some equipment suppliers, such as GE, Siemens and Westinghouse, to become producers and suppliers of electricity (Ernst & Young, 2006).

Although developed-country TNCs are the largest players in the electricity industry, including in developing countries, most remain regional entities, with a significant proportion of their revenues generated from, and assets located within, their home regions.⁴⁸ Thus there is considerable scope for developing-country TNCs in this industry to invest abroad, and indeed several of them, particularly those from Brazil, India, Malaysia, Singapore and Thailand, have begun doing so in recent years. Some of them have seized on the opportunity of openings created by the withdrawal of some developed-country TNCs from developing-country markets (Tenenbaum and Izaguirre, 2007). Their expansion, mainly to other developing countries, is thereby strengthening South-South cooperation in electricity infrastructure development, especially in Asia.⁴⁹

In *telecommunications*, most of the largest investors in developing and transition economies are headquartered in developed economies, especially in Europe. Telefónica (Spain), France Telecom (France) and América Móvil (Mexico), in that order, had the largest investment commitments in developing countries in 1996–2006, followed by Telmex (Mexico), Vodafone (United Kingdom) and Deutsche Telekom (Germany) (annex tables A.III.6–8). In addition to infrastructure TNCs, some of the major investors in telecommunications in developing countries are banks, such as Bank of America (United States), and conglomerates from current-account-surplus developing countries, such as the Abu Dhabi Group or Dubai Holding. The geographical spread of telecommunications TNCs often reflects considerations of geographical or cultural proximity (such as the Latin American investments of América Móvil and Telefónica) (Gerpott and Jakopin, 2007), or a combination of technological considerations and first-mover advantages, as with the largest mobile operators in Africa (Curwen, 2005; box III.16).

The structure of the telecommunications industry is changing both globally and in developing countries as a result of mega mergers or as some TNCs sell off foreign assets to new players. It is notable that the 7 largest M&A deals in infrastructure industries between 1991 and 2007 all took place in telecommunications, amounting to a total of \$437 billion (annex table A.III.3).⁵⁰ The main sell-off of affiliates by TNCs took place in Latin America and the Caribbean, where United States TNCs such as BellSouth, Verizon and AT&T, sold their assets to local and regional players (ECLAC, 2008; box III.15). Mexico's América Móvil and Telmex have been the most active in this restructuring of the

Box III.16. The entry of TNCs in the mobile telephony market in Africa

In recent years, Africa has experienced a “mobile revolution”. The continent had about 190 million mobile subscribers in 2006 following an annual growth rate of 46% in subscribers between 2001 and 2006; and mobile penetration had reached 22%, in comparison to 29% in Asia, for example. In 2001, mobile phones overtook fixed telephone lines, and now outnumber fixed lines by nearly seven to one.

TNCs have contributed substantially to this rapid market growth. Among the top 10 mobile operators in Africa in terms of national subscribers, 8 of them are foreign affiliates (box table III.16.1). MTN in Nigeria, Djezzy GSM in Algeria and Mobinil in Algeria are affiliates of operators headquartered in other African countries, highlighting a strong South-South (especially intraregional) feature of FDI flows in Africa’s mobile telephony market.

Box table III.16.1. Top 10 mobile operators in Africa, ranked by number of local subscribers, 2006

Rank	Operator	Host country	Parent company (equity share)	Home country	Total subscribers	Revenues (\$ million)
1	Vodacom	South Africa	Vodafone (50%)/Telkom (50%) (local)	United Kingdom	21 800	2 661
2	MTN	South Africa	Local	South Africa	12 483	2 859
3	MTN Nigeria	Nigeria	MTN (100%)	South Africa	12 281	2 053
4	Glo Mobile	Nigeria	Local	Nigeria	11 000	..
5	Maroc Télécom	Morocco	Vivendi (53%)	France	10 707	1 627
6	Djezzy GSM	Algeria	Orascom Telecom (100%)	Egypt	10 531	1 531
7	Mobinil Egypt	Egypt	France Télécom (Orange) (71%)/Orascom Telecom (29%) (local)	France	9 267	1 114
8	Vodafone Egypt	Egypt	Vodafone (100%)	United Kingdom	8 704	1 243
9	Mobinil Algeria	Algeria	France Télécom (Orange) (71%)/Orascom Telecom (29%)	France/Egypt	7 476	..
10	Celtel Nigeria	Nigeria	Zain Group (100%) ^a	Netherlands ^b	6 400	1 381
Total of Africa					110 649	14 469

Source: UNCTAD, based on ITU 2007a and company reports.

^a Previously MTC Group.

^b Celtel is an affiliate of Zain Group (Kuwait).

Source: UNCTAD.

regional industry.⁵¹ Of developed-country TNCs, only Telefónica (Spain) followed suit with the acquisition of BellSouth’s mobile telephony operations in Latin America in 2004–2005.

In *transport infrastructure*, in addition to major transport TNCs, such as Bouygues (France), Grupo ACS (Spain) and Hopewell Holdings (Hong Kong, China), a number of leading investors in developing countries are from related industries such as electronics (e.g. Siemens, Germany) (annex tables A.III.6–8). Since transport is also a very diverse industry, it is necessary to analyse it by sub-industries (i.e. roads, airports, seaports and railroads).

In *airports*, developed-country firms dominate. Many are affiliates of larger groups, mostly from developed countries (annex tables A.III.6–8). British Airport Authority⁵² (United Kingdom) has been by far the most active in developing and transition economies, especially during the period 2001–2006. Also significant in terms of investment commitments are Fraport (Germany), Copenhagen Airport⁵³ (Denmark), and ACS Group, the largest Spanish construction TNC. Developing-country TNCs, such as Bidvest Group (South Africa), Senai Airport Terminal Services (Malaysia) and Airport Authority of Hong Kong, also increased their commitments in developing countries in 2001–2006.

In *railways*, too, developed-country TNCs had the largest share of foreign commitments in developing countries over the period 1996–2000.⁵⁴ In 2001–2006,

however, a developing-country TNC, Mass Transit Railway Corporation (Hong Kong, China) became the largest investor.⁵⁵ In Africa specifically, railway concessions have often involved partners from the South (Bullock, 2005).⁵⁶

In *road infrastructure* in developing countries, large European firms, such as OHL (Spain), SyV (Spain) and Impregilo (Italy) have dominated investments. However, a significant number of Asian and Latin American firms, such as ICA (Mexico) and Cheung Kong Infrastructure Holdings (Hong Kong, China), also made substantial investment commitments during the period 1996–2000.⁵⁷ In addition, a new batch of TNCs from the South, including Odebrecht (Brazil) and MTD Capital (Malaysia), emerged in this area during this period.

In *seaports*, TNCs from the South are world leaders, and compete with their developed-country counterparts on a global scale. As noted above, Hutchison Whampoa is the largest investor worldwide, and DP World and PSA (Singapore) are among the top four (annex table A.III.4).⁵⁸ In terms of total physical capacity (throughput) worldwide, rankings are similar (table III.15), although the capacity of PSA exceeds that of DP World. The industry structure is also highly concentrated, with the four largest operators in seaports together responsible for almost half of global throughput (table III.15).

Today, most of the world’s large port operators are TNCs specialized in this sub-industry. This is quite

Table III.15. Major port operators, ranked by their share in world container port throughput, 2006
(Millions of TEU^a and per cent)

Ranking	Operators	Home economy	Throughput (million TEU) ^a	Share in world total (%)
1	Hutchison Port Holdings	Hong Kong, China	61	13.8
2	APM Terminals ^b	Netherlands	52	11.8
3	PSA	Singapore	47	10.7
4	DP World	United Arab Emirates	42	9.4
5	Cosco	China	22	5.0
6	Eurogate	Germany	12	2.7
7	Evergreen	Taiwan Province of China	9	2.1
8	MSC	Switzerland	9	2.0
9	SSA Marine	United States	8	1.7
10	HHLA	Germany	7	1.5

Source: UNCTAD, based on Drewry, 2007.

^a Twenty-foot equivalent unit.

^b Affiliate of AP Moller-Maersk (Denmark).

different from a decade ago, when most terminals were operated by ocean carrier TNCs seeking to secure dedicated terminal facilities for their ships.⁵⁹ This shift towards greater specialization has taken place because port operators now require more specialized knowledge and skills in terminal operations in the context of extensive trade expansion and growing competition. This competition has come mainly from new individual terminal operating companies in response to the spread of port concessions worldwide. However, apart from DP World, the majority of new entrants in the industry are small individual port operators that, having matured in their own economies, are seeking new opportunities abroad (e.g. the Irish Port of Dublin is partnering with Sabang Port in Indonesia).

In *water and sewage*, a few very large European TNCs, such as Veolia (France), Agbar (Spain), Suez (France) and RWE (Germany), dominate investment commitments in developing countries (annex tables A.III.6–8). TNCs in the water industry, such as Suez, RWE and EVN (Austria), often combine water and sewage with electricity services.

The shares of the largest (top 5 and top 10) investors in individual infrastructure industries in developing and transition economies fell in 2001–2006 – with the exception of transport – although from very high initial levels of concentration in the late 1990s (table III.16). For example, in 1996–2000, the 5 largest investors in the water industry⁶⁰ accounted for almost 75% of the total foreign commitments in

developing and transition economies, but by 2001–2006, their share had declined to less than 50% of the total.⁶¹

3. South-South investors in developing countries

TNCs from the South are undertaking more foreign investment commitments in other developing regions (table III.17), and especially in LDCs (section C.2), although developed-country TNCs still remain the largest investors. In Africa, the bulk of investment commitments still originate in developed countries, except, notably, in telecommunications. Moreover, 19 of the top 50 investment commitments in infrastructure in Africa are by TNCs from the South. Regional proximity seems important: 9 are headquartered in West Asia, and most of the others (8) in other African countries, especially South Africa and Egypt (annex table A.III.6). The second largest investor in the region, MTC (Kuwait)

Table III.16. Share of the top 5 and top 10 investors in total foreign investment commitments in infrastructure industries in developing and transition economies, 1996–2006
(Per cent)

Industry	Top 5		Top 10	
	1996–2000	2001–2006	1996–2000	2001–2006
Electricity	35.4	29.9	50.7	42.9
Telecom	58.7	48.0	75.6	69.4
Transport	27.0	31.0	42.2	46.2
Water	73.7	45.5	85.6	65.4

Source: UNCTAD's calculations, based on data from the World Bank's PPI Database.

Note: See figure III.1.

Table III.17. Origin of foreign investment commitments in the infrastructure industries of Africa, Asia and Oceania and Latin America and the Caribbean, 1996–2006
(Per cent)

Host region/industry	Developed economies	Developing economies	Transition economies
Africa total	60.8	39.1	0.1
Energy	91.3	8.5	0.2
Telecom	42.0	58.0	-
Transport	82.1	17.9	-
Water	100.0	-	-
Asia and Oceania total	57.1	42.8	0.1
Energy	78.7	21.3	-
Telecom	24.1	75.7	0.2
Transport	43.5	56.1	0.4
Water	76.0	24.0	-
Latin America and the Caribbean total	83.9	15.7	0.4
Energy	92.3	7.7	-
Telecom	73.6	25.3	1.1
Transport	85.6	14.4	-
Water	97.6	2.4	-

Source: UNCTAD's estimates, based on data from the World Bank's PPI Database.

Note: See figure III.1.

– renamed Zain in 2007 – is a developing-country firm, and the fourth largest is an intraregional investor (MTN of South Africa). The list includes not only large TNCs, but also intraregional niche investors, such as Trans Century (that invests in transport in Kenya) and Econet Wireless (that invests in telecommunications in Botswana).

In Asia, South-South investment commitments – especially intraregional – are very significant, reflecting the dominant position of the region's firms in the top 50 developing-country infrastructure TNCs. These TNCs account for over 40% of the total foreign investment commitments in the region, and for 56–76% in telecommunications and transport (table III.17). China Light and Power (Hong Kong, China) is the largest investor in terms of commitments registered in 1996–2006 (annex table A.III.7). Of the top 50 investors, more than half (27 firms) were from developing countries, and half (25 firms) were from developing Asia, with TNCs from Hong Kong (China) (9 firms) and Malaysia (5 firms) being the most active.

In Latin America and the Caribbean, the role of developing-country investors has been more limited. Of the total foreign commitments, developing-country TNCs accounted for less than 20% in infrastructure industries on average. Their most significant investments were in the telecommunications industry. Of the 50 foreign firms with the largest commitments in 1996–2006, only 7 originated from developing countries (annex table A.III.8).

D. Competitive advantages, drivers and strategies of infrastructure TNCs

Although a number of today's major infrastructure TNCs have operated overseas for many decades, most have internationalized only since 1990 (section C). TNCs internationalize in order to increase their profitability and/or protect their capital value. Whether they internationalize, in what forms (e.g. through FDI or management contracts) and where (e.g. in nearby countries or further afield) depends on a number of factors. Among the most important are, first, the possession of competitive advantages, which enables them to compete with other firms, including in the host economy;⁶² second, there must be location-specific reasons why a TNC chooses to operate in a particular host economy, rather than another one (or in the home country); and finally, the relative costs of a TNC internalizing and managing an operation in a host country, as opposed to selling the knowledge of how to do this to a local firm, which determines its modality of participation in a foreign market.⁶³

With these factors in mind, this section discusses the competitive advantages possessed by infrastructure TNCs, and then examines what drives and motivates these companies to internationalize. The overall aim of the section is to understand the patterns of TNC participation in infrastructure in developing countries, including geographical and industrial dispersion and entry modalities, as well as potential future developments. The analysis below is based on an UNCTAD survey of infrastructure TNCs (box III.17), as well as literature on their internationalization.

1. Sources of competitive advantages

Sources of TNC competitiveness can be firm-specific advantages (FSAs) or non-firm-specific advantages.⁶⁴ Firm-specific advantages include technologies or brands owned or possessed by the firm, or other advantages enjoyed by the firm because of external factors, for example, as a result of privileged access to cheap capital in the home economy. There are four categories of FSAs: technology and expertise, production and service capabilities, business models and forms of governance. Each of these is explained below in the context of the results of the UNCTAD survey of infrastructure TNCs.

- Advantages based on *ownership or possession of technology and expertise* are the most commonly cited in the TNC literature. They include proprietary technology and expertise arising from sustained investment in R&D and other capabilities or resources. For infrastructure TNCs responding to the survey, only a little over a third (37%)⁶⁵ of competitive advantages fell into this category. However, there is a big difference in responses by the origin of TNCs. The majority of FSAs mentioned by developed-country TNCs (61%) fell into this category. Among developing-country TNCs, only 12% of the FSAs were related to technology and expertise. There were also differences by industry. Nearly all responses by TNCs in the water industry were FSAs of this type,⁶⁶ as were 43% of advantages mentioned by electricity companies. Most of the ownership advantages mentioned arise not from product technology or brands, but rather from various types of embedded expertise. This was the case for both developed and developing countries. Companies mentioned, among others, expertise in network design and operation, engineering skills, environmental know-how, financial techniques, and project management capabilities. This underscores the nature of infrastructure industries, where the ability to manage complex networks of activities is generally more important than possessing state-of-the-art technology per se.

Box III.17. UNCTAD survey of infrastructure TNCs

UNCTAD conducted a global questionnaire-based survey of infrastructure TNCs during April-May 2008, in which executives answered detailed questions on a range of issues, including competitive advantages possessed by respondent companies, as well as their motives, strategies, international operations and attitudes towards home- and host-country policies. A sample of 175 major infrastructure TNCs was constructed based on a number of databases, focusing on larger TNCs in each industry and those with significant levels of involvement in developing and transition economies. Other TNCs with infrastructure interests were excluded. Care was taken to ensure that the sample of companies reflected the overall population of infrastructure TNCs (section C). The response rate was 22% (38 companies), and was broadly representative of the sample and population of infrastructure TNCs. By industry, 18 were in the telecommunications industry, 12 in electricity, 6 in transport and 2 in water; transport was slightly underrepresented. All of the major home economies were represented, including Australia, France, Japan, the Netherlands, Spain, Sweden and United States among developed economies; and Brazil, China, Hong Kong (China), India, Malaysia, Mexico, the Republic of Korea, Singapore, South Africa, Turkey and the United Arab Emirates among developing economies. Several companies were SOEs, in keeping with the significant number of such TNCs in infrastructure industries. As a whole, infrastructure TNCs in the survey sample were large, with average overall sales of \$15 billion (some are much larger), and they employed an average of 39,000 people. The average number of people employed overseas was high, at nearly 9,000, reflecting considerable international involvement, including in nearby countries. With regard to international orientation, on average, responding companies were active in 4.6 host economies.

Source: UNCTAD.

- *Production and service capabilities* derive from specialization in segments of industries or from a particular focus on certain aspects, such as ensuring minimum costs or customer orientation. Unlike the previous category of FSA, such advantages do not necessarily derive from embedded industry-level expertise; rather, they depend on factors such as scale or network coverage maximization, cost-consciousness, or flexibility and fast response (all of which were mentioned by respondents).⁶⁷ A significant proportion of infrastructure TNCs – proportionally more from developing countries – indicated that they possessed production and service capabilities (23% of all advantages mentioned). Such capabilities are important for all industries, especially telecommunications, and 30% of FSAs were in this category. This is not surprising, given that many telecommunication operators do not possess fundamental technology, but rather focus on its exploitation (Ingelbrecht, 2008).
- *Business models* include FSAs associated with the development and exploitation of relationships, including with suppliers and customers. About 15% of infrastructure TNCs in the survey mentioned FSAs in this category, including reliable partnerships worldwide and strong and well-organized marketing channels. Telecommunications are well represented in this group because of the importance of the retail segment in this industry, and the use of various innovative approaches to selling services to relatively poor customers (e.g. the approach taken by Reliance Communications). A large number of TNCs also mention their financial structure and strength and large cash flows as FSAs, especially in telecommunications, which are important for fostering rapid expansion and gaining market share. In the survey, TNCs were asked to cite their primary source of international investment finance: all telecommunications firms indicated that the preponderance of investment was from internal cash flow, sometimes up to 100%. In some cases, financial strength also signifies a strong, perhaps monopoly, position in the home economy, which allows infrastructure TNCs to invest some of their profits at home and overseas. In the case of all infrastructure TNCs in the survey apart from telecommunications, a sizeable share of their investments (or a particular investment) – about 20–30% – was financed from internal resources, primarily generated from profits in the home economy.⁶⁸ An important consequence of the financial prowess of infrastructure TNCs is the acquisition of created assets, an issue taken up further in section D.2.
- *Forms of ownership and organization*, including its organizational culture or whether a TNC is State-owned, represent 10% of FSAs mentioned in the survey. TNCs mainly stressed the extent to which organizational culture made companies flexible or open to new ideas, which were seen as conducive to business, especially in transport and telecommunications.
- *Non-FSA advantages*⁶⁹ can derive from a number of sources, including home country endowments, home government policies, or some specific relationship with the host country. Some 18% of competitive advantages mentioned could be categorized as non-firm-specific, ranging from access to capital (especially in countries with trade surpluses) to good working knowledge of developing host economies (particularly where the TNC is from a neighbouring country or already has operations in similar economies). Other non-FSAs mentioned by respondent TNCs included

experience of liberalization in the home economy (providing useful lessons for entry into host economies undergoing similar experiences).

As the survey indicates, competitive advantages of companies differ by industry. Competitive advantages in the *water industry* are mostly intangible and difficult to develop and sustain. This explains why nearly all TNCs in this industry with significant international investments – such as Agbar (Spain), Suez (France), RWE (Germany) and Veolia (France) – are long-established companies (some founded in the nineteenth century), and continue to invest considerable amounts in specialist technology and network expertise (Pinsent Masons, 2007; Singh, 2008; Hall and Lobina, 2007). There are very few significant developing-country TNCs in the water industry, apart from Hyflux (Singapore) and YTL (Malaysia) (table III.11); and both are far smaller than their developed-country equivalents.

In contrast to water, *telecommunications* has largely shed its natural monopoly characteristics (section A), primarily because of rapid technological change.⁷⁰ Moreover, unbundling in this industry is along the entire value chain, and competitive assets or advantages can now be created or acquired relatively easily. However, these advantages can seldom be retained in the long term, even by incumbents.⁷¹ These developments have facilitated the rise of new players, including developing-country TNCs, as observed in section C. In the survey, telecommunication TNCs – especially those from developing countries – indicated frequently that their FSAs derived from production and service capabilities or business models, rather than ownership of proprietary technology or expertise. This wide range of competitive advantages, along with more opportunities along the value chain and a high level of liberalization in most countries, have led to more telecommunications TNCs featuring among the top 100 infrastructure TNCs than those in any other industry (section C),⁷² of which about a quarter are headquartered in developing countries. However, incumbency does matter to some degree, and most foreign participation by developing-country TNCs is in the form of South-South involvement, since their competitive strengths are largely insufficient to compete as yet in developed country markets.⁷³ The largest developing-country TNC in telecommunications, Singtel (Singapore), is still far smaller (and possesses fewer competitive advantages) than industry leaders such as Vodafone, France Telecom, Verizon Communications and Telefónica, which continue to dominate developed-country markets.

The situation in electricity and transport is somewhere between that in telecommunications and water. In *electricity*, as with the water industry, there are some benefits to incumbency, and long-term network experience remains important. However,

innovation, especially in upstream segments of the value chain such as power generation, has resulted in considerable unbundling and entry by domestic private companies and TNCs (section A above; and Woodhouse, 2006).⁷⁴ In addition, the pivotal role of power in fostering industrial development has encouraged massive investment in the industry by both State and private enterprises, resulting in some developing-country electricity firms gaining extensive production capabilities. A few well-established TNCs, such as Eskom (South Africa) and KEPCO (Republic of Korea) have also acquired proprietary technologies.⁷⁵ Nevertheless, to date, advantages and expertise gained by these companies have been insufficient for them to expand much beyond their home regions or compete head-to-head with developed-country counterparts. Thus, of over 30 electricity TNCs in the top 100, only 3 are from developing countries (section C).⁷⁶ CLP (Hong Kong, China), the largest developing-country TNC had overseas assets of \$6 billion in 2006, well short of the \$112 billion of the largest TNC, EDF (France) (section C).

As with electricity, TNCs in *transport infrastructure*, especially those in roads and ports, have grown in the context of an immense expansion in international trade.⁷⁷ As a result, primarily as a consequence of “learning-by-doing”, TNCs from both developed and developing countries have acquired considerable FSAs related to production and service capabilities. In addition, the concentration of export-orientated industrialization in a few developing countries over the past few decades has encouraged the emergence of a number of large, competitive players in transport (section C). The competitive advantages of both developed- and developing-country TNCs engaged in port activities consist of managerial and operational expertise in running terminal operations efficiently and effectively; and the largest also benefit from client loyalty fostered by global portfolios of facilities, services and customers (Olivier et al., 2007; Drewry, 2007; UNCTAD, 2007h; Valentine, 2008). Developing-country TNCs engaged in ports are making inroads into developed countries (e.g. the acquisition of P&O Ports (United Kingdom) by DP World (United Arab Emirates) in 2006). However, as with other sub-industries in transport (e.g. intraregional transport networks), most of the emerging opportunities are in other developing countries. More particularly in the case of ports, the main global shipping lanes run east-west, and connections to developed countries are already well served. Furthermore, changing global patterns of production and trade are encouraging further links to the South, especially to Africa and South America.

The significant variations in types of FSAs by industry, as a consequence of differing patterns of corporate origin and evolution in each industry, also manifest themselves at other levels, such as size

and ownership (state versus private). Particularly significant, as indicated above, is whether a TNC is from a developed or developing country. Overall, developed-country TNCs are much more likely to possess competitive advantages derived from ownership of technology and expertise. These are often built up over the long term, and are characteristic of industries such as electricity and water. In contrast, FSAs of developing-country TNCs generally relate to production and service capabilities and novel business models – key characteristics, among others, of sub-industries within telecommunications and transport, such as mobile telephony and seaports.

Competitive advantages can ultimately be eroded, though the rate of this varies by industry. In the survey, the majority of infrastructure TNCs reported undertaking R&D and innovation in order to upgrade their FSAs. Nearly all of the sample companies backed up their FSAs in management and environmental quality standards with ISO 9001 and 14001 certification,⁷⁸ while some had specific quality certification from the Occupational Health and Safety Advisory Service (OHSAS 18001 for safety) and EMAS (eco-management and audit scheme). Two of them had ISO 27001, which relates to security issues.

2. Drivers, motives and modalities of infrastructure TNCs

a. Drivers and motives

Drivers are factors that trigger a company's internationalization or further expansion, while its motives (e.g. market-seeking versus efficiency-seeking) often determine the specific outcome. The drivers most mentioned by almost 100% of infrastructure TNCs in the UNCTAD survey are closely tied to market-related factors, especially in host countries. Therefore drivers and motives are treated together in this section.

Home country drivers. Infrastructure TNCs in the UNCTAD survey most frequently mentioned that liberalization of the industry in the home country led them to further exploit their competitive advantages in foreign markets in a number of ways. First, a number of TNCs decided to internationalize because the home economy offered few growth opportunities (e.g. because the home market was "mature"), or in order to use expertise and know-how where opportunities might be available ("worldwide development with no boundaries"), or because of a desire for diversification (i.e. to reduce overdependence on the home economy). Second, a few TNCs also opted to internationalize as competition had started to cut into their home market share after government liberalization policies encouraged market entry by domestic and foreign

companies. In some cases, infrastructure TNCs improved their FSAs against the competition posed by foreign TNCs in the domestic market prior to their own internationalization; good examples are Indian TNCs in telecommunications (Nazareth, 2008).

Although mentioned by only a few companies, technological changes, especially in telecommunications and electricity, which create new possibilities for competition at home and abroad, are also widely viewed as key drivers in the internationalization of infrastructure TNCs (Ramamurti and Doh, 2004; Clifton, Comin and Diaz-Fuentes, 2007; Minges, 2008). Overall, infrastructure TNCs from many developed and developing countries, including Brazil, China, France, India, the Republic of Korea, Singapore, South Africa, Sweden, Thailand, Turkey, the United Arab Emirates and the United Kingdom, reported that their home Governments actively supported or encouraged their overseas investments.

Host country drivers. Host country market-related factors were more frequently mentioned by TNCs in the survey than home country drivers, and by virtually every company. In particular, TNCs mentioned market-pull opportunities arising from: (a) liberalization and deregulation, leading to business opportunities, including acquisitions (e.g. China's entry into the World Trade Organization (WTO) was seen as highly significant by a number of infrastructure TNCs); (b) tenders from governments for new infrastructure development (e.g. facilities in South Africa for the 2010 World Cup); (c) strategic acquisitions of created assets, in nearly all cases facilitating entry into new markets (e.g. recent acquisitions by Indian telecommunications TNCs of submarine cables and other assets from various companies); (d) following clients in the infrastructure business (e.g. ports developments linking into transportation networks being established in Latin America); (e) regional growth opportunities and the realization of economies of scale (a common motive for many infrastructure TNCs, except those in the water industry); and (f) other market-related motives, such as targeting central and local governments in offering solutions, for example for energy efficiency or water purification (including advisory services).

Motives less frequently mentioned included, labour cost reduction, the achievement of synergies (e.g. with other businesses of the company), as well as the possibility of gaining experience and knowledge, and establishing good relations with clients such as local municipalities. This last set of motives was mentioned more by electricity and water companies.

The primacy of the host country market as a motive for infrastructure TNC involvement in developing economies creates significant obstacles

for LDCs, which almost by definition have small markets, both in general and in infrastructure industries more specifically. However, some infrastructure TNC involvement in LDCs does occur, despite market limitations, for strategic reasons (discussed below) or because companies – often but not exclusively from the South – have spotted niches that others have missed (e.g. Reliance Communications (India) in Uganda or Millicom’s (Luxembourg) LDC orientation).

Country- or region-specific market factors influence the location of TNCs by industry. For example, liberalization with respect to existing infrastructure, such as water and electricity utilities, were a major driver for inward investment and other forms of involvement in Latin America (and a number of other markets) in the 1990s. And the installed base of such infrastructure facilities remains a significant pull factor, especially for companies specializing in operation and maintenance activities.

Another pull factor since the 1990s has been the demand for new infrastructure facilities, especially in electricity and transportation in Africa and Asia, to support industrial expansion and trade. Indeed, this is behind recent trends in FDI and other forms of TNC participation in developing countries (section B). The situation in telecommunications is very varied. Greater liberalization of this industry in Latin America than in Asia as a whole would explain the difference in telecommunications TNC involvement in these two regions. It also depends on the extent of an existing fixed-line base. In regions such as Africa, where fixed-line telecommunication systems are not extensive, mobile telephony is usually subject to relatively liberal regulations and few strong incumbents (in mobile telephony) exist, there have been significant levels of FDI by TNCs from both developed and developing countries (sections B and C).

Other drivers. In addition to market-related drivers, the strategic economic and political considerations of home economies and governments have assumed greater importance in the internationalization of infrastructure TNCs. A good example of such considerations is the role that infrastructure TNCs from China and India are playing in supporting their respective countries’ investments in extractive industries such as oil, gas and mining.⁷⁹ Infrastructure investments by Chinese and Indian TNCs, in Africa, for instance (figure III.7), include both “parallel” investments (i.e. those supporting the extraction and transport of raw materials) and “barter” investments (i.e. those made in return for rights to extract raw materials (Corkin, 2007; Davies et al., 2008)).⁸⁰

“Strategic” infrastructure investments of this sort are not a unique phenomenon; for example

Japanese TNCs were involved in significant investments in extractive industries and infrastructure projects during a parallel period of rapid economic growth and “resource insecurity” in the 1970s and 1980s (Ozawa, 2008). Other countries pursuing strategic investments in infrastructure include Spain in Latin America (Clifton, Comin and Diaz-Fuentes, 2007) and South Africa. South African infrastructure companies – many of them State-owned, such as Eskom (electricity) and Spoornet (railways) – have been encouraged to invest in Africa in order to foster regional trade and integration, as well as particular policies such as the trans-Africa electricity grid (South Africa, MPE, 2004; 2007; section A.3).

Strategic motives for TNC involvement in infrastructure are generally related to export interests (e.g. exports of minerals or electricity). This explains why investment by some Chinese, Indian and some other developing-country TNCs takes place in developing countries – including LDCs – whose markets are deemed too small or risky, especially by developed-country TNCs.

b. Modalities of TNC involvement

The modalities of involvement by infrastructure TNCs in developing countries are determined by three factors: their competitive advantages, the degree of risk of a particular project, and host government objectives and policies. Overall, the legal forms under which they operate in developing countries differ significantly from the FDI-centred modalities that prevail in many other industries, notably manufacturing. Looking first at competitive advantages, the expertise, production capabilities and tacit-knowledge-based characteristics of most FSAs in infrastructure industries are best utilized through modalities that allow the direct participation of TNCs in projects.⁸¹

Regarding the issue of risks, according to infrastructure TNCs in the survey, since the scale of infrastructure projects can be extremely large, and the payback long term, in many cases the potential risks necessitate modalities involving partnerships, although other techniques are also used to reduce the risk. The two most common risk-related factors identified by respondents in the survey were political and economic instability (mentioned by 35% of TNCs) and regulatory and legal issues (cited by 47%).⁸² In order to disperse risk, TNCs make use of risk mitigation insurance cover,⁸³ and are adept at securing financing from a wide variety of sources (which is why financial expertise is an important FSA, as mentioned earlier),⁸⁴ as well as entering into partnerships of various kinds (e.g. joint ventures and consortiums). Partners take many forms, including private equity funds, international organizations and national agencies, and other infrastructure firms.

This explains the importance of project management expertise.

Finally, in addition to issues of FSAs and risk, the modality of a particular project is determined by host government policies. Many governments are reluctant to relinquish full ownership of State or public assets to the private sector, including TNCs, and often seek options short of this, such as management contracts and BOTs. Reflecting competitive advantages, risks and host government preferences together, a variety of legal forms prevail for infrastructure TNCs' participation in developing countries. This is borne out by the survey. Only 25% of cases of TNC involvement in the survey (multiple responses were allowed) were pure FDI, and most of these were in telecommunications or smaller scale electricity generation investments (which entail fewer risks and government resistance). Apart from FDI, of the remaining cases 55% were concessions (25% BOO, 16% BOT and 14% other types of concession) and 12% management contracts, depending on the specific nature of a project, TNC strategies and government objectives. (The remaining 8% of cases were denoted as "other".) These results support the evidence presented on legal forms (section B).

3. Internationalization strategies of infrastructure TNCs

Three types of TNCs can be discerned from the UNCTAD survey, each with a relatively clear strategy and geographic orientation. Companies in the first and largest group are from all regions and in all the infrastructure industries,⁸⁵ and they are internationalizing mainly at a regional level.⁸⁶ They are mostly small or medium-sized companies (though relative size differs by infrastructure industry) which have expanded into geographically proximate markets with which they are familiar, and which allows them to expand in scale and benefit from synergies, but at a relatively lower risk. Within developing regions, this results in the high share of South-South investment in total investment (table III.17), especially in Africa, Asia and the LDCs. This pattern is confirmed by other studies (Aykut and Ratha, 2004; Aykut and Goldstein, 2007; Naidu and Mbazima, 2008; Pradhan, 2005). These regionalization strategies are expected to continue in the future.

A second group of companies identified by the survey comprises large, developed-country TNCs, mainly European, and strongly represented in electricity, telecommunications and water.⁸⁷ Generally these firms have affiliates around the globe, but tend to be concentrated more in some host regions, such as Latin America for Spanish companies and Africa for French companies, reflecting historical and cultural affinities. As a consequence of the

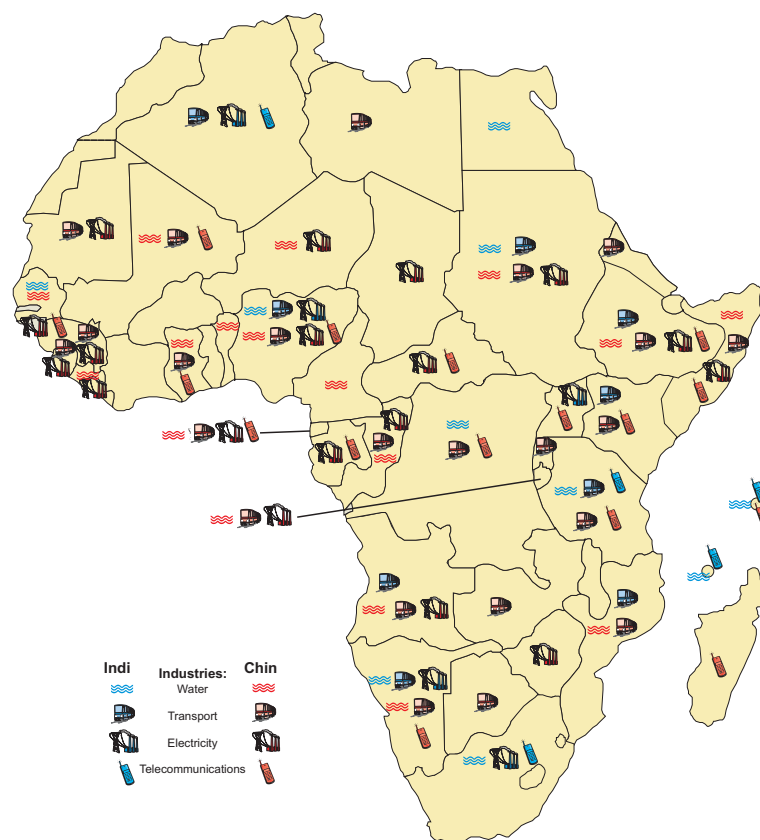
liberalization of infrastructure industries in the 1990s, they were the first to expand internationally, with the aim of benefiting from first-mover advantages, such as securing favourable terms of entry into host economies, having the best choice of local partners and establishing barriers to entry for latecomers (Ramamurti and Doh, 2004).

Latin America had the highest level of participation by this second group of TNCs during this period because it was the first region to liberalize extensively in infrastructure in the early 1990s (section B). For the same reason, and because so many investors were from developed countries, the South-South share is still relatively small (table III.17). However, this first wave of international expansion was a case of "over-reach" by a number of the major developed-country TNCs, because of their limited international experience among other factors. As a result, it subsequently led to a retrenchment from Latin America and to a relative shift to other regions, especially Asia. All companies in this group are planning to expand in the near future, both in host regions and countries where they are currently invested, as well as into new ones. Host regions and countries primarily targeted by this group for expansion are West Asia (especially the Gulf), the Russian Federation and CIS, and China and India.

The final group of infrastructure TNCs are large emerging Asian infrastructure companies from many economies, including China, India, Hong Kong (China), Malaysia, the Republic of Korea, Singapore and the United Arab Emirates.⁸⁸ They are well represented in electricity, telecommunications and transport and, though some are not as large as their developed-country counterparts, they can make formidable competitors (section D.1). Until the early 2000s, international investment by these companies focused on nearby countries, with some forays into other regions. However, unlike the first group of TNCs mentioned above, their scale and scope have allowed them to pursue global ambitions,⁸⁹ and their recent and near-term plans are the most expansionist of all three groups.

In the survey, all of the Asian infrastructure TNCs reported that they were planning expansion in Africa and South-East Europe and CIS, as well as further expansion within Asia itself; and nearly all mentioned plans to expand in Latin America and the Caribbean. A number of the TNCs in this group stated that one of their major objectives was to become a global player in their respective industry. In order to do this, they reported using a high proportion of their profits⁹⁰ to finance the acquisition of created assets in other developing countries, as well as in developed countries, in some cases to augment their competitive advantages (*WIR06*; Stenvert and Penfold, 2007).

Figure III.7. Significant Chinese and Indian investments in infrastructure in Africa, up to April 2008



Source: UNCTAD, based on research by Arno Neppen and Johanna Jansson, Centre for Chinese Studies, Stellenbosch University, South Africa.

E. Conclusions

Infrastructure is the backbone of economic activity and competitiveness, and demands for its large-scale expansion are burgeoning on a global scale. At the same time, a number of countries, especially LDCs, have been unable to secure the necessary investment to establish sufficient infrastructural facilities and services. Overall, developing countries face large financing gaps in their plans to invest in physical infrastructure; and their lack of institutional capabilities is preventing the realization of such investment. These gaps can be filled if all sources, including financing by TNCs, are mobilized.

There has been a fundamental change in the role of the State in infrastructure industries around the world, as governments have opened them up to much greater involvement by the private sector – including TNCs – in financing, investment, ownership and management. This new relationship between the State and the private sector will continue to change and deepen, at least for some infrastructure industries, as technological and other changes remove natural monopoly elements as a whole (e.g.

in most telecommunications) or in part (e.g. electricity generation), thereby opening them up to participation and competition by a number of players.

The following are some of the main characteristics and features of TNC involvement in the infrastructure industries, especially in developing and transition economies:

- Infrastructure TNCs' involvement in developing and transition economies takes a variety of legal forms or modalities, including FDI, non-FDI and mixed forms. These modalities are context specific, and vary by industry and region, and they shift over time. Since ownership advantages are not easily externally traded (e.g. in the form of licensing agreements), the modalities preferred by TNCs include management contracts, BOTs and FDI. The modalities selected also depend on other factors, including host country policies (which may only permit certain modalities) and risk-related issues (which may encourage partnerships and consortiums).

