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Transnational Corporations and the Infrastructure Challenge

An African perspective¹

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1. Introduction

The provision of good quality infrastructure is a prerequisite for economic and social development. It is considered one of the main preconditions for enabling developing countries to accelerate or sustain the pace of their development and achieve the Millennium Development Goals (MDGs) set by the United Nations. Infrastructure – especially electricity, telecommunications, transport and water – is important for all economies as they provide goods and services that are crucial for the efficiency, competitiveness and growth of production activity. Furthermore, access to affordable electricity and drinking water is an important determinant of the living standards of a country’s population.

Many low-income countries face huge infrastructure investment needs but lack the necessary capacity domestically to meet them. Mobilizing financial and other resources to respond to these needs are among the main challenges which beset governments and the international community. The gap between these needs and the availability of necessary resources has been one of the drivers behind the fundamental change in the role of the State in the provision of infrastructure in the past decades. Over the past two decades governments - from both developed and developing countries - have opened up infrastructure industries to much greater involvement by the private sector – including transnational corporations (TNCs).

This paper aims at contributing to a better understanding of the nature and extent of this involvement and of its development impact and policy implications. It focus on the four above mentioned infrastructure industries (electricity, telecommunications, transport and water services) and is organized as follows: against the background of the huge infrastructure needs (and investment gaps) in developing countries, section II examines the role and evolution of TNC participation in infrastructure in developing countries, with particular attention to Africa. Section III assesses the extent to which such participation has contributed to achieving various infrastructure-related development objectives and Section IV considers the policy implications of this participation in a development perspective. Section V concludes.

2. TNCs in infrastructure industries in Africa and other developing countries

a) Investment needs and financing gaps in infrastructure in developing countries

The magnitudes of the infrastructure investment needs of developing countries in general are huge, and the financing gaps enormous. It is estimated for instance that, on average, developing countries actually invest about 3–4% of their GDP on infrastructure annually, whereas they should be spending about 7–9% on new investment projects and maintenance of existing infrastructure, if broader economic growth and poverty reduction goals are to be achieved (World Bank, 2008; Fay and Morrison, 2007). Unless the current level of infrastructure spending in all infrastructure industries is increased to match projected investment needs, developing countries will face a serious challenge in meeting their targets for growth and development. This is particularly true for African LDC countries where public sector budgets are limited, private investment has fallen short of needs, and where ODA support is declining.

The gap between actual and needed finance for infrastructure investment, while significant, varies however across all developing regions and infrastructure industries. In *Sub-Saharan Africa*, for instance, this gap may exceed 50%. Indeed, it is estimated that \$40 billion investment in new infrastructure facilities and maintenance is needed annually until 2015 to meet the sub region's MDGs poverty reduction targets², with roads clearly requiring the largest investments, followed by electricity (table 1). Yet only, \$16.5 billion is likely to be forthcoming annually from identifiable internal, external and ODA sources, leaving an estimated annual financing shortfall of \$23.5 billion (Taylor, 2007).

Table 1. Sub-Saharan Africa: estimated annual infrastructure investment needs in selected industries, 2006–2015^a
(Annual average, in billions of dollars)

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

Source: UNCTAD, World Investment Report 2008: Transnational Corporations and the Infrastructure Challenge, figure III.3

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

^b Excluding investment needs for irrigations.

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

Similarly the investment needs and financing gap of the *Asia and Oceania* region are large, especially when considering the significant investment requirements of China and India³. In *Latin America and the Caribbean*, the public sector investment in infrastructure in the region has declined significantly, partly as a result of fiscal adjustments and a policy shift towards entrusting the private sector with greater responsibility for infrastructure development. Some 3-6 % of GDP would need to be spent annually on infrastructure in the region: currently however only 2 % is spent on average (Omura 2006, Fay and Morrison, 2007).

² This assumes an average annual economic growth rate of 7% and annual investment in infrastructure of 9% of GDP (Estache, 2005; Taylor, 2007)

³ Based on UN - ESCAP estimates for instance, the annual financial gap for Asia and Oceania in infrastructure for 2006- 2010 amounts to 220 \$billion dollars, i.e. about 36 % of the estimated financing needs for the region.

Regional integration in different parts of the world , a crucial element for facilitating intraregional trade, production and investment, is also accentuating the need for regional infrastructure development and cooperation. The investment requirements of those regional projects are also significant, although, in some cases overall financing gaps in countries can be bridged through a sharing of development costs or exploiting economies of scale and scope. A leading example of this financing gap is in electricity, given the scale of power blackouts in rapidly growing developing economies such as Brazil and South Africa.⁴ The investment gap is also large in other infrastructure industries, with the possible exception of some parts of the telecommunications sector, in which costs are falling because of rapid technological progress.

