

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
			–	Entel	Mobitel	–
	Bolivia	–	Millicom	América Móvil	Intelfon	5
Colombia	América Móvil	–	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.

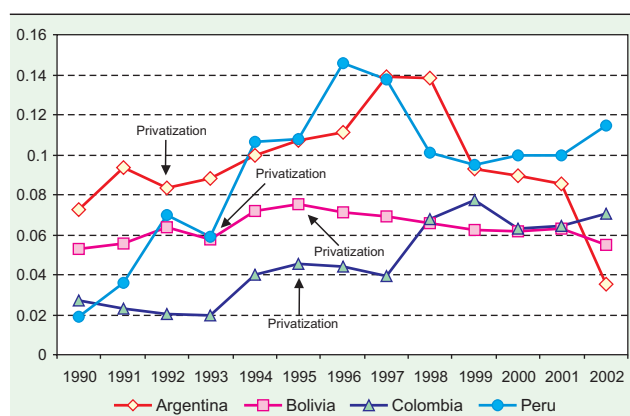
However, it is not always politically feasible to do this. For instance in India, when State electricity boards signed contracts with eight independent power producers (IPPs) (all with TNC participation) to purchase the output of the latter at agreed prices during industrial reforms in the early 1990s, 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.)