In some segments such as mobile telephony, where the market structure facilitates competition, FDI forms are usually very important. In other segments, especially in water supply, TNCs are usually permitted only to operate through non-FDI forms, such as management contracts.

- TNC involvement has taken different forms depending on the region. In Latin America and the Caribbean, for instance, equity forms were common in the 1990s, but there has been an increasing shift towards non-equity forms in the new millennium. In contrast, non-equity forms of TNC entry have been more common in Asia.
- The extent of TNC participation has evolved in cycles. After a rise in the 1990s, mostly by TNCs from developed countries, the end of the decade and the beginning of the new millennium witnessed a brief decline in infrastructure-related FDI and other forms of involvement FDI flows globally, followed by a recovery from 2002 onwards. In the latest wave, there are also differences in the extent of involvement in various infrastructure industries compared to earlier periods. For instance, the extent of new TNC involvement is relatively less pronounced in telecommunications. As a whole, the share of FDI in infrastructure in total FDI

globally was about 10% in 2006, compared to only about 2% in 1990.

- Over the period 1990–2006, the stock of FDI in infrastructure in developing countries, as a measure of TNC involvement, increased 29-fold to \$199 billion. Throughout the period it continued to grow in most infrastructure industries, though the expansion in water has flattened out since 2000. However, despite the large increase in TNC involvement, it is still small compared to the overall investment needs.
- Until 2000, Latin America had the highest amount of TNC involvement, both in absolute and proportional terms, but following a sharp decline there, Asia now has the highest in absolute terms. TNC involvement in Africa has been significant to date in transport and telecommunications, but less so in electricity and water. Overall, allowing for data limitations, Asia accounted for about 47% of the total stock of infrastructure FDI in developing countries in 2006, with Latin America and the Caribbean accounting for 46% and Africa for about 7%.
- The group of LDCs has remained by and large marginalized in the process of globalization of infrastructure investment, accounting for about 2% of the stock of infrastructure-related FDI in developing countries in 2006. Given the scale of the infrastructure gap faced by these countries, an important question is the degree to which TNCs can help in financing the gap, and what this participation entails in the wider context of sources of finance. In some LDCs, firms from other developing countries are prominent investors in infrastructure, especially in telecommunications and transport.
- The universe of the largest TNCs investing in the infrastructure industries of developing and transition economies is changing:
 - There has been a marked rise in international involvement by developing-country TNCs. In some industries, such as telecommunications, they have become major players, and in others, such as transport, they have even become world leaders.
 - The universe of infrastructure TNCs has also changed through mergers between large players. Both developed- and developing-country TNCs have enhanced their competitive advantages by purchasing and utilizing created assets through M&As. This has generally increased their size in terms of assets, employment and revenue and propelled them to higher positions in the list of leading infrastructure TNCs.
 - Many major infrastructure TNCs, from both developed and developing countries and across all industries, are State-owned enterprises.
 - Increasingly a number of new types of players are emerging, including private equity firms and sovereign wealth funds, which increases the range of options available to governments, both in terms of prospective operators and sources of finance.
- The types of competitive or ownership advantages that infrastructure TNCs possess are primarily related to specialist expertise or capabilities, such as network design and operation, engineering skills, environmental know-how, project management capabilities, and tacit, hands-on skills. Specialized business models and financial prowess are important in some industries and segments, such as telecommunications.
- Differences in competitive advantages by type of company are a key consideration for host country governments. For example, TNCs from developed countries retain a significant competitive edge in water and electricity, but not in transport and telecommunications. In some areas, such as ports and telecommunications, developing-country TNCs already compete head-on with global leaders. Within industries, the unique competitive advantages of TNCs are likely to vary along the value chain, from the setting up of physical infrastructure (e.g. submarine cables or wireless towers in the case of telecommunications) to specialized services for specific customers.

Looking to the future, infrastructure TNCs as a whole, including those in the UNCTAD survey, appear to be very optimistic about the global outlook for infrastructure in general, and prospects in developing countries in particular.⁹¹ Apart from the major recipient host countries of recent years (e.g. Brazil, China, India and South Africa), many other economies are being targeted by infrastructure TNCs, including some LDCs. Given this, it is necessary to ask how, and to what extent, infrastructure TNC involvement in their economies affects developing and transition countries, both positively and negatively, and how governments should respond in order to maximize the benefits and minimize the costs arising from TNC involvement. These issues are taken up in subsequent chapters.

Notes

¹ The term “infrastructure” used throughout this report denotes “economic infrastructure”, but excludes “financial infrastructure”, which is often included under economic infrastructure. This is in order to keep the analysis cogent, and in line with current usage by organizations dealing with development issues, including the United Nations, the World Bank and the Organisation for Economic Co-operation and Development (OECD), among others.

² The term “infrastructure”, rather than “economic infrastructure”, will be used in the rest of the Report.

³ The term “physical” infrastructure is sometimes used to denote this set of industries to distinguish them from other types of infrastructure (e.g. financial).

- 4 Water is recognized as a right in a number of international treaties and forums. Most notably the United Nations Committee on Economic, Social and Cultural Rights declares it a human right as follows: “The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses” (ECOSOC, 2002: 2).
- 5 In transport, for instance, provision of services and regional linkages and interconnectivity is key to economic growth: it links different parts of the world, regions and countries and integrates them into the global economy (OECD, 2006a). Improvements in transport infrastructure not only save travel time but also influence land values and people’s choices of modes of travel and shipment (e.g. using public transportation rather than the family car).
- 6 For example, the quality and coverage of transport networks influence the costs of inputs, production and distribution, and therefore national competitiveness (Aoki and Roberts, 2006). It is estimated that logistics costs, which account for 20% of sales on world average, are 50% higher in landlocked countries than countries having access to the sea (ESCAP, 2006). Some countries in East and South-East Asia are successful examples of “instrumentalizing transport for their overall national economic development” (ESCAP, 2006: 26).
- 7 According to ESCAP (2006: 34), “Transport is crucial to tackling the region’s poverty” because “distance is a key factor depriving the rural poor of access to basic services, such as health and education and to economic opportunities”.
- 8 Vertical unbundling relates to the separation of competitive and monopoly components of an industry. Horizontal unbundling refers to, for example, the splitting of a national network into regional ones and/or permitting several producers to supply one network.
- 9 See World Bank, “Issues Brief: Infrastructure” (<http://web.worldbank.org/>).
- 10 Domestic private sector investment in Africa’s infrastructure is typically low.
- 11 For example, the telecommunications industry has been more successful than transportation in attracting private investment. Chile has attracted more private investment in infrastructure than other countries in the region.
- 12 Partly because of divergent political perceptions of the role of infrastructure services in the economy and society, and partly because of the complex set of reasons behind the reforms (*WIR04*).
- 13 Although in broad terms “reforms” in infrastructure make industries more competitive, there are various types of reform (which are mutually reinforcing): (a) public sector reform, including corporatization, so that State-owned enterprises act autonomously of the State and in accord with “market discipline”; (b) market liberalization, including the unbundling of competitive segments from uncompetitive ones, and private participation in infrastructure financing and operations (to tap into the private sector’s assets, as discussed in Chapter IV, section D); and (c) regulatory reform, for example by establishing a regulatory agency in order to make the process of regulation independent of both the State and the operators (Sharan et al., 2007; Foster et al., undated; section A.1).
- 14 Prior to the late 1970s the United States’ model of dealing with the natural monopoly attribute of infrastructure involved the regulation of privately owned enterprises. The State was seldom involved in ownership or operations of infrastructure facilities (Ure, 2007). Unbundling effectively involved breaking up private monopolies.
- 15 However, the universe of infrastructure TNCs also includes many that are State-owned (section C), which also acquire companies and assets from “privatizations”.
- 16 Infrastructure TNCs emerged in various economies, including France, Hong Kong (China), Malaysia, Singapore, South Africa, Spain, Sweden, the United Kingdom, and the United States, entering both nearby and distant markets in the 1990s.
- 17 Many of them were engineering and construction companies, such as Bechtel (United States) and Hyundai Heavy Industries (Republic of Korea). Given the scale, scope and intricacies of infrastructure, they managed large, complex projects, often as lead firms in consortiums, establishing transport, electricity generating plants or other facilities.
- 18 Examples include CLP (Hong Kong, China), KEPCO (Republic of Korea), KDDI (Japan), Odebrecht (Brazil) and Transnet (South Africa).
- 19 The remainder is provided by commercial banks (Orr, 2008; Rodriguez and Santiso, 2007).
- 20 Among the most important reasons private equity investors give for investing in infrastructure are: rising population and strong demand, even in times of sluggish economic growth; attractive risk-adjusted yields; strong, predictable, inflation-linked cash flows; close compatibility with pension funds and insurance companies that require high-quality, long-term, income-oriented investments to match their long-term liabilities; lack of government bonds; and lack of correlation to equity and bond markets (Orr, 2007).
- 21 These are usually managed by private equity firms, and created to raise funds from institutional investors in order to invest in pre-defined sectors. There are now a large number of such funds, including Barclays Private Equity, Macquarie and the Galaxy Fund.
- 22 These invest directly in infrastructure assets as part of their diversification strategy. Examples of such investors particularly active in infrastructure are Ontario Teachers’ Pension Fund and Prudential.
- 23 For example, most major banks create such vehicles. Examples of infrastructure companies creating such vehicles (e.g. to facilitate systems integration) are Balfour Beatty and Babcock & Brown.
- 24 “Infrastructure Funds: Building on strong foundations”, *Financial Times*, 13 March 2008.
- 25 For example, Renaissance Capital, already very active in the Russian Federation and other CIS countries, is increasingly involved in Africa, especially in Kenya and Nigeria. Similarly, the Macquarie Bank Group, which probably has the largest number of infrastructure funds under management (\$22 billion), is active in both developed and developing countries, such as India and South Africa (Orr and Kennedy, 2008). Some developing countries, such as India, are actively encouraging funding in infrastructure by private equity funds (Nazareth, 2008).
- 26 For instance, in facilitating a dialogue with local groups.
- 27 Or “divestitures” in the terminology of the World Bank’s Private Participation in Infrastructure (PPI) Database.
- 28 In principle, the acquisition of a private stake can be separated from a full or partial takeover of the management of the facility, but this is rare.
- 29 These percentages have been calculated on the basis of the total and infrastructure-related FDI stocks of only those countries for which data on FDI stock in infrastructure were available. This is largely a consequence of differing country coverage of FDI data for the infrastructure industry, which shows that such information should be treated with caution.
- 30 This pattern is confirmed and complemented by the list of the world’s largest infrastructure TNCs (see section C) many of which are from these countries, together with others from Germany, Hong Kong (China) and Spain.
- 31 No information is available on actual investment.
- 32 Data on FDI flows and cross-border M&As indicate that the increase lasted till 2000, but data on commitments suggest a decline already in 1999.
- 33 It has to be stressed however, that cross-border M&A and FDI data are not directly comparable, and the fluctuations in the former have been much larger than in FDI flows (*WIR2000*).
- 34 For instance, in 1998, Telecom Portugal acquired 20% of Telesp Celular Participacoes (Brazil) for \$3 billion; in 2000, Telefónica (Spain) acquired the majority of Telecomunicaciones de Sao Paulo (Brazil) for \$10 billion, while in 2007 Telefónica acquired a 50% stake in Colombia Telecomunicaciones for \$3 billion.
- 35 In 2007, Vodafone (United Kingdom) acquired a majority stake in Hutchison Essar (India) for \$13 billion, while Qtel (Qatar) acquired majority shares in Wataniya (Kuwait) for \$4 billion.
- 36 These trends in foreign investment commitments are based on the dates the agreements were reached, rather than when

- investments were actually made – however the latter data are not available.
- 37 These findings differ partly from the results of previous studies. In one previous study of 34 independent power projects (IPPs) in 13 developing and transition economies, the majority of investments were in the form of FDI (Woodhouse, 2006).
- 38 In 1993, State-owned terminals accounted for 42% of world container throughput (i.e. the quantity of cargo that can pass through a port), but by 2006 this figure was down to 19%. The share of State-owned terminals in world throughput varies by region: in Northern Europe it is 6%, in South-East Asia 42%, Eastern Europe 24% and Africa 68% (Drewry, 2007). Even within the same region, the situation differs. For example, the Port of Tanjung Pelepas in Malaysia is 30% owned by the shipping line Maersk Sealand (part of the A.P. Moller-Maersk Group), whereas the adjacent Port of Singapore remains one of the few ports still owned by its national Government, although it has been corporatized. Yet today, most of the top 100 container ports, which represent over 80% of total world container port throughput, have some form of private participation.
- 39 Usually involved in directly related activities (e.g. construction companies also running toll roads, or electricity machinery operators moving into power generation).
- 40 Suez (France), RWE (Germany) and YTL Power (Malaysia).
- 41 For example, Suez (France) and YTL Power (Malaysia) are involved in electricity and water, Hutchison Whampoa (Hong Kong, China) operates in both seaports and telecommunications (and other, non-infrastructure industries), and Bouygues is involved in both roads (through its affiliate Colas) and telecommunications.
- 42 In the case of seaports, however, developed- and developing-country TNCs are on par; for instance, AP Moller-Maersk (Denmark) and DP World (United Arab Emirates) have practically the same amount of foreign assets (annex table A.III.4).
- 43 Foreign assets of infrastructure TNCs, especially firms that operate in a number of different industries (conglomerates), can include non-infrastructure businesses.
- 44 But not in the United States, as mention in section A.3.
- 45 The emergence of private TNCs in developed countries was also made possible by the fact that privatization in these countries seldom involved inward FDI, but rather domestic investments or foreign portfolio investments (though there was also a spate of cross-border M&As).
- 46 In 2007, the number of these firms fell from 7 to 6, as Enel, in partnership with Acciona (Spain), acquired control of Endesa (Spain) (annex table A.III.6).
- 47 Recent mega deals include the acquisition of Powergen (United Kingdom) by E.ON (Germany) in 2002, Electrabel (Belgium) by Suez (France) in 2005, and Endesa (Spain) by Acciona (Spain) and Enel (Italy), and Scottish Power (United Kingdom) by Iberdrola (Spain) in 2007 (annex table A.III.6). In 2008, EDF (France) and ACS (Spain) planned to mount a joint bid for Iberdrola (Spain) and Suez intended to merge with Gaz de France. European utilities are also acquiring assets in the United States. For instance, National Grid (United Kingdom) acquired Keyspan (United States) in 2007 (annex table A.III.3), which gave the former a strong foothold in that host country.
- 48 Regional integration and market liberalization have encouraged the formation of large regional electricity TNCs, especially in Europe and the United States. The EU's attempts to unbundle power generation, transmission and distribution from each other may further reshape the structure of the industry in the region, as utilities owning different segments would be obliged to re-sell some of the segments to new players.
- 49 Examples of such investors, most of which are not in the top 100 or top 50 infrastructure TNCs, include the following: Malaysian companies such as Malakoff, MMC, YTL and Zelan; Thai companies such as Banpu, EGCO and Ratchaburi; Brazilian companies such as Alusa, Petrobras and Votorantim; Singaporean companies such as Singapore's Power International and Asia Power; Kepco from the Republic of Korea; and India's Tata and Reliance Groups.
- 50 Of which Vodafone's acquisition of Mannesmann in 2002 alone accounted for more than \$200 billion.
- 51 América Móvil started its international expansion in 2000 by establishing a joint venture in Brazil with global players Bell Canada and SBC Inc. of the United States. Two years later, it acquired its partners' Latin American assets, and BellSouth's (United States) full Brazilian business. Between 2003 and 2006, it acquired the assets of Verizon (United States) in Argentina, Puerto Rico and the Dominican Republic, France Télécom's stake in Compañía de Telecomunicaciones de El Salvador, Telecom Italia's affiliate in Peru, and a company formed by Endesa (Spain) in Chile (Smartcom). Telmex's purchase of other TNCs' assets was smaller in scale: in 2002, it bought MCI's (United States) stake in a Brazilian long-distance operator, followed by the purchase in 2003–2006 of AT&T's (United States) assets in Argentina, Chile and Ecuador (ECLAC, 2008).
- 52 This company was acquired by Ferrovial Group (Spain) in 2006 (Deloitte & Touche, 2006).
- 53 Copenhagen Airport is an affiliate of Macquarie Airports (Australia).
- 54 Kansas City Southern Industries (United States) was the largest investor in railways in developing countries.
- 55 Bouygues (a major French construction TNC), Bombardier (a major Canadian manufacturer of aircraft and rail transportation equipment and systems) and CAF (Spain).
- 56 Examples are Comazar (South Africa), New Limpopo Bridge Project Investments (a joint venture between Mauritian and South African finance institutions), Railways of India Technical and Engineering Services (India).
- 57 Others include NWS Holdings (Hong Kong, China), Citra Lamtorogung Persada (Indonesia), Road King Infrastructure (Hong Kong, China), Hopewell Holdings (Hong Kong, China), Tribasa (Mexico), and Sideco Americana (Argentina).
- 58 AP Moller-Maersk Group (Denmark) is in second place, and, until its acquisition in 2006 by DP World, P&O Ports (United Kingdom) was fifth. Another significant player in developing countries, Modern Terminals (Hong Kong, China) has emerged more recently and its investment commitments in 2001–2006 exceeded those of PSA (Singapore).
- 59 For example, Sealand, Maersk, APL, P&O Containers and Mitsui O.S.K. Lines.
- 60 Agbar, Suez, Veolia, RWE and Southern Cross, in that order.
- 61 There was a similar, but less marked decline in the share of the top 10 investors (from 86% to 65%).
- 62 Local competitors have the advantage of familiarity with the host economy, everything else being equal.
- 63 In summary form, these factors are the essence of the eclectic or OLI (ownership-location-internalization) paradigm (Dunning and Lundan, 2008). In order to explain the existence of TNCs and their foreign involvement, it is essential to examine three issues. First, the ownership advantages (O) (e.g. technology, managerial expertise, or a recognized brand) a company possesses in order for it to be able to compete with other firms, especially in overseas markets (Hymer, 1976; Kindleberger, 1969; Dunning, 1979; Caves, 1982; Wernerfelt, 1995; Buckley, 1998; Dunning and Lundan, 2008). Secondly, there have to be some location advantages (L) to operating in the foreign host economy as opposed to at home (e.g. larger markets, acquisition opportunities, or lower costs of production). Finally, the modality of entry into a host economy depends on the internationalization decision (I) of the company – whether it is more cost-effective for a firm to utilize its competitive advantages through direct ownership and control of a foreign facility (FDI) or some other means (e.g. a management contract) (Buckley and Casson, 1976; Hennart, 1982; Dunning, 1995; Dunning and Lundan, 2008).
- 64 Early theory on competitive advantages tended to focus on a narrow set of advantages, such as the possession of proprietary technology, brands or other assets, hence “ownership advantages”. However, research has shown that firms can draw on a wider set of assets or advantages, both firm-specific and non-firm-specific, such as access to cheap capital. The typology of FSAs used in this section draws on a framework established in *WIR06* (chapter IV).
- 65 Respondents were asked to mention up to three competitive advantages they possessed, so the denominator for this and

- equivalent figures below is the number of TNCs responding multiplied by 3.
- 66 All the water companies in the survey were from developed countries.
- 67 Unlike other industries, in manufacturing for example, it is harder to distinguish between FSAs deriving from “ownership of technology and expertise” and “production and service capabilities”. The main difference is that the former are advantages embedded in the organization and employees, and are based on long-term experience and tested knowledge. The latter type of FSAs are more akin to solutions that work, but which need to be tested further before they are acknowledged to work or become a part of regular routines.
- 68 Since many projects in electricity, transport and water are large-scale, the remaining investment generally comes from partners in a consortium or bank loans.
- 69 These nevertheless have eventually to be transformed into “ownership” advantages (footnote 67).
- 70 As discussed in “Nomads at last: a special report on mobile telecoms”, *Economist*, 12 April 2008, as well as UNCTAD 2007g; Guislain and Qiang, 2006; and Clifton, Comin and Diaz-Fuentes, 2007.
- 71 For example, mobile virtual network operators (MVNOs) – where a company such as Virgin Mobile (United Kingdom) repackages a telecommunications service actually being run and operated by another company under its own brand – were recently pioneered in Europe, but are already being imitated by companies in Asia and elsewhere (Ernst & Young, 2008c).
- 72 There are also 20 telecommunications TNCs in the top 50 developing-country infrastructure TNCs.
- 73 The established position of incumbents also affects new players from developed countries, who therefore – like developing-country TNCs – find it easier to enter markets in the South. This is one of the reasons that companies such as Sithe Global (United States) in electricity and Millicom (Luxembourg) in telecommunications are focusing on investments in developing economies.
- 74 This topic is discussed in various articles published in Ernst and Young’s online journal, *Utilities Unbundled*, at: www.ey.com.
- 75 Some of them may have a competitive edge over incumbent TNCs because the formation of their FSAs has occurred relatively recently, during a high-growth, export-orientated development phase in their home economies, although these advantages must be critically juxtaposed against the well-honed, long-term experience of developed-country companies.
- 76 However, there are 12 electricity companies (two combined with other industries) in the top 50.
- 77 In the top 100 there are only 5 railroad companies, and none feature among the developing-country top 50.
- 78 The ISO 9000 and 14000 series are quality standards in management/business processes and environmental management respectively, set by the International Organization for Standardization and widely used by businesses.
- 79 Of course, not all investments by Chinese and Indian TNCs are intended to support their respective Governments’ strategic goals.
- 80 Apart from Chinese TNC involvement in infrastructure to support the home country’s extractive industry investments, there may also be other, longer term strategic interests at play in Africa. For example, China has started to establish a series of industrial zones, commencing with one in Mauritius.
- 81 In theory, internalization of markets occurs fully with FDI, partly with BOTs and not at all with management contracts.
- 82 Including controls, such as foreign exchange controls.
- 83 TNCs in the survey generally reported using risk mitigation insurance cover. The most commonly used are “breach of contract cover” and “partial credit guarantees”, but “political risk cover” and other types of insurance are also used. However, the use of risk mitigation cover and debt financing is less common in telecommunications and more frequent in electricity, transport and water, because of both higher short-term profitability and lower costs in telecommunications.
- 84 Commercial bank loans were the most commonly used by companies responding to the survey, though significant amounts were also raised from governments, international financing organizations (e.g. the International Bank for Reconstruction and Development (IBRD)) and private equity funds.
- 85 Apart from water, but this may be an artefact, because only a small number of water companies participated in the survey.
- 86 Here, region is viewed with respect to the location of company, rather than in a predefined way. For example, a Swedish company in the survey is investing in South-East Europe and CIS countries, while a Turkish company has investments around the Mediterranean.
- 87 Again a lack of representation in the survey may be an artefact, since proportionally larger companies were targeted. For example, many European port companies involved in developing countries – such as Mersey Docks (United Kingdom) – are relatively small.
- 88 A very small number of African and Latin American infrastructure TNCs have similar profiles, but generally these companies focus on their local region.
- 89 In some cases, their home governments see these companies as national champions and encourage their global strategies.
- 90 And in some cases, privileged access to cheap funds in their home countries.
- 91 Over 75% of the infrastructure TNCs in the UNCTAD survey have expanded their involvement in developing countries over the past five years, and virtually all said they would continue their expansion over the next five years.

CHAPTER IV

IMPACT OF TNC PARTICIPATION ON HOST DEVELOPING COUNTRIES

Given the participation of TNCs in the infrastructure industries of a growing number of developing countries, and the significance of infrastructure for sustainable development, the implications of TNC involvement are of considerable importance for host countries. Their involvement raises some crucial questions. How does TNC involvement affect the size of investment and performance of infrastructure industries and the provision of infrastructure services, including to the more vulnerable segments of society? In what ways are performance gains derived from TNC involvement better or worse than those engendered by domestic enterprises, and are there any negative impacts to consider? What are the wider effects of TNC participation in infrastructure on the host economy and society? This chapter examines the impact of TNC participation on, and its implications for, host developing countries.

Conceptually, the potential for positive and negative impacts arises mainly from the resources and capabilities that TNCs possess – often reflecting their firm-specific advantages (section III.D) – which can be transferred to their host-country operations, with potential implications for domestic industries and the economy. Among the main advantages are access to financial capital, both internally generated and externally mobilized, and knowledge and expertise (often tacit). The latter include production technology, engineering expertise, management and marketing skills and organizational know-how. Such know-how, in the case of infrastructure industries, also implies the capability of running

networks and managing complex projects. Other factors, such as the impact of TNC entry on market structure, competition and efficiency, can also result in performance gains or losses for a host-country's domestic industries, with implications for the economy as a whole.

Whether the potential for favourable impacts is realized, and the extent to which TNC participation in infrastructure might have negative consequences for host countries, depends in turn on a number of factors, including firm-, industry-, and country-specific conditions. For example, at the firm level, TNCs' strategies with respect to internationalization, in particular their mode of participation in a host country, affect the degree and type of technological or other assets that can be transferred to host-country entities. Industry-specific factors include the capital intensity, technological complexity, market structure and social significance of different infrastructure industries. Country-specific factors comprise, among others, domestic industrial and human-resource capabilities, and the availability of necessary inputs complementary to those provided by TNCs. And, most importantly, they also include government policies with respect to TNC participation, effectiveness of policy implementation, the quality of institutions and governance in host countries, and regulatory and negotiating capabilities with respect to private participation in general, and TNC participation in particular in infrastructure industries (chapter V).

A major challenge for the analysis is how to isolate TNC-specific impacts.



Current or past domestic public or private provision of the relevant services is taken into account as a counterfactual, where possible and relevant, in the analysis. Section A of the chapter examines the impact of TNC participation on financial flows for, and investment in, infrastructure industries. Section B considers first the impact of TNC involvement on the performance of infrastructure industries through the transfer of technology and organizational and managerial expertise, and through its effect on competition and efficiency in service delivery. It then goes on to examine the overall impact on the provision of infrastructure services and its implications for access by the poorer sections of the community. Finally, section C considers some broader development implications of TNC involvement in the infrastructure industries of host countries. Section D concludes.

A. TNCs' role in mobilizing financial resources and the impact on investment in infrastructure industries

Expanding and upgrading infrastructure in keeping with developing countries' growing requirements calls for substantial investment in infrastructure industries, which are typically capital-intensive due to the physical facilities and networks that they involve (section III.A.1). Many projects are very large and are characterized by economies of scale. They require huge capital outlays, while the stream of returns on capital is spread over many years. Thus the risks to investors are typically high. Mobilizing the necessary financial resources from domestic or international capital markets is difficult for public or private enterprises in many developing countries. This has led a number of countries to open up to FDI and/or encourage other modes of TNC involvement, such as build-own-operate (BOO), build-own-transfer (BOT) or rehabilitate-own-transfer (ROT) concession arrangements (section III.B). Indeed, TNCs may have a number of competitive advantages that enable them to contribute to the mobilization of financial resources for boosting investment in infrastructure industries, while also being directly involved in undertaking the investments and production activities for the provision of infrastructure services.

Financial strength and large cash flows are competitive advantages that foster rapid expansion of many TNCs operating in infrastructure (section III.D). In addition, large and well-established firms are able to raise funds from home-country and international markets as well as from host developing-country markets, where the latter exist (section III.A.3). This

ability to mobilize and harness external financial resources for investment is particularly evident in concessions such as BOTs, in which a high proportion of the costs are covered by debt.¹ However, the extent to which TNCs can contribute to financial resources for investment in infrastructure also depends on host-country conditions and objectives, the specific infrastructure needs of a country and the gaps in domestic (State and private) resources and capabilities.

In the early 1990s, as more and more developing countries began to open up their infrastructure industries to private national and foreign companies, it was believed that TNCs could play a key role in securing financial resources to reduce the persistent gap between infrastructure needs and investments by the State, which was the main provider of the services. At the time, many of the countries concerned, especially in Latin America and Africa, were heavily indebted and turned to the private sector, including TNCs. Since then, the financial situation has improved for some economies, but the investment gap in infrastructure still remains very large in the developing world as a whole (section III.A.2). Thus the ability of TNCs to mobilize financial resources for investment remains an important consideration for many countries. Indeed, TNC participation in infrastructure in developing countries has resulted in the inflow of substantial financial resources. One indicator, allowing for data limitations, is the stock of infrastructure FDI in developing countries, which surged 29-fold between 1990 and 2006: from \$6.8 billion to \$199.4 billion (table III.4). Another measure, the foreign investment commitments in private participation in infrastructure (PPI)² projects (which include FDI, but also other investments that are an element of concessions), also indicates that TNCs have mobilized significant resources for investment in developing countries. During the period 1996–2006 such commitments amounted to about \$246 billion (table III.7). The impact on infrastructure investment in developing countries arising from this mobilization of financial resources by TNCs is discussed below, including variations by region, industry and country.

Overall impact of TNC involvement on infrastructure investment in developing countries. Not all financial resources mobilized by TNCs constitute investment or an addition to productive assets for a host industry or country. One reason is that a proportion of FDI by TNCs is used to purchase privatized enterprises, which represents a transfer of ownership, but not new capital stock.³ But at the same time other forms of TNC participation also include investment.⁴ This is especially true of concessions, which involve large amounts of investment to build new or improve existing infrastructure.⁵ During the period 1996–2006, according to data on the breakdown

of foreign investment commitments (referred to in the discussion below as TNC commitments), 52% of TNC participation, *by value*, in the infrastructure industries of developing countries was in the form of FDI, while the remaining 48% was in the form of concessions.⁶ This nearly equal ratio of concessions to FDI implies a possibly greater overall impact on investment in infrastructure industries than that suggested by data on the stock of FDI (even allowing for some financial resources being used for purposes other than investment). Because some relevant data are not available, it is not possible to give a precise figure for the impact of TNCs, but it is certainly appreciable and likely to be higher than that suggested by FDI data alone.

The value of new TNC commitments in infrastructure projects in developing countries were lower in 2001–2006 than in 1996–2000 but this was largely a reflection of a more general downturn in infrastructure investments in developing countries and globally. TNC infrastructure investment commitments in Latin America and the Caribbean fell from \$109.4 billion to \$21.7 billion between 1996–2000 and 2001–2006 (table III.7). On the other hand, TNC commitments increased in Africa between the two periods, and fell only slightly in Asia (table III.7).⁷

The fall in TNC infrastructure investment commitments between the two periods was concentrated in a few large countries in Latin America⁸ and Asia, in particular Argentina, Brazil, Colombia, India, Indonesia and Peru.⁹ But, according to the PPI database, in most developing countries those commitments rose between 1996–2000 and 2001–2006. Some of the larger countries in which they rose sharply were Bangladesh, Chile, Egypt, Nigeria, Jordan, Pakistan and the United Republic of Tanzania.¹⁰

A number of factors influence the level of TNC investment, including the budgetary situation of prospective host countries. For example, trade surpluses from rising commodity prices and sales of goods and services have improved the budgetary situation in a number of countries, especially in Africa, Latin America and the Caribbean and West Asia. This allows them more options for infrastructure investment, including a greater reliance on domestic enterprises.¹¹ However, since a number of developing countries, especially least developed countries (LDCs), have insufficient institutional and enterprise capabilities to build and operate infrastructure facilities effectively, they are unable to readily convert an influx of funds into investments in this sector. Countries in this position are exploring a number of approaches to address this institutional gap, which poses a constraint to infrastructure development. Some of these approaches entail significant participation by TNCs, an example of which is the Angola-China partnership in infrastructure investment (box IV.1).

In addition to their direct impact on investment, the entry and operations of TNCs can indirectly influence investment levels in host country infrastructure industries through their effects on investments of domestic firms – whether SOEs or private enterprises (*WIR99*). These effects can vary: TNC involvement may “crowd in” other investors (e.g. successful operations by the TNC may encourage investment by domestic enterprises through their “demonstration effect”) (examined further in section B.1); or an increase in the competitive advantages of domestic enterprises through diffusion of technology and other know-how from TNC operations may enable them to invest in new areas (section B.1); or, taxes paid by TNCs could potentially be used for further infrastructure investments by the State (section C). On the other hand, a fall in investment levels might occur

Box IV.1 The Angola-China partnership in infrastructure investment

A strategic partnership was established between the Governments of Angola and China to finance and undertake infrastructure investments in 2004. Rich in oil and gas, but few other natural or man-made resources and in need of massive and speedy rehabilitation of its infrastructure after decades of civil war, Angola concluded an agreement with China, whereby, in return for providing China with a secure supply of oil, Angola would receive large oil-backed loans for rehabilitating and expanding its infrastructure. An important element of the agreement is that the bulk of the work would be undertaken by Chinese TNCs, but after a process of competitive bidding by at least three Chinese companies.^a

A number of other African countries, notably the Democratic Republic of the Congo, are considering similar strategic partnerships with China. Countries such as India are also showing interest in similar collaboration in Africa (section III.D). It is too early to assess the effectiveness of the Angola-China arrangement, especially compared to other approaches. But given the pressing infrastructure needs of a number of countries in Africa, their lack of domestic public and private capabilities in these industries, and the opportunity to use (future) trade surpluses to pay for (current) infrastructure investment, it is understandable that their governments are tempted by this approach.

Source: UNCTAD, based on Corkin, 2008; Pradhan, 2008; Chan, 2007; and Corkin and Burke 2006.

^a A number of Chinese companies, such as China Road and Bridge Corporation (CRBC), Jiangsu International and ZTE Corporation, are already working on infrastructure projects throughout Angola. A few have partnerships with Angolan firms and TNCs from other countries (such as Galf Engineering, a German firm specializing in road building).

from the “crowding-out” of investors, for example because of competition, when domestic enterprises are still at an early stage of development or due to anti-competitive behaviour by TNCs (section B.2).

A consequence of investment in infrastructure by foreign companies in the 1990s was a decline in public investment in the sector across much of Latin America and parts of Africa. In expectation of a large-scale increase in private sector investment, many governments in Latin America – faced with persistent budgetary gaps – cut back drastically on public expenditure in infrastructure in the early 1990s (Calderón et al., 2003, Calderón and Servén, 2004; Servén 2007, Kirkpatrick et al., 2006). Between 1980–1985 and 1996–2001, total expenditure on infrastructure investment in seven major Latin American economies taken together declined from a weighted average of 3.7% of GDP to 2.2%, even though private investment (primarily by TNCs) in the industries actually rose from 0.6% to 1.4% of GDP (Calderón and Servén, 2004), albeit with considerable differences between countries.¹² An important lesson from the Latin American experience is that TNC participation should not be considered sufficient to meet a country’s investment needs in infrastructure; rather, it should be viewed as an important supplement and complement to domestic investment. Developing countries should therefore strengthen and improve the capabilities of their State-owned enterprises (where these continue to play a role), while at the same time encouraging their domestic private sector to develop the necessary expertise and financial capabilities to participate effectively in infrastructure industries (chapter V).

Variations in the impact of TNC involvement on investment, by industry, region and country. As mentioned earlier, investments by TNCs in infrastructure projects in developing countries amounted to \$246 billion during the period 1996–2006, or an average of 28.5% of total investment commitments (figure III.1). This share indicates an appreciable contribution by TNCs to infrastructure investment in developing countries, as a whole. Differences exist in the degree of TNCs’ impact on the level of investments by industry, region and country, judging from the variations in the shares of TNCs in total private sector infrastructure investment commitments (or PPI investment commitments).

By infrastructure industry, TNCs’ shares in PPI investment commitments during the period 1996–2006, were highest in telecommunications (35.2%) and electricity (30.0%), and lowest in water (25.2%) and transport (19.3%) (figure III.1). Apart from this, according to the World Bank’s PPI database, other notable variations included: (i) a significant drop in the share of TNCs in energy investments in South Asia between 1996–2000 and 2001–2006, primarily

reflecting difficulties faced by India in realizing its strategy towards attracting infrastructure TNCs;¹³ (ii) a decline in TNC participation in the telecommunications industry in East Asia and South-East Asia and Latin America and the Caribbean during the period 2001–2006, reflecting the growing strength of domestic companies in these regions (section III.C);¹⁴ (iii) very large swings in TNC investment commitments in transport in nearly all regions between 1996–2000 and 2001–2006, possibly reflecting developments in a number of the sub-industries involved; and (iv) increases in TNCs’ share in overall private investment commitments in water in some regions and subregions between 1996–2000 and 2001–2006, reflecting the efforts of countries to improve access to safe, clean water for their populations.

Regionally, the share of TNCs in total PPI commitments ranged from 19.8% in Asia in 1996–2006 (with the lowest share in South Asia and highest in West Asia) to 35.5% in Africa and 33.3% in Latin America and the Caribbean.¹⁵ The variation in the share of TNCs in PPI investment commitments during the period 1996–2006 was even greater by country, with 75% of economies (out of 105 for which data are available) indicating a share above the overall average of 28.5% (table IV.1). The overall average share is low because a number of countries with large total investment commitments have below-average figures for the share of TNCs in these commitments, including Brazil, China, India, Malaysia, Mexico and South Africa.¹⁶

In a large number of countries the share of TNCs in total PPI investment commitments is significant: between 28% and 50%; and in a number of them the share is even higher, in the 50%–75% range (table IV.1). Furthermore, for nearly one fifth of countries (20) TNCs’ share in total private sector investment commitments is 75% or more. This group includes 13 LDCs, among them Burundi, Chad, Guinea-Bissau, Haiti, Maldives, Samoa and Sudan.¹⁷ Their high share of TNC participation implies that for many LDCs TNCs are more or less *the* private infrastructure sector.

* * *

TNC participation has mobilized significant financing for the expansion and improvement of infrastructure industries in developing countries, and the consequent impact on investment varies by industry, region and – especially – country. The impact on the level of investment is appreciable, with a 29-fold increase in FDI stock between 1990 and 2006, and considerable investment linked to concession agreements. The importance of TNC participation varies among countries; for example, of the countries receiving the highest amount of foreign investment commitments during 1996–2006, China and South

Table IV.1. TNCs' share of private sector investment commitments in developing economies, all infrastructure industries, 1996–2006

Percentage ranges				
Up to 25%	Between 25% and 50%		Between 50% and 75%	75% and over
Number of countries				
15	61		9	20
Angola	Below 28.5%		Afghanistan	Burundi
Barbados	Argentina	Lao People's Democratic	Cameroon	Chad
Cape Verde	Benin	Rep. of	Congo, Republic	Comoros
China	Botswana	Mauritius	Guatemala	Djibouti
India	Brazil	Mozambique	Jamaica	Dominica
Malaysia	Cambodia	Philippines	Liberia	El Salvador
Mauritania	Colombia	Viet Nam	Madagascar	Gambia
Nepal	Costa Rica		Panama	Grenada
Papua New Guinea	The average TNC share of private sector		Zimbabwe	Guinea
South Africa	investment commitments is 28.5%			Guinea-Bissau
Sri Lanka	Above 28.5%			Guyana
Thailand	Algeria	Iran, Islamic Rep.	Paraguay	Haiti
Trinidad and Tobago	Bangladesh	Iraq	Peru	Maldives
Venezuela, Bolivarian Rep.	Benin	Jordan	Rwanda	Nicaragua
Yemen, Republic	Bolivia	Kenya	Senegal	Samoa
	Burkina Faso	Lebanon	Seychelles	Sao Tome and Principe
	Chile	Lesotho	Syrian Arab Republic	Sierra Leone
	Congo	Malawi	Swaziland	Saint Lucia
	Côte d'Ivoire	Mali	Tanzania, United Republic	St. Vincent and the
	Cuba	Mexico	Togo	Grenadines
	Dominican Republic	Mongolia	Tunisia	Sudan
	Ecuador	Morocco	Turkey	
	Egypt, Arab Republic	Myanmar	Uganda	
	Equatorial Guinea	Niger	Swaziland	
	Gabon	Nigeria	Uruguay	
	Ghana	Oman	Zambia	
	Honduras	Pakistan		
	Indonesia	Palestinian territory		

Source: UNCTAD secretariat calculations, based on the World Bank's PPI Database.