The size of the financing gap is such that all sources of finance, including investment by TNCs, will need to be tapped into.

b) The expansion of foreign investment in infrastructure industries

i) The changing role of the state

One of the fundamental changes that the infrastructure sector went through over the past decades relates to the changing the role of the State and the concomitant increase in private sector participation, through a series of reforms, such as market liberalization, regulatory changes and enterprise restructuring. The earliest moves towards liberalization in infrastructure industries, during the late 1970s and 1980s, stressed different aspects of the reform process: regulatory reform and unbundling for instance in United States, privatization along with regulatory reform in the United Kingdom; and the creation of infrastructure State owned enterprise (SOEs) in some European countries (Clifton, Comín and Díaz-Fuentes, 2007). After 1990s, most of the developing countries, in particular in Africa, reformed their infrastructure industries opting for market liberalization through divestitures of State assets and other forms of private participation, including the involvement of TNCs.

New players emerged in infrastructure industries, both as operators and financiers, following the reduced or altered role of the State in infrastructure investment and operations. Some of them are the SOEs and private firms established since the 1980s, that began expanding abroad and have now become TNC in their own right, sometime featuring among the largest firms in the world. More recently a new breed of financiers has also emerged. It includes in particular private equity investors (infrastructure investment funds, or institutional investors such as pension and mutual funds for instance) which are attracted specifically by opportunities in infrastructure industries, both in their home and foreign markets (for example Renaissance Capital is increasingly involved in Africa, especially in Kenya and Nigeria, or Macquarie Bank Group, with the largest number of infrastructure funds under management, is active in India and South Africa). It also includes a second group of investors which operate in different sectors, composed of a variety of State-owned or government-linked entities, including sovereign wealth funds (SWFs) . Some of these investors also invest for strategic reasons in infrastructure to support their other activities, including in the extractive industries overseas for instance; this is the case for example of some infrastructure financiers from China, India and South Africa.

⁴ It has been estimated that during this decade, to 2010, developing countries will need to invest \$160 billion annually in electricity generation, transmission and distribution, but so far, only about half of this amount has been forthcoming.

Despite the remarkable expansion of the private sector in infrastructure, the role of the state remains however critical. While it plays today a lesser role as investor, its function as a regulator and a mediator is of increasing importance and is crucial to ensure that private participation in infrastructure project contributes to development objectives.

ii) Recent trends in FDI and other forms of TNC participation in infrastructure

Two features characterize FDI infrastructure industries in recent years: first its significant rise in the past fifteen years, and second the emergence in the past five to ten years of developing country investors.

FDI in infrastructure, mostly by TNCs from developed countries, rose significantly in the 1990s. The turn of the century however witnessed a decline in infrastructure FDI flows, followed by a recovery recently. Today, the share of infrastructure industries in global FDI stock currently hovers at close to 10%, but this represents a large increase over their roughly 2% share in 1990. At the industry level, the share of electricity, gas and water as a group remained at around 2%, or less, of total FDI between 1995 and 2006; while that of transport, storage and communications reached a peak of 7% in 2000, but fell back to 6% in 2006⁵.

Table 2. Inward FDI stock in electricity, gas and water, and in transport, storage and communications, by region, 1990, 1995, 2000 and 2006 (Millions of dollars)

Region	1990		1995		2000		2006	
	Electricity, gas and water	Transport, storage and communications	Electricity, gas and water	Transport, storage and communications	Electricity, gas and water	Transport, storage and communications	Electricity, gas and water	Transport, storage and communications
World	7 427	17 542	22 543	54 806	91 915	337 975	175 210	558 817
Developed countries	5 120	13 026	14 591	30 514	57 833	253 380	137 996	439 217
Developing countries	2 307	4 488	7 824	20 476	33 254	78 630	35 634	112 115
Africa	-	132	73	1 901	180	5 737	15	12 813
Asia and Oceania	14	1 366	1 875	10 944	5 884	34 708	13 833	80 121
Latin America and the Caribbean	2 293	2 990	5 876	7 630	27 190	38 186	21 785	19 181
South-East Europe and the Caucasus	-	28	129	3 816	828	5 965	1 581	7 486
Memorandum item: LDCs	-	1	240	209	396	627	2 511	870

Source: UNCTAD, World Investment Report 2008: Transnational Corporations and the Infrastructure Challenge, figure III.4

Following a substantial increase between 1990 and 2000 - from 27% to 37% -, the share of developing countries in global FDI stock in infrastructure fell back in recent years; it accounted for about a quarter of such stock in 2006 (table 2). Over the years, Africa remained by far the smallest recipient among developing regions (table 2). Its share in the developing countries FDI inward stock in transport, storage and communication, while still relatively small, increased however from 2.9% in 1990 to 11.4% in 2006, mostly as a result of significant investments in telecommunications.