Notes: The PPI database comprises infrastructure projects in developing countries with private sector investment – whether by TNCs or the domestic private sector. The total commitments in the PPI database include investments by TNCs and the domestic private and public sectors. Projects which are 100% public sector funded are excluded.

Africa had low TNC shares in total PPI commitments, but others, such as Egypt and Pakistan, had high shares. Significantly, of the developing countries for which the TNCs' share in PPI commitments exceeded 75%, over half (13 out of 20) were LDCs. Although LDCs do not receive much investment from TNCs, such investment nevertheless constitutes a very significant proportion of private investment in their infrastructure industries.

B. Impact on industry performance and the provision of infrastructure services

TNCs affect the performance of those industries and the provision of those services in which they participate, not only through their impact on investment, and thereby the capital stock for production (section A), but also through other channels. This section examines the impact of TNC participation on host country infrastructure industries through its technological effects (section B.1) and its effects on competition and efficiency of service provision (section B.2). It then considers the overall

impact of TNC participation on the provision of services in the various industries in terms of total supply, price and quality, and access (section B.3). A key question is whether, and to what extent, TNCs help improve the provision of infrastructure services relative to other options available. In attempting to answer this, the analysis considers a number of counterfactuals and their implications.

In developing and transition economies, TNC participation (and private sector participation in general) over the past two decades has often taken place in the context of the market-oriented reform of infrastructure industries. Such reform necessitates the introduction of market elements on both the demand and supply sides of transactions in infrastructure services. On the demand side, it requires changing expectations regarding payment for services such as electricity and water, which are often subsidized, regardless of buyers' incomes, under pre-reform public sector provision. On the supply side, it involves incorporating economic incentives in decision-making regarding policies relating to production, and establishing an effective pricing and collecting mechanism. In addition to the corporatization of State-run public utilities, the entry of TNCs is one option for achieving this end. Many developing countries, especially those with budgetary constraints and limited domestic private

enterprise capabilities in these industries, have chosen this option. Thus, in considering the impact of TNC participation on host country industries and services provision, it is important to bear in mind that the changes observed occur under conditions that differ from the pre-reform conditions in which the earlier State-run public utilities operated. In addition, the specific impact of TNC participation on efficiency¹⁸ and services provision varies by industry, depending on the technological and institutional characteristics of the industry.

1. Technology transfer and diffusion

Limited domestic technological and engineering capabilities, as well as managerial and other expertise, prevent many developing countries from undertaking infrastructure projects and providing related services. Thus in infrastructure, as in other industries, technology transfer is among the most important potential contributions that TNC participation can make to host developing countries.

TNCs in infrastructure bring both hard technology (e.g. specialist equipment for water purification) and soft technology (e.g. organizational and managerial practices or business models) to their operations in host countries. However, infrastructure industries are generally not of a high-tech nature. Therefore, hard technology is not the principal ownership-specific advantage of TNCs in this sector, except in specific niches (such as the knowledge to harness nuclear or geothermal power). More frequently, the competitive advantages of infrastructure TNCs hinge on specialist expertise or capabilities, such as the ability to organize and operate networks, engineering skills, environmental know-how, project management capabilities, financial prowess and managerial expertise (section III.D).

The extent of positive effects arising from technology transfer depends on the degree to which TNCs' expertise is superior to that of domestic firms that could have been involved in a similar way. In fact, in the initial phases of TNC participation in the 1980s and 1990s, private domestic alternatives were lacking in many of the host developing countries, and a number of improvements that occurred in host-country infrastructure industries can be attributed largely to the competitive advantages of TNCs in establishing, managing and operating their infrastructure entities.

As regards hard technology and equipment, in telecommunications, for instance, market entry by international operators from both developing and developed countries has contributed to the rapid diffusion of digital mobile telephone technology across the developing world (Rouvinen, 2006; Ure,

2008; box III.16). This technology has significantly lowered the threshold of access to and usage of information and communication technologies (ICT) for developing countries (UNCTAD, 2007). Similarly, international terminal operators such as Hutchison Port Holdings (Hong Kong, China) and APM Terminals (the Netherlands) (table III.15) have helped improve the efficiency of cargo handling by introducing new equipment and processes in container ports around the developing world, along with the expertise required for their efficient use.¹⁹

TNCs can also help improve productivity and efficiency by transferring soft technology to host country operations. A number of studies show that TNCs that took over State-owned service utilities made changes to processes that reduced costs and delivery times and, in some cases, improved quality standards (World Bank, 2002; Platz and Shroeder, 2007). Changes introduced included re-engineering of operational processes, improving procurement and subcontracting practices, and enhancing client records and collection methods.

Overall, studies show that the introduction of hard and soft technologies by foreign affiliates has helped enhance labour productivity in services provision in a number of cases. In Latin America, for instance, between 1994 and 2000 labour productivity increased by about 6% annually among privatized electricity distributors, most of which involved TNC participation, partly because of reorganization of operations (Estache and Rossi, 2002). (However, improved technology and enhanced productivity may also lead to retrenchments in the labour force, as discussed in section C.) Another study on Latin America found that labour productivity increased significantly for privatized fixed telephone services, electricity and water supply, as TNCs improved the systems in place (Andres et al., 2005). In India, labour productivity in port terminal operations rose dramatically after the participation of TNCs, which led to the introduction of newer technology and human resource management practices (Nazareth, 2008). In mobile telephony in some African countries, productivity measured by subscribers per employee has risen significantly after TNC entry, and it tends to be higher than in developed countries (Minges, 2007).²⁰

Looking beyond pure productivity and efficiency considerations, the introduction of technology by foreign affiliates has also helped improve the reliability and quality of service provision in a number of cases. Poor quality of services and inadequate maintenance of networks were often the most serious problems in earlier public provision of infrastructure services in developing and transition economies, even in some relatively high-income economies. Case study evidence on the results of

TNC-involved privatization and concessions in infrastructure industries show improvements in the reliability and quality of service provision as a result of investment in new hardware, systems and training (World Bank, 2001; Shirley, 2002; Jerome, 2004; UNCTAD, 2007g; Nazareth, 2008).

The industry-wide impact of technology transfer by TNCs also depends on their transmission of technology to other firms in the industry. To the extent that technologies and knowledge are firm-specific, the potential for wider dissemination may be more limited in the case of wholly-owned foreign affiliates, as compared with other modalities of TNC participation, such as joint ventures or non-equity participation.²¹ In China's electricity generation industry, for instance, TNC participation in large joint-venture projects has involved systematic and comprehensive project management cooperation between foreign investors and their Chinese counterparts, enabling the latter to enhance their expertise and efficiency (Wang, 2008). The capabilities and experience-based knowledge of TNCs in managing large-scale projects in China have enabled their local partners to acquire knowledge of, and adapt to, international standards and processes, including feasibility studies, project planning, migrant relocation, environmental protection, transparent bidding procedure and efficient project management.²²

In addition to the above-mentioned cooperative arrangements, there are other, less visible, channels for knowledge transfer from foreign affiliates to domestic firms in infrastructure, including spillovers of various kinds that may be particularly important in infrastructure industries in which firm-specific advantages are often in soft technology. Mobility of personnel from foreign affiliates to domestic enterprises is one example of a spillover; the demonstration effect is another. Regarding the latter, in some cases, even when the scope of TNC participation in an infrastructure industry has been limited, it has provided examples of high-quality service provision and exposed local competitors as well as regulators to international "best practices" in service provision, network maintenance and quality control. The influence of the demonstration effect is evident in a number of infrastructure industries in India, including telecommunications and transportation. For instance, in India's port industry, the high performance of TNCs has set a standard for the country's emerging domestic private operators in seaports, such as Reliance, Gammon and Adani, to strive for a similar international "best practice". Reliance Communications and Tata Communications have emerged as international players, partly as a result of the strong demonstration effect of telecommunications TNCs in the domestic market (Nazareth, 2008). Importantly, for spillovers such as

the demonstration effect to occur, existing capable domestic enterprises are essential.²³

In developing countries, in recent years, an increasing number of domestic private firms, often minority partners in TNC-led projects, have acquired the knowledge necessary to operate in infrastructure industries. Even without the direct participation of TNCs, domestic firms can build technological capabilities and improve services provision based on their own efforts, provided they have clear objectives and can invest in the necessary expertise.²⁴ For instance, the case of domestic private power producers in Mauritius demonstrates the potential technological capability and viability of local private enterprises (box IV.2).²⁵ An alternative is to enlist the support of international engineering and design companies such as Atkins (United Kingdom), BCEOM (France), Mott McDonald and Parsons Brinkoff (both United States), which have increasingly become important suppliers of skills and know-how in infrastructure industries. For example, all the above-mentioned engineering and design companies have established subsidiaries in India, that serve both domestic and international clients (Nazareth, 2008).

2. Effects on competition and efficiency

Where the potential for competition exists, TNC entry into infrastructure industries through greenfield investments can increase competition, and thus, efficiency. Generally speaking, the higher the contestability of a market for the services provided by an industry or industry segment, the more likely it is that TNC participation could contribute to enhanced efficiency via increased competition. Due to the specific features of infrastructure industries, however, the contestability of the industries is often seriously constrained (section III.A.1), and the effects on competition vary considerably by industry and host country.

In *mobile telephony*, technological progress – coupled with institutional changes and related market entry opportunities – has eroded the former natural-monopoly structure of the telecommunications industry. In many countries, a more or less competitive market structure has been established in the process of telecommunications reforms, including in LDCs such as Cambodia and the Lao People's Democratic Republic, very often as a result of greenfield TNC entry. Table IV.2 provides some examples of the estimated market share ranges of mobile operators – most of which are TNCs – in selected developing countries. TNC entry in the absence of sufficient numbers of domestic competitors has helped enhance competition, contributing to improved economic

Box IV.2. The potential for independent domestic power producers: the case of Mauritius

In the reform of electricity industries in many African countries, local private participation has been limited, often hampered by the technology- and capital-intensive nature of large-scale projects (ECA and UNEP, 2007). However, the Mauritian example shows that this need not be an insuperable obstacle. This country provides a model example of the potential role that domestic independent power producers can play. Indeed, as much as 40% of electricity generation in the country is undertaken by domestic, privately owned and operated bagasse-based cogeneration plants.^a Initially, domestic firms were only capable of undertaking projects based on conventional technologies with an investment of about \$4 million and an installed capacity in the range of 10–15 megawatts. Based on steady technological progress, domestic firms, in technology partnerships with foreign investors, have been able to construct a \$100 million high-tech, high-pressure cogeneration power plant with an installed capacity of 70 megawatts.

Source: UNCTAD, based on ECA and UNEP, 2007.

^a Cogeneration refers to the generation of electricity and thermal energy in a single, integrated system.

performance. This is reflected, for instance, in higher efficiency and lower prices. In Uganda, for example, competition between Uganda Telecom (State-owned, but partially privatized), Celtel (the Netherlands) and MTN (South Africa), has been intense (Econ One Research, 2002; Farlam, 2005). This had led to price reductions and a rapid increase in mobile penetration: from two subscribers per 1,000 inhabitants in 1998 to 31 per 1,000 in 2003. In 2006 the Government lifted a moratorium on new licences, and competition is intensified.²⁶ Consumers may benefit more, e.g. because of the entry of Reliance Communications (India) which has considerable experience in serving low-income customers in India.

On the other hand, experience in parts of the developing world demonstrates that the entry of TNCs into a country's telecommunications industry may be associated with significant market power. Two companies, Telefonica (Spain) and Telmex (Mexico) (with its sister firm America Mobile), have established strong positions in some key markets in Latin America (Mariscal and Rivera, 2005).²⁷ In Indonesia, the strong market position of ST Telemedia (a subsidiary of Temasek Holdings, Singapore) led to an antitrust suit against the company in 2007, leading it to sell its stake in the Jakarta-based PT Indosat.²⁸ Market dominance by TNCs can occur especially in small-sized developing countries, due to the small size of their telecommunications markets.²⁹ Thus, even in telecommunications, host country governments cannot assume that competition will occur automatically as a consequence of TNC entry; they need to play a proactive role in introducing and safeguarding competition by developing appropriate policies and regulations (chapter V).

Some studies show that privatization in telecommunications, including that involving TNC entry, can contribute significantly to enhancing the industrial performance of telecommunications, as measured by output growth, network expansion and productivity improvements (Ramamurti, 1996; Petrazzini and Clark, 1996; Ros, 1999; Li and Xu, 2002). A number of studies have examined

the relationship between privatization, regulation and competition. They have demonstrated the complementarities between privatization and competition, in that competition increases the gains from privatization and vice versa (Newbery, 1997; Ros, 1999; Wallsten, 2000a). In particular, the modalities of privatization and TNC entry related to different degrees of competition can influence the extent of performance improvements (Li and Xu, 2002).³⁰

In the *electricity industry*, the extent to which competition can be injected into services provision varies, depending on the segment of the value chain – generation, transmission or distribution (table III.2).³¹ In Asian countries such as China, Indonesia and the Philippines, TNC participation has been steered to investment in electricity generation through greenfield investments. The establishment of foreign-invested power plants has enhanced competition and helped improve efficiency to meet the rapidly growing demand for electricity (Bacon, 1999; Nikomborirak and Mannachotphong, 2007). In contrast, in Latin American countries such as Argentina, Bolivia and Peru, TNCs have participated in all three segments of the electricity industry in the privatization process, which was initiated with the specific objective of reducing system losses in electricity distribution (Bacon and Besant-Jones, 2001; Besant-Jones, 2007). In these countries, initial performance improvements were significant (table IV.3), but they did not always translate into price reductions and wider access to services (section B.3).

In other industries as well, governments need to be diligent in maintaining competition to the extent possible. For example, in Chile, a competitive electricity generation market was established during the privatizations of the 1980s. However, the Chilean Government did not place sufficient safeguards on the anti-competitive potential of a cross-ownership of assets in different segments of the electricity industry. After privatization, a foreign affiliate (Enersis) gained control of the three segments of one of the country's two major electricity systems³² (Lalor and Carcia,

Table IV.2. Estimated market share ranges of mobile telecommunications operators with TNC participation in selected countries, end 2007

Region	Country	Market share				Number of competitors
		50% and over	25% – 50%	10% – 25%	Less than 10%	
Africa	Dem. Rep. of the Congo	–	Vodacom	Millicom	–	4
	Ghana	MTN	Celtel	CCT	–	4
	Tanzania, United Rep. of	–	Millicom	Ghana Telecom	Hutchison	4
Asia	Cambodia	Millicom	–	Vodacom	Zantel	5
			–	Celtel	–	TTCL Mobile
	Lao People's Dem. Rep.	Lao Telecom	–	Camshin	Appliphone	4
	Sri Lanka	–	Dialog	Shinawatra	–	4
LAC	El Salvador	–	Millicom	Millicom	Hutchison	4
	Bolivia	–	Entel	Mobitel	–	3
	Colombia	América Móvil	–	Millicom	Intelfon	5
				Telefónica	Millicom	3

Source: UNCTAD, based on Millicom, Annual Report for the period ending 31 December 2007.

1996). This led to concerns over anti-competitive behaviour due to vertical integration, and consequent intervention by the Prosecutor's Office and the Antitrust Commission as early as 1992 (OECD, 2004). It also prompted a number of antitrust trials (Basanes et al., 1999), and eventually a reform of the law with two amendments, in 2004 and 2005 (Arellano, 2008).

In *water supply*, which is generally still a natural monopoly, the entry of TNCs runs the risk of State monopolies being turned into private foreign-owned ones (Kirkpatrick et al., 2006). The room for enhancement of allocative efficiency as a result of a higher degree of competition is therefore limited. In the context of market-oriented reforms, however, TNC entry may still help improve the efficiency of services provision by replacing inefficient operations with ones that have stronger organizational and managerial capabilities and can respond to incentives (section B.1).³³

While the entry of TNCs may increase competition and thus efficiency in some markets for infrastructure services, it may also preempt the entry of domestic players or crowd out existing ones. For example, in fast growing industries such as *mobile telephony*, where TNCs are major players in many developing countries (such as in Africa and Latin America), domestic players may not be able to emerge. This is partly because they would not be able to match the price and services that foreign affiliates offer. Similarly, in power sector reforms in many African countries, current trends indicate that the State is handing over large segments of

the electricity industry to foreign operators. This may be necessary in the short run because of insufficient indigenous technology and expertise to ensure essential services, but for the long term governments and the private sector need to work towards improving relevant domestic capabilities (ECA and UNEP, 2007).

In many LDCs, the capabilities of domestic private enterprises are often too low for them to be able to enter segments of the electricity industry in the near future, but it is

possible to work towards local private participation, for example in the development of independent power producers (IPPs). Indeed, vertical unbundling (section III.A.1) provides possibilities for governments to introduce competition in electricity generation and to allow the entry of IPPs. However, there are no IPPs at all in some LDCs, including Botswana, Burkina Faso, Eritrea, Ethiopia, Lesotho, Malawi, Namibia and Niger, largely because of a lack of local capabilities (ECA and UNEP, 2007).

In some developing countries where domestic capabilities exist, local private participants can enhance their competitiveness and efficiency by collaborating with TNCs in a variety of ways. For example partial privatization, with minority ownership participation by TNCs, has been implemented by many developing countries, with favourable results for competition. For instance, Maroc Telecom (Morocco) became a competitive enterprise and, indeed, a TNC in its own right³⁴ through such a process.³⁵ In China, infrastructure investments with TNC participation are usually joint ventures between foreign TNCs and State-owned enterprises,

Table IV.3. Indicators of performance improvements in electricity by distributors in Latin America: changes in selected indicators from the year of privatization to 1998
(Per cent)

Company	Host country	Year privatized	Parent company (home country)	Annual sales	Energy losses	Customers/employee	Bad debts (% sales)
Chilectra	Chile	1987	ENERSIS, a subsidiary of ENDESA (Spain)	26	-70	37	-88
Edesur	Argentina	1992	ENDESA (Spain)	79	-68	180	-35
Edenor	Argentina	1992	EDF (France)	82	-63	215	..
Luz Del Sur	Peru	1987	Peruvian Opportunity Company (United Kingdom/the Netherlands)	19	-50	135	-65

Source: UNCTAD, based on Besant-Jones (2007) and company websites.

with improvements in efficiency in the relevant firms (Wang, 2008). In India, the reform of the electricity sector triggered the emergence of domestic private electricity companies such as Tata Power, Reliance Power and Torrent Power, most of which entered the sector by establishing joint ventures with TNCs in the domestic industry during the 1990s (Nazareth, 2008). In other cases, various private-public partnership (PPP) arrangements have allowed governments in developing countries to retain their ownership of assets, while contracting TNCs or domestic private players to improve performance in service provision (chapter V).

As an alternative to TNC involvement, some developing countries have been able to improve the performance of public utilities through corporatization reforms,³⁶ without direct TNC participation. In telecommunications, some State monopolies have been transformed into companies listed in domestic and international stock markets through public offerings: corporatized firms such as China Mobile and China Telecom have been able to enhance their performance and provide sound services to the public (Ure, 2008). In water and electricity, significant performance improvements have also been achieved without the involvement of TNCs, as in the case of Ugandan National Water and Sewerage Corporation (UWSC), which has a performance contract with the Government (Muhairwe, 2007).³⁷ Furthermore, a number of SOEs have become competitive global players: in Singapore, for example, Singtel and PSA International³⁸ are leading TNCs in their respective industries (*WIR06*).

However, in some instances, corporatization reforms have failed (World Bank, 2005),³⁹ which underlines the need for caution when undertaking counterfactual analyses of TNC impacts relative to the alternatives available. It is important to ensure that such analysis are conducted on a realistic basis: many successful cases are reliant on specific national or local conditions, which may not be easily replicable. For instance, Singapore has been successful in nurturing State-owned infrastructure TNCs, but this was based on nearly two centuries of developing trade-orientated infrastructure assets and associated expertise. Furthermore, since the 1960s, the Singapore Government has had a sustained vision of the island State's infrastructure strategy along with the funds to realize it (Mirza, 1986; Williamson, 2004). Similarly, City Power (South Africa) has been successfully transformed into an efficient State-owned electricity enterprise, but this is more feasible in a large city such as Johannesburg, where power demand is growing at over 20% a year and the necessary human and other resources are available, than in an LDC (section III.A.3).

Finally, while TNC participation in an economy's infrastructure industries can enhance

competition in some markets and help introduce competitive elements into others that are akin to natural monopolies, it also exposes the country to certain risks. A major problem is that of frequent renegotiation of contracts in projects involving TNC participation (box IV.3). There has been a high incidence of such renegotiations, particularly in electricity and water. Renegotiation can be a useful instrument to tackle issues arising from the inherently complex nature of infrastructure contracts, and it is not an unusual occurrence (Harris, 2003). However, government decision-makers need to take into account the fact that excessive renegotiations, and the withdrawal of TNCs, that sometimes follows failure to reach agreement, may have implications for the industries concerned (chapter V).

3. Impact on provision of services and implications for universal access

For host country users of infrastructure services – households as well as enterprises – the final outcome of TNC involvement in those services is reflected in its impact on the quantity, quality and price of the services. To the extent that TNC participation enhances the supply capacity of infrastructure services through investment, and strengthens their technological and/or organizational and managerial capabilities, it expands the coverage of infrastructure networks and the total volume of services delivered. The increase may include expansion of existing services as well as introduction of new services, and, as noted earlier, it can also result in improved quality of services. More importantly, TNC participation can influence the prices of infrastructure services, the direction and extent of which depend on a number of factors, including the impact on supply as well as market structure, the degree of competition, contractual obligations, and the regulations prevailing in each infrastructure industry.

In addition to the impact on the overall conditions of supply of services, as indicated by changes in quantity, quality and price, the access dimension of infrastructure services provision needs to be considered. Ensuring universal access to such services, especially drinking water and electricity, remains one of the greatest development challenges for national and local governments, as well as for the international community (WHO and UNICEF, 2004; Platz and Schröder, 2007). Such access is considered essential for assuring and maintaining a basic or minimum acceptable standard of living for human beings and, moreover, has significant externalities.⁴⁰ Increased telecommunications and transport services also have substantial externalities and various indirect socioeconomic effects. The challenge of universal

Box IV.3. Risks, renegotiations and TNC withdrawals: implications for performance

Many economic, social and political factors underscore the risky nature of infrastructure industries, particularly those with significant natural-monopoly features, from both corporate and host country perspectives (section III.A). Some of the risks may be aggravated when investors based in foreign countries undertake investments in low-income countries. Systematic evidence comparing the failure rates of infrastructure projects undertaken by domestic and foreign players respectively is lacking, but there has been a high incidence of contract renegotiation in projects with the participation of TNCs, especially in Latin America.

When used opportunistically or strategically by an investor or a host country to secure additional benefits, the demand for renegotiation undermines the integrity of the contract, reduces welfare and threatens desired structural reform programmes in infrastructure (Guasch, 2004). It may also lead to investor-State disputes, with firms seeking financial remuneration in international tribunals (chapter V). A high incidence of renegotiations that exceeds expected and reasonable levels is particularly costly. Renegotiations also affect the performance of infrastructure industries, as the obligations of the parties involved in major projects and the conditions of service provision may change, which may influence the continuation and affordability of services.

Risks have also led to withdrawals by TNCs from developing countries, and hence influenced the performance of the relevant industries. For example, some TNCs with a presence in the Latin American electricity industry have announced their intention to retreat, and some of them have gradually divested their businesses in the region.^a The withdrawal of TNCs has not been limited to Latin America; they have also divested in other developing countries such as India (section III.C; Nazareth, 2008). This highlights the non-commercial risks related to TNC participation in infrastructure industries, especially – but not exclusively – related to economic crises in the developing world, such as the Argentinean financial crisis. The withdrawals of TNCs have also been partly due to home and host country policy changes, for example following political opposition to electricity privatization after the California power crisis and the Enron scandal in the United States (Hall, 2007).

Source: UNCTAD.

^a For example, PPL (United States) and Sithe Global Power (an affiliate of the Blackstone Group (United States), a private-equity firm), withdrew from their investments in Brazil's electricity industry, and AES (United States) threatened to do the same (Besant-Jones, 2007). Companies such as EDF (France) have gradually divested from Latin America. However, the holdings of the largest TNCs in the industry have remained fairly stable in recent years, partly because it has been difficult for them to find buyers (Hall, 2007).

access is the most acute in low-income countries (section III.A.2).

For users and consumers, access to infrastructure services depends on their availability and affordability, both of which can be influenced by the participation of TNCs in infrastructure industries.⁴¹ The *availability* of services is determined by the total supply of infrastructure services as measured by the size or extent of networks and the connections for serving potential users. It is also influenced by the location of service facilities in relation to consumers: those living in remote areas are less likely to be connected. By influencing the level of investment (section IV.A) and the productivity and efficiency of services provision, TNC participation can affect both the extent and the geographic scope of infrastructure networks. The *affordability* of services is jointly determined by the price of services and the disposable income of consumers in an economy. The impact of TNC participation on access to services can therefore differ among segments of a society, depending mainly on the level of their income as well as the location of their habitation. Thus improvements in industry performance do not necessarily translate into increased availability and affordability of services for all members of a society, especially the poor and those living in rural, remote and economically deprived areas.

At the heart of the issue of universal access lies the pricing of services. In considering the implications of the impact of TNC participation for universal access, the key question is the extent to which improvements in efficiency, if any, due to such participation translate into lower prices that can help increase access for lower income groups. As most infrastructure industries are regulated, both market forces and government policies influence prices. Because of political and social considerations, governments in developing countries have had a long tradition of holding prices below the costs of production; under public ownership, the gaps were either made up by transfers from public finances, or by lack of spending on maintenance of assets, causing them to deteriorate (Harris, 2003).⁴² The price impact of TNC involvement thus depends not only on the impact on supply, but also on the extent to which effective market competition or regulation of prices allow gains to be passed on to customers. It also depends on the level of prices (relative to the level of costs) that prevailed under the previous market and regulatory regimes.

Drawing upon available evidence, the discussion below focuses on the overall impact of TNC participation in infrastructure industries on services provision in terms of supply and coverage (or availability), quality and price, as well as on access to

services for the poor. The divergent effects of TNC participation are explained largely by differences in the host country and industry contexts. In particular, there is significant variation by industry.

a. Electricity

Evidence from a number of developing countries suggests that increased investment due to privatization – often with TNCs involved – has led to greater supply capacity and network connections in electricity. For example, in Chile, capacity measured in megawatts increased 2.5 times and the length of transmission lines doubled between 1982 and 2002 (Kessides, 2004).⁴³ Unstable supply and inadequate maintenance of the distribution network are often the most serious problems in the provision of electricity in many developing countries.⁴⁴ Following privatization, frequently involving TNCs in the 1990s, there were steady improvements in the reliability and quality of service provision in the electricity industry in many developing countries (Gassner, Popov and Pushak, 2008b; Jerome, 2004). In Chile, for example, the time for emergency repair service fell from five hours in 1988 to two hours in 1994, and power outages caused by transmission failures as well as power losses fell steadily (Kessides, 2004).

Evidence of the impact of TNC participation on prices, and thereby on access to electricity, is mixed, partly because prices reflect political and social, as well as economic, considerations. Prices of electricity provided by State enterprises do not necessarily reflect costs and are often subsidized. To attract private investors, some host country governments increased or allowed increases in tariffs, as in Brazil and Nigeria (Santos et al., 2008; Ezeobi, 2008), at the same time as they implemented other reforms, which included allowing private or foreign participation in order to sustain or increase investments and/or recover costs.

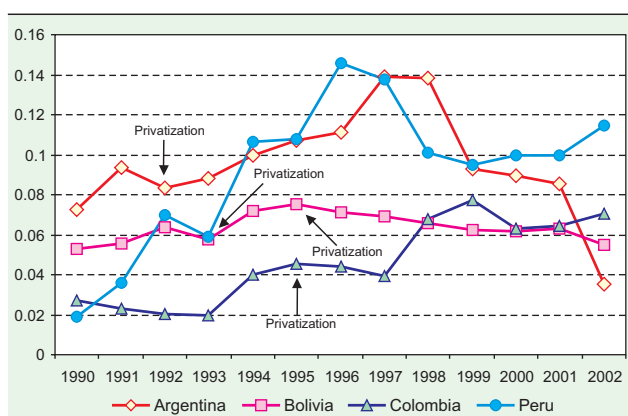
However, it is not always politically feasible to do this. For instance in India, when State electricity boards signed contracts with eight independent power producers (IPPs) (all with TNC participation) to purchase the output of the latter at agreed prices during industrial reforms in the early 1990s, the Central Government had to issue guarantees that it would meet any shortfalls in payments. Such shortfalls could occur, for instance, if the State electricity boards or local State governments were unable to raise electricity prices charged to consumers, resulting in insufficient revenue to pay the IPPs the agreed amounts (Nazareth, 2008).⁴⁵ Underscoring this point, a recent study comparing over 250 electricity utilities in private and public ownership in 53 developing and transition economies, found no systematic

change in prices as a result of privatization/TNC entry (Gassner, Popov and Pushak, 2008b). The study argues that political difficulties in raising prices was a factor explaining this finding.

In the longer term, efficiency gains that reduce the unit costs of production may help drive down the price of electricity, but not necessarily below subsidized levels. In Chile, for instance, prices fell by 25% between 1988 and 1998 (Estache, Lobo and Leipziger, 2000). However, price changes in a number of other Latin American countries that adopted a similar model of sector reform as Chile did not show a systematic trend (figure IV.1), which is consistent with the findings of some studies, such as Gassner, Popov and Pushak, 2008b mentioned above. In Argentina, for example, TNCs entered the country's electricity industry through privatization programmes during the 1990s. The initial impact was beneficial overall: supply capacity rose, and the price of electricity (denominated in pesos) fell. However, at the end of the 1990s, prices began to rise as a result of the indexation mechanism which had been negotiated in United States dollars and indexed according to inflation rates. By 2004, the country was again facing power shortages as the demand for electricity increased, but supply became erratic following the electricity price freeze (in nominal pesos) in 2002 (WIR04).

Overall, TNC involvement in the industry has improved the supply conditions of electricity by increasing network connections, reducing the cost of production and improving quality of delivery. However, the direction of price changes varies, depending on a number of factors, including political, social and contractual ones, as well as the degree of productivity and efficiency gains. In a number of cases, efficiency gains in electricity translated into higher profits for firms or lower government spending

Figure IV.1. Electricity prices for household users, selected Latin American countries, 1990–2002
(\$/kWh)



Source: UNCTAD, based on data from the Latin American Energy Organization.

on subsidies, rather than a fall in prices (Gassner, Popov and Pushak, 2008b).

b. Telecommunications

Improvements in supply and coverage of services due to increased investment and enhanced efficiency in developing countries by TNCs have been particularly significant in the telecommunications industry. For example, in Latin America, three countries that privatized in 1990–1991 with different degrees of TNC involvement – Argentina, Mexico and Bolivarian Republic of Venezuela – achieved much faster expansion of telecommunication lines during the period 1989–1994 than countries with State-owned monopolies, at that time Brazil, Colombia, Ecuador, Peru and Uruguay (Kessides, 2004). This was despite the fact that the former group granted 6 to 10 years of monopoly rights to private operators. Chile, which privatized the State operator, as well as introducing competition by issuing additional telecommunications licences to a number of companies, achieved even faster expansion during the same period. Rapid line expansion occurred in Brazil after it opened up the telecommunications industry to foreign investors in the second half of the 1990s. The number of fixed lines in the country rose from 15 million in 1995 to 50 million in 2003, and mobile telephony surged from 1.4 million subscribers in 1995 to 50 million in 2003. This made the country the fifth largest telephone market in the world (UNCTAD, 2005). Privatization (including to foreign investors) and competition were found to act better together than either factor alone in expanding capacity in telecommunications, according to studies covering a large number of developing countries (Wallsten, 2000a; Li and Xu, 2002).

Expanded telecommunications connections following privatization and TNC participation have generally been accompanied by improved quality of services. In Brazil, for example, standard measures of quality in the industry, such as the network digitalization index, the average waiting time for a dial tone, and the number of repair orders placed per 100 public telephones, improved significantly after privatization to foreign investors in the second half of the 1990s (UNCTAD, 2005). In Argentina, the quality of telecommunications services improved markedly after TNC entry (Estache, 2002).⁴⁶ In several other developing and transition economies (e.g. Chile, Côte d'Ivoire, Ghana, Malaysia, Mexico, the Philippines and Romania), competition from TNCs, in addition to privatization, proved instrumental in improving the quality of services, as well as stimulating supply and innovation and lowering prices (UNCTAD, 2005).

FDI in telecommunications, especially in mobile telephony, has contributed to expanded availability and the enhanced affordability of

services in many developing regions and countries (Fink, Mattoo and Rathindran, 2002; *WIR04*). In the 1990s, inward FDI played an important role in broadening the availability of telecommunications services in Latin American countries (ECLAC, 2000; Mortimore, 2003). Similarly, in recent years, driven by the entry of TNCs, Africa has experienced a “mobile revolution” (box III.16), with availability of mobile services expanding rapidly. In many low-income African countries, such as Côte d'Ivoire, Equatorial Guinea, Ghana and Uganda, cost-effective wireless technologies have reduced subscription prices, sometimes to lower levels than those of fixed lines (ITU, 2007a; Waverman, Meschi and Fuss, 2005), thus enhancing affordability. In addition, new business models introduced by TNCs have enabled the expansion of mobile services into low-income segments. This expansion has been facilitated, in particular, by affordable prepaid subscriptions (sometimes with users sharing a subscription) that have accounted for the bulk of Africa's (as well as South Asia's) mobile telephony market in 2007 (de Silva et al., 2008).

In Africa, the entry of TNCs has also helped some remote areas to gain access to telecommunications, where, previously, national providers had not regarded them as serviceable and profitable (Gillwald, 2003). The case of Uganda shows that government policies can influence the contribution of TNCs to universal access, including in rural areas, at least in the case of mobile telecommunications services (box IV.4; chapter V). Furthermore, TNCs have created mobile telecommunications markets at the subregional level by removing traditional roaming charges (ITU, 2007a). Since the launch of One Network in East Africa by Celtel (registered in the Netherlands) in September 2006, six countries – Congo, the Democratic Republic of the Congo, Gabon, Kenya, Uganda and the United Republic of Tanzania – are covered by the world's first borderless mobile network (UNCTAD, 2007l).

During the past decade, mobile telephony has emerged as a principal gateway for increased ICT access and usage in low-income countries (UNCTAD, 2007l). Table IV.4 lists developing countries that have made the most improvements, as measured by the UNCTAD ICT Diffusion Index, between 1997 and 2005. Most of the top performers have significant FDI and TNC involvement in their telecommunications industries.

While access to mobile telephony has improved considerably, this is not the case for all telecommunications services. For example, Internet connections, and particularly broadband, can significantly increase access to information, but prices remain high for consumers in many developing countries, and access is limited (ITU,

Box IV.4. The impact of TNC entry on telecommunications coverage in Uganda: how government policies can influence the outcome of TNC participation

Until recently, two TNCs, Celtel and MTN, and one partly privatized domestic enterprise, Uganda Telecom, were the only operators in Uganda's mobile telephony market. The licence contracts for the two "national operators"^a – MTN and Uganda Telecom – required the companies to provide full coverage in the entire country and meet roll-out targets in both rural and urban areas. This was in addition to other requirements, such as complying with price caps. Failure to meet coverage targets could entail penalties of up to 10% of companies' gross revenues (Econ One Research, 2002; Farlam, 2005). Initially, the two operators underestimated the importance of the rural market. With the expiry of their duopoly in 2006, following the end of a Government-imposed moratorium on new licences, the operators have been competing in expanding services to rural areas by intensifying their network installation efforts (UNCTAD, 2008f). For instance, the number of subscribers with Uganda Telecom has been grown rapidly in recent years, reaching 1 million in January 2008,^b as the company has also tried to offer its extended network services at affordable prices.

Source: UNCTAD.

^a Celtel is licensed to operate only in the southwest of the country.

^b Uganda Telecom at: www.utl.co.ug.

Table IV.4. Top 10 countries by change in UNCTAD ICT Diffusion Index,^a 1997–2005

Economy	Rank			TNC involvement
	1997	2005	Change	
Jamaica	92	59	33	Incumbent fixed-line operator (82% owned by Cable and Wireless (United Kingdom). Mobile operators owned by Digicel (Ireland), America Movil (Mexico) and incumbent.
Guyana	98	73	25	Incumbent 80% owned by Atlantic Tele-Network (United States). Mobile operators owned by incumbent and Digicel (Ireland).
Jordan	106	84	22	Incumbent 51% owned by France Telecom. Mobile operators owned 97% by Zain (Kuwait), Batelco (Bahrain) and incumbent.
Paraguay	103	82	21	Four mobile operators owned respectively by Millicom (Luxembourg) (100%), America Movil (Mexico) (100%), KDDI (Japan) (70%), and Telecom Argentina (68%).
Morocco	147	126	21	Incumbent 53% owned by Vivendi (France). Mobile operators owned 64% by Telefonica (Spain) and Portugal Telecom and incumbent.
Barbados	41	21	20	Incumbent 81% owned by Cable and Wireless (United Kingdom).
China	112	92	20	Leading operators have American depository shares (ADS) listed on the New York Stock Exchange. China Mobile is 3.3% owned by Vodacom (United Kingdom). China Netcom is 7% owned by Telefonica (Spain).
Maldives	96	79	17	Incumbent 45% owned by Cable and Wireless (United Kingdom). Mobile operators 100% owned by Wataniya (Kuwait) and incumbent.

Source: UNCTAD.

^a The ICT Diffusion Index is designed to evaluate ICT development using indicators of ICT diffusion across countries (UNCTAD, 2006c). It measures the average achievements in a country in terms of ICT connectivity and access.

2007b; UNCTAD, 2007g). Furthermore, ensuring that sufficient services are provided in rural, remote and economically deprived areas remains a challenge. In parts of Africa, for example, the rapid growth of pre-paid mobile phone services has reached some rural areas, but still remains more of an urban phenomenon (Shanmugavelan and Warnock, 2004; McCormick, 2005).⁴⁷

c. Transport

The participation of TNCs has helped extend transport networks, and build or improve transport utilities in some developing countries. It has also introduced new transport and related value-added services to household and commercial users. For example, international infrastructure companies in the transport industry have introduced new services in the area of logistics and helped meet evolving transport demand in China (Wang, 2008).

In the ports industry, the participation of international operators has contributed significantly to the development of seaports and terminals and to the growth of capacity and throughput in some developing countries. In China, for example, container terminals with foreign participation accounted for 64% of all berths and 72% of the total traffic capacity in 2007.⁴⁸ There were similar developments in India,⁴⁹ Malaysia⁵⁰ and the Dominican Republic.⁵¹ International terminal operators have also considerably improved the quality of services in major ports in many other developing countries, including Djibouti, Indonesia, Pakistan, Peru, Senegal and Viet Nam over the past decade (UNCTAD, 2007i; Valentine, 2008).

In roads, highways and railways, TNCs have helped expand transport networks in all developing regions (ESCAP, 2007; IADB, 2006; ICA, 2006). In India, for example, the Government launched the National Highway Development Programme (NHDP) in 1999 to build national expressway connectivity in the country. By the end of 2007, 15 foreign companies from 8 countries were involved. In some countries, connecting remote areas to transport networks has improved. For instance, TNCs have been participating in the rapid development of transport infrastructure in the western regions of China, connecting some remote and economically backward areas in provinces such as Guangxi, Shanxi and Sichuan to the country's expressway network.⁵²

TNCs are also involved in the development of transport corridors for facilitating trade and transportation links aimed at improving regional integration,⁵³ especially in Africa. For example, South Africa, Mozambique and other countries in Southern Africa have promoted the establishment of the Maputo Corridor with substantial public and private (including foreign) investments. This is designed to stimulate sustainable growth and development in the area.⁵⁴ An important element of this initiative was the 15-year concession in 2003 of the Port of Maputo to the Maputo Port Development Company (MPDC), a joint venture between a consortium headed by Mersey Docks (United Kingdom) and the Government of Mozambique.⁵⁵ It has contributed to significant improvements of the port facility as well as its road and rail links.⁵⁶ Considered an achievement for both Mozambique and the New Partnership for Africa's Development (NEPAD) as a whole, MPDC was the first PPP project involving a port authority in Africa.

d. Water and sanitation

TNC participation (as well as private participation generally) is much lower in water and sanitation than in other infrastructure industries in developing and transition economies (section III.B). Moreover, TNC investments in water, mainly in the form of concessions, are concentrated in a relatively small group of countries (box III.7). Their experience throws light on some aspects of the impact of TNC participation on services provision and its implications for universal access.

Given the limited involvement of TNCs in this industry, their impact in terms of increases in quantity supplied, measured in terms of connections, has been modest. However, there is evidence that well-designed schemes for TNC participation in water services have led to significant service expansion in the years following privatization in Latin America, Africa and Asia (Harris, 2003). For example, in Morocco, the coverage provided by private concession operators (all TNCs) has improved: between 1997 and 2002 the number of people served under the first concession increased from 440,000 to 590,000, with a tariff only slightly higher than that of public sector operators (Pérard, 2008). In addition, a number of case studies demonstrate that the quality of water supply improved after the entry of TNCs (World Bank, 2001; Shirley, 2002; Jerome, 2004).

Water tariffs traditionally have been kept low by governments (through subsidies and other policies).⁵⁷ In such circumstances, private sector participation (including that of TNCs) can be expected to result in price increases; indeed, this has been observed in some cases (Pérard, 2007; ECA and UNEP, 2007).⁵⁸ However, overall there was no systematic change in

water prices observed as a result of private sector/TNC participation in a recent analysis of 977 public and private water utilities in 48 developing and transition economies (Gassner, Popov and Pushak, 2008b). In the case of Aguas Argentinas (which was 40% foreign-owned), the water concession holder for Buenos Aires price was the basis of the dispute which led to the Government of Argentina rescinding the concessionaire's contract in 2006. This occurred after a period of arbitration at the International Centre for Settlement of Investment Disputes (ICSID) that began in 2001, with the operator pushing for a tariff rise of 60% and the Government offering 16% (Casarin et al., 2007; Solanes and Jouravlev, 2007; Food and Water Watch, 2007).⁵⁹

The issue of access assumes particular importance in the case of water and sanitation. Providing universal access to water services is one of the core development challenges, and the role and impact of private participation on access to water has been controversial (box IV.5). In order for private companies/TNCs to recover their costs, price increases may occur, which particularly affects access for the poor (Estache, Foster and Wodon, 2003; Robbins, 2003; Hale, 2006).

As a result of the need for cost recovery to make investments profitable, water networks are often expanded to wealthy areas and improve the standards of living only of those who can afford it (UNDP, 2006). For example, in the case of the Aguas Argentinas concession mentioned above, although, overall, the operator met most targets set in the contract, there were considerable differences in service between districts of the city served (Solanes and Jouravlev, 2007). In particular, a detailed statistical analysis by districts within the city indicated that between 1993 and 2003 contract compliance was significantly greater in areas where the cost of service expansion was low and the incomes of users were highest; in contrast, service to the poorer districts was worse.⁶⁰ (Casarin et al., 2007). In Manila, the Philippines, where the public water supply utility MWSS was privatized in 1997, a case study found that the private companies had not meet their commitments and that there was reduced access to drinking water (Hale, 2006). In Cochabamba, Bolivia, a 40-year water concession was granted to a private company with foreign interests in 1999. Shortly afterwards, the concessionaire increased prices significantly, leading to demonstrations and conflicts, and finally to the cancellation of the concession (Lobina, 2000; UNDP, 2006).

The impact of TNC participation on users' access to water has frequently been disappointing. The technological and regulatory characteristics of the water industry tend to limit scope for competition, and thereby for maximizing efficiency improvement. Thus

Box IV.5. Universal access to water and the debate on public versus private provision

Providing universal access to water services is one of the core development challenges facing humanity in the twenty-first century. It is estimated that over one billion people lack access to clean water, and about half a billion people lack access to sanitation. The human costs of these deficits are enormous. Clean water and sanitation are important not only for survival, but also for the realization of human potential. Child mortality, maternal health and gender equality are some aspects of development directly affected by lack of water and sanitation. It is estimated that 5,000 children die every day as a consequence of illnesses related to the absence of water and sanitation. The inclusion in the Millennium Development Goals of the objective to reduce by half the proportion of people without sustainable access to safe drinking water by 2015 captures to some extent the sense of urgency and the increasing awareness of the severity of the problem.

In this context, the relative advantages of public and private actors in expanding access to water and sanitation and providing quality services have generated heated debate. Some fear that private participation will exacerbate the “commoditization” of water and prevent the treatment of water as a public good. Others point to the failure of State companies to enhance access, and their inability to increase performance efficiency. However, this polarity in the debate has diverted attention from one of the most fundamental human development problems: how can public policy create a framework in which governments and the private sector – domestic and foreign – can meet the needs of a poor and vulnerable underserved segment of the population?

Source: UNCTAD, based on information provided by UNDP (www.undp.org).

the contribution of TNCs (and private enterprises in general) to reducing prices and providing affordable services has been relatively limited. In many cases, the reform of the water industry has led to tariff increases, and, apart from the issue of affordability, in some other instances there have been no recorded improvements in terms of availability or quality of water supply. In some cases, efficiency gains also sometimes translate into profits for companies or lower subsidies payouts for governments, rather than price reduction (Gassner, Popov and Pushak, 2008b).

Due to the nature of water as a basic human need, final responsibility for universal access lies with the State, and appropriate policies are crucial for ensuring that the poor are not excluded from the service (Prasad, 2007; Ugaz, 2003). This includes, among others, policies with respect to the extent and type of TNC participation.

* * *

To sum up, TNCs have helped to improve the performance of infrastructure industries in developing countries by bringing in and transferring hard and soft technology, and increasing competition and efficiency in the market. The extent of this contribution varies by industry, and depends on the contestability of industries, the mode of entry of TNCs and the characteristics of host countries, especially the regulatory environment and domestic capabilities. Domestic enterprises with greater capabilities are more likely to benefit from technology diffusion and to be able to compete effectively with TNCs. TNC participation can also have a negative impact on domestic enterprises, for instance by pre-empting the entry of new local players or “crowding out” existing ones. Their participation may also entail various risks.

The participation of TNCs has generally increased the supply of infrastructure services in host countries and improved service quality, but their impact on prices has varied. This has given rise to concerns about pricing services beyond the reach of the poor. In any case, the final outcome depends not only on changes in supply capacity and efficiency as a result of TNC participation, but also on industry characteristics, host country regulations and the behaviour of foreign affiliates. In particular, there is considerable variation by industry. In telecommunications and transport industries, TNCs’ contribution to affordability of and access to services has been significant. In electricity, while TNC participation has increased supply capacity and network connections in a number of countries, the impact on prices has been mixed. In water, where the scope for competition and related efficiency benefits is limited, TNC participation alongside reform of the industry has led to increased tariff levels in many cases. For those services which are considered essential, if the efficiency improvements achieved by TNCs cannot allow them to maintain prices at low levels in order to cover their costs, and if the government does not provide subsidies to users, the result could be reduced access for the poor.

C. Broader development impacts and issues

Apart from its impact on investment in infrastructure industries and services, the participation of infrastructure TNCs can have a variety of broader or second-order effects that influence host economies and their development. However, the evidence on such broader impacts is limited, for a number of reasons. First, TNC involvement in many developing countries’

infrastructure industries is still relatively new and evidence is sparse, especially given the variety of country experiences and data shortcomings. Secondly, most research has understandably focused on their impact on the effective provision of infrastructure services, and there has been less focus on broader issues, including the further impact of those effects on the economy as a whole. Finally, and perhaps most importantly, many of the broader effects are industry-specific and it is not always clear that there is a TNC-specific aspect. For example, large-scale infrastructural developments such as hydroelectric dams will have both positive and negative impacts on the socio-economic and natural environment, but on the whole this will occur no matter what kind of company is involved – whether local or foreign.⁶¹ Notwithstanding these limitations, this section attempts to draw attention to some of the impacts of TNC participation in infrastructure industries in a number of key economic and political areas in host countries.

1. Wider economic impacts

Apart from the impact of TNCs' on resource mobilization for and investment in infrastructure, industry performance and conditions of service provision (discussed in sections A and B above), other important economic impacts on a host country relate to the public sector budget, employment and human capital (*WIR99*).⁶²

Fiscal impact on the public sector budget. For many countries, a favourable budgetary impact was one of the main anticipated outcomes from infrastructure reform and TNC involvement. Governments, especially in Africa and Latin America and the Caribbean, implemented privatization measures, including sales of enterprises and concessions to TNCs, in response to serious fiscal deficits, especially for the operation and maintenance of infrastructure facilities and services (section A). The gains were expected to derive from three elements of the process: (i) income from the sale, lease or rental of assets; (ii) reductions in public sector operational and capital expenditures by passing part of them on to private operators; and (iii) a decrease in subsidies and a net increase in tax and non-tax revenue (Estache and Goicoechea, 2005). In assessing the fiscal impact of private participation, it is important to distinguish between the short and the medium- and long-term effects.

Private participation allows governments to raise funds and to eliminate or reduce the need for subsidies in the short term. Receipts from one-time privatizations, as well as concessions, can be very substantial, which can help alleviate fiscal pressure, at least in the short term.⁶³ In Latin American countries,

the privatization of infrastructure enterprises (largely to TNCs) played an important role in sustaining their macroeconomic stabilization plans, and much of their privatization experience is seen as a response to fiscal pressures (Basualdo and Azpiazu, 2002; Besant-Jones, 2006). Some studies have shown that SOEs can be sold at a discount in developing countries, but generally the involvement of TNCs in competitive bidding has tended to raise prices of privatizations and also concessions (Birdsall and Nellis, 2003; Auriol and Picard, 2006). For instance, in Brazil, the Federal Government received \$48 billion from the privatization of SOEs, of which \$35 billion came from asset sales and concession awards in the telecommunications and electricity industries (Castelar Pinheiro et al., 2001).

India has also raised large revenues, especially in mobile telephony, from sales of concessions to private companies. However, the Indian experience also illustrates the dangers of single-minded attention to revenue maximization.⁶⁴ For example, rather than stress technological and performance parameters in choosing operators, focus was almost entirely on the level of licence fees they committed to pay. As India's experience shows, this strong emphasis on short-term revenue extraction from infrastructure TNCs created a natural tendency towards "over-bidding" and high tariffs, which caused the sector to come to an effective standstill during the 1990s and the consequent default of most mobile phone operators.⁶⁵ It eventually led to a change in the regulatory regime and consolidation in the industry. This delayed the Indian Government's mid- to long-term tax yield from what is normally a highly profitable industry (Nazareth, 2008).

The longer term fiscal effects of opening up infrastructure industries to increased private/TNC involvement are harder to assess, as this is generally part of a wider set of market-oriented reforms, such as trade liberalization, fiscal reform and macroeconomic stabilization packages. As privatized firms become more efficient in their infrastructure operations, governments are able to eliminate subsidies (as costs fall) and also start collecting taxes from them, both of which improve the public sector budget. This has not occurred to the degree that many governments had anticipated (Solanes and Jouraviev, 2007), but there are significant differences by industry and region.

For example, in Latin America, the historical profit rate (average returns on concessions) is 8.2% in telecommunications, which is the most profitable industry for private/TNC concessionaires (with little volatility in profitability between projects). Water is the least profitable at 4.3% (with the greatest volatility), and electricity (7.2%) and transport (5.2%) fall in between. Thus water is of more concern for governments, in tax and budgetary terms, than the other three industries. However, calculations on a

sample of concessions suggest that the profitability – and hence the positive fiscal impacts – of all industries increases over the lifetime of the concessions, in large part because significant early investments are recouped over the entire period (Sirtaine et al., 2005). In developing regions and countries where the principles of “user pays” and “full cost recovery” have been broadly applied, especially in most of East and South-East Asia, infrastructure investments tend to be profitable and contribute to the public purse at an earlier stage (Dollar, 2008; Wang, 2008; Gómez-Ibáñez, 2007).

The use of private/TNC infrastructure service providers, while reducing public budget outlays in the short term, can expose the economy to greater fiscal risks and uncertainty in the longer term, and sometimes entails higher costs than traditional public financing. (Hemming, 2006; Polackova, 1999). For example, when governments provide guarantees of service demand or exchange rate levels they are exposed to potentially very significant contingent liabilities. In Colombia, for instance, potential cumulative payment obligations over the life of PPI contracts has been estimated to represent as much as 4% of one year’s GDP (World Bank 2004b). Such guarantees, often based on overly optimistic projections, may shift the risk from the private investors to the government. When guarantee payments are called upon, typically at times of recession, their fiscal impact can be significant. For instance, in Colombia, payment obligations amounting to \$1.5 billion were triggered in 2003 for two electricity-generating facilities, and these are projected to rise to \$3 billion by 2014, when the contract expires (World Bank, 2004c).⁶⁶

Employment and human capital. The employment effects of restructuring State-run assets, whether by public or private enterprises, are likely to be significant, because many such assets are characterized by overstaffing (Gomez-Ibanez, 2007). Available evidence suggests that during the restructuring of infrastructure in Latin America in the 1990s, the initial labour lay-offs in many of the infrastructure facilities that were taken over were in excess of 30% of the workforce. In electricity and water, a large-scale assessment of staff reductions in 71 countries as a result of private sector/TNC participation, found a 24% decline in average employment in electricity and 22% in water (Gassner, Popov and Pushak, 2008b). This level of job losses has considerable implications for adverse impacts on the affected workers and their families, as well as on the wider economy because of reduced consumption (and multiplier effects)⁶⁷ (McKenzie and Mookherjee, 2002). In some regions, for example in South-East Europe and the CIS, the lay-offs were lower but political fallout was an issue (Gassner, Popov and Pushak, 2008a).

The actual scale of medium- and long-term impacts on employment and the economy will depend on the speed of lay-offs and productivity gains, compensation and retraining packages and other related effects (such as revenue gains/losses).⁶⁸ It will also depend on whether and how many workers are rehired in infrastructure services (e.g. because of rising demand or subcontractors) or other sectors, for example because of economic growth.⁶⁹ In some Latin American infrastructure projects, for instance, many of the jobs lost were recouped, and up to 80–90% of workers were rehired in the infrastructure industries within three years (Gomez-Ibanez, 2007). Both the job losses and rehiring may be greater and faster in privatizations involving TNCs, partly because they are more likely to push for rapid efficiency gains, and partly because they tend to have more efficient technology or organizations. For example, DP World in India has improved the efficiency of its ports operations rapidly over the past few years by trimming the workforce; but there have been employment gains as well, as a result of rapid growth not only of this TNC’s operations but also that of other international terminal operators (Nazareth, 2008).

When TNC participation in developing-country infrastructure involves establishing new facilities and services, this normally generates net employment gains. In certain countries, especially in LDCs, it is usually not possible to rapidly establish infrastructure, such as mobile telecommunications, without significant TNC involvement.⁷⁰ And although there may be some job losses in existing, especially fixed-line, enterprises, overall there is a significant positive employment effect (Ure, 2008). Similarly, the Maputo infrastructure corridor established in 1996 in Southern Africa – involving TNCs in essential aspects of transportation, water and other infrastructure industries – has resulted in sizeable employment creation (Horne, 2008). However, it is possible that infrastructure TNCs, even when establishing new facilities, might not generate many additional jobs, perhaps because of their use of foreign suppliers and contractors.⁷¹

Another impact of the use of foreign contractors on employment in a host country arises from their importing workers from the home country, as do infrastructure construction TNCs from China and India, for example (Pradhan, 2008). There may be reasons for this practice (e.g. shortages of relevant skills in the host country, or because fixed-term contracts mean that it is unattractive to train local workers), but they have repercussions in terms of employment creation and, potentially, adverse reactions by governments and populations. In the case of Chinese contractors, although many or most employees in their projects might be local, a large proportion of them – sometimes as much as 50%

– may be Chinese (Levitt, 2007; Chan, 2007). By 2007, the number of Chinese employees working for Chinese infrastructure companies in Africa ran into the hundreds of thousands, resulting in tensions with the local workforce and some governments (Sautman and Hairong, 2008).

2. Bargaining power and regulatory concerns

Concerns over the balance of bargaining power. TNCs in infrastructure are often large relative to the size of developing-economy enterprises and can wield considerable power, potentially of a monopolistic nature. As a result, particularly early in the opening up of an industry, infrastructure TNCs may enjoy considerable bargaining power, especially in the absence of a significant domestic private sector (section IV.A; Matsukawa and Habeck, 2007). At a later stage, as local enterprises develop, size and other advantages may disappear, but in the short term⁷² host countries are in a relatively weak position. Even if a government would like to alter the behaviour of a TNC participant in its infrastructure industries, it may not be able or willing to do so: it may not be feasible to let infrastructure operations fail (even temporarily), or government's may not wish to return operations to State ownership (Ramamurti, 1997 and 2001. This "reverse obsolescing bargain"⁷³ means that, at least for a while, TNCs can exercise significant power in their dealings with governments. A good example of such a situation is the large-scale renegotiation of concessions that occurred in Latin America and some other parts of the developing world in the late 1990s and early 2000s (box IV.3).

Impacts on regulatory regimes. Host country governments have created new regulatory frameworks for the infrastructure sector over the past two decades. This has been for two main reasons: (i) in response to the evolution of technological and other characteristics of the industries themselves, and (ii) to ensure effective oversight over the operations of enterprises – both SOEs and the private sector – in the provision of infrastructure services in the public interest (sections III.A; Parker et al., 2005). TNC involvement in infrastructure provision adds an extra layer of complexity to the regulatory regime and to the burden of the regulatory authorities. There are enormous intricacies inherent in regulating domestic private enterprises, requiring knowledge of, for example alternative regulatory systems, models of costing and pricing and the diverging interests of stakeholders, including firms, users, politicians and administrators. In addition, TNC participation requires regulatory agencies to familiarize themselves and deal with a number of different stakeholders, such as foreign companies, international donor and

creditor agencies and international banks. This puts additional pressure on institutions that in many developing countries are no more than a few years old, and are usually constrained by limited funding. Even regulatory bodies which have been in existence for a while, including in developed countries, face a number of problems when dealing with TNCs and other large companies. The most important problems relate to information asymmetries,⁷⁴ regulatory capture and regulatory opportunism, as highlighted in the literature on economic regulation (Kirkpatrick et al., 2006; Boehm, 2007).

In developing countries, especially poorer ones or those suffering from severe budgetary and debt problems, resource constraints and weak institutions can aggravate these problems, especially because TNCs are large entities (compared to local enterprises in most developing countries) with ultimate decision-makers based in other countries. Moreover, these TNCs can call on a dedicated team of lawyers and other experts for advice, which may be beyond the budgetary possibilities of host governments. In consequence, foreign firms often have greater bargaining power and expertise than their counterparts on the government side, and locally they are more able to attract and retain skilled employees due to their capacity to pay higher wages and salaries (WUP, 2003).

Information asymmetries between TNCs and developing countries' regulators can be an important obstacle to efficient regulation (Massarutto, 2007). In many cases, regulatory agencies have no choice but to rely on information provided by TNCs (Boehm, 2007, Maldonado and Herrera, 2007; Fischer and Galetovic, 2001; Rozas, 1999). A survey of utility regulatory practices in developing countries and transition economies showed that the difficulty most often cited by regulators concerned information asymmetries (Kirkpatrick et al., 2006).⁷⁵

Regulatory regimes can also succumb to "regulatory capture" by vested interests: from bureaucrats and firms to major firms in the industry regulated, including TNCs. The concentration of regulatory powers in the hands of bureaucrats and politicians may lead to an abuse of their position to foster their own goals instead of serving the public interest. On the other hand, the concentration of regulatory benefits and the diffusion of regulatory costs enhance the power of lobbying groups over regulators and can also lead to regulatory capture by private firms, including through bribery and corruption (Kirkpatrick et al., 2006; Boehm, 2007). Apart from the direct costs of regulatory capture, for example the impact on infrastructure access if companies are able to retain higher prices than might otherwise be the case, governments need to avoid such situations because of other consequences. One of the most important of these is the danger of lower

investment in an infrastructure industry by other TNCs and local enterprises, precisely because of the privileges received by incumbent firms (Banerjee et al., 2006).

D. Conclusions

Financial constraints faced by governments were a major reason why an increasing number of developing countries opened up to FDI and TNC involvement in infrastructure industries in the 1990s. Today, they continue to seek TNC participation for mobilizing financial resources and raising investment levels in infrastructure industries. Other reasons are related to the potential impacts of such participation, including technology transfer, and greater competition and efficiency, which could improve industry performance and service provision.

TNC participation has indeed mobilized significant financing for the development of infrastructure industries in developing countries. Allowing for data limitations, the stock of infrastructure FDI in developing countries rose 29-fold: from \$6.8 billion in 1990 to \$199.4 billion in 2006. Foreign investment commitments in infrastructure in these countries (which include concession agreements, as well as FDI) were about \$246 billion in the period 1996–2006. However, despite these significant levels, more is required: the financing gap in the sector remains vast (section III.A.2) and considerably more investment is needed, irrespective of the source.

From the host country perspective, not all of this FDI constitutes investment in infrastructure. In particular, privatization sales of existing assets do not necessarily add to capital formation. But at the same time other forms of TNC participation also involve investment. This is especially true of concessions, which involve large amounts of investment to build new or improve existing infrastructure. Inasmuch as concessions were about equal in value to FDI in all investment commitments during the period 1996–2006, the contribution of TNCs to infrastructure investment in developing countries is likely to be larger than is suggested by FDI stock.

The relative impact on investment levels in host country infrastructure has varied by industry: TNCs' shares of investment commitments were highest in telecommunications and electricity and lowest in water and transport. The importance of TNC participation also varies greatly among countries. For example, in some of the largest recipient countries, such as China and South Africa, TNCs' shares in private sector investment commitments have been low, but they have been high in others, such as Egypt and Pakistan. Furthermore, of the developing countries in which TNCs' shares of private sector infrastructure

investment commitments exceeded 75%, over half (13 out of 20) are LDCs. Even though LDCs do not receive much investment from TNCs (as mentioned in section III.B), whatever they receive is a very significant proportion of the total private investment in their infrastructure industries. For some of these countries TNCs are more or less *the* private sector.

Investment in infrastructure by foreign companies in the 1990s was connected with an unanticipated decline in public investment in the sector across much of Latin America and parts of Africa. In expectation of a large-scale increase in private sector investment, many countries cut back on public expenditure in infrastructure, but the increase in investment by TNCs (and the domestic private sector) did not fully compensate for this decline. An important lesson from this experience is that TNC participation should not be considered as sufficient to provide for a country's investment needs in infrastructure industries; rather, it should be viewed as an important supplement and complement to domestic investments.

Depending on their ownership advantages, TNCs have brought both hard and soft technology (particularly the latter) to their operations in infrastructure industries in host countries, thereby contributing to increased productivity in these industries. The extent of this direct technological effect of TNC participation depends on the extent to which TNCs' technology and expertise are superior to those of domestic firms – public or private. The industry-wide technological impact of their participation also depends on the diffusion of technology, if any, to domestic firms through various channels, such as joint-venture cooperation, personnel mobility and demonstration effects. The degree to which this transfer occurs is influenced, among others, by TNCs' technological advantages and modes of entry, and by domestic capabilities in infrastructure industries.

Although the contestability of infrastructure industries is often constrained, TNC entry has increased competition, and thereby efficiency in infrastructure industries such as mobile telephony and electricity generation, where the potential for competition exists. However, in some cases TNC entry may be associated with significant market power and crowding out effects. In industries that are still natural monopolies, such as water supply, the entry of TNCs through privatization or concessions often results in State monopolies being turned into foreign private ones, so that efficiency gains from competition are limited. Foreign participation also entails various risks, including a high incidence of concession renegotiations or sometimes TNC withdrawals, which may affect industry performance.

The participation of TNCs has generally increased the supply of infrastructure services in host countries and improved service quality, but its impact

on prices has varied, giving rise to concerns of services being priced out of reach of the poor. The final result depends not only on changes in supply capacity and efficiency as a result of TNC participation, but also on industry characteristics, host country regulations and the behaviour of foreign affiliates. Government policy and price regulations can significantly influence the degree and duration of price changes, and thus the effects on affordability and access for different segments of society, especially the most vulnerable, including the poor and those living in rural, remote and economically deprived areas.

In particular, there is significant variation by industry in terms of the effects of TNC participation on affordability and access to services. On the one hand, in some segments of the telecommunications and transport industries, frequent technological progress and regulatory reforms, innovative business models and competitive pressures have caused prices to fall. In these instances, TNCs' have contributed to affordability of and access to services. In other essential infrastructure services, in the absence of government subsidies to users, additions to supply capacity, along with efficiency improvements, may be insufficient to maintain low prices, while recovering costs. This has sometimes been the case in electricity and, more commonly, in water. In such cases the participation of TNCs has not contributed to improved access for the poor.

TNC participation is not the only way for a developing country to improve industry performance and provision of services, nor is it necessarily a substitute for domestic enterprises – public or private. Some developing countries have achieved improvements in performance through domestic efforts, without or with limited TNC involvement. However, these successes are found mainly in relatively high-income or larger developing economies. For many LDCs, mobilizing sufficient domestic resources and building productive capacities in infrastructure industries remains a challenging task, and they are in urgent need of the types of assets, including capital and technology, that TNCs can offer.

Apart from their direct impact on infrastructure performance and provision of services, the participation of TNCs has further impacts, both positive and negative, on host economies and their development. Some of the areas where their involvement has had an impact include the public sector budget, employment and human capital, and the regulatory regimes under which companies operate. Regulatory oversight over companies in particular is essential in infrastructure industries to safeguard the public interest. However, some developing countries' regulatory agencies – especially those with budgetary problems – face difficulties when dealing with better-resourced TNCs and other large companies. For instance, some of them lack access to information

on costs, rates of return and corporate investment strategies, all of which would allow regulators to be more effective.

While the ultimate impact of TNCs is influenced by the behaviour of each firm, one of the most important determinants is the quality of the institutional and regulatory framework of the host country. Government capabilities are as important for formulating and implementing rules governing privately operated infrastructure as they are for undertaking the difficult task of running SOEs and for providing services to the poor (chapter V).

Notes

- ¹ According to a study by Sader, who examined typical BOT-type projects (Sader, 2000).
- ² Total investment commitments in the World Bank's *Private Participation in Infrastructure* (PPI) database comprise those made by TNCs and the domestic private sector in developing and transition economies. If the State or State-owned enterprises have a share in these private sector projects, these investments are also included in the total. However, investments in infrastructure made solely by the State are *not* included (for further details see box III.13).
- ³ According to the PPI database, during the period 1996–2006, about 60% of FDI in infrastructure, by value, resulted from privatizations (i.e. the acquisition of existing capital assets). However, a proportion of privatizations is likely to have led to new investments, inasmuch as some of the existing capital stock needed to be upgraded. For example, according to a review of the telecommunications sector in the 24 countries covered in the Africa Infrastructure Diagnostic (AICD) project, in all investment projects with the participation of the private sector (mostly TNCs), some \$3.3 billion were paid for privatization and license fees, while another \$20 billion was committed to new investments (Minges, 2007).
- ⁴ The investment component varies by type of TNC involvement. FDI and most concession typically have significant amounts of associated investments; while management contracts do not.
- ⁵ Because of the nature of concessions such as build-own-operate (BOT), build-operate-own (BOO), and rehabilitate-operate-own (ROO), i.e. to rehabilitate or build infrastructure and run related services, much of the financial flows mobilized by TNCs participating through such arrangements represents investment in these industries. BOO and BOT schemes were generally used for greenfield projects in infrastructure in Latin America (Strong et al., 2004). In addition to FDI and concessions, a small share of investment commitments consists of pure non-equity forms (e.g. management contracts).
- ⁶ This is in contrast to the breakdown in figure III.6, which is by number of projects. The biggest difference arises in terms of management contracts and licenses - whereas these account for 6% of the total number of PPI project in 1996–2006, by value they fall to a negligible 0.2% because very few financial resources are associated with this type of agreement.
- ⁷ The greatest decline in total infrastructure investment commitments was in Latin America, from a level of \$346 billion in 1996–2000 to \$85 billion in 2001–2006, according to the PPI database. Table III.7 shows that in Africa, the TNC share as well as foreign investment commitments increased (to \$25.5 billion in 2001–2006), but in Asia, only the share increased, while the commitments fell a little (to \$31.4 billion). There has been a recovery in investment in infrastructure industries in the last couple of years (section III.B).
- ⁸ Among the largest recipient countries in the PPI database, only Argentina, Brazil, Colombia and Peru saw falls in TNCs' shares of investment commitments between the two periods. Of these,

the largest falls were in Argentina and Colombia, from about 37% in each case in 1996–2000 to 16% and 13% respectively, partly because of disputes between the respective Governments and TNCs amid the financial and economic crises of the late 1990s and early 2000s (Solanes and Jouraviev, 2007). In some of these countries, the domestic private sector took up some of the slack.

⁹ Most developing-country governments remain interested in greater TNC participation in their economies. For example, in India, the scale of investment needs is so great (section III.A.2) that the Government is encouraging further TNC investment, including by foreign private equity firms in joint ventures with domestic and foreign partners (Nazareth, 2008).

¹⁰ For example, in Pakistan and Bangladesh the shares of TNCs in total private sector commitments reached 73.9% and 85.4%, respectively, in 2001–2006.

¹¹ For example, in 2007, Brazil announced the Programa de Aceleracao de Crescimento, which included a plan to boost infrastructure spending to about 5% of GDP, largely funded by the State and relying on State-owned enterprises (SOEs), but with room for the private sector, including TNCs (Jonathon Wheatley, “Brazil must lift barriers to new infrastructure”, *Financial Times*, 28 February 2007; “Brazil” (special report), *Financial Times*, 8 July 2008; *Business Monitor International*, “Brazil Infrastructure Report Q2 2008, 30 April 2008).

¹² For example, in Bolivia, Chile and Colombia, an increase in private investment, including FDI, more than compensated for the decrease in public investment. In contrast, in Brazil, there was a steep decline in total investment in infrastructure, from 5.2% of GDP to 2.4% in the early 2000s (Calderón and Servén, 2004), and according to the World Bank, it was as low as 1% of GDP by 2005 (Jonathan Wheatley, “Brazil must lift barriers to new infrastructure”, *Financial Times*, 28 February 2007).

¹³ India’s financial crisis of 1991 spurred it to liberalize its economy and to invite foreign TNC participation in infrastructure. While the country’s other service industries and manufacturing were opened only gradually to TNC participation, 100% foreign ownership was permitted in power generation as early as 1991, and similar favourable treatment was offered in segments of other infrastructure industries. Following liberalization, initially there was a large increase in approvals of FDI and other types of TNC participation, but in most industries inflows soon declined. This was largely because of institutional hurdles, including long delays in obtaining the approvals necessary to begin operations, problems related to licensing and pricing policies and regulatory uncertainty. In electricity, and transport, significant levels of early entry by TNCs in the 1990s have since been reversed, and in telecommunications, TNCs have returned in significant numbers only in the last few years (Nazareth, 2008).

¹⁴ TNCs’ shares in overall private sector investment in telecommunications remained stable or increased in other countries.

¹⁵ Data are drawn from the World Bank’s PPI database.

¹⁶ All of these countries have a high amount of TNC investment commitments, but considerable investments are made by the domestic public and private sectors.

¹⁷ All nine African countries in this group are LDCs.

¹⁸ The aspects of economic efficiency discussed include allocative efficiency, dynamic efficiency and X-efficiency. *Allocative efficiency* generally refers to limited resources being allocated in accordance with the interest of consumers. In the short run, as emphasized in neoclassical economics, competition is necessary to ensure that allocative efficiency is achieved and consumer welfare is maximized. *Dynamic efficiency* refers to technological improvement that leads to an increase in the efficiency and welfare of the economy (Nelson and Winter, 1982). *X-efficiency* refers to the effectiveness with which a given set of inputs is used to produce outputs. When firms are in a protected market, incentives to achieve minimum cost may be blunted, and a considerable amount of slack may exist in the organization. The term “X-inefficiency” (first introduced by Leibenstein, 1966) is used to describe this kind of internal disorganization. If

competitive pressures can be intensified, X-inefficiency will tend to disappear.

¹⁹ For example, in China, global operators, as well as other smaller TNCs, have introduced state-of-the-art equipment and management expertise to the country’s port operations, thereby helping to improve productivity in the industry. For example, at Chiwan Container Terminal in Shenzhen, which is operated by a joint venture established by Modern Terminals and Kerry Holdings (both of Hong Kong, China), cranes capable of lifting six 20-foot equivalent units (TEUs) or three 40-foot equivalent units (FEUs) are in operation, contributing to higher productivity (UNCTAD, 2007i). In the Dominican Republic, to improve efficiency, the Harbour Authority granted concessions to foreign operators for two ports. The DP World Caucedo port near Santo Domingo, which commenced operations in 2003, uses advanced equipment, as well as an integrated port management system, and is moving towards a turnaround time of two days (UNCTAD, forthcoming b). In India, global operators such as PSA International and DP World have helped upgrade the efficiency of cargo handling at major ports. Terminals managed by them now operate at international standards of efficiency, and their average turnaround times are two to three days, in comparison with eight days at comparable government-run terminals.

²⁰ For example, Vodacom’s five mobile networks in Africa had an average of 2,425 subscribers per employee in 2003, whereas the OECD average was 1,527 (OECD, 2005). One of the reasons for this is the high number of pre-paid subscribers in Africa which tends to create a lot of downstream employment allowing operator staff to focus on core activities.

²¹ However, where valuable proprietary technology is involved, TNCs may be reluctant to engage in joint ventures or non-equity cooperation arrangements.

²² Information obtained from interviews with local electricity companies in China (Wang, 2008).

²³ Of course, the domestic private sector – and SOEs – will usually need to acquire the necessary technology and expertise.

²⁴ In addition, domestic companies can buy technologies and expertise through trade arrangements with foreign companies. For example, the facilities operated by City Power (South Africa) (box III.8) are technology- and capital-intensive, requiring it to source widely for equipment. It buys transformers from various countries, such as China, Croatia, India and the United States. It has also invested heavily in the expertise and skills of its employees, sending many of them overseas for training, frequently to programmes run by electricity TNCs. The company has hired a number of new managers from the outside, some from the private sector, including TNCs (UNCTAD, based on information provided by City Power).

²⁵ In the course of electricity-industry reforms in Africa, domestic private participation has been often hampered by the technology- and capital-intensive nature of large-scale projects (ECA and UNEP, 2007).

²⁶ “Telecom trends in Uganda getting interesting”, *Bellanet*, 24 August 2007.

²⁷ As Telefonica consolidated its position after the acquisition of BellSouth in many countries in the region, Telmex developed an aggressive acquisition strategy in fixed-line telephony as well as in the mobile telephony sector (Mariscal and Rivera, 2005).

²⁸ ST Telemedia’s decision in June 2008 to sell its stake in Indosat follows a legal dispute that began in November 2007, when Indonesia’s antitrust authority accused Temasek of violating a monopoly law by holding indirect stakes in Indosat and PT Telkomsel (www.zawya.com).

²⁹ For example, in Jamaica, Digicel (Ireland) had 1.9 million customers by 2008, equivalent to 82% of the country’s mobile market and 72% of the total population (source: UNCTAD case studies).

³⁰ Privatization through share issue is associated with better performance, while granting a newly privatized operator a period of exclusive market access reduces the gains from privatization but does not entirely negate the gains (Li and Xu, 2002).