Another measure of TNC participation in infrastructure, foreign investment commitments in private participation in infrastructure (PPI) projects⁶, also point to the significant investment by TNCs in these industries in developing countries. During the period 1996–2006, such commitments amounted to about \$246 billion, with a concentration in Latin America and the Caribbean (about 67% of foreign investment commitments for the whole period). Only 15 % of these commitments were directed to Africa for the same period. However after the turn of century, TNC commitments shifted away from Latin America and the Caribbean to Asia and Oceania, which became the largest recipient region, and to the Africa continent (table 3). The latter's share of foreign

⁵ Statistics on FDI flows and stock are available only for electricity, gas and water as one group and for transport, storage and telecommunications as another one.

⁶ These data are from the World bank PPI database. Such data - which cover all forms of financial commitments by private entities - include FDI as well as non-equity contributions to investments (such as debt instruments).

commitments almost tripled (to 30%) largely owing to investments in telecommunications.

The group of *LDCs* - where the bulk of countries is from Africa - has remained by and large marginalized in the process of globalization of infrastructure investment, accounting for about 2% of the stock of infrastructure FDI in developing countries in 2006. Their share in the foreign investment commitments in infrastructure industries of developing and transition economies in the period 1996–2006 (of \$246 billion) was less than 5% (table 4).

Table 3. Foreign investment commitments in the infrastructure industries of developing economies, by host region, 1996–2006

(Millions of dollars and per cent)

Region	All infrastructure			
	1996–2000		2001–2006	
	Value (\$ million)	Share in total developing economies (%)	Value (\$ million)	Share in total developing economies (%)
Africa	19 691	12.1	25 473	30.4
Asia and Oceania	33 332	20.5	31 404	37.4
Latin America and the Caribbean	109 383	67.4	27 038	32.2
Total for developing countries	162 407	100.0	83 915	100.0
<i>Memorandum items:</i>				
<i>LDC</i>	5 778	3.6	7 234	8.6
South-East Europe and CIS	9 203	..	8 478	..
New EU members	23 628	..	18 424	..

Source: UNCTAD, *World Investment Report 2008: Transnational Corporations and the Infrastructure Challenge*, table III.7

Table 4. Industry composition of foreign investment commitments in the infrastructure industries of LDCs, 1996–2006

(Millions of dollars and per cent)

Infrastructure industry	Value (\$ million)	Share in LDC total (%)	Share of LDCs in developing and transition total (%)
All infrastructure	13 013	100.0	4.9
Energy	4 569	35.1	4.2
Telecom	6 394	49.1	6.4
Transport	2 017	15.5	4.5
Water	32	0.2	0.3

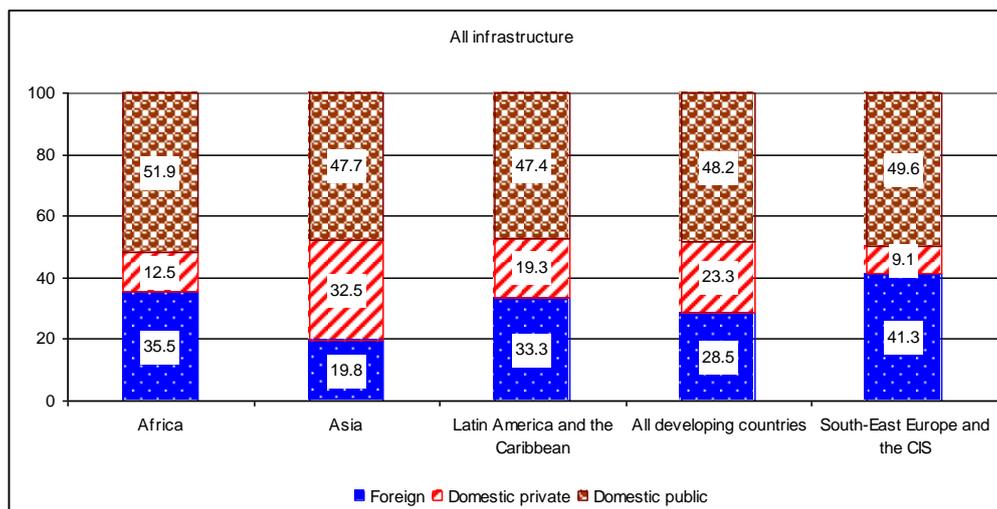
Source: UNCTAD, *World Investment Report 2008: Transnational Corporations and the Infrastructure Challenge*, table III.9

In spite of the increase in commitments noted above, however, the amounts involved fall far short of the investment needs of developing countries in infrastructure. For instance in the case of Africa, foreign investment commitments for the ten year period 1996 – 2006 amounted to about \$45 billion (table 3), which is barely equivalent to the annual infrastructure needs of the continent mentioned above (\$40 billion).