- 31 As noted in section III.A.1, the generation segment has competitive characteristics, and can be structured as a competitive business; the transmission segment is considered a natural monopoly, and most countries have only a single entity owning and operating the transmission network; the distribution segment has the characteristics of a natural monopoly, but it is possible to structure wholesale distribution as a competitive business. Therefore, vertical unbundling (i.e. unpackaging vertically integrated utilities into separate companies) is a central element of reform of the electricity industry, in addition to private participation.
- 32 Because of its geographical characteristics, Chile has two main power systems: the Sistema Interconectado del Norte Grande (SING), which is predominately thermal, and the Sistema Interconectado Central (SIC), which is about 75% hydro and 25% thermal.
- 33 After the implementation of market-oriented reforms, private participation – which often entailed TNC involvement – in many cases helped improve efficiency because private providers, as commercial entities, had the incentive to increase revenue by collecting fees, and to cut wasteful cost by reducing managerial slack. A number of case studies show higher collections, decreasing costs and accordingly reduced losses after the entry of TNCs (e.g. World Bank, 2002; Platz and Schroeder, 2007).
- 34 The incumbent State-owned telecom, Maroc Telecom, was partially privatized in 2001 when 35% of its equity was sold to Vivendi (France) for \$2.1 billion. It was subsequently listed on the Casablanca and Paris stock exchanges in 2004 when 14.9% of government holdings were floated for \$1 billion. In 2005, Vivendi acquired an additional 16% of government shares for \$1.4 billion (raising the foreign share to a majority stake) Maroc Telecom has since developed into a TNC: it purchased 54% of Mauritel, the incumbent telecommunications operator of Mauritania, in 2001 and in late 2006 it bought 51% of ONATEL, the incumbent operator in Burkina Faso. This was followed by the purchase of 51% of Gabon Telecom for \$80 million in February 2007.
- 35 Other examples are Telmex and América Móvil, both owned by Grup Carso, although in their cases, domestic private companies also played a major role in addition to TNCs. During the privatization of Teléfonos de México (Telmex) in the early 1990s, TNCs participated through part ownership, but later relinquished the bulk of their ownership to Grupo Carso. Afterwards, as mentioned above and in section III.C, Telmex grew significantly to become one of the largest telecoms operators from and in the developing world (Clifton et al., 2007).
- 36 Corporatization refers to non-corporate entities (including State-run public utilities) taking up the organization and governance structures of corporations and operating in a commercial way.
- 37 While the results of similar performance contracts in other countries were disappointing (e.g. World Bank, 1995), the reform of UWSC has been very successful. For instance, collection efficiency increased from 60% in 1998 to 95% in 2006, and the number of staff per 1,000 connections fell from 36 to 7 during the same period.
- 38 Originating from the Port of Singapore Authority, PSA International is now a global port operator. It operates 26 port projects in 15 countries across Asia and Europe, with a global capacity of 111 million 20-foot equivalent units (TEUs).
- 39 Governments sometimes found it difficult to impose financial discipline on public enterprises and to give them financial autonomy, and they continued to assign multiple policy objectives to managers of these companies (Harris, 2003).
- 40 For instance, better sanitation and cleaner water can enhance the health and welfare outcomes of a country; providing electricity in a developing country can contribute to “social development through education and public health, satisfying more effectively basic human needs of food and shelter”. Various social services can benefit from expanded networks of water and electricity supply. For instance, schools can benefit as a result of night-time studying possibilities, and hospitals can benefit with improved health care provision (OECD, 2006a).
- 41 Availability and affordability of infrastructure services are related. For instance, the price of services and the (average) disposable income of inhabitants of a given location will jointly determine the affordability of services to those inhabitants. Of course, the two factors also influence the anticipated profitability for service providers, and therefore affect corporate decisions on whether to extend networks to that location. This can affect the coverage of networks and the availability of services.
- 42 In the early 1990s, the gaps were greatest for electricity and water, where, on average, revenues covered as little as 60% and 30% of costs respectively (Harris, 2003).
- 43 ENDESA (Spain) as well as other TNCs participated in the process of privatization in Chile during the 1980s and 1990s. In 2000 and 2001, several additional international firms became involved in the Chilean electricity industry through M&As (Bureau of Economic Geology, “Results of electricity sector restructuring in Chile”, www.beg.utexas.edu).
- 44 In the Philippines, for instance, under the State electricity company, electricity supply was interrupted for seven hours a day in many areas of the country, and in 1990, the area around the country’s capital lost about \$2.4 billion in economic output due to frequent power cuts (World Bank, 1995).
- 45 In the event, the projects that are operational have not had to resort to these guarantees.
- 46 In Argentina, under public provision the waiting time for a telephone connection was eight years; it took on average 23 days for phones to be repaired (Estache, 2002).
- 47 Figures on urban growth sometimes conceal the frequent lack of progress in rural telecommunications development (Shanmugavelan and Warnock, 2004). The rural population, which comprises the majority of Africans, has yet to benefit adequately from the deployment of new telecoms technologies (McCormick, 2005).
- 48 The country has 13 ports with a throughput of over one million TEUs; six of them are among the world’s top 20 container terminals (UNCTAD, 2007i). HPH operates 12 terminals in 10 ports at: Gaolan, Huizhou, Jiangmen, Jiuzhou, Nanhai, Ningbo, Shanghai, Shantou, Shenzhen and Xiamen; PSA International is involved in terminal operations at the ports of Dalian, Dongguan, Fuzhou, Guangzhou and Tianjin; DP World operates at the ports of Qingdao, Shanghai, Tianjin and Yantai; APM Terminals operates at the ports of Dalian, Qingdao and Shanghai. Source: China Communications and Transportation Association and company websites.
- 49 TNCs are involved in the operation of some of India’s 12 major ports. For instance, PSA International is involved in the operation of the ports of Chennai, Hazira, Kolkata and Tuticorin; and DP World in those at Cochin and Visakhapatnam.
- 50 Westport (Malaysia) had completed nine berths capable of serving vessels in the range of 8,000 to 9,000 TEUs by 2005 and handled 6.2 million TEUs in 2006 (UNCTAD, 2006b and 2007i).
- 51 The country is realizing its potential as a regional trans-shipment base with the development by DP World of the Santo Domingo container terminal (with a capacity of one million TEUs) and a related free zone (UNCTAD, forthcoming b).
- 52 For example, MTD (Malaysia) has invested in and operates a highway linking Yangshuo and Luzhai in Guangxi Province (Li Rui, “The first foreign-invested BOP highway project in Guangxi starts”, *Xinhua Net*, 23 June 2008 (http://news.xinhuanet.com/newscenter/2008-06/22/content_8417569.htm)).
- 53 There is a potential two-way relationship between broader regional economic integration and integration in the area of transportation, and regional approaches are also particularly appropriate for transport facilitation along main transport corridors (TDR07).
- 54 The Maputo Corridor provides the shortest transit route to the sea for all the northern provinces of South Africa and the neighbouring regions, and ends at the deepwater ports of Maputo and Matola in Mozambique.
- 55 The consortium, which owns 51% of MPDC, consists of Mersey Docks (United Kingdom), Skanska AB (Swedish construction company), Liscont-Operadores de Contentores SA (Portuguese

- terminal operator) and local partner Mozambique Gestores SARL. The Government of Mozambique and the national ports and railways authority, CFM, hold the other 49% of MPDC shares. The chief executive of the joint venture was seconded from Mersey Docks.
- ⁵⁶ Throughput is expected to increase from 4 million tonnes in 2003 to 13 million tonnes by 2018 (“Mersey Docks led consortium to control Maputo Port”, at: www.portmanagement.com).
- ⁵⁷ As an extreme example, in 2006 Indian consumers of water paid, on average, only 10% of the actual cost of its production and delivery (Nazareth, 2008).
- ⁵⁸ One study, focusing on Eastern Europe and Central Asia, found that price increases in these regions have been driven more by foreign involvement (Gassner, Popov and Pushak, 2008a). Sometimes price decreases have also been observed. Overall, the regulatory regime is probably more important than ownership in determining price (e.g. where a government continues to subsidize user tariffs). In addition, studies on the relative cost efficiency of public sector operators of water utilities have shown that there is a far greater variation in their operations than that of TNC/private sector operators. This means that the direction of price change after private sector/TNC participation depends very much on the level of efficiency of the previous operator (Massarutto, 2007).
- ⁵⁹ One of the reasons for this price dispute was that the contract tariffs were stipulated in dollars, but this became unfeasible from the country’s perspective when the Argentinean crisis of 2001–2002 led to the Government abandoning its policy of holding the Argentine peso at parity with the United States dollar.
- ⁶⁰ Of course, the situation was very complicated, as pointed out by Casarin et al. (2007), who suggest that the dynamic behind underpayment in poorer districts partly explains the operator’s behaviour.
- ⁶¹ Of course, TNC-specific aspects can be discerned in particular cases. For example, TNCs have started to introduce clean technology to power stations in China, which is also being taken up by local firms (Wang, 2008). However, there is insufficient evidence to warrant a separate discussion of the environmental impact.
- ⁶² The impact of TNC participation on infrastructure industries also, and importantly, affects the competitiveness of local businesses and industries across the host-economy development generally, but analytically it is not particularly meaningful to examine the relationship between TNC participation in infrastructure and a country’s competitiveness (or development under conditions of openness to international competition). Apart from a wide variety of confounding factors, the main relevant causal factors between infrastructure and the economy as a whole relate to the quality and performance of infrastructure industries per se – not their ownership. And even in this respect, the direct connection is not so clear, recalling the remark by Robert Solow in 1987, “You can see the computer age everywhere, but in the productivity statistics” (cited in “The broadband myth”, *Economist* 23 May, 2008).
- ⁶³ In the longer term, the fiscal effect of the change in ownership is harder to gauge. Ultimately, this depends on the initial price, on the use of the net revenues obtained from the sale, on the post-sale stream of tax revenues, and how well privatized enterprises perform post-sale.
- ⁶⁴ The obverse of this is the private sector/TNC’s inflated expectations of the values of licences, concessions or market potential. This too has led to overbidding in developed and developing countries, especially in sectors such as telecommunications and electricity – leading to reduced viability and profitability. This provides fiscal benefits to host Governments in the short run, but potential for problems in the long run because of a higher risk of bankruptcy or defaults (Harris, 2003).
- ⁶⁵ By 1998, 8 of the 22 mobile phone operators, and all but one of the wireless operators, had defaulted on their licence fees, and the cellular market had not taken off as expected. While a post-1995 economic slump was partly responsible, far more important was the nature of the policy framework within the sector. The ability of the Indian Department of Telecommunications to operate both as regulator and service provider enabled it to write the rules of the game completely in its own favour. In particular, it made mobile telephony subscribers – not fixed-line users – pay for the calls they received from its fixed-line system, further adding to the higher cost of mobile calls. This regime of “receiver pays” contravened international standards, and posed a de facto tax on cellular services (Nazareth, 2008).
- ⁶⁶ In Mexico, the bailout of a failed Mexican toll-road programme in 1997 cost the Government between \$7 and \$12 billion (1%–1.7% of Mexico’s GDP) (Guasch et al., 2005).
- ⁶⁷ However, multiplier effects on the economy due to lay-offs (and hence reduced consumption) are generally small, since infrastructure employment is seldom more than 2% of the total workforce (Foster et al. undated; McKenzie and Mookherjee, 2002). The Study by Gassner, Popov and Pushak, 2008b confirms average staff reductions of this order of magnitude as a share of the total workforce in 71 developing and transition economies.
- ⁶⁸ For example, in the case of Argentinean railways, the workforce was reduced to 19,700 employees from an initial total of 92,500. The State spent \$360 million to compensate dismissed employees, thus diverting funds from other uses by the State (Kopicki and Thompson, 1995).
- ⁶⁹ Some rehiring could result, for example from infrastructure improvements, which shows how important it is to look at the overall cost-benefit equation. This is certainly the case for TNC involvement in China and India (Wang, 2008; Nazareth, 2008).
- ⁷⁰ For instance, companies such as Millicom International (Luxembourg) and Celtel (part of Zain Group (Kuwait, but registered in the Netherlands)) specialize in business models that bring millions of new customers into the industry as a result of innovative technology or organization. Millicom, for example, specializes in pre-paid subscriber systems, which it tailors – among others – to LDC markets such as Cambodia, the Democratic Republic of the Congo, the Lao People’s Democratic Republic and the United Republic of Tanzania.
- ⁷¹ It is common for TNCs to use foreign construction companies because of existing relationships and the desire to minimize costs. Some of the leading construction/engineering companies acting as subcontractors or suppliers to infrastructure TNCs are from countries such as Brazil, China, India and Turkey. For example, ETC (United Arab Emirates), and Huawei (China) have a global partnership, whereby the latter supplies equipment to the former in each market it enters (Pradhan, 2008). This means that fewer jobs are likely to be created in a host country and, where they are created, few are available to nationals.
- ⁷² In the longer term, the balance of power in infrastructure industries shifts as new players enter the market, thereby eroding the monopolistic power and privileges accrued by TNCs (and other firms) as a result of entering early into newly liberalized markets.
- ⁷³ More commonly, in the context of TNC-government relations, the term “obsolescing bargain” means that high sunk costs by TNCs in industries such as mining and infrastructure can give the host country government the upper hand in renegotiating contracts (*WIR07*).
- ⁷⁴ This term refers to differences in the levels of information on costs, revenues, rates of return, investment scenarios and plans available to different participants in a market or stakeholders – in this case, TNCs (and large domestic private firms) as opposed to regulatory agencies.
- ⁷⁵ Of the 41 respondents, 33 mentioned information asymmetry as a serious problem, and 22 also mentioned enterprises providing misleading information. (The questions were specifically addressed to regulators using price-cap and rate-of-return tariff structures.)

CHAPTER V

POLICY CHALLENGES AND OPTIONS

A. A complex challenge

The significant investment needed for infrastructure development in developing countries (chapter III) necessitates greater involvement of the private sector, in many instances that of TNCs. It is therefore important for host countries and their governments to determine when it is appropriate to bring TNCs into the development and management of infrastructure projects and how to attract TNC participation that leads to the expected development outcomes. Throughout the world – in developed as well as developing countries – policymakers are faced with the challenge of developing adequate, efficient and equitable infrastructure industries and services. This involves a number of complex issues.

First, the perspectives of many different stakeholders have to be considered when deciding on whether and how to involve TNCs. At least four different stakeholders can be distinguished: the government (at different levels), the various companies and financiers involved, the users of the infrastructure services and the society at large (Scott, 2007). To avoid the risk of failure, the varying objectives of these groups need to be adequately taken into account.

Secondly, there are no one-size-fits-all solutions. Policy priorities and options differ considerably between countries at different levels of economic development and with different characteristics. For example, for landlocked countries it may be important to give special attention to cross-

border infrastructure that can improve their access to global transport networks; and the infrastructure solutions for countries with small economies may differ considerably from those with large national markets. As a result, the right mix of public and private (including TNC) investment will continue to vary greatly by project, industry and country.

Thirdly, designing and implementing appropriate policies to harness the potential role of TNCs in infrastructure require adequate skills and capabilities. Many infrastructure investments are socially sensitive and technically challenging, and need to be regulated by means of long-term contracts within an appropriate legal framework. Governments have to prioritize among competing demands for different projects (keeping in mind the dual needs to maintain existing physical infrastructure and develop new projects), establish clear and realistic objectives for the projects chosen, and integrate them into broader development strategies. This means that the ministries and implementing agencies concerned have to possess the necessary institutional capacity and skills to guide, negotiate and regulate the projects. As many infrastructure projects are handled at the subnational level, development of capabilities is warranted not only at the central level, but also at provincial and municipal government levels. Thus, for leveraging TNCs for infrastructure development, adequate human and institutional resources are needed.

Added to these challenges is the rise in global demand for investment in existing



and new infrastructure. Since many developing countries are seeking foreign investment to develop their physical infrastructure, competition for such investment is becoming more intense. Moreover, growing demand in the developed world and in large emerging economies is leading potential investors to expect higher returns for a given level of risk. At the same time, failures and investment disputes associated with infrastructure projects, notably in Latin America, have contributed to a more cautious attitude among some governments as well as overseas investors. Even very large TNCs today think twice before committing managerial and financial resources to projects in developing countries that they perceive as presenting a relatively high level of risk. And with fewer potential investors, governments may face a greater risk that bidding processes for specific projects will be less competitive.

Tackling the complex and multifaceted challenges requires concerted action by all parties concerned. The ultimate responsibility for creating an environment that is conducive to long-term infrastructure investments and for prioritizing and taking the necessary decisions with regard to the potential role of the different stakeholders in different projects rests with national and subnational governments in each country. In some cases, cooperation among several countries in a region may be necessary to maximize the benefits from infrastructure investments. For many developing countries, especially LDCs, national efforts have to be complemented by active support from the international community.

This chapter reviews current developments with regard to national and international policymaking in the area of infrastructure investment, focusing, in particular, on areas of relevance to TNC participation. Thus the analysis only briefly covers issues related to sectoral reform and broader regulatory matters. The chapter is structured as follows. Section B provides an overview of recent trends in host-country policies aimed at attracting TNCs and enhancing the potential benefits from their participation. It reviews the extent to which countries allow and promote TNC participation in different infrastructure industries and analyses the various contractual arrangements and policy options that countries use in order to derive benefits from the presence of TNCs. Section C considers the role of international investment agreements (IIAs) and examines potential implications of the rising incidence of investor-State disputes related to infrastructure. Section D highlights the role of home countries and international institutions in facilitating foreign infrastructure investment in developing countries, wherever this is desirable, and section E concludes.

B. Host country policies to attract and benefit from TNC participation

A growing number of countries have opened up their infrastructure industries and are actively seeking to involve TNCs through FDI and other forms of participation. TNCs can bring benefits to a host country if the circumstances are right, but their involvement may also present risks that governments need to consider (chapter IV). This section looks at national measures to attract TNCs in infrastructure and to maximize the benefits they can bring. It begins by emphasizing the importance of a country's overall institutional and regulatory framework. It then considers the extent to which countries permit TNC activity in infrastructure and the role of investment promotion agencies (IPAs) in this context. The subsequent sections discuss the policy implications of different forms of TNC participation and various approaches to enhancing the social development gains from their involvement.

1. Building the institutional and regulatory framework

With or without TNC participation, countries need to develop strong legal and regulatory systems to ensure efficient as well as equitable pricing, investment and delivery of infrastructure. Moreover, the quality of the overall institutional environment is a major determinant of a country's ability to attract and benefit from foreign investment (chapter IV). The creation of participatory, transparent and accountable governance systems that promote and enforce the rule of law is critical in this context. Before committing funds to a project, companies consider whether laws and contracts are likely to be properly enforced, and whether their rights and responsibilities are well defined and likely to be respected (section III.D). Clear, transparent and well-enforced rules of conduct, grounded in law, are important for reducing the risk of political or popular backlashes against projects. In this context, governments also need to understand the implications and costs of compensating a company if the contract is unilaterally terminated.

If an adequate regulatory framework is not in place, there is an increased risk that countries will lose out by opening up. Moreover, once a country liberalizes, it is often hard to reverse the process. This makes the *sequencing of reform* important. A case can be made for gradual reforms that enable a country to develop the institutional capabilities first before designing and actually implementing the reforms

(see, for example, *WIR04*). Competitive restructuring, the introduction of regulations and the establishment of an independent regulatory agency should precede steps towards liberalization. Such a sequence helps clarify the rules of the game for investors, and governments become better prepared for engaging in a specific project. In reality, however, opening up to foreign investment has often preceded comprehensive sectoral reforms, with less positive results (Fay and Morrison, 2007; Wint, 2005; Wells and Ahmed, 2007; Kessides, 2005). Unless credible regulatory bodies can be established, most developing countries are likely to be better off keeping their utilities in the public domain, in particular the profitable ones (Bull, Jerve and Sigvaldsen, 2006). In fact, governments require greater skills and capabilities to privatize and to govern privately operated infrastructure than to run State-owned enterprises (SOEs) (Wells and Ahmed, 2007).¹

The legal and regulatory framework for issuing licenses or concessions should define the rights and obligations of utilities, clarify pricing mechanisms and establish procedures for dispute resolution. It may also include conditions for ensuring that efficiency gains are shared with consumers. To the extent possible, the institutional framework should seek to minimize the possibility for conflicts of interest between participants (i.e. competing firms, remaining monopolies and consumers) in the provision of physical infrastructure and related services. Although the specific features of infrastructure industries necessitate a greater reliance on regulation of the sector (chapter III), competition policy also plays an important role. Even when the benefits outweigh the costs of unbundling (chapters III and IV), opening up needs to be complemented by competition laws and authorities sufficiently equipped to enforce these laws (Kessides, 2004: 69; Newbery, 2006). Without a competitive restructuring of infrastructure industries, privatized companies may more easily acquire a dominant position. Competition authorities should have the mandate to review regulatory decisions, assess their impact on competition and take action against firms that use the regulatory process for anticompetitive purposes.

Another important element of reform is the establishment of independent and accountable regulatory agencies to implement laws and regulation in infrastructure industries. An autonomous regulatory agency that is separate from the executive branch of the government is more likely to help maximize benefits from reforms, balancing the interests of consumers and service providers and providing foreign investors with a degree of assurance that they are protected from political intervention (Fay and Morrison, 2007; Sader, 2000).² A strong regulatory agency can be a useful counterweight to political opportunism as well as to opportunistic investors. Investors may try to

shift risks to consumers or taxpayers by demanding renegotiation of key elements of governing contracts. They may threaten withdrawal from a project, calculating that the government, concerned with the disruption of service, will give in to their demands. The incidence of contract renegotiations has been found to be much higher in countries with weak or no regulatory agencies (Guasch, Laffont and Straub, 2003).

There are few clear yardsticks or rules of thumbs that policymakers can use when designing and implementing sectoral infrastructure reforms and opening up to TNC involvement (Estache and Fay, 2007; Woodhouse, 2006). However, some general principles have been developed that may help governments in this area, including by the Organisation for Economic Co-operation and Development (OECD) (box V.1). Other policy guidelines include those developed by the United Nations Commission on International Trade Law (UNCITRAL) (UNCITRAL, 2004); the United Nations Economic Commission for Europe (ECE, 2008) (box V.2); and the United Nations Industrial Development Organization (UNIDO, 1996).

TNC involvement represents just one of several options policymakers can consider to develop their infrastructure. Governments need to weigh the potential benefits and risks involved (chapter IV) by studying all options – from privatization to traditional government provision. If a decision is made to involve TNCs, it is important to develop an overall policy for such participation and to set clear goals, values and principles (ECE, 2008: 19). This includes making sure that the views of existing constituents are reflected in the decision-making process and in project execution.

As noted above, inviting TNCs to deliver infrastructure services tends to place more rather than less responsibility on public officials. Governments that decide to engage TNCs in infrastructure industries therefore need to develop the expertise and capabilities required for the public sector to administer often highly complex projects. This is equally important at the regional and municipal levels of government, which are responsible for a growing number of infrastructure projects but generally have limited resources and institutional capabilities.

Eventually, however, the only way to gain the necessary experience is through learning by doing (i.e. by engaging in an actual project). In this context, it may be advisable to start on a small scale rather than adopting a major programme across industries. It may also be useful initially to concentrate on less contentious segments of an industry. In the case of water, for example, network operations and billing are the most politically contentious aspects, as these activities involve direct interaction with

Box V.1. The OECD Principles for Private Sector Participation in Infrastructure

The OECD *Principles for Private Sector Participation in Infrastructure* were designed to help governments that wish to involve private investors, including foreign companies, in the development of their infrastructure industries. They were developed in consultation with a broad group of public and private sector experts as well as some from civil society. The Principles do not advocate private participation; rather, they suggest that governments should be guided by an objective assessment of what best serves the public interest – that is, supports the common well-being. In this context, a number of factors should be considered, including current conditions, what households and companies can afford, coverage, efficiency, long-term maintenance of assets as well as social and environmental sustainability. The Principles can be applied by governments in both developed and developing countries and address five main sets of challenges:

1. Deciding on the utility and nature of potential private sector involvement;
2. Providing a sound institutional and regulatory environment for infrastructure investment;
3. Ensuring public and institutional support for the project and choice of financing;
4. Making cooperation between the public and private sectors work;
5. Communicating governments' expectations about responsible business conduct to their private partners.

The Principles are intended to serve as a first step in the authorities' consideration of private sector participation. They can also be used as a template for country self-assessment at national and local government levels, aid public authorities to report on progress, provide guidance for private enterprises and serve as a tool for structuring regional and other intergovernmental cooperation and public-private sector dialogues.

As a follow-up, a specific application of the Principles was launched for the drinking water and sanitation sector. The practical guidance to optimize private sector participation in this area involves three interlinked dimensions: adapting the Principles to the sector, building an information base of country experiences, and engaging discussions at the regional level. To this end, a round table was organized jointly by the New Partnership for Africa's Development (NEPAD) and the OECD – as part of the NEPAD-OECD Africa Investment Initiative – in Lusaka in November 2007, and in March 2008 the OECD and the Asian Development Bank held a joint expert meeting.

The resulting guidelines (to be launched at the Istanbul World Water Forum in 2009) are intended to help governments and other stakeholders to properly assess the implications of involving private actors in the financing, development and management of water and sanitation infrastructure. This should enable them to better manage such involvement, including through an appropriate allocation of roles, risks and responsibilities and the establishment of the necessary framework conditions. The focus is mainly on developing and transition economies. The private sector operating in this area comprises a range of players, such as international investors, local and regional actors, small-scale water operators, construction companies, joint ventures between public and private companies as well as public companies operating abroad as private participants in competitive bidding.

Building on the application of the Principles in the water and sanitation sector, the OECD plans to develop a similar framework for energy to support the institution's efforts in addressing the impacts on climate change.

Source: UNCTAD, based on information provided by the OECD (see OECD, 2007b and www.oecd.org/daf/investment/ppp).

final consumers. In contrast, bulk water provision (including mobilization of new water resources and building reservoirs and water treatment works) does not directly involve the customers.³

However, if countries wish to involve TNCs in infrastructure activities that are complex to manage, as in water, it may be appropriate to start with low-level contracts. For example, technical assistance or management, operations and maintenance contracts do not attract capital inflows, but neither do they have the potential for controversy or entail the same level of costs and contractual risk. On completion of such a contract, the government can choose to revert to municipal operation, award a follow-up contract on similar terms (through an open tender or by negotiation with the original contract holder), or develop a concession contract. Another option may be to corporatize the public operators in the sector

and recruit managers with private sector experience to run the operations (Estache and Fay, 2007: 27–28). Whatever the nature of TNC involvement, low-income countries are likely to benefit from partnerships with various development partners that can contribute both financial resources and expertise.

2. Openness to TNC involvement varies by industry and country

Since the Second World War, the opening up of infrastructure industries to foreign investment has been much slower than in other industries. It was only in the early 1990s that developing and transition economies began in earnest to dismantle legal barriers to private – and often foreign – investment in infrastructure. Today, many countries have some foreign involvement (chapter III). As

Box V.2. The ECE Guidebook on public-private partnerships

A common misconception about public-private partnerships (PPPs) is that they require less public sector involvement; in reality they demand more. PPPs require a strong public sector that is able to adopt a new role and perform new skills. Weak institutions can hamper the implementation of PPP programmes. Moreover, poorly constructed, non-transparent projects can lead to failure and considerable frustration. This in turn can generate a backlash and political opposition towards the whole concept of partnerships between the public and private sector in infrastructure development.

The United Nations Economic Commission for Europe (ECE) has prepared a *Guidebook on Promoting Good Governance in PPPs* (ECE, 2008). Its purpose is to assist Governments in realizing the benefits from PPPs through a strengthening of their governance frameworks. The Guidebook sets out seven principles of good governance and the ways each principle can be achieved with respect to:

- A coherent PPP policy to provide clear direction and leadership;
- Strong enabling institutions within the Government, with skills in identifying, initiating, delivering and monitoring projects;
- A legal and regulatory framework that offers clarity, simplicity and predictability in legal processes;
- Fair risk-sharing between public and private sectors;
- Transparency, openness and fairness in selecting private partners;
- Putting people first by making the projects accountable to them for performance and delivery; and
- Sustainable development, ensuring the outcomes have the maximum developmental impact and respect for the environment.

With these principles as a basis, the ECE is currently elaborating a toolkit entitled *How to do PPPs*, consisting of training the trainer modules for a PPP capacity-building programme designed to improve PPP governance.

Source: UNCTAD, based on information provided by ECE.

with private sector participation more generally, the trend towards opening up to TNC participation has been more widespread among developed countries and the relatively advanced developing and transition economies. Although the nature of liberalization has varied significantly, all groups of countries are now more open to TNC activities in infrastructure than they were two decades ago. However, national investment policies with respect to infrastructure development are generally still more restrictive than those relating to manufacturing and other service industries (UNCTAD, 2006d: 19; Golub, 2003).

There are significant differences across infrastructure industries as regards the degree of openness, for various reasons. Some factors relate to the nature of each industry, notably the scope for unbundling and competition (chapter III). Reaping benefits from TNC involvement is easier in infrastructure industries that are relatively easy to expose to competition (such as mobile telephony) than in those characterized by a natural monopoly (such as water distribution). Other factors are related to the characteristics of the host country environment, including the level of development and the quality of administrative capabilities.

There have also been exogenous factors at play. During the 1980s and 1990s, a number of developing countries opened up to TNC investment in response to structural adjustment policies of the International Monetary Fund or as part of loan conditionalities of the World Bank.⁴ In the 1990s, privatization became a

key element of loan conditionalities in the electricity sector, and privatization and/or cost recovery policies were recurrent conditionalities in the water sector (Bayliss, 2001; Grusky, 2001). Such conditionalities sometimes seem to have led governments to privatize in a hurry in order to be able to access aid funds. In some cases this meant shortening the privatization processes, for example by failing to establish sound regulatory bodies. Privatization and liberalization are still included as conditions in World Bank and IMF loans, but less frequently,⁵ and these institutions, which still exert considerable influence, have not given much attention to alternative policy prescriptions. Moreover, there are few donors that completely disregard private involvement in the infrastructure sector (Bull, Jerve and Sigvaldsen, 2006: 26).

a. In electricity, openness is the greatest in the generation segment

A 2006 study found that 17 of 50 developing and transition economies had a total ban on foreign investment in electricity (UNCTAD, 2006d). The Asian region was generally more restrictive than Latin America and the Caribbean.⁶ A large number of low-income countries were seen to have full State ownership of power utilities: 32 out of 47 countries of sub-Saharan Africa, compared to only 8 countries that had concession contracts and 7 that had management or lease contracts with private partners (Gokgur, 2004).⁷ In some countries, State-owned enterprises (SOEs)

coexist with private (including foreign) operators that may be allowed to enter the market by way of greenfield projects (Wang, 2008; Nazareth, 2008). Private independent power providers (IPPs) (many of them foreign) often operate alongside SOEs (World Bank, 2004a). As expected, openness to foreign involvement is greater in electricity generation than in distribution, and very low in transmission (Estache and Goicoechea, 2005; see also section V.B.3).

b. Almost all countries allow TNCs to invest in telecommunications

The extent to which foreign companies are allowed to participate in *telecommunications* similarly differs by segment and country. More countries allow foreign investment in mobile telephony than in fixed line telephony, partly because it has been easier to introduce competition in the former (ITU, 2007b), and because technological capabilities are not sufficiently developed by domestic firms. The first privatization of an incumbent telecommunications provider took place in the United Kingdom in 1981 with the sale of Cable and Wireless.⁸ Among developing countries, the Government of Chile was the first to privatize when, in 1988, it divested its shares in CTC and ENTEL. In most developing countries, incumbent telecommunications operators have rarely been fully privatized. Instead, part of the operators have been sold through private sales, public offerings or a combination of the two, with the government retaining some ownership. By the end of 2006, about half of all developing countries had sold all or part of their incumbent operators, often to TNCs. Of the 78 developing countries that partly or fully privatized their telecom operators, 82% sold significant stakes to a strategic foreign investor, while the remaining 18% divested shares through initial public offerings (Minges, 2008).

In general, there is greater openness to TNC involvement in this industry in developed countries than in developing and transition economies (OECD, 2003; UNCTAD, 2006d). The number of countries without TNC involvement is shrinking.⁹ Today, it is estimated that only 10 developing countries lack any

form of TNC involvement in telecommunications,¹⁰ and only a few countries have outright prohibition of foreign investment. In Ethiopia, *Proclamation No. 281/2002* identifies government-owned Ethiopian Telecommunications Corporation as the sole telecommunications service provider.¹¹ In Costa Rica, telecommunications has also been regarded as a natural monopoly.¹² However, following the ratification of the Central American Free Trade Agreement in October 2007, a Government bill was adopted in May 2008 that will allow private companies to offer wireless services.¹³

In other countries, there are caps on foreign investment (table V.1). India, for example, has imposed a ceiling on the level of foreign ownership in telecommunications, which was raised from 49% to 74% in 2005 with the aim of attracting more foreign investment.¹⁴ In Bolivia, by contrast, the country's President announced in May 2008 that the Government would take immediate control of ENTEL, in which Telecom Italia then held a 50% stake.¹⁵

c. Water remains highly restricted

The *water* industry remains relatively closed to foreign investment. As the costs of production are low relative to the transportation costs, unbundling is not especially attractive (chapter III). Unsurprisingly, more than 90% of all water utilities are run by public entities, either at the national or local level (World Bank, 2007c; Hall and Lobina, 2006: 3).¹⁶ Most contracts with TNC participation are concessions or operation and management contracts (chapter III).¹⁷ During the period 1985–2008, in developing countries, TNCs have been involved in the provision of water to at least 184 million people.¹⁸ Apart from Chile, however, they are not known to provide any significant water services in rural areas (Hall, Lobina and de la Motte, 2004: 3; Owen, 2008). Their absence in rural areas reflects the income gap between rural and urban households and difficulties in achieving the economies of scale needed to reduce costs.

The private sector provided water to more than 30% of the population in only 6 of the 70 developing

Table V.1. Foreign ownership restrictions in telecommunications, selected developing countries, latest year

Country	Restrictions
China	49% limit, and up to 50% for value-added services.
India	74%, with the remaining 26% owned by Indian citizens or companies.
Indonesia	35%
Malaysia	30%, and permit >50%, but has to be reduced after 3 years.
Mexico	Concessions granted only to Mexican nationals. Foreign investment can be no greater than 49% except for cellular telephony services where permission is required from the Commission of Foreign Investment for a higher level of foreign participation.
Philippines	40%
Singapore	49% on facilities-based operators.
Thailand	49%

Source: UNCTAD, based on the ICT Regulation Toolkit, Table 3.6, available at: <http://icttoolkit.infodev.org/en/PracticeNote.aspx?id=2551>.

countries listed in table V.2; in most of the economies, the corresponding share was below 5%. At the same time, about 60% of the countries have seen some TNC involvement during the past two decades. Current trends in TNC involvement differ considerably. For example, in the Central African Republic, Chad and Guinea, TNCs are no longer present. Their exit has been due to war and political instability, the end of the contractual period, and a general wish to withdraw interests from the region (Owen, 2008). In other economies, such as Argentina, Bolivia, Brazil, Malaysia, the Philippines, Thailand and Viet Nam, the trend is towards emphasizing local private sector rather than foreign participation (table V.2). By contrast, China, India and a number of West Asian economies are increasingly interested in encouraging TNC participation in water projects (Owen, 2008).

d. Road transport the most open, rail transport the least

There is limited information on the openness to TNC involvement in *transport infrastructure*. A recent study of developing and transition economies found that the average level of restrictions on foreign investment within transportation – including infrastructure and related services – was lowest in *road transport* and the highest in *rail transport* (UNCTAD, 2006d).

e. Rising concerns related to the strategic nature of infrastructure

In recent years, policymakers in both developed and developing countries have cautioned against foreign investment in “strategic” infrastructure. While there is no common agreement as to what is

to be regarded as “strategic”, this tendency has been associated with national security or public interest concerns (chapter I), and seems to be particularly pronounced in the case of cross-border M&As where the acquiring company is State-owned (*WIR06*).

A recent review of the FDI policies of 11 countries found that most of them impose some sort of limitations or review requirements on foreign investment related to energy infrastructure (United States, GAO, 2008: 19; see also box I.2).¹⁹ In the United States, the Foreign Investment and National Security Act of 2007 explicitly requires the Committee on Foreign Investment in the United States to investigate any transactions involving an acquiring company that is controlled by a foreign government or that concern critical infrastructure (Ibid.: 32–33). China includes power generation, power distribution and telecommunications among industries deemed critical to the national economy, and the Russian Federation includes natural monopolies and telecommunications in its definition of “strategic sectors”.²⁰ Several countries, especially in Latin America and the Caribbean, have also adopted or are considering policies aimed at re-nationalizing infrastructure (box V.3).

* * *

To conclude, many countries are today open to TNC involvement in infrastructure. However, there are significant variations by industry, and recent years have also witnessed growing concerns with respect to foreign control of certain infrastructure segments. The highest degree of openness has been observed in mobile telephony, while water services remain the least open to TNC participation. Openness is generally higher in industries that are easier to unbundle and expose to competition, and in more developed economies. Large-scale projects and those requiring

Box V.3. Recent re-nationalizations in infrastructure

The Government of *Argentina*, in 2006 rescinded its contract with Aguas Argentinas, which was responsible for providing water services to the greater Buenos Aires metropolitan area. This provoked a dispute with Suez Lyonnaise des Eaux and Veolia Environnement (both French), both of which held shares in the company. Earlier, in mid-2004, Argentina had re-nationalized the San Martin railroad, previously in the hands of Argentine company Metropolitano.^a The *Bolivarian Republic of Venezuela* in 2007 nationalized the electricity company, Electricidad de Caracas, as well as the main telecoms company, CANTV, and its mobile unit, Movilnet. In the *Dominican Republic*, in 2003 the Government decided to re-purchase the shares of the private company Union Fenosa in the privatized electricity distribution companies EdeNorte and EdeSur (*WIR04*). In *Bolivia*, President Morales on 1 May 2008 announced that the country’s largest phone company, ENTEL, would be bought from its current owner, Telecom Italia (EIU, *Business Latin America*, 12 May 2008). In the *Russian Federation*, a dispute is pending concerning the re-nationalization of Moscow’s Domodedovo airport.^b A number of re-nationalizations of infrastructure have also been announced in developed countries, including in Estonia and Slovakia (chapter II).

Source: UNCTAD.

^a See www.thefreelibrary.com/argentina:+government+rescinds+contract+with+aguas+argentinas,...-a0144164403.

^b On 20 March 2008, the 10th arbitration appeals court upheld a lower court ruling in January 2008 to return a large amount of the airport’s property to federal ownership, including parts of the terminal. The Government has argued that the airport was illegally privatized in 1997 (see: www.themoscowtimes.com/article/1010/42/361633.htm).

Table V.2. Private sector and TNC involvement in water projects, selected developing economies, December 2007

Economy	Private sector participation (PSP)		TNC involvement	
	PSP during past 20 years	Share of population served by PSP projects	TNC involvement during past 20 years	Comment
LDCs				
Bangladesh	No	0%	No	
Burkina Faso	Yes	5%	Yes	Limited to operation & management (O&M) projects
Cambodia	Yes	>1%	No	Small local companies gaining concessions
Central African Rep.	Yes	0%	Yes	Civil war led to the SAUR company ending its SODECA concession
Chad	Yes	0%	Yes	Renationalization (2004) as Veolia ended O&M contract
Congo, Dem. Rep. of	No	0%	No	Cascal declined to enter into a management contract in 2004
Guinea	Yes	0%	Yes	SEEG lease contract expired in 2001
Guinea-Bissau	No	0%	No	Suez has provided technical assistance since 1991
Lesotho	No	0%	No	External support for PSP may evolve into a management contract
Malawi	No	0%	No	
Mali	Yes	1%	Yes	Bouygues has a concession for the main towns
Mozambique	Yes	4%	Yes	Bouygues is involved in a management contract
Nepal	No	0%	No	
Niger	Yes	14%	Yes	Veolia has a broadly based O&M contract
Senegal	Yes	32%	Yes	10 year O&M contract was renewed for another 5 years in 2006
Sudan	Yes	0%	Yes	Status of Cascal's water PSP contract awarded in 2007 is uncertain
Tanzania, United Rep. of	Yes	0%	Yes	Cascal O&M contract revoked in 2005
Uganda	Yes	2%	No	Emphasis is on medium-sized local companies
Zambia	Yes	0%	Yes	A short-term contract completed
Other developing economies				
Algeria	Yes	29%	Yes	Desalination and water management contracts underway
Argentina	Yes	11%	Yes	Most major TNC contracts have ended
Bahrain	No	0%	No	PSP under consideration for some years
Belize	Yes	0%	Yes	Cascal has an O&M contract
Bolivia	Yes	0%	Yes	Government policy against private/TNC participation
Brazil	Yes	27%	Yes	Many TNCs have sold project stakes, strong local PSP
Cameroon	Yes	25%	Yes	ONEP won bid on privatization of SNEC in 2007
Chile	Yes	81%	Yes	TNCs have divested some of their holdings
China	Yes	10%	Yes	Market is welcoming to TNCs, albeit competitive
Côte d'Ivoire	Yes	29%	Yes	Bouygues operates a concession
Cuba	Yes	5%	Yes	Agbar is expanding its activities
Dominican Rep.	Yes	15%	Yes	One large O&M contract
Egypt	No	0%	No	PSP laws passed in 2000, no contracts signed
Ecuador	Yes	19%	Yes	Two TNC concessions
Gabon	Yes	44%	Yes	Veolia concession listed on local stock exchange
Ghana	Yes	27%	Yes	Vitens and Rand Water operate a PSP contract
India	Yes	1%	Yes	Supportive environment emerging
Indonesia	Yes	5%	Yes	Major concessions by TNCs, regional players emerging
Iran, Islamic Rep. of	No	0%	No	
Iraq	No	0%	No	
Jordan	Yes	45%	Yes	One water BOT for Amman & Northern Jordan, plans for further contracts.
Kazakhstan	Yes	2%	Yes	Some small O&M contracts
Kenya	No	0%	No	Veolia has a support contract
Korea, Rep. of	No	0%	No	Wastewater PSP with TNCs
Kuwait	No	0%	No	Wastewater PSP since 2001, no water PSP
Lebanon	No	0%	No	Beirut PSP plans postponed in 2002
Malaysia	Yes	64%	Yes	Trend towards concessions run by local companies
Morocco	Yes	22%	Yes	Veolia and Suez operate a series of concessions
Namibia	No	0%	No	Veolia has a wastewater contract, no water contracts
Nigeria	No	0%	No	Little progress on PSP
Oman	Yes	31%	Yes	One desalination and one water contract awarded to TNCs in recent years.
Pakistan	No	0%	No	
Panama	Yes	9%	Yes	One contract (Cascal)
Paraguay	No	0%	No	No formal PSP
Peru	Yes	3%	Yes	Small TNC projects
Philippines	Yes	13%	Yes	Major projects being handed over to local investors
Qatar	Yes	0%	No	Desalination by a local consortium
Saudi Arabia	Yes	15%	No	A series of management projects under development
Singapore	Yes	10%	No	Current emphasis on local players
South Africa	Yes	2%	Yes	Pressure on TNCs to provide free water in contracts
Sri Lanka	Yes	>1%	No	
Taiwan Province of China	Yes	14%	Yes	Major project developed, slow PSP progress
Thailand	Yes	3%	Yes	Shift towards local players
Trinidad & Tobago	Yes	0%	Yes	No contract has replaced Severn Trent O&M contract
Tunisia	No	0%	No	A series of formal PSP proposals are under development
Turkey	Yes	2%	Yes	Small-scale TNCs active, especially in sewerage
United Arab Emirates	No	0%	No	Water and desalination PSP projects being developed
Uruguay	Yes	11%	Yes	Agbar divested to local partners, others continue
Venezuela, Bolivarian Rep. of	Yes	0%	Yes	Low-key PSP presence
Viet Nam	Yes	1%	Yes	TNCs now discouraged
Zimbabwe	No	0%	No	PSP project awards withdrawn

Source: UNCTAD, based on Owen, 2008.

Box V.4. UNCTAD survey on openness to TNCs in infrastructure: some preliminary findings

In research for *WIR08*, UNCTAD conducted a special survey of its member States to examine their level of openness to TNC involvement in infrastructure industries. Questions were related to the extent to which the legal framework allowed private and foreign companies to participate; what forms of involvement were allowed; possible requirements on foreign companies; and possible incentives offered to attract TNCs. The survey focused on legal aspects rather than actual private or foreign involvement. The questionnaire was distributed in March 2008 and by mid-July, 26 governments had responded.^a

In general, the survey results confirm the patterns found in other studies (box table V.4.1). The overall picture is one of relatively high levels of openness. For example, all responding countries stated that TNC involvement was allowed in electricity generation, and at least 80% of the countries allowed it in roads, seaports, airports, electricity distribution, mobile telephony, water supply and sewage infrastructure. In most industries, developed countries are more open to both private and foreign company involvement. However, in airports, seaports and mobile telephony, the share of developing and transition economies that were open was higher than that of developed countries.

In network industries, such as railways and electricity transmission, only 60–70% of the respondents stated that TNCs were allowed to participate. The water industry was more open than expected; all developed countries and almost three quarters of the other economies allowed TNC participation. Somewhat surprisingly, more countries permitted TNCs to engage in water supply than in sewage infrastructure.

Openness to foreign TNCs appears to be highly, though not entirely, correlated with openness to private companies. In telecommunications, however, while all respondents allowed private participation, only 79% and 88% of them allowed TNCs to participate in fixed and mobile services respectively.

Due to the relatively low response rate, the above analysis is a preliminary assessment. A more complete analysis of relevant issues will be prepared by UNCTAD once a sufficiently large number of responses have been obtained from member States. That analysis will include detailed information on the forms of involvement that are permitted by different countries, possible requirements imposed as well as incentives offered.

Source: UNCTAD.

^a Eighteen developing and transition economies: Albania, Algeria, Bosnia and Herzegovina, Botswana, the Dominican Republic, Egypt, Gabon, Guinea, Indonesia, Mauritania, Mauritius, Mexico, Monaco, Qatar, South Africa, Sri Lanka, Trinidad and Tobago and Turkey; and eight developed countries: the Czech Republic, Estonia, Finland, Germany, Greece, Japan, Romania and Switzerland.

Box table V.4.1. Share of countries that legally permit private and foreign companies, respectively, to be involved in selected infrastructure industries, 2008
(Percentage share of responses)

Industry	All countries		Developing and transition economies		Developed countries	
	Private	Foreign	Private	Foreign	Private	Foreign
Transportation						
Road	87	83	88	75	86	86
Rail	75	71	71	56	86	86
Seaports	91	86	94	81	88	83
Airports	87	83	94	81	67	67
Electricity						
Generation	100	100	100	100	100	100
Transmission	64	60	56	56	71	71
Distribution	75	80	72	78	86	86
Telecom						
Fixed	100	79	100	76	100	86
Mobile	100	88	100	88	100	86
Water						
Water supply	86	86	80	80	100	100
Sewage	81	81	73	73	100	100

Source: UNCTAD Survey, conducted March–July 2008.

high levels of technological know-how similarly tend to be more open. These findings are supported by preliminary results from an UNCTAD survey of openness in selected infrastructure industries (box V.4). However, many governments are showing greater interest in restricting inward FDI in selected infrastructure industries due to strategic and national security concerns.

3. Investment promotion agencies attach growing importance to infrastructure

A growing number of countries have moved beyond the removal of barriers to TNC involvement in selected infrastructure industries to promoting it

actively. This section presents the findings of a joint UNCTAD and the World Association of Investment Promotion Agencies (WAIPA) survey of the role of investment promotion agencies (IPAs) in attracting FDI in infrastructure and related services (box V.5).

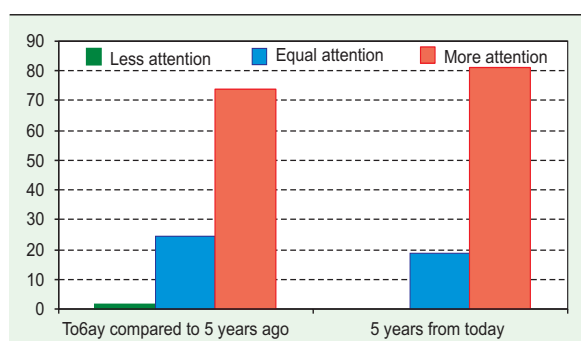
The survey found that IPAs are paying increasing attention to these industries (figure V.1): about 70% of the respondents stated that they were actively seeking FDI in these industries, while only 24% were not.²¹ Almost three quarters of all respondents stated that attracting foreign investment into infrastructure industries is more important today than five years ago, and an even higher share (80%) expected infrastructure to become an increasingly important aspect of their work until 2012. Only one IPA said it pays less attention to infrastructure today

Box V.5. The UNCTAD-WAIPA survey of IPAs

In April–June 2008, UNCTAD and WAIPA conducted a joint questionnaire-based survey of all WAIPA members on the role of IPAs in attracting FDI in infrastructure and related services. A total of 70 questionnaires were completed, representing an overall response rate of 33%. A geographical breakdown of the responses shows a fairly similar distribution as that of the WAIPA membership. However, IPAs from developed countries were somewhat overrepresented and those from Africa somewhat underrepresented. The questionnaire was completed mainly by directors or deputy directors of IPAs. In general, responses were of high quality, with between 80% and 100% of questions completed by each IPA.

Source: UNCTAD.

Figure V.1. Degree of IPA attention to infrastructure industries, 2008
(Percentage of responses)



Source: UNCTAD-WAIPA Survey of IPAs, April–June, 2008.

than five years ago, and no IPA expected its interest in infrastructure investment to decline over the next five years. This increased focus seems to be justified, as UNCTAD's 2008 *World Investment Prospects Survey* identified infrastructure (and especially telecommunications) as among the most promising industries for future international expansion by large TNCs (see chapter I).

IPAs show varying degrees of interest in different infrastructure industries (table V.3). The picture largely confirms the broad patterns of openness to TNC involvement presented earlier. Almost half of

the respondents said they were actively promoting foreign investment in *electricity generation*. The second most preferred infrastructure industry was *Internet services* (44%), followed by *airports* (41%). The industries that were targeted by the smallest percentage of IPAs were *electricity distribution* (17%) and *transmission* (19%). However, there is significant regional variation in terms of priorities. For example, while only one developed-country IPA actively sought to attract TNCs into road transport infrastructure, about 40% of those in developing and transition economies did so. In developed countries, Internet services were the most frequently targeted (45%); in Africa, electricity generation (79%) and Internet services (71%) topped the list; in Asia, road transport and electricity generation (46%) were the most often mentioned; in Latin America and the Caribbean the greatest interest was in seaport infrastructure and electricity generation (44%); while in South-East Europe and the CIS, airport infrastructure was the most preferred target (71%).

General promotion (e.g. providing information through brochures or special events and targeting of potential investors) was reported to be the most commonly used approach to attract TNCs in infrastructure. Other means commonly used are special privatization programmes and the use of dedicated public private partnership (PPP) programmes. Many

Table V.3. Share of IPAs that promote FDI into specific infrastructure industries, by region, 2008
(Percentage of responding IPAs)

Infrastructure industry	All countries	Developed countries	Developing countries	Africa	Asia	Latin America and the Caribbean	SEE and CIS
Transport							
Roads	31	5	42	43	46	38	48
Seaports	37	30	42	50	31	44	29
Airports	41	35	40	57	23	38	71
Railways	24	15	28	50	23	13	29
Electricity							
Generation	49	30	56	79	46	44	57
Transmission	19	0	26	36	23	19	29
Distribution	17	5	23	36	23	13	14
Telecommunications							
Fixed	29	20	30	50	23	19	43
Mobile	40	40	40	57	38	25	43
Internet services	44	45	42	71	31	25	57
Water and sanitation							
Water supply	33	26	33	43	23	31	57
Sanitation	26	15	28	29	23	31	43
Number of responses	70	20	43	14	13	16	7

Source: UNCTAD-WAIPA Survey of IPAs, April–June, 2008.

countries also apply incentives, payment or legal guarantees. However, the tools used vary by industry (figure V.2). IPAs indicated that whereas general promotion was used in all infrastructure areas, it was used the most for road transport. Privatization (and PPP) programmes appeared to be especially common for airports, seaports, and water and sanitation. Incentives were used mainly for the various telecommunications segments.

Only a minority (30%) of the responding IPAs stated that they targeted infrastructure TNCs from specific home countries or regions. However, such targeting was somewhat more common among IPAs in the developed world (40%). The most frequently mentioned home regions were the United States and the EU (or a specific EU member State), followed by South-East Asia and the Gulf region. Specific developing home economies mentioned included Brazil, China, India, Malaysia, Mexico, Singapore, Taiwan Province of China and Turkey. Among developing economies, only one in four IPAs targeted specific home countries or regions. Their focus was on TNCs from Asia, apart from those from the United States and the EU. Two IPAs from economies in transition indicated that they targeted specific countries, notably Austria and Germany.

To conclude, the UNCTAD-WAIPA survey suggests that infrastructure investment is of growing importance to IPAs. This signals strong interest in involving TNCs in future infrastructure projects. The findings largely mirror the general patterns of openness to TNC involvement in different industries described in earlier sections of this report. Most developing-country IPAs do not target specific home countries when they promote infrastructure

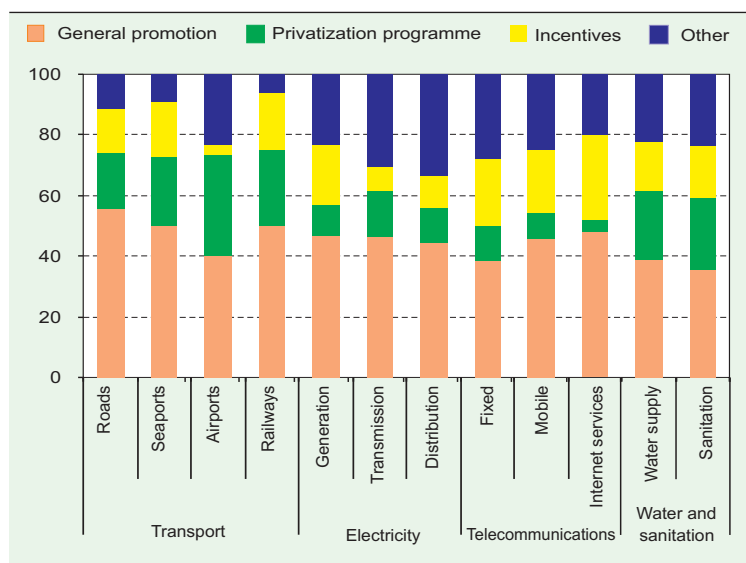
investment. However, judging from the information presented in chapter III (table III.10), there may be a case, especially for low-income countries, to target TNCs from other developing countries, at least in transport infrastructure.

4. Managing different forms of TNC participation

Beyond the overall institutional and regulatory framework, investments in infrastructure typically require the negotiation of a contract between the host country and the foreign investor(s). Contractual arrangements aim at supplementing the applicable laws and regulations of the host country with regard to the investment at stake. The contract consists of a tailor-made agreement that responds to the particular requirements of each project and the intentions of the contracting parties.²² This makes it important for countries to develop the knowledge and capabilities needed to determine the desirable forms of TNC involvement, to negotiate with foreign investors and to monitor project implementation.

As noted in chapter III, many different types of TNC involvement exist, ranging from full privatization to management contracts, with various kinds of PPPs in between. The choice of contract type dictates the ownership/control mix as well as allocation of risks over a project's life cycle. The picture differs considerably by industry. In water and transportation, various forms of PPP dominate. In telecommunications, most projects with TNC participation have involved privatizations or greenfield investments, while in energy, concessions dominate. Given the diversity of projects, it is difficult to generalize about the appropriateness of different types of contracts.

Figure V.2. Promotion instruments, by infrastructure industry or service, 2008



Source: UNCTAD-WAIPA Survey of IPAs, April–June, 2008.

Infrastructure projects are far from simple to negotiate and implement. Adequate legal frameworks and institutional stability are prerequisites for successful project implementation. Contracts need to establish a set of durable relationships that take into account the tendencies of actors to behave strategically and in their self-interest over a project's life cycle. Overarching contract types formalize financial arrangements and govern shifts in ownership and control during the period of the project. This implies, inter alia, specifying in advance under what conditions services should be provided over an agreed period (say 15–30 years), allocating risks between the various parties and how prices

and guarantees should develop. Changes in policies, demographics and technology can be expected to influence the operational environment over the project's lifetime, and many contracts have been renegotiated in response to demands by either the private or the public party (chapter IV). Renegotiations are often related to the scope of work, service level of commitments and pricing.²³

The allocation of risk is critical in this context. Two basic principles for risk allocation are that (i) the party responsible or with more control over the risk factor should be the one bearing the risk; and (ii) the party that is more able to bear the risk (i.e. that is less risk-averse) should do so (Guasch, 2004; Fay and Morrison, 2007). How they are applied in practice depends on many factors, such as the industry and country in which the project is to be undertaken, as well as the bargaining power of the negotiating parties. Indeed, TNCs may have an interest in negotiating a contractual arrangement that shifts as much of the risks as possible to the host country government. While this may enhance the chances of attracting more foreign investment, governments must be careful not to make too many commitments and offer to cover too much of the risks. Experience has shown that, as a result of past commitments, several governments today face very large contingent liabilities (chapter IV).

As parties to a contract often have diverging interests, the final contract is the product of negotiations and bargaining. Successful negotiations require adequate skills and expertise – resources that are not always available in developing countries. Asymmetries of information and experience – for example, between an experienced TNC and a municipality with little experience of TNC involvement – can constitute a significant problem. Public sector staff may find it difficult to match the resources of the private sector (e.g. Wells and Ahmed, 2007). Ex-post monitoring of contracts can also be both costly and difficult.

In the context of the bidding process, governments need to ensure that the financial sponsor(s) and the operator of the infrastructure project have adequate experience and capacity to deliver, and that the project is financially viable. Ideally, company selection should be done through transparent and competitive processes with well-defined bidding criteria. Lessons from Latin America and the Caribbean suggest that it may be advisable to fix tariff levels in advance and to establish clear rules relating to factors that might justify future tariff adjustments or renegotiations of other contractual aspects. The contract should then be awarded to the company that is prepared to pay the most for a concession, or accept the lowest subsidy when

agreeing to produce an otherwise unprofitable service (Guasch, 2004; Fay and Morrison, 2007).

In practice, it is not easy to achieve the ideal agreement. There is a risk that bidders will behave opportunistically and present their offers with the intention of demanding quick renegotiations of the contract soon after it has been awarded. This may help to explain why so many infrastructure contracts have been renegotiated within the first two years of the contract period. In addition, finding a sufficient number of bidders on a contract can be a major challenge, especially for low-income countries.

With a view to reducing the risk of speculative bidding, governments might consider some form of realistic and flexible incentive-based regulation. For example, if a company outperforms its efficiency targets, benefits from its better-than-expected performance could be shared between the company and the government. Governments may also improve their bargaining power through regional collaboration. For example, a regional regulator could help pool comparative data and expertise. If enough data are assembled on project and operating cost elements in a range of circumstances and expectations, each government will have a better basis for judging whether potential bids are credible or not. A regional body could also help in reviewing bids.

Political commitment at the highest level is an essential ingredient to align and anchor related public sector accountabilities, allocate resources and address sources of institutional inertia. This is particularly important where there may be a potential conflict between public and private interests and when concerns exist about the loss of public control over the provision of public services (Scott, 2007).

An added challenge is to retain the necessary skills – legal, technical and financial – within the government sector. Even in developed countries, expertise tends to migrate to the private sector over time because of higher salaries. As a result, the capacity of governments to monitor the performance of projects can be seriously curtailed (Verkuil, 2007). These problems are often accentuated in developing countries, and they underscore the importance of proper legal and financial counsel. While major TNCs tend to make use of international law firms specializing in project finance transactions, most of which are based in the United States and the United Kingdom,²⁴ it is often difficult for developing countries to find the corresponding support. International institutions, including the World Bank Group, regional development banks, export credit agencies and others, offer capacity-building services in this area (section V.D), but there is a need for more assistance. This will become all the more important if

the current trend of relying on TNCs spreads further to low-income countries.

5. Factoring in social objectives

Enhancing the broader value to society requires attention to key social objectives, such as making services universally accessible and affordable to the poor (chapter IV). The social dimension of infrastructure is particularly important in the context of water, which is an essential resource and considered a basic human right (chapter III; ECOSOC, 2002; Anand, 2007), but also in other industries. A key challenge is to meet the twin targets of cost recovery (i.e. to make the investment financially sustainable) and wider access to the service (i.e. to make the investment socially sustainable). The challenge is accentuated in low-income countries, as weak purchasing power of households may make it virtually impossible to recover the costs of certain infrastructure services through user charges.

Several policy lessons can be drawn from experience with water concessions (UNDP, 2006). First, the complexity of giving increasing access to the poor should not be underestimated. The poor are not a homogeneous category. Connection costs can be a huge barrier.²⁵ In many low-income countries, the majority of the poor have to satisfy their water needs through an array of private “informal” providers, typically paying much higher rates than those connected to the municipality’s distribution system. Social policies (such as tariff structure and increasing coverage rates) to accompany concession operations, along with regulation of informal providers and subsidies for connections may need to be considered. A second lesson is that transparency matters. There is a need to build public support through proper understanding of the processes, and to take into account the views of the poor. Without this, services cannot be tailored to users or community needs, and the capacity of communities to undertake system maintenance is often overlooked. Finally, regulation and governance of concession arrangements are essential. Increased efficiency and coverage of water systems has mainly been due to independent regulation, rather than to State ownership of utility companies (UNDP, 2006).

Three basic types of policy instruments can be identified to address the need for improved access for the poor: imposing requirements on investors to provide access (service obligations); reduced costs of connection and consumption; and an increased range of suppliers to provide more choice to consumers (Estache and Fay, 2007: 19). In some, mainly developed, countries with private sector providers of water services, social policies are incorporated into contractual obligations. However, in developing

countries, private companies have often managed to negotiate exemptions from such obligations (Prasad, 2007: 13). To recover costs and achieve universal access to water in areas with weak purchasing power, experience to date suggests that tariff payments have to be subsidized in some form (WEF, 2006; chapter IV). But subsidies remain controversial. On the one hand, they can sweeten the deal for TNCs, making an otherwise unattractive investment commercially appealing. They may also help widen the consumer base to reach larger segments of society. On the other hand, they may reduce the incentives of private companies to make infrastructure projects efficient and profitable (Zhang, 2000: 735), and they may result in the company offloading the costs of a project on to the government while it realizes most of the benefits accrued.

Subsidies can be financed from different sources and take several forms. In the case of water, governments have used cross-subsidies, public subsidies, rising block tariffs and deliberately low tariffs, among others (Prasad, 2007). Rising block tariffs work on the principle of increasing tariffs per unit of water for higher levels of consumption, and low water usage per account has a low fixed cost per unit of water. This approach is based on the notion that “water for necessity” should be relatively cheap while “water for luxury” should be relatively expensive. In theory, low tariffs should benefit everybody at the lower end of consumption and should be offset by higher tariffs at the upper end. However, the actual effects may be different. First, better-off people may have private wells (Aquafed, 2007). Secondly, group purchases by less well-off people may mean that they have to buy water at a relatively high price (UNDP, 2006). Thirdly, there is a relatively weak correlation between income and water consumption (Fay and Morrison, 2007). Evidence from the water industry in Latin America suggests that subsistence blocks were often set too high, while tariffs were not sufficiently progressive, suggesting that the subsidies were not well targeted.²⁶ In 2001, the Government of Chile started to provide a “water stamps” scheme to allow low-income residents to recover part of their water fees (Castro, 2006).

Another example of a subsidy is “take or pay” clauses, which involves a commitment on the part of the government to ensure revenue streams for the investors by making up the difference between user demand and previously agreed company revenues. Such subsidies are generally funded through taxes. The risk is again that the subsidy could become a disincentive for companies to produce efficiently. A third form involves providing consumers with financial support for infrastructure use (World Bank, 1997: 37).

As is often the case, there is no one-size-fits-all solution: the approach has to be adapted to the specific circumstances. Regardless of the form of subsidy employed, however, governments may seek to apply certain criteria to determine the appropriateness and success of different subsidies (Irwin et al., 1997; Kerf et al., 1998; World Bank, 1997). First, the subsidy should benefit the segment of the population that is targeted. Secondly, it should ensure that the infrastructure service becomes affordable to the user. Thirdly, it should not distort the use of the service or create inefficiencies in service provision. Fourthly, it should not undermine competition. Fifthly, it should be transparently awarded and measurable in financial terms. Finally, the transaction costs of implementing the subsidy and the costs to the economy at large from funding the subsidy should be minimized.

C. International investment agreements and investment disputes

1. The role of international investment agreements

While national legislation and investment contracts between a host country and the foreign investor are the principal legal foundation for TNC participation in infrastructure investments, international investment agreements (IIAs) can add an important component to this relationship. By concluding IIAs – such as bilateral investment treaties (BITs), regional, sectoral, plurilateral or multilateral investment-related treaties, or economic cooperation agreements that include investment provisions – contracting parties may agree to refrain from taking certain measures detrimental to the investment, such as “unfair” treatment, discrimination, expropriation without compensation, or transfer restrictions. While such protection can be particularly important for infrastructure investment, it can also be sensitive from the host country point of view. This has been highlighted by the more than 90 known treaty-based investor-State disputes related to infrastructure projects (section V.C.2).

The socially sensitive nature of infrastructure, the huge costs involved, and its strategic importance for the economic development of a host country make the sector more prone to State involvement than most other economic activities. Host countries typically have to exercise their regulatory powers during the preparation, implementation and operation phase of the investment. Consequently, governments need to ensure that the IIAs they enter into leave them with

sufficient autonomy to regulate infrastructure projects in the public interest. However, this objective may be at odds with the goal of foreign investors to obtain maximum protection against changes in government policies and regulations. Striking the “right” balance in IIAs between these diverging interests thus becomes a key challenge. Here, special attention is given to the role of IIAs in terms of influencing the entry and treatment of foreign investors in infrastructure.

The first area in which IIAs may limit a government’s regulatory power is with regard to the *entry* of foreign investors. In general, IIAs do not reduce the sovereign right of a host country to admit or reject foreign investment in infrastructure in its territory. If a country does not wish the involvement of foreign investors in some or all of its infrastructure industries, or in a particular project, IIAs generally do not pose an obstacle. A few agreements, however, include binding obligations concerning the pre-establishment phase (box V.6). But even IIAs that grant foreign investors non-discriminatory treatment with regard to their establishment in a host country generally contain reservations relating to investment in infrastructure.²⁷

A special area to consider relates to national security concerns mentioned above (section V.B). Several governments have taken action to prevent foreign takeovers of domestic infrastructure companies where such companies are considered to be of strategic importance for the country, or they have forced foreign investors to disinvest. In the latter case, government action may amount to an expropriation, in which case the host country has to pay compensation according to the expropriation provision of the relevant IIA. There is an issue as to whether a host country can be exempt from this obligation if the IIA includes a “national security exception”. Such exceptions usually allow contracting parties to take any measures they consider necessary to protect their essential security interests, provided there is no arbitrary discrimination or a disguised investment restriction. A host country may argue that domestic control over a strategic infrastructure project is required for national security reasons. If such a clause is drafted in a “self-judging” manner it can give host countries considerable discretion in assessing whether a foreign investment in infrastructure poses a threat to national security.²⁸

The second main area in which IIAs may limit a host country’s sovereign regulatory power is in the *treatment* of established investors. Most IIAs provide protection at least against discrimination, unfair treatment, expropriation, transfer restrictions and often also against breaches of other commitments that a host country has made. Any one of these provisions is potentially important for infrastructure investments,

Box V.6. Establishment rights in IIAs

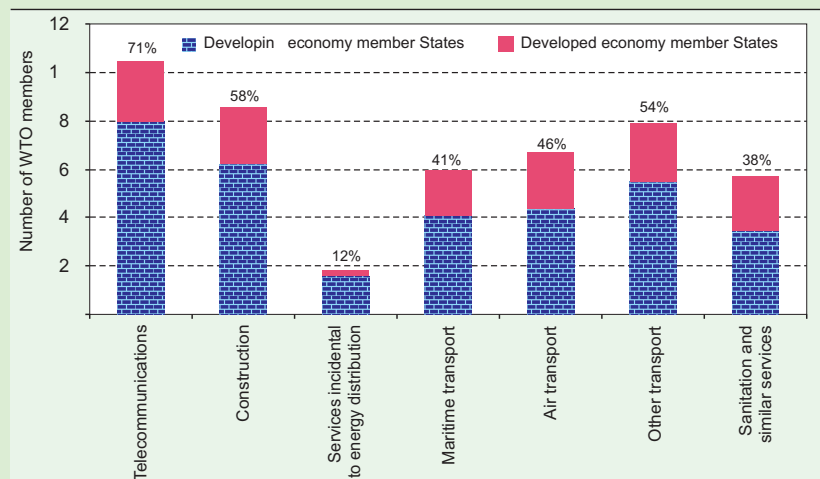
The most common approach in IIAs covering the pre-establishment phase is that foreign investors may claim non-discriminatory treatment (i.e. national treatment and most-favoured-nation treatment) concerning their establishment in a host country. However, this right may be subject to reservations concerning specific sectors, which ensure that foreign investors can make investments, including in infrastructure, only to the extent desired by the host country. Examples of IIAs that cover the pre-establishment phase include NAFTA, the Framework Agreement on the ASEAN Investment Area, the Colonia Protocol for the Promotion and Reciprocal Protection of Investments within MERCOSUR,^a and BITs of Canada, Japan and the United States. These IIAs have adopted a “top-down” liberalization approach, identifying those industries that are not open to foreign investment.

A multilateral agreement that deals with pre-establishment rights in infrastructure services is the WTO General Agreement on Trade in Services (GATS). Its approach to scheduling commitments on national treatment and market access is based on a positive determination of sectors (and modes of supply) in which liberalization commitments are scheduled, combined with a negative list of non-conforming measures. The GATS method is “bottom-up” (i.e. limiting liberalization to those industries and activities where contracting parties have made a positive commitment). The extent to which countries have made liberalization commitments under the GATS concerning mode 3 (service supply through commercial presence in the territory of any other member) varies greatly by industry. Among the industries included in box figure V.6.1, telecommunications is the industry in which the most (71%) WTO members have scheduled commitments, while energy distribution has the lowest share (12%). In the case of water distribution, however, no country has scheduled any commitment.

A more ambitious approach has been adopted by the EU. The EU Treaty provides for an absolute right of establishment (i.e. not only non-discriminatory treatment), which may only be denied on grounds of public order. An important question in this context is whether foreign investment in infrastructure considered by the host country to be strategically important could be rejected for public security reasons. The European Court of Justice interprets this derogation narrowly and requires that there be “a genuine and sufficiently serious threat to a fundamental interest of society”.^b

Box figure V.6.1. Infrastructure-related sectoral patterns of commitments in the GATS

(Number of WTO members with at least one commitment in the relevant industry; and percentage of members with commitments in the sector)



Source: UNCTAD, based on Adlung and Roy, 2005.

Note: In this figure, developing economy member States include member States with economies in transition.

Source: UNCTAD.

^a The Colonia Protocol for the Promotion and Reciprocal Protection of Investments within MERCOSUR has not yet entered into force.

^b See Case C-483/99 Commission v. France [2002] ECR I-4781, para. 48; see also Case C-503/99 Commission v. Belgium [2002] ECR I-4809, para. 47; Case C-463/00 Commission v. Spain [2003] ECR I-4581, para. 72; Case C-207/07 Commission v. Spain [2008] Judgment of 17 July 2008, para. 47.

and many of them have received particular attention in recent disputes related to infrastructure investment (section V.C.2). These are reviewed below.

Many IIAs contain a provision requiring contracting parties to grant investors of the other contracting party *fair and equitable treatment*. Originally perceived as a minimum standard of treatment that protects foreign investors against “outrageous” or “bad faith” actions of the host country,²⁹ it has gradually evolved into a more demanding code of behaviour for States. Arbitration

tribunals nowadays increasingly focus on whether the measures of the host country have violated the “legitimate expectations” of the foreign investor (section V.C.2). A host country needs to know how free it is to impose regulatory changes that are potentially inconsistent with the legitimate expectations of investors if it concludes an IIA that obliges it to grant foreign investors fair and equitable treatment.

Most IIAs include an obligation requiring contracting parties to grant established investors in

their territory *national treatment* and *most-favoured-nation treatment*. With regard to infrastructure, this provision may imply, for example, that a host country must not treat foreign investors less favourably than competing SOEs or foreign investors from other countries. Privileges reserved for SOEs, such as those related to funding, could contradict an IIA that has a national treatment provision. Also, contracting parties may have to ensure non-discriminatory treatment in relation to access to infrastructure networks.

Recent re-nationalizations (box V.3) in the area of infrastructure have brought the *expropriation* article in IIAs back into the limelight. To the extent that host countries are bound by IIAs concluded with home countries of the foreign investors concerned, they could be obliged to pay compensation in accordance with the expropriation article in the agreement if they decide to expropriate the assets of a foreign investor or nationalize an entire industry. The expropriation provisions in IIAs could also become relevant in case of nullification or substantial alteration by the host country of existing contracts with a foreign investor.

More generally, host countries are confronted with the risk that changes in their laws and regulations in respect of foreign investment in infrastructure amounts to a regulatory taking for which compensation needs to be paid.³⁰ Such taking would occur if, as a result of the regulatory measure, the investment is no longer economically viable, although the ownership status of the foreign investor remains formally untouched. More than in other industries, there may be instances where foreign investors in infrastructure claim that regulatory actions of a host country constitute an indirect expropriation. The problem is accentuated by the fact that many developing countries are still in the process of establishing and completing infrastructure-related laws and regulations. Other developing countries have started to re-evaluate their previous privatization policies and are considering corrective measures.

Another important provision is the “*umbrella clause*” (or “*respect clause*”). Numerous IIAs include a commitment of the contracting parties to respect any other obligation that they have assumed with regard to investments of investors of the other contracting party. This provision covers host country obligations deriving from investment contracts – common in infrastructure – with foreign investors.

2. Infrastructure-related investment disputes

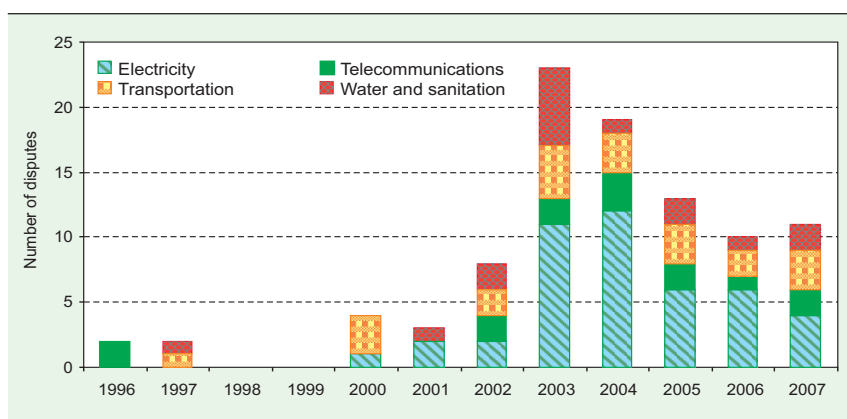
a. Many investment disputes are related to infrastructure

At the end of 2007, 95 disputes – or about one third of the cumulative number of known treaty-based disputes – were related to electricity, transportation, telecommunication, water and sanitation (figure V.3).³¹ Until the end of 2002, the number of new infrastructure disputes per year had been in the single digits. In 2003, as many as 23 disputes were recorded, mainly linked to electricity and water. Since then, the annual number of new disputes has fallen, but never below 10.³²

At least 41 governments – 25 of them in the developing world, 12 in developed countries and 4 in transition economies – have faced investment treaty arbitration in one or more of these industries. Argentina tops the list with 26 claims lodged against it. Other countries with multiple known claims include India (9), Turkey (6), Hungary (5), Ecuador (4), Poland (3) and the Czech Republic (2). In terms of industry distribution, the largest number of known disputes relates to electricity (44), followed by transportation (21), water and sanitation (16) and telecommunications (14) (figure V.3).

Circumstances and the main substantive issues of infrastructure investment disputes vary by industry. In *water and sanitation*, disputes relate to investment in water distribution and sewage services as well as to the construction of dams. Investors have brought claims alleging violations of treaty obligations based on, for example, interferences with the tariff regime of the underlying water services concession (box

Figure V.3. Number of known infrastructure-related investment disputes, 1996–2007
(Annual new cases)



Source: UNCTAD, based on information from UNCTAD's Investor-State Disputes database (www.unctad.org/ia).

V.7),³³ lack of security and termination of concession agreements.³⁴

In *telecommunications*, disputes have arisen with regard to both mobile and fixed telecommunications. Investors have brought claims against States alleging violations of treaty obligations based, for example, on failure to abide by a cooperation agreement entered into with the investor aimed at securing a mobile phone licence,³⁵ imposing on the foreign mobile provider the subsidization of fixed-line operators (box V.8), dispossession and loss of control of the investment in the national telecommunications company,³⁶ termination of a contract to operate a mobile phone network,³⁷ and expropriation and nationalization.³⁸

In *transportation*, disputes have been recorded with regard to investments in the construction of highways, roads, bridges, tunnels, airport terminals, waterways and railways, as well as in the operation of port terminals, airport terminals, toll highways and railway networks.³⁹ Investors have brought claims alleging violations of treaty obligations based, for example, on deception and misrepresentation in connection with the investment contract,⁴⁰ delays in handing over the land,⁴¹ non-payment of construction bills,⁴² discriminatory treatment,⁴³ interference in setting the toll fees to be charged on the highway,⁴⁴ termination of the investment contract,⁴⁵

annulment of the investment contract (box V.9), and expropriation.⁴⁶

In *electricity*, disputes have arisen with regard to investment in electricity generation (including construction and operation of power plants) and distribution. Investors have brought claims alleging violations of treaty obligations based, for example, on the conduct of the host State in the following areas: unsuccessful conclusion of the investment contract,⁴⁷ failure to turn over the land,⁴⁸ discriminatory treatment,⁴⁹ interference with the tariff regime,⁵⁰ revocation of the operating permit,⁵¹ non-payment for delivered electricity,⁵² failure to enforce electricity rate and prevent electricity theft,⁵³ termination of the contract and expropriation.⁵⁴

b. Recent arbitral decisions on core IIA provisions

At the end of 2007, of the 95 known treaty-based disputes in infrastructure investment, 38 had been concluded either through settlement (20) or a final decision of the arbitration tribunal (18). Thus, the majority of the known disputes remained pending (57). Whereas almost 30% of the disputes in electricity had been settled, none of the disputes in water and sanitation sectors had reached a conclusion through settlement at the time of writing this report.

Box V.7. Vivendi v. Argentina

In May 1995, Compagnie Générale des Eaux (France) (later Vivendi Universal) along with two Argentine construction companies and a Spanish firm purchased a 90% shareholding in Compañía de Aguas del Aconquija S.A. (CAA), an Argentinean company which had been awarded a 30-year concession agreement with the Argentine Province of Tucumán for the provision of water and sewage services. In accordance with the agreement, CAA had to make substantial investments to improve service quality. The contract entailed refurbishing the chlorination system, arranging the cleaning of the drinking water system, leasing buildings and purchasing supplies and new equipment.