The share of foreign to total commitments in each region reflects the importance of foreign investors in their infrastructure financing. This ratio has been higher in Africa (36%) and Latin America (33%) and relatively low in Asia where domestic private

investment plays a relatively important role (figure 1). By contrast, private domestic investment in infrastructure accounted for the smaller share in Africa, suggesting that when the private sector is involved in that region it is predominantly foreign.

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



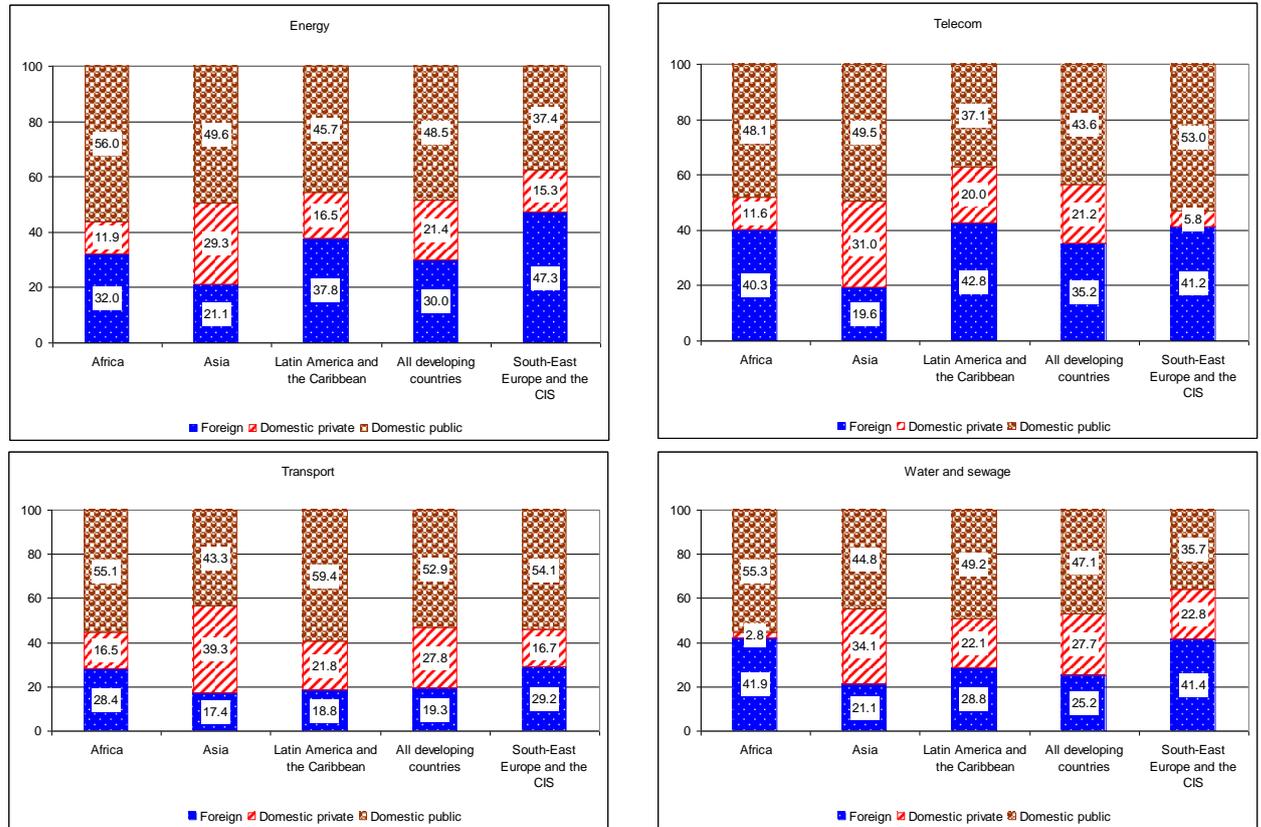
Source: UNCTAD, *World Investment Report 2008: Transnational Corporations and the Infrastructure Challenge*, based on figure III.1.