Soon after the concession had been taken over, the newly elected Government expressed its discontent with a tariff increase. The legislature of the Province recommended that the Governor impose unilaterally a temporary tariff reduction. Furthermore, following two episodes of turbidity in the drinking water, the Provincial Government – supported by the Federal Government – and CAA commenced negotiations to reorganize both parties' obligations in the concession contract. Finally, unable to reach a positive outcome CAA gave notice of its termination of the contract in August 1997.

In the same year, the investors initiated ICSID proceedings claiming that (i) the investment had been expropriated without compensation and (ii) the action of the Province was in violation of the “fair and equitable treatment” standard under the Argentina-France BIT. About \$317 million plus interest was sought in damages.

In its defence, Argentina argued that the case involved exclusively contractual matters (i.e. disputes arising under the concession agreement) over which the Tribunal had no jurisdiction. Furthermore, it argued that, faced with the claimants' material breaches of the concession agreement, the Province had the right and the responsibility to take the requisite steps to ensure the availability of safe drinking water for its population on an affordable and accessible basis.

After one of the longest running disputes at ICSID, a tribunal found Argentina to be liable for violating the Argentina-France BIT (*inter alia* by expropriating a water and sewage concession) and ordered it to pay \$105 million in compensation. The decision is currently under discussion before an annulment committee.

Source: UNCTAD, based on ICSID Case No. ARB/97/3. *Compañía de Aguas del Aconquija S.A. and Vivendi Universal v. Argentine Republic*, (Argentina/France BIT), Award of 20 August 2007.

Box V.8. Telenor v. Hungary

Pannon GSM Telecommunications Rt, an affiliate of Telenor (Norway), provides mobile services in Hungary. Among various regulatory initiatives taken by Hungary between 2001 and 2003 to bring its telecommunications regime in line with EU norms, the country introduced a “universal service” programme. It stipulated that all telecommunications providers would pay a small portion of their revenue into a central fund that would be used to compensate fixed-line service providers for providing below-cost telephone access to individuals in poor or rural areas.

In 2003, Telenor initiated ICSID arbitration alleging that the programme constituted expropriation in violation of the Hungary-Norway BIT, as it required mobile operators to subsidize services provided by fixed-line operators at the State’s request. Telenor also alleged that the programme violated the treaty guarantee of fair and equitable treatment. The company sought damages of up to \$152 million.

In its defence, the respondent argued that it was in the nature of regulation that it involved some sort of wealth deprivation and that Telenor’s contention according to which any form of interference with the investor’s property or diminution of its value constitutes expropriation would be out of line with expropriation jurisprudence. Accordingly, in the respondent’s view, the Tribunal lacked jurisdiction as the BIT permitted arbitration only with regard to claims of expropriation.

In September 2006, the ICSID tribunal rejected the claims, as the Hungary-Norway BIT provided for arbitration only with regard to expropriation. The measures at issue were found to fall short of a substantial economic deprivation of the investment required to constitute expropriation.

Source: UNCTAD, based on ICSID Case No. ARB/04/15 *Telenor Mobile Communications A.S. v. Republic of Hungary* (Hungary/Norway BIT), Award of 13 September 2006.

Most arbitral decisions (at least in known cases) are eventually made public, though the terms of settlement are invariably confidential.⁵⁵ With regard to their outcome, 7 arbitral decisions accepted the investor’s claim, at least in part, while the remaining 11 were rejected either for lack of jurisdiction or on the merits.

Regarding the infrastructure investment disputes that have been concluded with an award of an international tribunal (either accepting or rejecting the investor’s claim) and for which information is available, out of a total of \$6.16 billion in claimed damages, tribunals have awarded \$649.3 million. This corresponds to little more than 10% of the total damages claimed, or 25% of the amounts claimed in the nine disputes in which damages were awarded (see annex table A.V.1).⁵⁶ The large majority of arbitral decisions have addressed one or more of the following investment protection standards: fair and equitable treatment, expropriation and the umbrella clause. Some observations on recent decisions are made below.⁵⁷

(i) Fair and equitable treatment

Several infrastructure-related investment disputes are based on alleged violation of the fair and equitable treatment (FET) standard. For host countries involved in such disputes, it is worth noting that recent arbitration practice has tended to interpret this principle in a relatively broad manner. Accordingly, the applicability of the FET standard is not limited to conduct attributable to the host State aimed at undermining the investment.⁵⁸ Rather, recent awards emphasize the importance of protecting the

investor’s legitimate expectations with regard to the maintenance of a stable and predictable legal and business framework.⁵⁹ In *Parkerings-Compagniet AS v. Lithuania*,⁶⁰ the tribunal specified certain criteria for determining the legitimacy of the investor’s expectations in the stability of the legal system.⁶¹ A clarification of the scope of “legitimate expectations” is crucial for preserving each State’s right to exercise its regulatory power in the area of infrastructure. However, arbitral case law is still evolving and it remains unclear to what extent future arbitration awards will follow the reasoning in the *Parkerings-Compagniet* dispute. Furthermore, certain tribunals have considered the effect of the investor’s conduct when determining whether the FET standard had been infringed. This has been done where investor conduct is deemed relevant in determining the nature of the respondent State’s actions, or where the actual cause of the loss to the investor is an issue.⁶²

(ii) Expropriation

The issue of *direct* expropriation was dealt with in, for example, *ADC v. Hungary*. In this case, the tribunal found that the Government’s actions in taking over the investor’s activities concerning the operation of two terminals at Budapest airport did not comply with the requirements of a lawful expropriation under the IIA.⁶³ A more controversial issue, particularly for infrastructure investments, is under what conditions regulatory activity of a host State amounts to an *indirect* expropriation. Investment tribunals have focused on balancing two competing interests: the degree of the regulation’s interference with the right of ownership, and the power of the State to adopt

Box V.9. Fraport v. the Philippines

In 1999, Fraport AG (Frankfurt Airport Services Worldwide) initiated a series of direct and indirect investments in PIATCO, a company in the Philippines that held a concession to construct and operate an international terminal at Manila airport. Over time, the Terminal 3 concession became the subject of domestic discontent and was also at the centre of a legal controversy, as the legality of the concession and related agreements came under review for alleged fraud.

In 2002, the administration of President Macapagal-Arroyo sought unsuccessfully to renegotiate the concession, which had been agreed to by a previous administration. Subsequently, the Philippines Supreme Court declared the concession and related contracts null and void since (a) the original concessionaire had not been properly pre-qualified as financially able to undertake the contract and (b) the concession agreement was entirely different from the draft concession agreement that had been tendered, resulting in greater financial advantages to the concessionaire.

In 2003, Fraport sought ICSID arbitration against the Philippines alleging violation of the Germany-Philippines BIT and seeking \$450 million in damages. The respondent argued that the tribunal lacked jurisdiction in this arbitration, as the protections afforded by the BIT (including consent to jurisdiction) did not extend to investments made in violation of Philippine law. In the respondent's view, the duty to comply with the host State's law is an ongoing one which must be respected throughout the period in which the investment is made. According to the respondent, the investor openly sought to evade the nationality requirement under Philippine law limiting foreign ownership of the capital of a public utility to 40% through the device of "indirect" ownership coupled with secret shareholder agreements. On the other hand, the investor's central position on jurisdiction was that its investment, which allegedly totalled more than \$425 million, was made in accordance with Philippine law, with the result that the investment must be deemed accepted under the BIT.

The majority of the tribunal members in August 2007 held that the tribunal had no jurisdiction over the claim. It concluded that Fraport had not made an "investment" in accordance with Philippine law that was required to enjoy protection under the BIT. In January 2008, Fraport initiated an annulment proceeding with ICSID.

Source: UNCTAD, based on ICSID Case No. ARB/03/25, *Fraport AG Frankfurt Airport Services Worldwide v. Republic of the Philippines* (Germany/Philippines BIT), Award of 16 August 2007.

its policies. In evaluating the degree to which the government's actions interfere with an investment, tribunals have highlighted the importance of the economic impact of the action (i.e. whether there was an effective change of control or ownership of the investment and/or interference with the investor's reasonable expectations) and its duration.

Another issue of particular relevance for infrastructure-related investments is linked to the expropriation of contractual rights. The difficulty here lies in distinguishing between an ordinary breach of contract and the expropriation of contractual rights. For the latter, investment tribunals require that (a) the host State has acted in its sovereign capacity and (b) the breach of the contract has given rise to a substantial decrease in the value of the investment. For example, in *Vivendi v. Argentina*,⁶⁴ the tribunal concluded that the claimants' concession rights had been expropriated because the conduct of the Argentinean Province constituted "sovereign acts designed illegitimately to end the concession or to force its renegotiation" which "struck at the economic heart of, and crippled, Claimants' investment".⁶⁵

(iii) Umbrella clause

An issue brought several times before arbitration tribunals is whether the umbrella clause protects against breach by the host State of any kind

of obligation it has entered into vis-à-vis a foreign investor (e.g. a commercial contract), or whether such protection is limited to obligations entered into by the host State in its capacity as a sovereign (e.g. a concession agreement). This distinction can have huge implications for the host country. For example, under a broad interpretation of the umbrella clause, a "mere" dispute about the agreed quantity of electricity to be purchased by the host State from the investor could give rise to treaty-based arbitration. A narrow understanding would exclude arbitration in this case, unless the purchase commitment was included, for example, in a concession agreement. Arbitration tribunals have taken different stances on this issue. While the tribunal in *LESI-DIPENTA v. Algeria* opted for a broad interpretation,⁶⁶ the one in *El Paso v. Argentina* excluded ordinary commercial contracts from the scope of the umbrella clause.⁶⁷

Another question of considerable relevance for host countries is whether the umbrella clause applies only to cases where the claimant investor and the host country itself, rather than an agency or subdivision, are parties to the contract that the umbrella clause seeks to protect. The tribunal in *Azurix v. Argentina* required the parties to the underlying contract and the parties that had agreed upon the umbrella clause to be the same.⁶⁸ By contrast, the tribunal in *El Paso v. Argentina* appears to have affirmed that the

obligations of the State on which the umbrella clause confers protection potentially include obligations entered into by State entities or subdivisions for whose conduct the State would be responsible at the international level.⁶⁹ As a result of these contradictory awards, there is still a high degree of uncertainty as to the precise scope and effect of umbrella clauses. This is only partly attributable to variations in IIAs.⁷⁰

3. Conclusions and implications

A review of recent arbitration decisions shows that many investor-State disputes have arisen in all the main infrastructure industries, and relate to a wide range of issues. It also shows that less than half of the awards rendered have favoured the claimant, and that damages awarded have been considerably smaller than the total initial claims made by investors. The fact that more than 90 known disputes have arisen in infrastructure shows that concluding IIAs (and the coexistence of IIAs and State contracts) can have significant implications for host States. At the same time, the number of disputes should be considered in the context of the existence of several thousand IIAs and the huge number of investment projects in infrastructure. In addition, many renegotiations of investment contracts in infrastructure never reach the arbitration stage.

The disputes have provoked debate over the implications of IIAs, and especially BITs. As noted above, most known disputes related to infrastructure have relied on clauses in BITs, in particular the principle of fair and equitable treatment, the umbrella clause and the expropriation article. Governments have entered into such treaties with a view to attracting more foreign investment by way of offering better protection for the rights of foreign investors. However, there is some concern that improved protection and certainty for foreign investors has come at the price of too much of a reduction in the government's regulatory flexibility. Some experts further argue that the possibility of investor-State arbitration may discourage States from adopting public welfare regulations in the interests of their citizens (Solanes and Jouravlev, 2007: 12).

Other observers question whether IIAs have been, and ever will be, able to provide the protection they were originally intended to offer investors. TNCs that have seen their cases dismissed, or received damages far below what they had claimed, have found that the protection offered through the BITs was less comprehensive than expected, and many of them have expressed disappointment with the role played by international institutions (Ontiveros, Conthe and Nogueira, 2004).

One major issue is where to draw the line between the two international law principles of "*pacta sunt servanda*" (sanctity of treaties) and "*clausula rebus sic stantibus*" (which allows for the termination or adaptation of an investment contract in case of a fundamental change of circumstances). A common criticism is that tribunals pay too little attention to changes in the circumstances of host countries. It has been observed that "Arbitrators sitting on investor-State panels have often focused on the rights of the foreign investors" (Solanes and Jouravlev, 2007: 8), leaving countries without "guarantees that their legitimate public interest concerns, public policies, and regulations will be considered or taken into account, including issues associated to [sic] human rights" (Ibid: 72; Kriebaum, 2007). In this regard, it may be asked whether the absolute language used in many IIAs, which requires host countries – in all cases – to respect any obligation they have entered into with an investor, would need some refinement to reflect situations where host-country governments have a legitimate reason to demand an alteration of the contractual terms. To this end, IIAs might expressly recognize the right of the host country to deviate from such obligations under specific circumstances.

In case of a dispute, a tribunal would need to consider not only the behaviour of the host government, but also the conduct of the investor. Conduct to be taken into account could, for example, include situations where the investor does not carry out due diligence in assessing the feasibility of the project, or is negligent in the implementation of the investments but then blames the commercial loss on governmental action.⁷¹ Taking the investor conduct into account could lead to a more balanced appraisal of the facts of a dispute and of whether the IIA has indeed been breached. It could also result in lower damages if the investor's conduct can be shown to have significantly contributed to the loss.

Problems of interpretation may be accentuated by the vague language that most IIAs use in connection with the key provisions of relevance to infrastructure investment discussed above. Ambiguous text and its interpretation by arbitration tribunals can result in unexpected rulings for governments and other parties involved. Host countries concerned about these developments might therefore wish to add some clarification concerning the meaning of these treaty standards in an IIA.⁷² On the other hand, there is a risk of the intended elucidation becoming counterproductive by further complicating the content of the IIA. In addition, some awards from investor-State arbitrations have been inconsistent or contradictory, raising further uncertainty about the implications of entering into IIAs. While this can be

seen as a normal development until a more consistent case law develops, it remains a pertinent matter.

Another important issue is that investor-State arbitration, in general, lacks the degree of accountability and transparency mechanisms typically available in domestic courts, such as public records of proceedings, public access to the pleadings, neutral rosters of the judges and the right to appeal (Solanes and Jouravlev, 2007). While ICSID awards are usually made public, a call for more transparency in infrastructure disputes involving the public interest is justified as long as it does not affect the legitimate interests of the disputing parties to protect confidential information and does not place an excessive burden on them (UNCTAD, 2007j). Otherwise, there is a risk of disputing parties shying away from transparency-promoting forms of arbitration and seeking more discreet ways of dispute resolution.

A further key issue concerns the arbitrators. The fact that – contrary to the situation in the WTO – no appeals mechanism is currently available in international investment disputes, gives the arbitrators deciding a case a very powerful role. Choosing the “right” arbitrator therefore becomes a crucial task for the claimant and the defendant host country.

Given the problems mentioned above concerning balanced, clear and consistent treaty interpretation and procedural effectiveness, some experts have advocated that greater efforts be made to seek amicable solutions as opposed to arbitration (see e.g. Wells and Ahmed, 2007). Even if a host country is accused of having violated a clause in an IIA, it does not necessarily follow that it will be drawn before an arbitration tribunal. In light of the high sunk costs involved in most infrastructure investments and the frequent lack of adequate alternative investment locations, foreign investors might well prefer to seek an amicable solution with the host country, which allows them to continue their business under changed conditions. They could resort to alternative dispute resolution mechanisms such as mediation and conciliation (UNCTAD, forthcoming d). However, much depends on the circumstances of each case. From the host country’s point of view, an important consideration is whether its authorities have sufficient regulatory discretion to negotiate an amicable settlement with the investor. The readiness of an investor to seek a mediated solution of the conflict will largely depend on the frequency and gravity of the alleged treaty violation, and whether it can afford to lose time in case that mediation fails. Neither party is likely to be keen to involve a conciliator or mediator if it is convinced that it will prevail in the dispute. Furthermore, alternative dispute resolution may not be in the interest of those who advocate more transparency in investment disputes.

The complexity of these issues, together with the dynamic evolution of IIAs and the related international case law, underline the importance of capacity-building to ensure that developing-country governments understand the implications of concluding such agreements, and are equipped to handle potential investment disputes. UNCTAD contributes to such capacity-building through policy analysis of IIA-related issues and various forms of technical assistance.

D. The role of home countries and international institutions

Given the enormous needs for more infrastructure investment, it is important to consider how home countries and the international community could facilitate more foreign investments in the developing countries that seek such inflows. This is particularly relevant from the perspective of low-income countries, which generally have failed to attract significant TNC involvement in infrastructure development (chapter III). Various home country and international measures have been developed and represent important complements to those implemented by host countries, but more efforts are required.

Four types of interventions are discussed below. The first group of measures relates to official development assistance (ODA) for infrastructure projects, notably in low-income countries. A second set of measures seeks to mitigate non-commercial risks, in particular, that are inherent to infrastructure projects, and especially in countries with weak institutional capabilities. The third type of measures is geared specifically towards strengthening the institutional capabilities of developing countries in the area of infrastructure. The final group of measures seeks to promote the development of cross-border infrastructure projects that can facilitate regional integration.

1. Making better use of official development assistance

As documented in preceding chapters, without subsidies of some form, it is very difficult to attract TNC involvement in many infrastructure projects in economies, communities and industry segments that are characterized by weak purchasing power and poor records of payment. In these cases, multilateral and bilateral development finance institutions can act as catalytic financiers. In industries such as electricity,

water and transport, in particular, there is significant potential for synergies between foreign investment and ODA (UNCTAD, 2008g). By making more funds available, development partners and the home countries of the investing firms could play a significant role in helping to “crowd in” foreign investment into infrastructure projects in developing countries. This is particularly important for addressing the needs of the LDCs and other low-income countries. Furthermore, when allocating aid resources, it is important that increases in ODA for social infrastructure are not made at the expense of ODA for investments in economic infrastructure (UNCTAD, 2008h).

The need for increased international support to infrastructure development in general has been recognized in various forums in recent years, and development partners have pledged significant increases in aid to support such projects, not least with a view to helping meet the MDGs. For example, the report of the Commission for Africa (2005) to the G-8 Gleneagles Summit in 2005 called for additional assistance of \$10 billion per annum to meet Africa’s infrastructure needs by 2010. More recent assessments suggest even higher levels are needed (chapter III).

Some recent trends are encouraging. Between 2002 and 2006, bilateral and multilateral donor commitments to infrastructure (communications, energy, transport and storage, and water supply and sanitation), as reported by the OECD, almost doubled: from \$9 billion to \$17 billion (annex table A.V.2).⁷³ Moreover in 2007, bilateral and multilateral agency members of the Infrastructure Consortium for Africa (ICA) committed ODA and non-concessional lending amounting to \$12.4 billion (box V.10) for various infrastructure projects – a 61% increase over

the \$7.5 billion committed the previous year. Despite such positive trends, current levels of support have not recovered from the earlier period of decline in lending by multilateral institutions. For example, World Bank lending to energy and mining averaged more than \$3 billion during the period 1990–1998, but this figure fell to just over \$1 billion during 2002–2004. Although it has recovered more recently, it was still only a little over \$2 billion in the period 2005–2007 (Besant Jones, 2007).

Some new development partners – particularly China – have also become active in infrastructure, notably in natural-resource-rich countries in Africa (chapter III).⁷⁴ The Government of China supports such investments by providing bilateral aid in terms of grants, and interest-free and concessional loans. China EXIM Bank, the sole provider of Chinese concessional financing, had financed over 300 projects in Africa by mid-2007, representing almost 40% of its total loans (Davies et al., 2008: 3). The Bank’s lending practices of providing concessional loans mostly to infrastructure development are often linked to China’s foreign aid policy. The China Development Bank provides financing on commercial terms. In May 2007, it was designated to manage a \$5 billion China-Africa Development Fund (Ibid: 3). Loans by State-owned Chinese banks are linked to the contracting of Chinese SOEs. Indeed, Chinese TNCs are sometimes involved in bids that other development partners would deem to be too costly but that are strategically important for the Government of China (Corkin and Burke, 2006: 7; chapter III).

Moreover, while development partners have failed to honour their pledged commitments in recent years to scale up infrastructure investments in low-

Box V.10. The Infrastructure Consortium for Africa

The Infrastructure Consortium for Africa (ICA) was established in 2005. Its members include bilateral aid agencies from the G-8 countries, as well as the European Commission, the European Investment Bank, the World Bank Group, the African Development Bank Group and the Development Bank of Southern Africa (DBSA). It is intended to improve the effectiveness of assistance by its members in supporting infrastructure development in Africa through the sharing of information, project development and good practices. Although not a financing agency, the Consortium is intended to act as a platform to broker more donor financing of infrastructure projects and programmes, especially those related to projects with private sector participation in Africa.

ICA seeks to address both national and regional constraints on infrastructure development, with an emphasis on regional infrastructure, recognizing the particular challenges at this level. However, it also engages in efforts at the country level, since regional infrastructure projects generally also affect national budgets and raise various implementation and harmonization issues. A key role of ICA is to ensure a larger and more effective response to Africa’s infrastructure needs, including greater attention to national poverty reduction and other development strategies. ICA will also seek to provide better information on who is doing what, where and with what money, so as to identify gaps. Capacity-building is also on the agenda, as rationalization and expansion of existing capacity-building efforts could help increase aid effectiveness. In addition, ICA recognizes the need for better monitoring of actions and outcomes.

Coordination with China is a growing area of activity of the Consortium. At the Annual Meeting of the African Development Bank in Mozambique in 2008, an agreement was signed with China EXIM Bank for greater information-sharing and possible joint funding of projects in the future.

Source: UNCTAD, based on information from the ICA (www.icafrica.org).

income countries, funds that are available are not being fully disbursed. One study found that the World Bank and the regional development banks at the end of 2004 had unused funds amounting to more than \$200 billion (WEF, 2006: 8). Recent assessments further show that development finance institutions have very high liquidity at present (Te Velde and Warner, 2007).⁷⁵ Among possible reasons for this “infrastructure paradox” are skills shortages, lack of government capacity to prepare bankable projects, and a mismatch between the requirements of development partners and the priorities of recipient countries.

Efforts are needed to ensure that existing funds for infrastructure investment are better utilized. Risk-mitigation, capacity-building and regional cooperation are discussed in the next three sections. There is also need for greater collaboration and cooperation among the development partners. For example, the ICA was established in 2005 to accelerate progress towards meeting the urgent infrastructure needs of Africa (box V.10). While some observers have expressed concern that greater donor coordination could imply reduced policy space and weaken the bargaining power of recipient countries (Bull, Jerve and Sigvaldsen, 2006; UNCTAD, 2008i), collaboration among development partners in the preparation and delivery of projects would be beneficial.

A number of innovative initiatives have been taken in recent years in response to the need for more infrastructure investment in rural communities. Output-based aid is a strategy for using explicit performance-based subsidies to support the delivery of basic services where policy concerns would justify public funding to complement or replace user fees (box V.11). At the industry level, the Energy Poverty Action is an illustration of how joint ODA and TNC

involvement can bring electricity to rural areas in LDCs, while at the same time empowering local communities (box V.12).

In order to make existing ODA funds more efficient in catalysing private (including TNC) investment, it may be necessary to give greater attention to certain risk-mitigating policy instruments (discussed in the next section; and WEF, 2006). Some experts are also suggesting that development finance institutions have to become more willing to take risks in order to make their investment and lending practices more complementary to those of commercial market players, and to enhance the share of their financing to LDCs (Te Velde and Warner, 2007; WEF, 2006: 11–12).

2. Risk-mitigating measures

Given the special nature of infrastructure projects (chapter III), various policy tools have been developed to mitigate risks associated with such investments. While host countries can reduce the level of risk by strengthening their institutions and governance frameworks, such efforts take time. Risk-mitigation measures by home countries and by international organizations can therefore be an important complementary step in the short term to mobilize private financing of infrastructure projects in developing and transition economies. They can complement private market insurers that are also important players in providing investment insurance.⁷⁶ While infrastructure investors are exposed to many types of commercial and non-commercial risks, special attention is given here to measures aimed at mitigating three broad types: political risk (including sub-sovereign and contractual and regulatory risks), credit risk and exchange-rate risk.

Box V.11. The Global Partnership on Output-Based Aid

Output-based aid (OBA) aims at increasing access to basic services, including infrastructure, for the poor in developing countries. It links the payment of aid to the delivery of specific services or “outputs”, such as the connection of poor households to electricity grids or water and sanitation systems. Under an OBA scheme, service delivery is contracted out to a third party, usually a private firm, which receives a subsidy to complement or replace user fees. The subsidy should explicitly target the poor and be performance-based, meaning that most of it is paid only after the services or outputs have been delivered and verified by an independent agent.

In 2003, the Global Partnership on Output-Based Aid (GPOBA) was created. It is a partnership of donors and international organizations aimed at improving service delivery to the poor.^a It provides three types of OBA-related support: technical assistance, dissemination of experiences and best practices, and grants for subsidy funding. The programme covers water, sanitation, electricity, telecommunications, transport, health and education. To date, more than 90 World Bank projects use an OBA approach – more than half of which involve the GPOBA – with a total funding of over \$2.2 billion, predominantly in infrastructure. Since April 2007, the GPOBA has signed 19 grant agreements for OBA subsidy funding for a total of \$72 million. Over 2.8 million people are expected to benefit from these schemes in both rural and urban areas in 17 countries.

Source: UNCTAD based on information from the GPOBA (www.gpoba.org).

^a It was established in 2003 by the United Kingdom’s Department for International Development (DFID) and the World Bank. Other donors include the International Finance Corporation (IFC) of the World Bank, the bilateral aid agencies of the Netherlands (DGIS), Australia (AusAID) and Sweden (Sida). As of June 2008, donor funding for GPOBA totalled \$249 million (including contributions and pledges).

Box V.12. Enhancing rural electrification in Lesotho through the Energy Poverty Action

Among the greatest challenges in meeting the infrastructure gap is to improve access to affordable electricity to rural areas in LDCs. To this end, the Energy Poverty Action (EPA), a joint initiative of the World Business Council for Sustainable Development, the World Energy Council and the World Economic Forum (WEF), has introduced a novel approach. This private sector initiative seeks to use business expertise and best practices to develop innovative, scaleable and replicable energy projects. It was initiated by British Columbia Hydro and Power Authority (Canada), Eskom (South Africa) and Vattenfall (Sweden) at the Annual Meeting of the WEF in Davos in 2005. These corporate partners have signed an EPA Alliance Agreement and have committed to developing an initial project in Lesotho.

An attractive feature of the EPA initiative is its focus on local autonomy (i.e. building the necessary local capacity to empower users to manage, operate and maintain the projects in a sustainable manner). Development finance institutions are to provide funding for the up-front capital investment, but local users will then assume responsibility for all costs associated with ongoing operations and maintenance of the infrastructure thereafter. In 2007, the African Development Bank (AfDB) officially announced its intention to co-finance this project to the value of about \$5.4 million. A formal decision by the AfDB Board for the funding is expected in September 2008.

The preparatory work for EPA's first project in Lesotho is well under way. A local user association, the Mphaki Electricity Distribution Association (MEDA), has been set up. MEDA's members – all connected customers – will be responsible for operation and maintenance on a commercial basis. The EPA and the Government of Lesotho have pledged in-kind contribution to the value of about \$1.4 million (comprising mainly the provision of expertise) for project development and implementation. The infrastructure will be leased by MEDA from the Government of Lesotho under a long-term contract, and bulk power will be purchased by MEDA from existing suppliers. Some 1,850 customers are expected to be connected through grid extension, using either low voltage connections or solar photovoltaic installations, by December 2009.

An EPA Management Unit hosted by the Development Bank of Southern Africa was set up in September 2007 to manage and promote the initiative. Its mid-term objective is to develop the institutional capacity to act as matchmaker between leading electricity companies, governments, local entrepreneurs and communities, as well as national and international financial institutions and donors, for project financing and execution with a view to addressing the challenges of energy poverty. By seconding specialists to the management unit, the alliance partners will provide skills in support of existing projects and the replication or scaling up of new projects. Their activities will include matchmaking, development of pre-feasibility and bankable feasibility studies, project management, collation and diffusion of best practices, and development and implementation of financing mechanisms.

Source: UNCTAD, based on information from the EPAMU.

a. Coverage for political risk

Political risk insurance (PRI) is important for infrastructure projects, especially in countries with weak institutional and regulatory capabilities. Investors and governments today have a better understanding of how to mitigate political risks, and are forging partnerships that bring together the know-how and financing of the private sector with the regulatory backing of the public sector. Guarantees for investments in infrastructure can help investors obtain the necessary project financing from banks. PRI instruments typically cover war and civil disturbance, expropriation and confiscation, and currency convertibility and transferability. The main public schemes for this classical version of PRIs are operated by bilateral agencies with a mission to promote national exports and overseas investment, such as export-import banks and export credit agencies (Winpenney, 2005; Matsukawa and Habeck, 2007). The Multilateral Investment Guarantee Agency (MIGA) is the largest multilateral investment insurer (box V.13). Another international investment guarantee institution is the Inter-Arab Investment Guarantee Corporation.⁷⁷ The Islamic Corporation for the Insurance of Investment and Export Credit

(ICIEC) provides export credit and insurance to its member States and reinsurance facilities to member export credit agencies.⁷⁸

The demand for PRI has been shifting towards coverage of risks that arise from the actions or inactions of a host government that adversely influence the operations of private companies (Matsukawa and Habeck, 2007: 5). Cover for breach of contract and for changes in law and licence requirements is more difficult to arrange than classic PRIs, since they are highly project-specific. However, most international financial institutions now offer some form of cover against these risks, with the World Bank's partial risk guarantee (PRG) extending the most comprehensive coverage. MIGA has also introduced a specific breach of contract guarantee (box V.13).

For certain infrastructure projects, countries may benefit from regional cooperation. For example, the African Trade Insurance Agency (ATI) was put in place by the Common Market for Eastern and Southern Africa (COMESA) to provide political risk coverage for trade and investment projects in its member countries.⁷⁹ It emerged from a World Bank initiative, which provided \$100 million in the form of individual loans to the founding member countries to set up the agency. The ATI is based in Nairobi, Kenya,

and provides insurance cover against both political and non-political risks.⁸⁰

For *sub-sovereign risks*, private monoline insurers can provide so-called wrap guarantees for municipal bonds of sufficiently creditworthy municipalities. Multilateral development banks have traditionally lent to sub-sovereign governments either through or with the guarantee of the relevant sovereign government. The European Bank for Reconstruction

and Development (EBRD) and the IFC have created municipal finance units and provide loan and partial credit guarantee support (including local currency) to selected sub-sovereign governments and entities based on their own credit. Other institutions, including the Inter-American Development Bank and MIGA, can provide PRGs and PRI for municipal concession projects (Mistry and Olesen, 2003; Kehew, Matsukawa and Petersen, 2005).

Box V.13. Investment guarantees by the Multilateral Investment Guarantee Agency

The Multilateral Investment Guarantee Agency (MIGA) protects foreign investors against the political risks of expropriation, breach of contract, currency inconvertibility, transfer restrictions and war and civil disturbance, including terrorism. It insures new cross-border investments originating in any member country and destined for any other developing member country.^a MIGA can provide insurance coverage for up to 15 years (and in some cases 20 years). It also supports investments at the sub-sovereign level, where partners tend to be relatively inexperienced and investments therefore riskier. Coverage for PPPs is another area where MIGA is becoming increasingly active.

MIGA's services have enabled some transactions to materialize that otherwise would not have been possible. For example, a project concerning the development, design, construction, management, operation and maintenance of a new container port terminal in the city of Doraleh, Djibouti, is being developed under a 30-year concession granted by the Government of Djibouti to the main sponsors, DP World (United Arab Emirates) and Port Autonome International (Djibouti) through a joint-venture vehicle, the Doraleh Container Terminal S.A. In 2007, MIGA was approached to provide PRI for this project that was funded through an Islamic financing structure, and issued guarantees totalling \$427 million. By adapting its guarantee services to suit an Islamic financing structure, MIGA was able to issue coverage for an investment supported by such a structure for the first time.

Another recent MIGA-supported project illustrates how PRI can help get infrastructure projects off the ground. In 2006 (fiscal year), MIGA provided \$108 million in coverage for the development of a toll road in the Dominican Republic. With total project costs estimated at \$220 million, the investor, Autopistas del Nordeste (Cayman Islands), contributed \$30 million in equity and the Government agreed to another \$30 million equity stake. The investor and its financial advisers approached the capital markets for a \$162 million bond issue. The credit rating agency Fitch was brought in to rate the transaction. MIGA agreed to provide a partial guarantee of 51% of the bond issue, which allowed Fitch to rate the transaction higher than the sovereign ceiling for the country, resulting in a 40% oversubscription. Thus the political risk guarantees issued by MIGA reduced the cost of capital and played a critical role in securing financing, according to Autopistas del Nordeste, which allowed the company to extend the tenure of the pay-back period.

During 2007 (fiscal year), MIGA issued \$494 million in guarantees for 12 infrastructure projects, accounting for 41% of the total gross outstanding portfolio. That share has increased considerably compared with the late 1990s, when it stood at 19%. South-South investments now feature prominently in its infrastructure portfolio,^b with special attention to infrastructure projects in Africa as well as in low-income countries. Since 1996, MIGA has issued \$536 million in guarantees for 16 telecommunications projects in sub-Saharan Africa and an additional \$443 million in guarantees for 11 projects involving transportation, power and sanitation. Infrastructure accounts for about 42% of all the guarantees issued for sub-Saharan Africa from 1990 to 2007. Low-income countries accounted for 21% of its gross exposure in infrastructure in 2007, a share that has been increasing steadily over the past four years.

MIGA's support for infrastructure investment draws on the agency's experience in markets considered to be higher risk, as well as its ability to offset risks encountered at the sub-sovereign level. As a multilateral agency and member of the World Bank Group, it may contribute to deterring harmful government actions and to resolving disputes to prevent claims situations from escalating, while keeping investments on track. If a dispute cannot be resolved, MIGA ensures that valid claims are paid promptly.

MIGA's new policies on social and environmental sustainability and disclosure, which took effect for all new project applications from 1 October 2007, are aimed at strengthening the standards that the agency already applies to projects it supports. These policies, which also apply to infrastructure projects, address the following: social and environmental assessment and management; labour and working conditions; pollution prevention and abatement; community, health, safety and security; land acquisition and involuntary resettlement; biodiversity conservation and sustainable natural resources management; indigenous peoples; and cultural heritage.

Source: UNCTAD, based on information provided by MIGA (www.miga.org).

^a New investments include greenfield projects, as well as the expansion, modernization or financial restructuring of existing projects and acquisitions that involve the privatization of SOEs. Eligible forms of investment include equity, shareholder loans and shareholder loan guaranties, provided that loans have a minimum maturity of three years. Some non-equity forms of investment, such as technical assistance, management contracts, leases, franchises and licensing agreements, may also be eligible under certain conditions.

^b In the fiscal year 2007, MIGA issued four guarantees (\$244.1 million in gross exposure) specifically for South-South investments in infrastructure.

b. Coverage for credit risk

In addition to PRI and PRGs – which can protect lenders against some types of perceived risks – partial credit guarantees (PCGs) are the most common form of credit risk cover. They cover losses in the event of debt-service default, regardless of the cause of default. Thus both non-commercial and commercial risks may be covered (Matsukawa and Habeck, 2007: 2). Credit enhancement can be used to support issuance of long-term currency bonds, and may reduce the costs of debt by securing higher credit ratings. This in turn may open up more sources of capital for infrastructure projects (Fay and Morrison, 2007).

c. Coverage for currency risk

Coverage for currency risk is particularly important for TNC involvement in infrastructure. As most of the revenue is generated locally, devaluations can have a significant impact on profitability of projects that are often financed in foreign currencies. This problem arises especially in countries that lack well-established and liquid long-term debt markets and currency hedge products (Matsukawa and Habeck, 2007: 7).

Sometimes, foreign-exchange risk is contractually mitigated by allowing tariff indexation of foreign currency cost components to foreign exchange rates, thus transferring the risk to the off-taker and ultimately the consumer. However, such mechanisms are controversial. They may divert the use of scarce foreign exchange from other, higher priority uses, increase the risk of contract renegotiation and be unfair to consumers. Governments may not be able to hedge their exposure, and by offering such guarantees they may crowd out local financing in countries with nascent debt markets.⁸¹ It is debatable whether State governments and municipalities should bear the risk of foreign-exchange movements, as they have no control over these fluctuations. Indeed, it may be argued that this risk should be treated as commercial risk and be borne by the private sector (Platz and Schröder, 2007: 26). In fact a growing number of insurers appear to be prepared to cover transactions financed in local currency.⁸²

Nonetheless, the international community could help indirectly to mitigate foreign-exchange risk. For example, the Association of Southeast Asian Nations+3 (ASEAN+3) has launched the Asian Bond Market Initiative to eliminate currency mismatches and to develop local capital markets in participating countries. Also, a guarantee facility for local currency debt is currently being developed under this Initiative (Winpenny, 2005). This is an area for which further support is needed. Using local capital sources to finance investments is the best way to avoid currency

risk. However, such funding is difficult to arrange in low-income countries with poorly developed local capital markets. An increase in and issuance of local currency instruments could play an important role in furthering the development of domestic credit and capital markets. A way forward may be to create mechanisms to optimize the input of local currency funding by developing high-quality structured finance bonds allied to a project or a group of projects.

The *GuarantCo* initiative was established by the Private Infrastructure Development Group to enhance local currency debt issuance by private, municipal and parastatal entities for infrastructure projects in low-income countries.⁸³ Its objective is to reduce or prevent the reliance of projects in poorer countries on hard currency financing by building capacity in their domestic markets to deliver viable and sustainable infrastructure financing solutions, and assist with poverty alleviation.

* * *

Despite the plethora of risk mitigation instruments available, it has been argued that current programmes are insufficiently tailored to the situation of low-income countries (Mistry and Olesen, 2003). For example, local-currency-denominated financing by development finance institutions typically requires a well-established currency swap market. However, where such markets exist, a need for interventions by the development finance institutions is less likely (Fay and Morrison, 2007). Various suggestions have been put forward to address the specific problems of LDCs. One study proposed the establishment of a small, special-purpose LDC infrastructure investment fund that would provide equity and debt financing as well as mobilize domestic currency resources for lending to infrastructure projects in LDCs (Mistry and Olesen, 2003). The Commonwealth Secretariat has made a similar suggestion, arguing for a dedicated and separate fund owned by, but legally distinct from, existing international financial institutions. Focusing specifically on LDCs and other small and vulnerable economies, this fund would offer loans in domestic currencies and quasi-equity investment capital and guarantees, while providing a specially simplified form of MIGA cover for political risk (Hughes and Brewster, 2002).

At the same time, risk-mitigation instruments are not a panacea. A key concern is that too much risk mitigation may lead to problems of moral hazard and encourage reckless risk-taking on the part of investors and lenders (WEF, 2006: 15). Moreover, while risk-mitigation tools can facilitate the mobilization of private debt and equity, they do not make poorly structured projects more viable (Matsukawa and Habeck, 2007: 6). This further underscores the importance of capacity-building efforts.