Available information from the World Bank PPI database also suggest that telecommunications and electricity were the two most important targeted infrastructure industries for foreign investors (with telecommunications clearly ahead of all others) while transport, and to a lesser extent water services, were more modest targets

Data on cross-border M&As of infrastructure companies in developing countries (figure 3) supplement FDI data, as they cover a larger number of host countries. These figures broadly confirm the trends in FDI, and suggest that developing countries paralleled world cross-border M&A trends in infrastructure industries, including the peak level reached in the late 1990s. Here again, the share of Africa is virtually nil until the early 2000s, and remains in any case extremely limited.

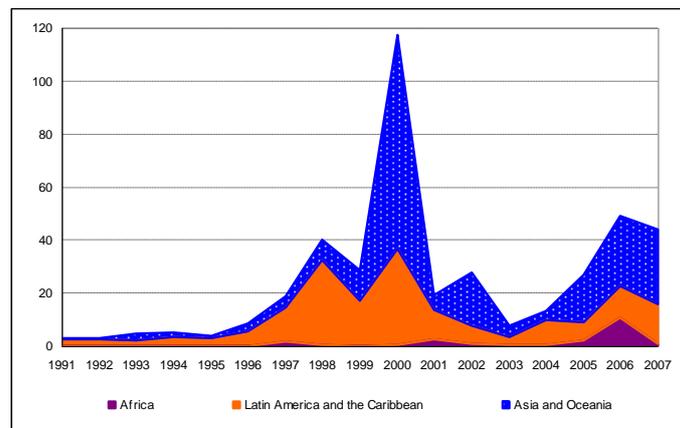
Figure 2. Share of foreign, domestic private and domestic public investors in the investment commitments of the infrastructure industries of developing countries and transition economies, by region, 1996–2006

(Per cent)



Source: UNCTAD, *World Investment Report 2008: Transnational Corporations and the Infrastructure Challenge*, figure III.1.

Figure 3. Cross-border M&A sales in infrastructure by developing target region, 1991–2007



Source: UNCTAD, *World Investment Report 2008: Transnational Corporations and the Infrastructure Challenge*, figure III.1.

The origin of FDI stocks in infrastructure is still predominantly from developed countries but FDI from developing and transition economies rose substantially in the past

fifteen years: its share in total outward FDI stock in infrastructure increased from less than 1 to close to 9 per cent between 1990 and 2006 (table 5). This expansion was most markedly led by FDI from Asia. In some industries (such as telecommunications for instance) while developed country TNCs divested from some failed or difficult projects, several developing-country TNCs entered into a phase of fast international expansion. Today a number of them have become important global players in their respective industries, as illustrated in the following section.

Table 5. Outward FDI stock from selected economies in infrastructure, 1990, 1995, 2000 and 2006
(Millions of dollars and per cent)

Home region/economy	Industry	1990	1995	2000	2006
World	Electricity, gas and water	7 301.2	14 458.9	86 264.9	117 454.1
	Transport, storage and communications	31 974.0	75 484.5	441 348.7	484 865.2
	Share of infrastructure in total FDI (%)	2.9	3.5	10.3	6.0
Developed countries	Electricity, gas and water	7 301.2	14 458.9	85 365.1	109 526.0
	Transport, storage and communications	31 617.4	58 367.3	418 715.8	440 331.8
	Share of infrastructure in total FDI (%)	2.9	3.2	11.0	6.1
Developing economies	Electricity, gas and water	-	-	899.8	7 519.2
	Transport, storage and communications	356.6	17 116.9	22 556.9	44 620.3
	Share of infrastructure in total FDI (%)	3.0	6.3	4.4	5.1
Of which Latin America	Electricity, gas and water	-	-	105.8	4 452.6
	Transport, storage and communications	20.3	75.9	1 160.7	2 799.7
	Share of infrastructure in total FDI (%)	1.3	1.9	2.1	7.1
Of which Asia	Electricity, gas and water	-	-	794.0	3 066.5
	Transport, storage and communications	336.3	17 041.0	21 332.8	41 447.0
	Share of infrastructure in total FDI (%)	3.2	6.3	4.6	4.8

Source: UNCTAD, World Investment Report 2008: Transnational Corporations and the Infrastructure Challenge, based on annex table A.III.4

c) The changing universe of infrastructure TNCs

Although developed-country TNCs still dominate in infrastructure industries internationally, there has been a marked rise in involvement by developing-country firms. For instance, 22 of the top 100 infrastructure TNCs in the world (ranked by their international assets) are from developing countries, a much larger proportion than is the case for all industries⁷. In some cases, such as telecommunications, they have emerged as major players, and in others, such as transport, they have now become world leaders⁸.

TNCs from the South are playing an increasingly prominent role in the infrastructure industries of developing countries, though they do not invest as much as their developed-country counterparts. In Africa, for instance, developed country TNCs still are the largest investors in infrastructure industries, but six of the top TNCs are from developing economies (table 6). The importance of the role of developing country investors in Africa is reflected in their share in foreign commitments, which is close to 40% and particularly high in telecoms (58% of all investment commitments), and transport. Regional proximity is an important factor: out of the top 50 foreign investors in infrastructure in Africa over the 1996 -2006 period, 19 were TNCs from the South; 9 of them were headquartered in West Asia, and most of the others (8) in other African countries, especially South Africa and Egypt⁹. The second largest investor in the region, MTC (Kuwait) – renamed Zain in 2007 – is a developing-country firm, and the fourth largest is an intraregional investor (MTN of South Africa).

⁷ In the case of the largest non – financial TNCs in the world, seven in 2006 were from developing countries (WIR 08, Annex table A. I. 5)

⁸ The fourth and fifth largest investors in transports for instance are DP World and China Ocean Shipping.

⁹ Based on data from WIR 08, Annex table A.III.6

Rank	Corporation	Home economy	Grand total	Energy	Telecom	Transport	Water
1	Vivendi	France	6 113	-	6 113	-	-
2	Mobile Telecommunications Co.	Kuwait	4 989	-	4 989	-	-
3	France Telecom	France	4 945	-	4 945	-	-
4	MTN Group	South Africa	4 555	-	4 555	-	-
5	Bouygues	France	4 550	-	-	4 485	65
6	Orascom	Egypt	3 777	-	3 777	-	-
7	Bombardier	Canada	3 483	-	-	3 483	-
8	Vodafone	United Kingdom	3 455	-	3 455	-	-
9	Emirates Telecommunications Corp.	United Arab Emirates	3 411	-	3 411	-	-
10	Suez	France	3 048	3 048	-	-	-
11	Portugal Telecom	Portugal	2 474	-	2 474	-	-
12	Veolia Environnement	France	2 368	2 353	-	-	15
13	Dubai Holding	United Arab Emirates	2 250	-	2 250	-	-
14	Wataniya Telecom	Kuwait	2 069	-	2 069	-	-
15	Telefónica	Spain	1 945	-	1 945	-	-

Source: UNCTAD, *World Investment Report 2008: Transnational Corporations and the Infrastructure Challenge*, based on annex table III.6.

The emergence of developing countries TNCs, particularly mobile operators over the past decade has been remarkable, even if in term of size they are still much smaller than their developed country counterpart. The size of the largest developing country telecoms TNC (SingTel) for instance is much below that of other industry leaders from developed countries. The situation in the transport industry - in particular roads and ports - is in that respect quite interesting,. TNC growth in this sector has taken place amid huge expansion in international trade over the past decades. Fast export oriented industrialization in some developing countries has encouraged the emergence of large competitive players from the South. In road infrastructure for instance, while large European firms (from Spain and Italy in particular) have dominated investment, a significant number of firms from Latin America (Mexico in particular) and Asia (Hong Kong for instance) have invested substantially in the late 1990s and new ones have begun to emerge recently (from Brazil and Malaysia). In port management, TNCs from the South, particularly from Singapore and Hong Kong, are industry world leaders, with firms such as Hutchinson Wampoa occupying the first place.

3. Impact of TNC participation on host African and developing countries

Given the participation of TNCs in the infrastructure industries of a growing number of African countries, and the significance of infrastructure for sustainable development, the implications of TNC involvement are of considerable importance for host economies. Conceptually, the potential for positive and negative impacts arises mainly from the resources and capabilities that TNCs possess – often reflecting their firm specific advantages such as access to financial capital, both internally generated and externally mobilized, and knowledge and know how. Knowledge and know how - for instance the capability to run networks and manage complex projects - can be extremely important in infrastructure industries. The extent to which such advantages are transferred to the host economy determines the role of TNC in infrastructure development. Their entry has also an impact on market structure, competition and efficiency, and as a result on the performance of the industry. These various effects are bound to influence the provision of infrastructure services in recipient countries in term of quantity, price and

quality of service. This has implications for the economy as a whole, but also for the society though its impact on the access of the poorest segments of the population to essential services.

a) TNCs' role in mobilizing financial resources and the impact on investment in infrastructure industries

Financial strength and large cash flows, and the ability to raise funds from home-country and international markets as well as from host developing-country markets, are competitive advantages that foster rapid expansion of many TNCs operating in infrastructure. In the early 1990s, 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 Africa and Latin America were heavily indebted and turned to the private sector, including TNCs. Then, the financial situation has improved for some economies, but as stressed above the investment gap in infrastructure still remains very large in the developing world. Thus the ability of TNCs to mobilize financial resources for investment remains an important consideration for many countries.