3. Capacity-building measures

A weak enabling environment in some developing countries – at national, provincial and local levels – represents a major obstacle to successfully engaging TNCs in infrastructure projects. They require support in areas such as creating better regulatory frameworks, preparing infrastructure projects for bidding and negotiation and ensuring greater transparency. As local governments are playing an increasingly influential role in ensuring the financial sustainability of utilities, capacity-building in municipalities is also needed to build expertise in areas such as finance, regulatory work and governance.

Preparing “bankable” infrastructure projects for private financing is also required to make better use of available ODA funds allocated to such investments, thus addressing the “infrastructure paradox” (discussed in subsection D.1). Multilateral and bilateral institutions are offering some assistance of this kind. For example, the Infrastructure Project Preparation Facility of the New Partnership for Africa’s Development (NEPAD) – managed by the African Development Bank – has received additional funding to help in the preparation of infrastructure

projects.⁸⁴ Table V.4 presents a list of capacity-building projects for infrastructure development in Africa. However, the effectiveness of these projects has not been well studied, and it is not known to what extent they have helped improve governments’ capacities. Moreover, interviews conducted for this report as well as other studies (see, for example, WEF, 2006), suggest that current efforts remain insufficient and are not always effectively deployed. Anecdotal evidence indicates that available ODA funds dedicated to capacity-building are not always effectively disbursed. For example, the Southern African Development Community (SADC) has reportedly had to return to the World Bank significant funds that should have been used for capacity-building. Similarly, while a substantial portion of the resources available at the African Capacity Building Foundation has been committed to capacity-building operations, the Foundation recognizes that it needs to improve the level and rate of disbursements to grant recipients.

Another area in need of capacity-building is related to the legal implications of contracts and projects as well as their monitoring. More attention should be given to ensuring that projects are implemented in accordance with the contracts

Table V.4. Capacity-building facilities for infrastructure projects in Africa, 2006

Facility	Hosting organization	Phases in project development					
		Enabling environment	Project definition	Project feasibility	Project structuring	Transaction support	Post-implementation support
ACP-EC Energy Facility	European Commission	√	√	√	√	√	√
African Capacity Building Foundation	African Capacity Building Foundation	√	√	√	√	√	√
African Catalytic Growth Fund	World Bank	√	√	√	√	√	√
African Water Facility	AfDB	√	√	√	√	√	√
DBSA Development Fund	DBSA	√	√	√	√	√	√
DEVCO	IFC and DFID	√	√	√	√	√	√
FEMIP Support Fund	European Commission and EIB	√	√	√	√	√	√
FEMIP Trust Fund	European Commission and EIB	√	√	√	√	√	√
Fund for African Private Sector Assistance	African Investment Bank	√	√	√	√	√	√
Global Environmental Facility	UNEP	√	√	√	√	√	√
Global Partnership for Output Based Aid	World Bank	√	√	√	√	√	√
Islamic Development Bank TAF	Islamic Development Bank	√	√	√	√	√	√
IFC Advisory Services	IFC	√	√	√	√	√	√
IFC Municipal Fund	IFC	√	√	√	√	√	√
NEPAD IPPF	AfDB	√	√	√	√	√	√
NEPAD PPFS	DBSA	√	√	√	√	√	√
Nigerian Technical Cooperation Fund	AfDB	√	√	√	√	√	√
PHRD Technical Assistance Grand Programme	World Bank	√	√	√	√	√	√
PIDG Technical Assistance Fund	PIDG	√	√	√	√	√	√
Public Private Infrastructure Advisory Facility	World Bank	√	√	√	√	√	√
SEFI Transaction Support Facility	UNEP and Base	√	√	√	√	√	√
Slum Upgrading Facility	UN Habitat	√	√	√	√	√	√
Water and Sanitation Program	World Bank	√	√	√	√	√	√

Source: UNCTAD based on ICA, 2006.

Note: ACP: Africa, Caribbean and Pacific group of States signatories of the Cotonou Agreement. AfDB: African Development Bank. DBSA: Development Bank of Southern Africa. DEVCO is a multi-donor facility established by IFC and DFID to support IFC’s advisory work on privatization in infrastructure. DFID is the United Kingdom’s Department for International Development. EC: European Commission. EIB: European Investment Bank. FEMIP: Facility for Euro-Mediterranean Investment and Partnership. IFC: International Finance Corporation. NEPAD IPPF: New Partnership for Africa’s Development Infrastructure Project Preparation Facility. NEPAD PPFS: NEPAD Preparation and Feasibility Studies Facility. PHRD: Policy and Human Resource Development. PIDG: Private Infrastructure Development Group. UNEP: United Nations Environment Programme. SEFI: UNEP Sustainable Energy Finance Initiative.

signed. In response to repeated calls from African governments, development partners and international organizations, the African Development Bank is in the process of establishing an African Legal Support Facility.⁸⁵ Another initiative in Africa is the decision by the Development Bank of Southern Africa to scale up its monitoring activities.

The international community needs to step up its capacity-building efforts as part of its assistance to low-income countries with a view to helping them develop their infrastructure and negotiate with private firms. Efforts should complement existing programmes and should include legal, financial and technical counsel that is tailored to low-income countries' requirements. For advisory services to become more effective, comparative, systematic and empirical data are needed to evaluate experience with infrastructure projects to date, especially in low-income countries. Advisory services should include not only how to encourage investment but also how infrastructure development can be made to fit into overall development plans and objectives. In this context, it may be important to develop an independent advisory service unit that is not a direct stakeholder in the actual transactions negotiated, in line with the kind of technical assistance that was once offered by the United Nations Centre on Transnational Corporations (see, for example, Sagafi-nejad and Dunning, 2008: 107).

4. Promoting regional infrastructure projects

Many developing countries see their small national economies and limited access to international markets as serious constraints on economic growth and on attracting FDI. Regional integration can be a possible solution. But since successful regional integration requires improved infrastructure across the member countries, it is important to encourage the development of cross-border infrastructure. In Latin America, for example, the Central American Interconnection System was set up to enable the creation of a wholesale electric power market and a regional grid (Fay and Morrison, 2007). In Africa, NEPAD is placing strong emphasis on cross-border projects in such areas as transportation and energy.

However, it is often difficult to implement regional projects. They require the highest political backing, and even with this there can be major hurdles to securing agreement among participating governments on project design and implementation. A major problem in Africa is the lack of harmonization of laws and regulations, which is creating substantial delays in project development and implementation.

Some projects have been in the planning stage for as long as 20 years (box V.14).

The need for international assistance in this area is increasingly recognized. For example, the number of regional integration projects in the pipeline of the World Bank Group has been growing, with more than \$2 billion worth of projects set to be financed over the next three years. This includes projects in transport, energy, water and telecommunications based on the NEPAD Short Term Action Plan priorities and the Africa Action Plan.⁸⁶ Financial support from the members of ICA (box V.10) to projects which connect two or more countries or which have an important regional impact more than doubled, to \$1.9 billion in 2007.⁸⁷ A recent European initiative that aims at improving regional infrastructure projects in Africa is the EU-Africa Infrastructure Fund (box V.15). The action plan for the period 2008–2012 emerging from the Tokyo International Conference on African Development (TICAD) gives special emphasis to regional transport and power infrastructure and to greater involvement of regional institutions (TICAD, 2008).

E. Conclusions

Policymakers need to give priority to the development of physical infrastructure. The needs are huge, and will require an optimal use of the private sector, including TNCs. This applies particularly to LDCs, where infrastructure improvements are critical for realization of the MDGs. At the same time, low-income countries are often too poorly equipped to attract TNCs into infrastructure and to extract benefits from TNC involvement. Thus, finding the appropriate mix of public and private sector involvement is not easy. Whatever approach is chosen, adequate institutions and enforcement mechanisms are essential to ensure efficient and equitable delivery of infrastructure services. For many developing countries, this is a daunting challenge that will require a concerted effort by all parties concerned – host and home countries, the international community and the companies involved.

Expectations should be realistic: TNCs will only be willing to invest in projects in which they can expect adequate returns, and the higher the perceived risks associated with a project, the greater will have to be the expected returns. A further complication is that demands for infrastructure investment in developed countries and in large emerging economies may hamper the ability of low-income countries to compete for TNC investment.

A first priority of host country governments in developing countries should be to strengthen the rule of law, including protection of property and

Box V.14. The Grand Inga Hydropower Project

While regional infrastructure projects can have huge development potential, they are also challenging to implement. The Grand Inga Hydropower project proposed for the Congo River in the Democratic Republic of the Congo is a good illustration. Based on the existing Inga 1 and Inga 2 dams and the proposed Inga 3 dam, the Grand Inga project constitutes the world's largest hydropower scheme. It is part of a greater vision to develop a trans-Africa power grid that could help spur the continent's economic and social development. The project's backers include Eskom (South Africa), NEPAD and SADC.

When completed, the Grand Inga could produce up to an estimated 39,000 MW of electricity – more than twice the power generated by the Three Gorges Dam in China and more than a third of the total electricity currently produced in Africa. While feasibility studies are yet to be completed, the project is already being projected as a way to “light Africa”. Mining companies are said to have a particularly strong interest in the Grand Inga, and electricity shortages in South Africa and neighbouring countries have underlined the importance of the project.^a A decision to proceed with Grand Inga will only be made once Inga 3 has been completed. Construction work for the Grand Inga is planned to start in 2014 and it is expected to begin operating between 2020 and 2025.

Mega projects such as the Grand Inga entail many risks. Its development has been hindered by poor maintenance and financial problems of the nearby Inga 1 and Inga 2 dams, as well as civil war and poor governance in the Democratic Republic of the Congo.^b Moreover, the project faces a number of challenges, such as corruption, the need to raise funds, environmental concerns (e.g. threat to the local environment as well as the Congo River basin) and social concerns (e.g. the displacement of local communities).

A particular challenge stems from the Grand Inga being a regional project involving multiple stakeholders. Regional projects require coordination, legal harmonization, coordinated administrative decisions, strong political will and, most importantly, sound governance by all participants. Poor governance and a lack of legal harmonization create significant delays in project development and implementation. A major effort is therefore needed to ensure smooth implementation of such projects by improving governance on a regional basis and by agreeing at the outset on how projects will be implemented, including the allocation of responsibilities to implementing agencies and the time frame for implementation.

Source: UNCTAD, based on International Rivers (www.internationalrivers.org).

^a According to Eskom, demand for electricity in South Africa alone is rising at the rate of 3% per annum, with no new generators to meet this growing demand.

^b The Inga 1 and 2 dams are undergoing a major rehabilitation with financial assistance from the World Bank, the European Investment Bank and the African Development Bank. The Inga 2 rehabilitation is also financed through a partial privatization scheme with the company, MagEnergy (Canada), and financial support from the Industrial Development Corporation of South Africa.

contractual rights, and the development of transparent and predictable sectoral laws and regulations. A high-quality general institutional and regulatory framework is crucial for fostering infrastructure investments, with or without TNC participation. It is the best way of reducing the risks associated with infrastructure projects, and of securing benefits from the investments. Within the overall governance framework, governments should identify how infrastructure projects may support broader development objectives and what potential role TNCs should play in their implementation.

Many developing countries would need to accord higher priority to infrastructure investments when allocating public funds. This requires considerable political will and commitment to long-term investments in the maintenance of existing and development of new infrastructure. Experience to date shows that TNC investment cannot substitute for public investment in infrastructure, but it can be an important complement (chapter IV). Increased government spending on infrastructure investment is therefore needed – with or without TNC involvement. Especially in electricity and water, government

investment is likely to help “crowd in” foreign investment.

For developing countries with large endowments of mineral resources, the current commodity price boom offers a window of opportunity. They need to ensure that windfall gains are managed and used in ways that promote development objectives. This includes infrastructure investments and the building of the necessary skills and capabilities to manage those investments. Some countries have linked the granting of mining concessions to commitments by foreign companies to develop infrastructure (chapter III). It is also important that the long-term sustainability of projects is factored in from the outset. To this end, governments should ensure they benefit from sufficient knowledge transfers from TNC partners to enable them to assume responsibility for the projects, if necessary, when their contract period expires.

Governments also need to develop the capabilities to assess the suitability of different forms of infrastructure provision – whether public, private or through some form of PPP – as well as to design and monitor specific projects. This will require training personnel in how to operate and maintain

Box V.15. The EU-Africa Infrastructure Trust Fund

In the context of the Gleneagles Declaration on Africa emerging from the G-8 Summit in 2005 and the EU Council's adoption of an EU Strategy for Africa, the EU and its African counterparts initiated a Partnership for African Infrastructure (the Partnership). To support its implementation, the EU-Africa Infrastructure Trust Fund (the Trust Fund) was launched in 2007.^a It encourages the financing of infrastructure programmes which facilitate interconnectivity and regional integration on the African continent. It aims to support synergies between European development agencies for the benefit of Africa, leveraging additional funds by blending grants and loans. To date, 11 donors have joined the Trust Fund, with financial commitments of €97 million.^b

A major project being supported by the Trust Fund with a €2.6 million subsidy is the East African Submarine Cable System (EASSy). It is expected to deliver high-speed Internet access to 20 Eastern and Central African countries. The EASSy cable will be owned and operated by a consortium of internationally licensed operators, either wholly private or with mixed public-private ownership. Some large operators will participate in the consortium directly in their own right, while others will receive co-financing from the European Investment Bank (EIB) and several other development finance institutions. These will channel their investments through the West Indian Ocean Cable Company Ltd (WIOCC), a special purpose vehicle (SPV) created to exist alongside the direct consortium members. The main purpose of the hybrid SPV model is to incorporate key development policy objectives into the WIOCC's shareholder agreement and other project documents. The grant from the Trust Fund will ensure efficient management of this complex project by funding the costs of a core management team during its set-up period.

The Trust Fund gives priority support to projects in the energy, water, transport and telecommunications industries. To be eligible, these projects must be sustainable and encompass a cross-border dimension and/or have a regional impact, be driven by public or private sector entities or with mixed public-private capital, contribute to poverty alleviation and economic development, and involve at least one country located in sub-Saharan Africa (and projects located in South Africa must involve another sub-Saharan country).

Support comes in the following forms: interest rate subsidies on medium and long-term loans; technical assistance and capacity building, including project preparation activities; subsidies for certain capital investments with an environmental or social component that are directly linked to the infrastructure project; and insurance premiums to cover country risks during the construction phase of large projects, for a two to three year period.

Source: UNCTAD based on information provided by the EIB.

^a See: www.eib.org/acp.

^b The donors include the European Commission and nine EU member States (Austria, Belgium, France, Germany, Greece, Italy, Luxembourg, the Netherlands, Spain and the United Kingdom).

infrastructure facilities (see, for example, Campos and Vines, 2008). To the extent that TNC involvement is desired, it would also be necessary to develop the expertise and capabilities to administer often complex projects. In countries that possess limited experience of projects involving TNCs, it would be appropriate to start on a small scale and to concentrate on projects that are less contentious. Furthermore, it may be easier to begin with contractual arrangements that have a relatively low level of TNC involvement, such as management and operations contracts.

Active promotion by IPAs can contribute to raising awareness of existing investment opportunities among potential investors. In this context, it is important for IPAs and other agencies involved to identify the main players and their respective responsibilities in the different infrastructure segments. The rise of TNCs from the South and the growing interest in infrastructure projects among sovereign wealth funds and private equity funds (chapter III) should also be considered when developing promotional strategies. At the same time, governments need to strengthen their negotiating skills with regard to investment contracts with TNCs to maximize the development gains from

any inflows of investment. They need to develop a clear understanding of the wide range of possibilities of TNC involvement in order to identify what is most appropriate for a given situation. For example, innovative, small-scale solutions could be explored for rural and other low-income areas. The form and content of the contracts have a major influence on the allocation of risks among the different parties. Governments should avoid offering overly generous subsidies or guarantees that may result in very large contingent liabilities. Similarly, TNCs should not seek too large subsidies or guarantees as this may backfire at a later stage and increase the likelihood of renegotiation and/or disputes.

With a view to fostering greater investment, many countries have complemented their national legislation and contractual arrangements with various international treaties in order to enhance investor protection. The proliferation of investment agreements has recently been paralleled by an increased incidence of investment disputes related to infrastructure. These developments have triggered an intense debate among policymakers on how to ensure that the use of IIAs facilitates much-needed investments without imposing too much of a

constraint on the legitimate needs of governments to adjust regulatory frameworks or renegotiate contracts when circumstances change. This consideration makes it important for governments to enhance their understanding of the implications of concluding IIAs.

Increased regional collaboration among developing countries should be encouraged in the area of infrastructure development. Closer regional integration can help create larger markets and thereby promote growth opportunities. But this requires supporting regional projects to enable an effective economic exchange among the members of the region. Various initiatives are already under way to speed up the development of such projects. However, it has often proved difficult to implement specific projects, partly due to the lack of harmonization of national laws. Regional support entities could play a key role in assisting national regulators to achieve such harmonization. For example, commonly agreed project definitions in law (that can be transposed to national laws) could help reduce the cost of developing contracts.

The actions of TNCs themselves obviously matter for securing benefits from foreign investment. In this context, all companies – private or State-owned, large or small, from the North or the South – should seek to abide by high standards of corporate behaviour. It is important to engage new corporate players in ongoing processes aimed at securing sustainable development gains from foreign investments. Financial institutions involved in infrastructure projects are becoming more aware of environmental and social issues. For example, the Equator Principles – a set of guidelines for determining, assessing and managing social and environmental risk in project financing – have been adopted by about 50 banks and other financial institutions, including 19 lead arrangers, which in 2006 were responsible for arranging close to half of all project loans. The Principles now have to be applied to virtually all infrastructure projects (Esty and Sesia, 2007). While more financial institutions should be encouraged to abide by them, further research is needed to examine their actual impact.

Regarding development assistance, development partners should honour their ODA commitments for infrastructure. They can also do more to help mitigate risks associated with infrastructure projects, especially in low-income countries. Bilateral and multilateral organizations need to become more willing to assume risks and to allocate a greater share of their activities to the needs of low-income countries. In addition, they should keep all options open. While a strong case can often be made for facilitating greater involvement of the private sector, including TNCs, other solutions should not be ruled out. In some projects, notably in water

and some electricity segments, there may be strong arguments for keeping the operation of basic services in public hands. But also in other industries, weak institutional capabilities may make private sector involvement too risky. In such situations, international support efforts focused on revitalizing existing public sector producers may be more effective (Estache and Fay, 2007). Thus it is important that development partners give sufficient attention to financing those infrastructure projects for which it may not be possible to mobilize private sector involvement.

But it is not only a matter of providing more money. Given the massive requirements for supporting infrastructure development, an urgent need is to address the “infrastructure paradox” (i.e. the non-utilization of available funds). International support for capacity-building in all relevant areas, especially in LDCs, is necessary to address this situation. Depending on the specific circumstances of each country, assistance may be provided for developing legal and regulatory frameworks, assessing different policy and contractual options, preparing project proposals, and monitoring and enforcing laws, regulations and contracts. Considering the nature of infrastructure projects, all levels of government – national, provincial and municipal – in many developing countries are in dire need of some form of assistance. While steps have been taken to meet these needs, current efforts remain vastly inadequate. In addition, even funds available for capacity-building are reportedly not always used. It would be worth exploring how the United Nations could play a more active role in this context, for example by helping developing-country governments to evaluate management contracts and review agreements.

Notes

- ¹ As privatization and various forms of PPPs raise many complex issues and their implementation can be demanding in regulatory and contractual terms, failure to build the necessary capacity can lead to skewed risk allocation, inadequate development gains and poor performance (Scott, 2007).
- ² In practice, however, as long as the regulator’s budget is controlled by the government, complete independence from the government is not possible to achieve. Therefore, it may be appropriate to finance the operating budget of an agency through levies on the regulated industry (Guasch, 2004). In England and Wales, for example, the water regulator is funded by a fee from the companies involved, and the independence of funding is enshrined in law.
- ³ They are capital-intensive and self-sufficient projects, with the customer relationship in effect being between the municipality and the contract operator.
- ⁴ The World Bank increased its emphasis on private sector involvement in infrastructure industries in the early 1990s, in light of the disappointing performance of State-owned utilities as well as rising government debts in many developing countries (World Bank, 1995).
- ⁵ A study by the Independent Evaluation Office of the IMF recently reconfirmed the need to reduce the volume of structural

- conditionality and to limit the use of conditionality to the core areas of IMF expertise (IEO, 2007).
- 6 This picture is confirmed by project data, which showed that Latin America and the Caribbean received close to two-thirds of all foreign investment commitments in developing and transition economies during the period 1996–2000 and about 30% of all such investment commitments in 2001–2006 (chapter III).
- 7 Another study concluded that electricity utilities are owned and operated by the State in 55%, of all developing countries covered in the World Bank's *PPI Database* (Kikeri and Kolo, 2005).
- 8 In developed countries, this was followed by British Telecom (United Kingdom), Teleglobe (Canada) and NTT (Japan).
- 9 For example, the Democratic People's Republic of Korea, which had previously prohibited FDI, in January 2008 allowed Orascom Telecom (Egypt) to introduce third generation mobile services in the country. A joint venture company, 75% owned by Orascom and 25% by the Korea Post and Telecommunications Corporation) will provide the service. Orascom plans to invest up to \$400 million on the project over the next three years ("Orascom Telecom Receives The First Mobile License in the Democratic People's Republic of Korea." Press Release (www.orascomtelecom.com), 30 January 2008).
- 10 Comoros, Costa Rica, Djibouti, Ethiopia, the Federated States of Micronesia, the Libyan Arab Jamahiriya, Myanmar, Nauru, Palau and Tuvalu (Minges, 2008).
- 11 "A Proclamation to provide for the amendment of telecommunications proclamation", Proclamation No. 281/2002, 2 July 2002.
- 12 The State-owned Instituto Costarricense de Electricidad (ICE) has had a monopoly on telecommunications services.
- 13 See "Lawmakers give final OK", 15 May 2008; available at: <http://www.sellingr.com/main-content/lawmakers-give-final-ok-3.html>.
- 14 See <http://www.networkworld.com/news/2007/020707-verizon-enters-indias-long-distance.html>.
- 15 See "Morales nationalizes Bolivian telecom, foreign gas companies", *Mercurynews.com*, 1 May 2008.
- 16 Some countries, such as the Netherlands and Uganda, have passed laws banning privatization of public water supply (Hall, Lobina and de la Motte, 2004).
- 17 There is full privatization in Chile (TNCs and local firms) and China (local firms). In India, Jamshedpur's water assets and operations have always been developed, owned and operated by Tata Steel. In developing countries, except for Chile, all contracts where the assets are held by the private sector are with local companies (Owen, 2008).
- 18 This estimation is based on data provided to UNCTAD by the *Envisager Water and Wastewater Database*, which covers a total of 343 water-specific private sector contracts serving at least 10,000 people in developing economies and awarded between 1987 and 2008.
- 19 The countries covered were Canada, China, France, Germany, India, Japan, the Netherlands, the Russian Federation, the United Arab Emirates, the United Kingdom and the United States.
- 20 New legislation approved by the Russian Duma in April 2008 requires foreign investors seeking to acquire more than 50% of the shares of Russian companies operating in strategic sectors to obtain government approval (see Foreign investment in Russian strategic industries: Duma approves Bill, in: *Policy Matters*, April 2008; available at: https://www.usrbc.org/pics/File/Member%20Contributions/PolicyMatters_April2008.pdf).
- 21 In many cases, when IPAs do not actively promote FDI in infrastructure, it is because FDI promotion for this sector is sometimes handled by another government agency (47%). In general, however, reasons also seem to be IPA-specific (e.g. lack of capacity, different focus), or country-specific (e.g. only public investment permitted or via public concessions).
- 22 Infrastructure projects are often governed by an overarching concessionary agreement. However, for a large project, a cluster of over 40 contracts may formalize arrangements among the numerous actors involved (Esty, 2004).
- 23 See "Best practices for contract renegotiation", *IT Business Edge Negotiation*, 3 September 2005, (www.itbusinessedge.com/item/?ci=17180).
- 24 The small number of firms and the market dominance of lawyers from these two economies may be tied to the dominance of investment bankers from these jurisdictions in financing infrastructure projects globally (Flood, 2002).
- 25 Also, issues related to legal house tenure and gender discrimination can be very important considerations with regard to access to water, but are not strictly related to water management.
- 26 Tariffs appear to have been better designed in the electricity sector (Fay and Morrison, 2007).
- 27 In this context, recent arbitrations have underlined the importance of so-called domestic "conformity clauses", requiring that investments be made in accordance with the law of the host country. Such clauses gain special significance when investments violate domestic law. Depending upon the circumstances, claims by an investor concerning such investments will not be allowed by international tribunals. See, for example, *Fraport AG Frankfurt Airport Services Worldwide v. Republic of the Philippines*, ICSID Case No. ARB/03/25 (Germany/Philippines BIT), Award of 16 August 2007; *Inceysa Vallisoletana S.L. v. Republic of El Salvador*, ICSID Case No. ARB/03/26 (El Salvador/Spain BIT), Award of 2 August 2006; *Desert Line Projects LLC v. Republic of Yemen*, ICSID Case No. ARB/05/17 (Oman/Yemen BIT), Award of 6 February 2008.
- 28 On the other hand, such a strategy might also be based on protectionism, in which case arbitrators would decide whether it is a valid defence (UNCTAD, forthcoming c).
- 29 The seminal decision in this respect is the "Neer" case (*Neer v. Mexico*, Opinion, United States-Mexico General Claims Commission, 15 October 1926, A.J.I.L. 555, 1927).
- 30 A regulatory taking can be defined as a government measure that, while leaving the property rights of an investor formally untouched, has the effect of depriving the investor of all or a substantial part of the economic value of the investment.
- 31 This number does not include cases that are exclusively based on investment contracts (State contracts), and cases where a party has so far only signalled its intention to submit a claim to arbitration, but has not yet commenced the arbitration (notice of intent). Since the International Centre for Settlement of Investment Disputes (ICSID) is the only arbitration facility to maintain a public registry of claims, the number of actual treaty-based cases is likely to have been still higher. See UNCTAD, "Latest developments in investor-State dispute settlement", *IIA Monitor* No. 1, 2008, UNCTAD/WEB/ITE/IIA/2008/3.
- 32 Of the 95 known disputes related to infrastructure 70 were filed with ICSID (or the ICSID Additional Facility), 20 under the arbitration rules of the United Nations Commission on International Trade Law (UNCITRAL), 3 with the Stockholm Chamber of Commerce and the remaining 2 through ad-hoc arbitration.
- 33 See also *Azurix v. Argentine Republic*, ICSID Case No. ARB/01/12 (Argentina/United States BIT), Award of 14 July 2006; and *Aguas del Tunari S.A. v. Republic of Bolivia*, ICSID Case No. ARB/02/3 (Bolivia/Netherlands BIT), registered on 25 February 2002; and several disputes against Argentina following emergency laws.
- 34 See *Consortium Groupement L.E.S.I.- DIPENTA v. Algeria*, ICSID Case No. ARB/03/08 (Algeria/Italy BIT), Award of 10 January 2005, *L.E.S.I. S.p.A. et ASTALDI S.p.A. v. Algeria*, ICSID Case No. ARB/05/3 (Algeria/Italy BIT), Decision of 12 July 2006.
- 35 See, for example, *Nagel v. Czech Republic*, SCC Case 49/2002 (Czech Republic/United Kingdom BIT), Award of 9 September 2003.
- 36 See, for example, *Telekom Malaysia Berhad v. Republic of Ghana*, Case No. HA/RK 2004, 667 and 788 (Ghana/Malaysia BIT), Decision of 18 October 2004.

- ³⁷ See, for example, *France Telecom v. Lebanon* (France/Lebanon BIT), Award of 22 February 2005.
- ³⁸ See, for example, *Telefónica S.A. v. Argentine Republic*, ICSID Case No. ARB/03/20 (Argentina/Spain BIT), Registered on 21 July 2003; *E.T.I. Euro Telecom International N.V. v. Republic of Bolivia*, ICSID Case No. ARB/07/28 (Bolivia/Netherlands BIT), Registered on 31 October 2007.
- ³⁹ Two known disputes also arose with regard to the setting up of a motor vehicle registry.
- ⁴⁰ See, for example, *Jan de Nul N.V. and Dredging International N.V. v. Arab Republic of Egypt*, ICSID Case No. ARB/04/13 (Belgium-Luxembourg/Egypt BIT), Decision on Jurisdiction of 16 June 2006.
- ⁴¹ See, for example, *Bayindir Insaat Turizm Ticaret Ve Sanayi A.S. v. Islamic Republic of Pakistan*, ICSID Case No. ARB/03/29 (Pakistan/Turkey BIT), Decision on Jurisdiction of 14 November 2005.
- ⁴² See, for example, *Bayindir Insaat Turizm Ticaret (op. cit.) and Walter Bau AG v. Kingdom of Thailand*, UNCITRAL (Germany/Thailand BIT), 2007.
- ⁴³ See, for example, *Lanco International Inc. v. Argentine Republic*, ICSID Case No. ARB/97/6 (Argentina/United States BIT) Award on Jurisdiction of 8 December 1998.
- ⁴⁴ See, for example, *Walter Bau AG v. Kingdom of Thailand*, UNCITRAL (Germany/Thailand BIT), 2007.
- ⁴⁵ See, for example, *Consortium R.F.C.C. v. Kingdom of Morocco*, ICSID Case No. ARB/00/6 (Italy/Morocco BIT), Final Award of 22 December 2003.
- ⁴⁶ See, for example, *ADC Affiliate Limited and ADC & ADMC Management Limited v. Republic of Hungary*, ICSID Case No. ARB/03/16 (Cyprus/Hungary BIT), Award of 2 October 2006.
- ⁴⁷ See, for example, *PSEG Global et al. v. Republic of Turkey*, ICSID Case No. ARB/02/5 (Turkey/United States BIT), Award of 19 January 2007.
- ⁴⁸ See, for example, *Impregilo S.p.A. v. Islamic Republic of Pakistan*, ICSID Case No. ARB/03/3 (Italy/Pakistan BIT), Decision on Jurisdiction of 22 April 2005.
- ⁴⁹ See, for example, *Noble Energy, Inc. and Machalaporer CIA. LTDA v. Republic of Ecuador and Consejo Nacional de Electricidad*, ICSID Case No. ARB/05/12 (Ecuador/United States BIT), Decision on Jurisdiction of 5 March 2008.
- ⁵⁰ See, for example, several cases related to Argentina.
- ⁵¹ See, for example, *M.C.I. Power Group L.C. and New Turbine, Inc. v. Republic of Ecuador*, ICSID Case No. ARB/03/6 (Ecuador/United States BIT), Award of 31 July 2007.
- ⁵² See, for example, *Hrvatska Elektroprivreda d.d. v. Republic of Slovenia*, ICSID Case No. ARB/05/24 (Energy Charter Treaty), Registered on 28 December 2005.
- ⁵³ See, for example, *Société Générale v. Dominican Republic*, UNCITRAL (Dominican Republic/France BIT), 2007.
- ⁵⁴ See, for example, *Barmek Holding A.S. v. Republic of Azerbaijan*, ICSID Case No. ARB/06/16 (Energy Charter Treaty), Registered on 16 October 2006; *Empresa Eléctrica del Ecuador, Inc. (EMELEC) v. Republic of Ecuador*, ICSID Case No. ARB/05/9 (Ecuador/United States BIT), Registered on 26 May 2005; *Libananco Holdings Co. Limited v. Republic of Turkey*, ICSID Case No. ARB/06/8 (Energy Charter Treaty), Registered on 19 April 2006.
- ⁵⁵ A large number of arbitration awards can be found in the UNCTAD database at: www.unctad.org/iia; other main sources on the Internet include: <http://ita.law.uvic.ca>, www.investmentclaims.com (subscription required), and <http://icsid.worldbank.org/ICSID/Index.jsp>.
- ⁵⁶ These figures do not include claims for, and awards of, interest and legal costs.
- ⁵⁷ See also Dolzer and Schreuer, 2008.
- ⁵⁸ For example, in *Compañía de Aguas del Aconquija S.A. and Vivendi Universal v. Argentine Republic*, the tribunal concluded that a unilateral lowering of tariffs by the regulator and a prohibition to pursue lawsuits and enforce judgements rendered against debtors constituted an illegitimate campaign against the foreign investor amounting to a violation of the FET standard, ICSID Case No. ARB/97/3, Award of 20 August 2007 at para. 7.4.39.
- ⁵⁹ See *PSEG Global et al. v. Republic of Turkey*, ICSID Case No. ARB/02/5 (Turkey/United States BIT), Award of 19 January 2007 at para. 252-253.
- ⁶⁰ *Parkerings-Compagniet AS v. Republic of Lithuania*, ICSID Case No. ARB/05/8 (Lithuania/Norway BIT), Award of 11 September 2007.
- ⁶¹ See, for example, *Parkerings-Compagniet AS v. Republic of Lithuania*, (*op. cit.*) at para. 331: “The expectation is legitimate if the investor received an explicit promise or guaranty from the host-State, or if implicitly, the host-State made assurances or representation that the investor took into account in making the investment. Finally, in the situation where the host-State made no assurance or representation, the circumstances surrounding the conclusion of the agreement are decisive to determine if the expectation of the investor was legitimate. In order to determine the legitimate expectation of an investor, it is also necessary to analyse the conduct of the State at the time of the investment.” See also *M.C.I. Power Group L.C. and New Turbine, Inc. v. Ecuador*, ICSID Case No. ARB/03/6 (Ecuador/United States BIT), Award of 31 July 2007 at para. 278.
- ⁶² For a discussion of the cases, see Muchlinski, 2006 and 2007.
- ⁶³ *ADC (op. cit.)*, para. 476.
- ⁶⁴ *Compañía de Aguas del Aconquija S.A. and Vivendi Universal (op. cit.)*.
- ⁶⁵ *Vivendi (op. cit.)*, at paras. 7.5.22 and 7.5.25. See also *Consortium RFCC (op. cit.)*, para. 165; *Azurix Corp (op. cit.)*, para. 315; *Parkerings-Compagniet AS (op. cit.)*, paras. 443–456.
- ⁶⁶ *LESI-DIPENTA (op. cit.)*, para. 25(ii) [English translation of the original award in French]. The case dealt with difficulties in execution and finally the cancellation of a contract that the claimant was awarded for the construction of a dam to provide drinking water to the city of Algiers.
- ⁶⁷ *El Paso Energy International Company v. Argentine Republic*, ICSID Case No. ARB/03/15 (Argentina/United States BIT), Decision on Jurisdiction, 27 April 2006, para. 81. The dispute arose in the context of the Argentinean financial crisis. The United States-based claimant argued that measures taken by Argentina to counter the crisis had impaired its investments in four Argentine companies involved in the electricity and hydrocarbons industries.
- ⁶⁸ *Azurix Corp (op. cit.)*, para. 384. See also *CMS Gas Transmission Company v. The Argentine Republic*, ICSID Case No. ARB/01/8 (Argentina/United States BIT), Decision on Annulment of 25 September 2007.
- ⁶⁹ *El Paso (op. cit.)*, para. 84: “[T]here is no doubt that if the State interferes with contractual rights by a unilateral act, whether these rights stem from a contract entered into by a foreign investor with a private party, a State autonomous entity or the State itself, in such a way that the State’s action can be analysed as a violation of the standards of protection embodied in a BIT, the treaty-based arbitration tribunal has jurisdiction over [...] the claims arising from a violation of [the foreign investor’s] contractual rights.”
- ⁷⁰ See OECD, 2006b: 9–14.
- ⁷¹ Another example would be if the investor has obtained an investment contract by means of false representation (see also Muchlinski, 2007).
- ⁷² A few countries, in particular Canada and the United States, have already done so (UNCTAD, 2007k).
- ⁷³ In relative terms, growth in commitments was the highest in water supply and sanitation (198%) and the lowest in energy (30%).
- ⁷⁴ China is the biggest external provider of finance for infrastructure investment in Africa. Its commitments in 2006, estimated at

around \$15 billion, far exceeded the combined commitments by OECD countries (United Kingdom, DFID, 2007).

⁷⁵ According to this study, "total capital... at the IFC is now close to total commitments of loans, equity and debt securities... and the institution's capital adequacy ratio has risen from 45% in 2002/3 to 57% for 2006/7. The FMO's [The Netherlands Development Finance Company's] capital adequacy has increased from 38.4% in 2000 to 50.5% in 2005" (Te Velde and Warner, 2007: 2).

⁷⁶ In the investment insurance area (synonym for political risk insurance), members of the Berne Union – the leading association for export credit and investment insurance – had provided coverage amounting to \$54.5 billion in 2007. At the end of that year, Berne Union members had an investment insurance exposure of \$143.1 billion on their books. The share of private market insurers in these two figures was around 40%.

⁷⁷ See www.iaigc.net.

⁷⁸ The ICIEC is a multilateral agency, based in Jeddah, with 35 member countries. Part of the Islamic Development Bank Group, it has become very active in investment insurance in recent years. For example, ICIEC cooperated with MIGA in covering the Doraleh Container Terminal project in Djibouti (see also box V.13), covering \$50 million of the total coverage of \$427 million.

⁷⁹ Membership in ATI is open to all African States that are or could become members of the African Union (including Burundi, the Democratic Republic of the Congo, Djibouti, Eritrea, Kenya, Madagascar, Malawi, Rwanda, Uganda, the United Republic of Tanzania and Zambia) as well as international development finance institutions and regional economic organizations (www.ati-aca.org). Private corporations with the competence, interest and commitment to support trade and investments in Africa may also join ATI as corporate members. Current corporate members

include COMESA, Atradius Group, the Eastern and Southern African Trade and Development Bank (PTA Bank) and PTA Reinsurance Company.

⁸⁰ Its FDI insurance covers the investor or financier against loss of equity in a project due to confiscation or broad political *force majeure*. Risks covered include, *inter alia*, inability to transfer dividends overseas in hard currency, confiscation, expropriation, nationalization, breach of concession rights, forced abandonment and political violence.

⁸¹ Despite these drawbacks, an exchange-rate guarantee for a specific project may be preferable to government financing of a project because the exchange-rate guarantee exposes the government to a single risk rather than to the full range of project risks.

⁸² Communication by the Berne Union.

⁸³ See www.pidg.org.

⁸⁴ The additional funding, received in 2008, was provided by the United Kingdom (\$12 million), Norway (\$9 million), and the African Development Bank (\$10 million).

⁸⁵ When established, this facility will, among other things, provide legal advice and help develop legal competencies in complex commercial transactions, project finance and investments agreements. It has been proposed that funding would come from contributions from the Bank, from member and non-member countries of the Bank, and other international organizations.

⁸⁶ See web.worldbank.org/wbsite/external/countries/africaext/extregini/extafreginicoo/0,,contentmdk:20625610~menuup:1631231~pagepk:64168445~pipk:64168309~thesitepk:1587585,0.html.

⁸⁷ Communication from ICA.