At the same time, while investment in infrastructure by foreign firms increased during the 1990s, public sector investment in these industries declined in much of Latin America and Africa. Many countries actually reduced public expenditure in expectation of the increase in private investment. However, the amount actually invested by private participants did not compensate for the decline in public sector spending. This suggests that TNC investment, while a potential significant source of infrastructure finance, should not be viewed as a substitute for public investment to meet a country's investment needs in infrastructure. It should rather be considered as an important complement to domestic investment.

b) Impact on the provision of infrastructure services

TNCs affect the performance of infrastructure industries and the provision of those services in which they participate, not only through their capital stock but also through their technological effects and their effects on competition and efficiency of service provision.

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. Studies show that in a number of cases the introduction of both hard and soft technology by TNCs has helped enhance productivity as well as reliability and quality. This has been the case for instance in mobile telephony and in port management.¹⁰ However such benefits are not automatic. They often depend upon the establishment in the host country of a well-defined regulatory framework that will for instance encourage cooperation between foreign and local firms, for example in project management, as well as of local enterprises capable of taking advantage of spillovers.

¹⁰ Inges (2007), Nazareth (2008), UNCTAD (2007) and World Bank (2001) for instance

The impact of TNC entry into infrastructure industries on competition partly depends upon the natural monopoly characteristic of the industry. Where the potential for competition exists, TNC entry through greenfield investments can increase competition, and thus, efficiency. As a result the impact of TNC participation on competition varies by industry.

- In mobile telephony, for instance, 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. TNC entry in the absence of sufficient numbers of domestic competitors has helped enhance competition, contributing to improved economic performance. This is reflected, for instance, in higher efficiency and lower prices, as illustrated in the case of Uganda where competition between Uganda Telecom (State-owned, but partially privatized), Celtel (the Netherlands) and MTN (South Africa), has been intense and led to price reductions and a rapid increase in mobile penetration¹¹: On the other side, the entry of TNCs may also pre-empt 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.
- 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. In many countries, 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 provides possibilities for governments to introduce competition in electricity generation and to allow the entry of IPPs. Such an option however does not exist in all countries. In a number of LDCs in particular (such as Botswana, Burkina Faso, Eritrea, Ethiopia, Lesotho, Malawi, Namibia and Niger) there are no IPP largely because of a lack of local capabilities.

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 by TNCs has been implemented by developing countries such as Morocco in telecommunications, with favourable results for competition.

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. The participation of TNCs has generally increased the supply and improved the quality of infrastructure services in host countries, but their impact on prices has varied.

¹¹ The number of subscribers increased from two per 1,000 inhabitants in 1998 to 31 per 1,000 in 2003 (Econ One Research, 2002; Farlam, 2005).

- In electricity for instance, 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. 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).
- In telecommunications, improvements in supply and coverage has been most significant and accompanied in a number of cases by improved quality of services. This has been the case for a number of Latin American countries, following privatization. In Africa, the fast expansion of mobile services has led to a "mobile revolution". 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, 2007; Waverman, Meschi and Fuss, 2005), thus enhancing affordability. In addition, the expansion of mobile services into low-income segments has been facilitated by the introduction of new business models by TNCs, such affordable prepaid subscriptions (sometimes with users sharing a subscription) that have accounted for the bulk of Africa's - s 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 - that were not previously considered by national providers as serviceable and profitable - to gain access to telecommunications, . In that respect, the case of Uganda (where the government required the two operators in the country to provide full coverage to the entire country) shows that government policies can influence the contribution of TNCs to universal access, including in rural areas. Unfortunately, similar improvements in internet services in term of supply and prices have not been registered in Africa.
- In transport industry, TNCs are also involved in the development of transport corridors for facilitating trade and transportation links aimed at improving regional integration, 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.
- 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, and their impact in terms of increases in quantity supplied, measured in terms of connections, has been modest. There has been some cases, though, of schemes for TNC participation in water services that have led to significant service expansion in the years following privatization, as in the case of Morocco (Pérard, 2008). As far as price effects are concerned, in many countries water tariffs have traditionally been kept low through government subsidies and other policies. In such circumstances, private sector participation alongside reform can be expected to lead to price increases, especially if increased supply capacity and efficiency gains are

insufficient to compensate for the lack of subsidies. This has been the case in water services in many instances.

In summary, in telecommunications and transport industries, TNCs have contributed substantially to making services more affordable and accessible. For those services that are considered essential, such as drinking water, if the efficiency improvements achieved by TNCs cannot allow them to maintain prices at low levels while covering costs, and the government does not provide subsidies to users, access for the poor is affected. Government policies are critical for all infrastructure industries, but, from a social perspective, more so in the case of electricity and water.

4. Policy challenges

Host countries need to consider when it is appropriate to draw TNCs into the development and management of infrastructure. They also need to find ways of ensuring that projects with TNC involvement lead to the expected development effects. This is a complex policy challenge.

It was only in the 1990s that developing countries began in earnest to open up their infrastructure industries to private investment, which often meant foreign investment. Such an opening has been in fact much slower than in other industries. The trend towards opening up has been more widespread among developed countries and the relatively advanced developing and transition economies. While the nature of liberalization has varied, all groups of countries are now more welcoming to TNC activities in infrastructure than they were two decades ago (even if investment policies in infrastructure remain still more restrictive than in manufacturing and other services).

However, there are significant variations by industry. Openness is the highest in mobile telecommunications, and the lowest in water. Countries are generally more open to TNC involvement in industry segments that are relatively easy to unbundle and expose to competition. Openness also appears to be greater in countries with more developed institutional and regulatory capabilities. At the same time, some governments are becoming more careful about allowing foreign companies to take control of certain infrastructure, including power generation and distribution, port operations and telecommunications. New restrictions have been proposed based on national security or public interest concerns.

These concerns notwithstanding, many countries have moved beyond the removal of barriers to TNC involvement, and are actively promoting it in some areas of infrastructure. Many investment promotion agencies (IPAs) are targeting infrastructure industries. In a survey conducted by UNCTAD and the World Association of Investment Promotion Agencies, about 70% of the IPA respondents stated that they were actively seeking such investment, while only 24% were not. Almost three quarters of the IPAs stated that infrastructure is a more important priority than it was five years ago. In Africa 79% of IPA respondents stated they are seeking investment in energy generation and 71% in internet services. The percentage was lower in water and sanitation and electricity transmission and distribution.

Table 7. Proportion of IPAs that promote FDI in specific infrastructure industries, by region
(Percentage of responding IPAs)

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

Source: UNCTAD, *World Investment Report 2008: Transnational Corporations and the Infrastructure Challenge*, table V.3.

Some characteristics of infrastructure industries make it more difficult to promote FDI in such industries in the poorest countries. First these are usually very capital intensive and complex activities. Their assets last a long time, involve huge sunk costs and are locations specific. They are often regarded by investors and operators as high risk undertakings, especially in developing countries. In addition they are usually market seeking investment. All these characteristics put the poorest of the developing countries - particularly LDCs - at a disadvantage to attract FDI in infrastructure, as reflected in the extremely low levels of foreign investment in infrastructure observed above. For these countries greater commitments from the international community are required, through scaled up ODA and risk mitigation programmes tailored to their specific needs.

But providing more money is not the only issue at stake. There is also a need to address the infrastructure paradox, i.e. the non-utilization of available resources due to the lack of bankable projects. Designing and implementing appropriate policies to harness the potential role of TNCs in infrastructure, and setting up and monitoring bankable projects, however require adequate skills and capabilities. Government agencies have to possess the necessary skills to negotiate, and manage projects and to set up an adequate regulatory framework without which countries will lose out by opening up. There is hence a need to assist countries in building the capacities required for instance to prepare project proposals for bidding and negotiation, monitor and administer such projects, ensure greater transparency, create appropriate legal and regulatory framework, and set up law enforcement mechanisms. Recent years have seen the development of a number of initiatives in that respect, such as for instance the OCED Principles for Private Sector Participation in Infrastructure and the Infrastructure Project Preparation Facility of the NEPAD. But more remains to be done.

5. Conclusion

The development of physical infrastructure in developing countries remains one of the most urgent areas for policymakers to address. The needs are huge, and meeting them will require greater use of the private sector, including TNCs. This applies to Africa and particularly to LDCs, where infrastructure improvements are critical to their

attainment of the MDGs. At the same time, low-income countries are often poorly equipped to both attract TNCs into infrastructure and maximize the benefits from TNC involvement. Whatever mix of private and public sector involvement is chosen, adequate institutions and enforcement mechanisms are essential to ensure efficient and equitable delivery of infrastructure services. Meeting the infrastructure challenge requires a concerted effort by all relevant parties. This implies an appropriate combination of improved governance and capabilities in host countries, greater support from the international community and responsible behaviour on the part of the investors.

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